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The Scholarship of Teaching
Volume 3, Issue 1/November 2010
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Dear Colleagues,

This third edition of The Scholarship of Teaching is particularly poignant to me as it is the last issue for which I serve as editor. Our new TCLT Interim Director, Jan Worth Nelson, graciously agreed to allow me to write this final letter since the issue was underway before I assumed my new role as Dean of the School of Education and Human Services.

In this issue, our featured essayist, former Chancellor Juan Mestas, underscores the responsibility of a public university to improve the quality of its graduates’ lives while calling us to duty in engaging as active citizens within the community we serve. Psychology faculty Tom Wrobel and student Jeremy Glasstetter offer reflections of an online learning experience that took place with Tom as instructor and Jeremy enrolled in the course online from 8,000 miles away as he served on active duty in Iraq. Focusing on advancing student enrollment, nursing faculty Christina Alpin-Kalisz and Constance Creech describe their compelling approach for selecting candidates for the new Doctorate of Nursing Practice (DNP) while University Relations explains how “branding” of the academy helps communicate our distinctive identity. School of Management faculty Clement Chen and a colleague from Illinois State University assess the effectiveness and student perception of blended versus traditional classroom learning. Finally, Quamrul Mazumder, engineering faculty, shares his research on the use of metacognition to improve student learning in his courses.

As I think back to the inspiration for creating this publication, I am reminded of the conversation with Chuck Dunlop, Professor of Philosophy, when we bantered back and forth about the pressing issues surrounding general education reform. I tried to make the case for why reform would inspire a new generation of students to appreciate the relevance of general education, to which Chuck commented “relevance is over-rated.” His comment nagged at me for days. I wanted to continue our intellectual sparring and it occurred to me that a regular venue for wider debate of issues might be welcomed by our faculty. The Scholarship of Teaching was launched as a “written agora” for the presentation of ideas in the form of essays, stories, and research authored by faculty with Chuck as the first featured essayist.

Since that time, a wide range of viewpoints, scholarly work, and insights from faculty, staff, and students across our campus has been shared with one another in this internal publication. The feedback from readers has been overwhelmingly positive and the willingness of so many to write and be read by colleagues speaks to the commitment so many feel toward engaging with one another.

Working with faculty across each academic unit was an opportunity I treasure as it provided a first-hand view of faculty members at work in their classrooms. Their commitment toward advancing personal excellence in teaching was compelling to witness. I am deeply honored to have served as the director of the Thompson Center for Learning and Teaching and believe Jan Worth-Nelson to be the perfect individual to move the Thompson Center for Learning and Teaching to its next level of excellence. Her extraordinary creativity and writing talent will undoubtedly inspire others to even greater heights in exploring the scholarship of teaching.

With great regard,

Mary Jo Finney, Dean
School of Education and Human Services
Associate Professor of Education
Former Director, Thompson Center for Learning and Teaching

November 2010
A word of thanks

In her comments introducing the June 2009 issue of *The Scholarship of Teaching*, then-TCLT Director Dr. Mary Jo Finney pertinently concluded, “While the rest of the world may hang in the balance, the university is a place where reflection, contemplation and creativity are allowed to flourish.” As I think about the various transitions that have led the UM – Flint to where we are today, these three values -- reflection, contemplation and creativity -- seem more crucial to our institutional life than ever.

In particular, as I reread the essays in this issue of *The Scholarship of Teaching*, I am moved by our tradition of reflection. This is not just idle daydreaming, though certainly there is a place for that. As I write this, in fact, I keep stopping to look out the beautiful big windows of the TCLT office, where the maples above McKinnon Plaza are turning yellow and red from the top down. It’s lovely and calms me down as I arm-wrestle with the sentences crawling down the screen. Hmm, change occurring from the top down, my daydreaming brain whispers… I wonder if that’s a useful metaphor. But then I quickly steer my eyes, and my focus, back to the blinking cursor. So it goes, as Kurt Vonnegut used to say: reflecting starts with evidence. We see ourselves, we pay attention. The act of seeing is transformative: we are changed by what we see. And the smarter we get about the world from repeated acts of seeing and reflection, the more we tend to see and the more we begin to divine meaning from the complicated evidence of the world. We begin to be able to answer the complex question: What should we do? In a nutshell, this recursive cycle of seeing, reflecting and acting is at the heart of the academy.

This is the tradition *The Scholarship of Teaching* attempts to capture. My thanks to Dr. Finney for understanding the need for this publication – it exists because of her expert seeing, reflecting and acting. Thanks, also, to Sandy Alberto and the contributors, who were patient with many delays as the Center adjusted to its new era. I predict the wait – both for the writers and readers -- will be worth your contemplation.

All best,

Jan Worth-Nelson, Interim Director
Thompson Center for Learning and Teaching
Lecturer of English

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The Thompson Center for Learning & Teaching

The Thompson Center for Learning & Teaching acknowledges and advances excellence in teaching throughout campus. The Center assists faculty members in their efforts to deepen knowledge of their current teaching practice, explore new methods for promoting active learning and incorporate new technologies into teaching. To that end, the Center provides the following:

- Activities, workshops, programs and services that encourage the enhancement of teaching
- Private consultation for individuals and departments regarding pedagogical issues
- Campus-wide events and activities for faculty and staff
- Collaborative ventures with individual faculty members, departments and units
- Financial support in the forms of internally funded grants and fellowships in support of teaching
- A collection of teaching resources for faculty use

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*A faculty board, representing each academic unit, serves in an advisory capacity to the director.*

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Public Universities and the Public Good

by Juan Mestas, Chancellor Emeritus
Professor, Foreign Language

Word of Introduction

Dr. Theodosia Robertson, associate professor of history, was senior advisor to the Chancellor in 2002-2003 when Juan Mestas helped the UM-Flint move dramatically forward toward a residence hall. We asked Teddy to reflect on what she learned about him that year:

“My impression of Juan is that he cared about people, and believed that one needed to be related to people. That was true from the very beginning—that was the hallmark of how he did things. He approached people openly and warmly regardless of who they were and what his title was. This spirit extends to housing because he was absolutely convinced student housing would alter our campus in a good way. He understands the intellectual life, but he also believes the best kind of atmosphere includes a strong dimension of the community side—that the community is where we grow and learn. It would just be impossible for Juan to think that the university, located where it is, would not have relationship with our neighbors, whether they’re in the Mott Building or Saginaw Street or the College and Cultural Center. That relationship just keeps rippling out, including the physical neighborhood and the City of Flint, ripple after ripple. It’s part of his personality.”

A couple of years ago, the Regents of the University of Michigan issued a request for proposals to design, furnish and manage what would become the first student residence on the Flint campus. One of their reasons for taking this action was their desire to “encourage nearby neighborhood revitalization.” The key word was “revitalization.” The neighborhood was in very bad shape.

The reasoning that led to this decision was almost as important as the decision itself. Why would UM-Flint care about the fate of its neighborhood? The answer is simple: by its very nature, it is a public responsibility understood and appreciated by the public.

National surveys show that about 90% of Americans have confidence in state colleges and universities, a remarkable level of support. Yet, underneath that demonstration of public approval, certain inaccurate images of our institutions remain.

At one end of the spectrum we find the pervasive vision of the ivory tower, the institution dedicated to the pursuit of knowledge, truth and beauty in protected isolation, free from the contaminating influences of the outside world. While this image may be relished by a few within our campuses, mostly as nostalgia for a past that never was, no public university in Michigan—certainly not ours—fits that description.

At the other end we find the purely utilitarian view: the university as training center. This is what Alexander Astin has called the “pegboard” mission: the job market presents holes of a certain shape; the universities produce pegs shaped to fit the holes as snugly as possible. There are, indeed, institutions of higher education that pursue this narrow goal, but Michigan’s public universities—most certainly ours—have broader scopes and offer much more.

The truth is that public universities are inherently responsible to the public. They exist because the public believes, accurately, that a well-educated citizenry is essential to the health and prosperity of a democratic society. John Dewey said it well: “Democracy must be reborn in every generation, and education is its midwife.” True, our commitment to the search for knowledge, truth and beauty transcends our space and time, but we engage in that search for beauty, truth and knowledge here and now. That entails a civic duty.

Our primary responsibility to the public is to provide education of the highest quality to our students, to prepare them for a life of leadership as citizens and professionals. It is as simple as that. By and large, we do so exceptionally well.

That is why the national unemployment rate for university graduates is only about half the rate of those with only a high school degree. One reason for the difference is that the college-educated, possessing a broad set of skills and accustomed to exercising leadership, are in a better position to adjust to shifts in the employment market.

And this is why research shows that university graduates tend to be more professionally mobile, more open-minded, more cultured, more rational, more consistent, more knowledgeable of world affairs, less authoritarian, and less prejudiced than non-graduates. In other words, they tend to enjoy and create a higher quality of life.

The public responsibility for public universities goes beyond facilitating employment or higher income, or even improving the quality of graduates’ lives. We have the duty to be wholehearted participants in the efforts to improve the educational, cultural, economic and social conditions of the communities we serve. That is part of our accountability as
custodians of the public trust, but it is also a matter of being good neighbors.

An academic community exercises its civic duties best when its members act as citizen scholars, practicing what Ernest Boyer called the “Scholarship of Engagement,” linking the resources of the institution to the pressing problems, needs and concerns of the community. Institutions exercise their citizenship responsibility in many ways: through service-learning activities, through outreach efforts, through partnerships with civic and cultural organizations, and through individual acts of neighborliness—in short, by engaging in active citizenship.

Every public university in Michigan has programs and initiatives especially designed to reach out to their communities as problem-solving partners. For universities located in urban areas—such as the University of Michigan-Flint— the challenges are particularly exigent, given the multiple and complex needs of these communities in transition and the central role that the campuses play in their development and wellbeing.

That is why the Regents of the University of Michigan cited the public good as a reason for exploring the construction of student housing on the Flint campus. There is no doubt that such a move did indeed play an important role in revitalizing the city’s downtown. There is no doubt, either, that a vibrant downtown would contribute to the vitality of the university. This should be an ideal town-gown partnership.

There are now university students living in a university residence hall in downtown Flint. They are good neighbors—good members of the university and the town communities—and the neighborhood welcomes them. In fact, just about every leader of this city recognizes the critical importance that the UM-Flint residence hall has played in the development of this community. There are new restaurants and businesses and dormitories in the center of this city, around the university. Downtown has come back to life.

**LIVING AT MICHIGAN CREDO**

The University of Michigan-Flint is a special place. It is an educational community designed to foster freedom of thought and unconventional, even uncomfortable, opinions. It attempts to provide an environment conducive to inquiry, in which innovation and creativity are nurtured. Part of this openness to ideas is an acceptance and appreciation of diverse cultures from around the country and around the world -- an allowance not only for people to be different, but a recognition that such diversity is the vital core of University life. Housing and Residential Life is committed to an inclusive, sensitive, socially just and humane community in our residence halls.

Many students use their college years to explore and develop their personal identity and values. We believe this exploration can best take place in an environment that is open to and respectful of individuals across the spectrum of human differences and distinctions. It is the responsibility of every member of the Housing community, staff and students alike, to work to create and maintain such an environment. We pledge to work collectively to examine our values and conduct, and to question those values when they reflect an origin of fear, anger, or ignorance. Acts of bigotry are acts of hatred against us all, and they will not be condoned or tolerated. We must all share in the responsibility of confronting unacceptable behavior, and in providing an example of involved citizenship. We continue to strive towards fulfilling our ideals. Join us in this affirmation of our common humanity.
Online in Iraq

By Thomas Wrobel, Professor
Psychology

Word of Introduction

Does it matter where our students are physically located when they are learning? Does it matter what else a student is doing while taking our courses? How does individual experience affect a sense of community in an online course? And how does the teacher of an online class welcome, nurture and adapt to the realities of students who may be thousands of miles apart? The following two pieces – one from Iraq veteran Jeremy Glasstetter and another from his professor, Psychology Professor Thomas Wrobel, document and examine a fascinating online semester, when Glasstetter was simultaneously fighting the war in Baghdad and pursuing his UM–Flint degree.

Monday, May 5, 2008 was the first day of the Spring semester at the University of Michigan-Flint. For those of us teaching online, it was the day that our courses became available to the students enrolled. Prior to that date, the syllabus was prepared, and the assignments, discussion boards and quizzes were carefully loaded into the BlackBoard shell like dinner settings at a table awaiting the thirty registered guests.

Teaching online was a concept I first met with skepticism. I mean, after all, wasn’t online teaching just a poor imitation of taking a “real” course? Wasn’t online teaching for those (students and faculty) too lazy to come to campus? What could students possibly learn without the pearls of wisdom coming from me in person?

Nonetheless, I took the required development training, and put together an online introductory psychology class, PSY 100. By May of 2008, I had already taught the course a handful of times, and through experience was transformed from an online skeptic into a believer in the potential of online courses.

So, on May 5, 2008 I logged into the PSY 100 class and waited for the students to arrive. As an ice-breaker of an assignment, I write a bit about myself, and ask the students to do the same. We psychologists are inherently “people” people, and I have found that I prefer to know what the class I am about to work with looks like. I need to visualize them in order to relate to them. One by one the students entered the discussion board. The first day was slow: only four students wrote about themselves. On the second day, with the time stamp of 3:55 am, the message “Greetings from Iraq” was posted. In it Jeremy Glasstetter introduced himself as serving on active duty in the US Army and deployed to Iraq. It was a few hours later, at 10:58 am the second day of class that Mr. Glasstetter asked the first clarification question. It was about the mechanics of the course, and I think it resulted in useful information for the entire class. Thus began an interesting, but not very typical online class.

Mr. Glasstetter’s introduction could have been met in many different ways. I remember the 1960’s, and can recall when the military and the university students did not always see eye to eye. The reaction of the students in the course over the next few days was uniformly positive with posts of “Thanks for your service to our country, and good luck in the class!” and “it is people like you that enable America to be a free country.” This rapid and positive exchange of information from across the globe amazed me. During the Vietnam War, I remember it took weeks for the letters my grade school class wrote to PFC John Gawel, the brother of one of my classmates, to be answered. Now, our class could interact between Iraq and Michigan instantaneously. Despite differences in time and perspective, the course discussions were always respectful even if occasionally the students challenged each other’s views.

As a course run asynchronously, the students never all met together online, but exchanged observations on a series of structured assignments. Although in Iraq, Mr. Glasstetter was one of the most frequent contributors to the class. When we discussed drugs, he was able to describe what the processed opium poppy looked like and his conversations with the farmers who chewed it. When we discussed language, he told of how he learned, word by word, to communicate with his Afghan nationals during his tour there. He said by sharing language they became friends. The first complete phrase he learned to say meant “All men are my brother.”

During the course, Mr. Glasstetter continued to be one of the most prolific contributors to the class discussions. He addressed class assignments thoughtfully, often putting them into the context of missions he had been on, and the challenges and rewards of his time in Afghanistan and Iraq. We knew he fit in his class participation after working a full day like many of our students. We also knew he was in danger. It seemed he knew as well, and occasionally alluded to the risks of working
in a war zone. Of course, personally, I was concerned about his safety. My concern resonated with my own life’s experiences. I remember well when my grade school class went to the funeral of our correspondent, in Vietnam, PFC Gawel.

Currently the American Psychological Association points to the importance of teaching the cultural context of human behavior. In our PSY 100 class, certainly having one of the class members with one foot in our class and the other in Iraq helped all of us appreciate some human universals. Mr. Glasstetter certainly brought to the course not only a unique background and experiences, but a very unique situation. I have had many veterans in class, and even active duty soldiers, but never taught in a war zone. Mr. Glasstetter indicated that participating in the class at the end of a long and challenging day transported him from Iraq to Flint. In the opposite way, his writings transported the class in Flint to the war in Iraq. The online class format enabled a far richer experience than the classroom could have.

Even in online classes the professors and students can form personal bonds. As the course ended, Mr. Glasstetter and I e-mailed about his impending return to the U.S. He asked if I wanted something from Iraq, and I asked for something simple, like a camel. I waited for his return with my fingers crossed. I had never met the man, but felt that he had allowed me and my class a glimpse into a different world, and I looked forward to actually seeing him. The spring semester ended, and into the summer I heard that Mr. Glasstetter was coming to see me. I knew that he was a man of honor, a man of his word. I was therefore elated, but just a bit concerned when the department secretary called me and said “Jeremy Glasstetter stopped by to see you, and he left something for you....”

My story: Student and Soldier

By Jeremy Glasstetter, Undergraduate Student
Bachelor of Business Administration
National Vice President, Student Veterans of America

It was nearly 6 am in Baghdad, Iraq and I had already been awake studying for 2 hours. The end of our semester was rapidly approaching and I had final exams to prepare for. At the same time, I knew work call was approaching in less than an hour. On today’s agenda: a flight mission out to a remote forward operating base (FOB) where an infantry battalion is conducting daily city patrols and hostile fire was a common occurrence. Back on my FOB, Baghdad International Airport (BIAP), studying proved difficult most of the time as mortars would rain down on us like clockwork. Each morning between 6:30 and 7:00 a.m. the FOB sirens would begin blaring out their warning that incoming rounds were targeting our position and everyone must take cover. As this happened the powers that be would invariably pull the plug on our internet connection, ceasing any hope that I might actually finish reading my classmates contributions on Blackboard. As the warning siren sounded, our only job was to get in bunkers, which were located everywhere on the FOB. That doesn’t mean I was happy about it. It’s never a joyous moment getting deep in a philosophical debate, only to be interrupted because someone wants to kill you. Working on my bachelor’s degree while 8000 miles from home proved to be a struggle every day, but somehow I managed.

This was my second deployment in the US Army, and I was more than ready to get home. It was, however, my first time being a student, online, and in combat. My first deployment to Afghanistan put me in such an austere environment that working online would not have been possible. In Iraq, however, the infrastructure allowed me the freedom of daily internet, with brief interruptions in service, to actually spend time online and in the virtual classroom.

Interacting with my fellow students was interesting, to say the least. Their reaction, once they found out I was physically
in Iraq and in class with them, was mixed. Some offered their accolades and thanks for all the hard work my fellow soldiers and I were doing; others were not so receptive. Some students actually criticized me for fighting in a war that they felt was unjust or uncalled for. That reaction is understandable coming from some folks, I thought. I knew full well that people’s ideologies could be clouded when the only news they get is from a biased, television-based source. I, on the other hand, was on the ground, in the war zone, trying to be a college student, and attempting to expose my classmates to the reality of life as a soldier.

Wrapping up my studies for the day, I got up, dressed, and headed out to the flight line where my helicopter was located. My official title in the Army was Aircraft Avionics, Armament, and Electrician which meant I could fix any problem that might pop up on the aircraft. It did not mean, however, that I always enjoyed it. The drive from my tent to the airfield was about 20 minutes and I had to pass through numerous ID checkpoints to get to our ready room. Once I was on the airfield, I was located on the center-most point of the BIAP FOB. While it may seem the safest, it was, in reality, the most dangerous as mortars were constantly trying to obliterate any and all the aircraft possible. My job as a crew chief involved both maintaining the ‘bird’ and also flying in it to conduct missions. It seemed pilots did one thing well, and that was break aircraft. Whether it is that they maneuvered too hard during the flight, or that general wear and tear caused constant maintenance, more time was being spent fixing our equipment than using it. My $16.7 million dollar piece of US Army equipment many days saved my life, but those of my comrades. I was forever grateful to it, and was privileged to maintain it.

Sitting in class a half a world away proved difficult at times. While I physically had my textbooks in hand, interacting with my fellow students via my thoughts in a virtual environment always seemed difficult. You don’t want to offend someone whom you’ve never met, but want your point of view understood and measured. The full class load I took meant that much more important. It was my escape from the horrors I witnessed at times. Putting my mind at ease by reading a textbook or interacting with others allowed me an outlet through which I no longer felt I was sitting in the middle of a warzone, but back home in Flint, Michigan. I’m not saying that every day was a horrific day - on the contrary. There were many days which went by where heroic events, by normal, everyday men and women in uniform in my unit, took place. Creating schools, hospitals and parks were a part of our daily life in Iraq and Afghanistan. In Iraq alone I helped build two schools and four clinics, all while attending a full class load. By the same token, while attending class I also medivac’d (medical evacuation) countless American and Iraqi personnel who were wounded in the field. While each day of my military life proved to be different, my time taking classes online far away in a combat zone, remained my one true constant and the place where I found solace.

\textit{I, on the other hand, was on the ground, in the war zone, trying to be a college student, and attempting to expose my classmates to the reality of life as a soldier.}
Doctor of Nursing Practice Candidate Selection: An Action Research Approach

By Christina Aplin-Kalisz, Assistant Clinical Professor and Constance J. Creech, Assistant Professor and Director of Nursing Graduate Programs

Introduction

The student selection process is an important faculty responsibility that impacts student success in individual courses, retention, and ultimately graduation rates. In this article, the current literature related to the selection of students in graduate programs is reviewed, as well as a discussion of the University of Michigan-Flint Nursing Graduate Program’s first year process. Also, described is the action research process as it was used by the nursing faculty to design their selection process and to generate ideas for improvement of student selection processes in the future. Ideas for future research are also included.

Background

The graduate nursing program at the University of Michigan-Flint has recently transitioned from a traditional instruction Masters of Science in Nursing (MSN) degree program to an online Doctor of Nursing Practice (DNP) degree in 2009. This change contributed towards generating a large applicant pool for the inaugural year of the DNP and resulted in significant challenges for the faculty selection committee. Over the past 11 years the MSN program has had a relatively modest number of applicants every year. Faculty admission decisions were made throughout the year as completed applications were received and candidates met the established criteria for admission. This “rolling admission” policy has worked well for many years. When a predetermined number for a cohort group was admitted, admissions were closed. For example in fall of 2008, 31 students were admitted to the MSN program of approximately 50 that applied. Grade Point Average (GPA), personal goal statement, three recommendations, and an individual interview were included in the process included. Candidates are required to have a current Michigan registered nurse license, college transcripts showing a baccalaureate degree or equivalent and the two prerequisite courses. The Graduate Records Exam (GRE) while initially required has not been a part of our graduate admission process for the past five years.

Over the past year, several nursing faculty have discussed “action research” as a method to determine the processes needed to formulate admission criteria in the Doctor of Nursing Practice program. After the Higher Learning Commission approved our new program in February 2009, our applicant pool grew steadily each month. As the numbers increased, so did our dialogue about our selection process. There was a pool of close to 100 applicants at the time of the April 2009 application cutoff date. The faculty were challenged to develop new processes for a competitive selection process that were consistent with the literature. It presented a unique opportunity to utilize the action research approach to look more intently at our selection process to obtain our first cohort of 25 DNP students. A brief literature review for selection and admission criteria for graduate programs will be discussed in the next section.

Literature Review

The focused literature review completed on graduate school admittance criteria was both interesting and limiting. For clarity, it is important to mention that only a handful of articles were found on admitting or selection criteria for either graduate nursing programs or doctoral nursing programs. Therefore, the literature review was opened up to graduate programs in general. There was a significant amount of information for medical schools, law schools, and business as well as psychology programs found. In terms of nursing, a significant amount of literature exists on undergraduate programs. However, the focus of this paper is on graduate nursing programs and thus the undergraduate nursing program information was not
utilized. It is possible that the lack of information on graduate nursing programs may be related to the relative newness of such programs especially when compared to the other graduate programs in medical school and law.

Of the few articles found on the selection process in graduate nursing education, Wilson (1999) asked the same questions that our graduate nursing committee was asking: How can the process be improved? Wilson also reported that the most frequently used selection criteria was undergraduate GPA. Wilson argued that it was most important to utilize the last 60 credits of the Baccalaureate of Science in Nursing (BSN) GPA versus using the non BSN GPA.

At the University of Missouri at Kansas City (UMKU) the graduate nursing faculty developed a revised method of selecting applicants for admission due the lack of any consistent and successful method being identified in the literature. UMKU included BSN-GPA, the California Critical Thinking Skills Test (CCTST), references, career development and years of nursing experience, and professional development. These variables were weighted with the BSN-GPA consistently accounting for 30% of the 100 possible points. The CCTST was weighted at a possible 5%. References accounted for a possible 12%. Career development accounted for a possible 35% and professional development such as committee involvement or professional organizations accounted for 5% of the possible points. The last 13% of points included measures for diversity such as 4% for minority applicants, 4% if full-time student status and 4% if the applicant resided in a healthcare provider shortage area. The last one point was awarded for applying to UMKU, (Wilson 1999). While many aspects of the UMKU process appear to have significant merit, such as the largest proportion of points being awarded based on career development and years of nursing experience, the last 13% seems unclear. Certainly there is appropriate merit in acknowledging diversity, but full-time student status and if the applicant resided in a healthcare provider shortage area were not criteria that could easily be applied to our University of Michigan-Flint part-time DNP program.

The other pertinent research on graduate nursing education (Yavuz 2004) noted that the admission criteria varied per school but all included GRE, undergraduate GPA, letters of recommendation and personal statements. Some of the universities also looked at prior nursing and professional experience. Thus concluding the review of the small number of available articles on nursing graduate admissions, the literature search was expanded to other disciplines and discussed next.

Social work has struggled as a profession to find validity in the admission criteria and subsequent success of the students in the graduate social work programs for over 30 years, (Pelech, Stalker, Regehr, and Jacobs 1999). In a summary of 11 studies examining this relationship, pre-admission criteria including academic preparation was examined including GPA, quality of undergraduate program, relevance of undergraduate degree, prior human service work or volunteer experience, demographics such as age and gender, faculty ratings such as suitability, interview ratings and overall ratings and finally references were examined. In this particular study, the findings were mixed. Four of the 11 studies reported a statistically significant positive correlation between undergraduate GPA and GPA in the graduate social work program. However, mixed results were found with the correlation of applicant personal statements as well as overall faculty ratings. Overwhelmingly the study concluded that undergraduate GPA continues to be the most valid predictor of subsequent academic performance and overall success in the program.

Psychology too has had difficulty in correlating a relationship between admission criteria, academic performance and professional performance. Littlepage, Braff and Rust (1978) found that the evidence supporting a relationship between admission criteria and graduate school performance is neither strong nor consistent. They further proposed that the persons selected based on the criteria utilized have not been proven to be the best professional psychologists. However, Littlepage et al (1978) did acknowledge that the most commonly utilized tools for admission criteria continue to be GRE, undergraduate GPA, and letters of recommendation. Granted this particular article is over 30 years old.

Bruihl and Wasielewski (2004) surveyed 886 graduate psychology programs regarding admissions criteria. Seventy and one-quarter percent required an undergraduate minimum GPA of 3.0, 25% required a minimum GRE score of 1000; however, 41.2% required no minimum GRE score. These were referred to as the objective data. Of the second-order or nonobjective criteria, 62.5% of schools reported the letters of recommendation as very important, 52.2% stated the personal statement was very important and 32.0% found the interview to be very important. However, 48.6% did not use the interview at all in the process. It was determined that the graduate admission committees in this particular study placed primary emphasis on GRE and GPA with letters of recommendation and personal statements also receiving a considerable amount of weight in selection.

Harvard’s Business School Admission Director in a recent interview shared that a personal interview, the GMAT, undergraduate GPA and personal references remain the cornerstone of their selection process in 2009. Truell and Woosley (2008) looked at admission criteria and other variables as predictors of business school graduation levels or completion. They pointed out that there are two broad categories of admissions criteria that have been studied in the literature: cognitive/academic and non-cognitive. Truell and Woosley continued to clarify that the academic and cognitive criteria for
graduate school admissions are similar and include standardized testing such as the TOEFL, GRE, GMAT, LSAT and MCAT. Also included under academic and cognitive was undergraduate GPA. They were careful to point out that there is no evidence in the literature to correlate any of these factors with grades or success beyond the first year of graduate school. In addition, they pointed out that these traditional admission criteria are often biased against minorities and women. Truell and Woosley additionally denote that the non-cognitive measures used in admission criteria include letters of recommendation, interviews, essays and extra-curricular activities. They continued to conclude that the literature reveals that the personal interview to be the most effective screening measure and the GRE to be the least effective. They also pointed out that “quantitative factors aren’t good predictors of success.”

The literature is consistent in finding that objective standardized measures such as the GRE, Miller Analogy Test and other field specific tests such as the MCAT have very little predictive value of future achievement (Sternberg 1997).

In a contrasting opinion, Hoefer and Gould (2000) looked at how admission criteria could be correlated to predicting students’ academic performance in graduate business programs. They found that in the mid-1990’s, over 1200 graduate schools worldwide used the GMAT as a part of the criteria and that 800 schools required the GMAT. They looked at a large metropolitan business school longitudinally over a period of four years and looked at 590 students undergraduate GPA, GMAT, as well as grades in the MBA program and utilizing a regression analysis found that the GMAT; specifically the verbal and mathematical, and undergraduate GPA were indeed very important determinants of academic performance.

What to do when supply exceeds demand? Keith-Spiegel, Tabachnick and Spiegel (1994) addressed this very issue. They were specifically looking at doctoral candidates and readily admitted that often GRE, GPA and letters of recommendation fail to adequately narrow the field to the amount of openings that are available for a given program and year. They continue to suggest that writing skills and “good match” factors are very important criteria for these students. In their particular study, they considered social/personality style of the candidate to be very important. In addition, they further identified “good match” to be a goodness of fit between the applicant and the graduate faculty program members. They concluded that some secondary criteria as mentioned above are more important to one program than to another. For example, empathy is very important for medical school candidates, but is not nearly as vital for engineering candidates.

Brink (1999), tackled the ominous task of surveying graduate schools to determine how they were selecting their graduate school applicants. Out of the 88 graduate schools surveyed regarding several aspects of their admission process 76 rated undergraduate GPA as the primary factor, 16 rated the personality of the student as very important, and 21 rated the interview with the student as very important. None rated the student’s performance on standardized testing as very important.

Some research exists on the validity of the references and the personal interviews utilized in the selection process. Stansfield and Kreiter (2007) looked at the reliability of admissions interviews and their ratings for medical students. The goal of their study was to add a quantitative method for garnering more reliable information from the personal interview scores in order for these interview scores to have a reliable impact on admission decisions. They concluded that there was a significant amount of variation in the scoring of the same applicants by different interviewers and that the most consistent ratings were found on the extremes, that is on the high and low scoring applicants.

In addition, the validity of the personal statement as an indicator of an applicant’s writing ability has been looked at in the literature. However, Powers and Fowles (1997) point out that only a minimal amount of such research exists. They looked at 302 graduate student applicants, garnered from a GRE testing pool, and more closely looked at how they developed their personal statements that accompanied their admission packets for graduate school. These students were from a variety of disciplines. Fifty-nine percent admitted that they received at least some help in editing and revising their statements. Of these 59%, 34% admitted to receiving moderate to substantial help, 36% admitted to receiving assistance in drafting their personal statements, with 19% getting moderate or substantial help. Fifteen percent admitted to getting moderate or substantial help in both drafting and editing and revising their statements, while 38% denied getting any help with their personal statements at all. Based on this study and the premise of this study, there exists reason to cast serious doubt on the validity of the personal statement in terms of its utility in the admission selection process for graduate school.

Finally, the literature also addresses the predictive validity of applicants’ reference information for admission to a doctoral program. This particular study looked at doctoral education students. However, Young (2005) noted that similar processes are followed in utilizing and scrutinizing references for medical school and for law school applicants. Using regression analysis, Young looked at 107 doctoral applicants and found a distinct difference in the references of those admitted versus those rejected. These distinct differences were in relation to the ratings in research ability and work habits. In both cases, the rejected applicants’ references were lower in these two areas.
committee met in April 2009 and decided to divide the field of applicants into two groups based on their undergraduate GPA. Admissions were then selected for those with a GPA above 3.0 and those below 3.0. For those students with a GPA over 3.5, admission was recommended, with a goal statement of less than 3.0 being considered. This process took the committee members most of an entire morning and afternoon to complete. After this initial round of selection, there were 20 applicants selected with stellar GPAs and outstanding personal statements and references. This resulted in approximately 5 admission placements left.

Next the second section of applicants with GPAs between 3.0 and 3.5 were closely examined. The final candidates were selected based on the highest GPA of the remaining applicants. Of these five additional applicants selected, all had very good goal statements and references. It should be noted that UM-Flint is offering three distinct Doctor of Nursing Practice concentration specialties: Adult Nurse Practitioner, Family Nurse Practitioner, and Adult Psych Mental Health Nurse Practitioner. It was decided to accept the top applicants in each specialty utilizing the above approach.

We accepted 25 students into the inaugural class of the DNP program utilizing the competitive process above. In addition, we decided to take several alternates in both the ANP and FNP programs. Should a place in the program open up for whatever reason, those alternates would be accepted for fall 2009 admission, again in rank order as determined by the GPA. From past experience, we have encountered some attrition from the time of selection to actual starting of each class. Anticipating this will occur again, we as a faculty decided it was important and prudent to select several alternates. The alternates, after much discussion, were decided to be guaranteed admission for the academic year of 2010-2011.

After an expanded literature review of both nursing and other disciplines, it was clear that no distinct process existed across the board for graduate school admission. It was also clear that undergraduate GPA was the single most influential and commonly used factor...
In the future, we are looking at developing a more distinct selection rubric consisting of a specific number of points for GPA, points for the professional goal statement, and points for the three recommendations. Thus the top scoring applicants in these weighted areas will be selected. We planned to trial this system with the currently selected class for fall 2009 to identify the mean admitted score of this newly admitted class for comparison. The planning for next year’s selection has already begun, but will involve future consultation with a statistician and the Graduate Programs Office to streamline the process. There is a projected very high interest in this program with even greater numbers of applicants for 2010. This will require a much smoother and well defined process that is an efficient use of faculty time and consistent with the literature to be successful. The action research process was found to be a practical and efficient method for the determination of this year’s selection processes and will continue to be used next year for continued program improvement.

Implications for Further Research

Since post baccalaureate to DNP programs are relatively new, little is available in the selection process literature to date that is specific to Doctor of Nursing Practice programs. Research in this area that is discipline specific to nursing may be needed to fully encompass the uniqueness of these candidates. A more comprehensive review of several graduate nurse practitioner programs’ selection criteria in Michigan and other states is needed. The research literature in related fields such as Doctor of Physical Therapy, Doctor of Optometry, and Doctor of Pharmacy etc. will be examined further in this coming year for insight and guidance in the selection process. Research that combines processes across disciplines that are selecting candidates at the practice doctorate level could also be useful.

At the University of Michigan-Flint, we have begun to discuss researching our DNP graduate certification pass rates and their exam scores of the first few cohort groups and comparing these scores with their admission ranking among other ideas for improving the selection process.

References


Food for Thought:
Marketing the University of Michigan-Flint

By Bob Mabbitt, Senior Brand Analyst
and Jennifer Hogan, Executive Director, University Relations

Word of Introduction

Food as metaphor and cooking as analogy seem like a winning route to a reader’s attention in this “tasty” reflection on the UM-Flint’s process of “branding” itself. Here Jen Hogan, Executive Director of University Relations, and Senior Brand Analyst Bob Mabbitt, offer a culinary explanation for how to keep the UM-Flint stew distinct from other higher education entrees. They consider how the cooks carefully obsess over which ingredients to feature and analyze for effect; for example, what does it mean to be a “premier urban center” and primarily a teaching institution? What are the implications of our connection with Ann Arbor? And what are the roles of research and civic engagement in the promises we make? This complicated broth clearly is part of what’s brought to the table almost every day as Strategic Plan conversations proliferate and General Education decisions continue.

There is a technique in cooking known as reduction. For the uninitiated, a reduction is quickly simmering a liquid, reducing it down to a thickened consistency. Reducing liquid in such a way brings out the essential flavor, creating a bold, exciting taste. In that sense, reduction is a metaphor we can use to describe the University of Michigan-Flint’s approach to our “brand.”

Too often, “brand” is considered from a point of view diametrically opposite this process and parable of reduction. Asked if brand means a logo, a tagline, a billboard, a website, and a t-shirt, we are inclined to answer, “Yes, of course. All of the above.” We think that if brand is the consistent, recognizable, overall feeling individuals take away from all the messages and emotions marketers desire to clearly convey, surely more must be better. We believe intuitively that every possible positive attribute and anecdote one could tie to an entity’s identity would enhance its overall image and further “build the brand.”

However, to continue the cooking analogy, endlessly adding more chicken stock, meat and vegetables to the pot will not automatically make for a more memorable meal. In fact, despite the deliciousness of individual ingredients, the end product risks becoming watered down, bland, and potentially tasting quite dissimilar to different individuals depending on when they eat, the size and aim of the ladle, and who is doing the cooking. Sometimes, more is just simply more. To avoid dilution, control quality and consistency, and to truly bring out the best, boldest, and most distinctive flavors, the best chefs mesh their creativity with proven techniques like reduction.

Flavor Profile

In 2008, the University of Michigan-Flint engaged the firm Education Marketing Group to conduct the institution’s first comprehensive marketing research analysis in nearly ten years. The resulting “Awareness and Perceptions Report” was based on surveys with individuals from five designated segments within Genesee County (Business & Opinion Leaders, Prospective Students, Parents & Influencers, Non-matriculating Applicants, and Adult Members of the General Public). The findings not only allowed us to gauge the effectiveness of previously marketed messages, but also to explore the credibility, importance and palatability of messages about the institution that had not previously been given prominence.

The totality of that data, including results from focus group testing of marketing concepts featuring those previously untested messages and visual treatments, was then reduced down to UM-Flint’s “brand promise.” Again, the recipe followed to achieve the most flavor-packed, memorable, distinctive and deliverable “brand promise” began by considering all of the possible ingredients in UM-Flint’s pantry (all potential positive messages), asking our dinner guests (our target audiences) which they most preferred (viewed as important, believable and differentiating), to finally arrive at a concise, delicious, and deliverable brand promise:

The University of Michigan-Flint is the premier urban center for learning, research and civic engagement.

The brand promise is not a slogan. It really serves as a guide to developing the menu of examples that fully illustrate the brand. We believe that to leave an indelible impression on the minds of our stakeholders, we need evidence of concrete
examples of the learning, research and civic engagement that takes place in and around the campus.

**Follow the Recipe**

Similar in logic and practice to what political consultants refer to as "staying on message," the concept of "staying on brand" is key to ensuring all brand messages are relevant, resonant, and are thereby, remembered. Because it may not be immediately evident where and how a particular department or initiative falls within the scope of the brand promise, let us further break down (or reduce) the statement to its separate elements and examine how some concrete university examples fit.

**What is a “Premier Urban Center?”**

The most significant factor contributing to UM-Flint's "premierness" is our affiliation with the University of Michigan. UM-Flint certainly has traditions, integrity, and earned respect of its own. However, the ability to accurately and authentically make the connection between the achievements of this institution to those of the University of Michigan give us an advantage over other universities. We are part of this world-renowned university, and we need to make that clear.

Some might say that all the benefits of our connection to Ann Arbor's reputation are voided by Flint's. For years, there was a tendency, intentional or unintentional, to downplay the urban location of the UM-Flint campus. The fact of the matter is that the campus is located in the heart of downtown Flint. There is no denying it, and based on the marketing research there is no shame in it. Rather, there is opportunity to celebrate our urban location and all of the strong qualities associated with that reality.

As a premier urban center, it is essential to highlight all of the aspects that contribute to this concept. The University of Michigan-Flint Honors Program certainly falls into this category, providing our best and brightest with unique opportunities and distinct advantages when they graduate. UM-Flint is also home to the only Physical Therapy Department in the entire University of Michigan system. And, we would be remiss if we did not acknowledge the special relationship the university has with its surrounding community in the downtown area. Such things as the College Town Membership partnership with the Flint Institute of Arts and the numerous community partnerships that provide service learning opportunities for students are examples of this special relationship.

**What do we mean by “Learning?”**

Learning can be a rather nebulous notion. For the purposes of the brand promise, it is primarily recognizing and celebrating our faculty and their personal connections to students. University of Michigan-Flint faculty were highly praised in the 2008 Marketing Report. Noted for strong mentoring relationships with students, this is a source of pride for the university, and an important message to convey to future students.

UM-Flint is primarily a teaching institution. As such, faculty who work at UM-Flint are in the classroom. Classes are generally not taught by graduate assistants. For the most part, class sizes are small, creating a more intimate atmosphere for learning, more in depth conversation, and more one-on-one interaction. Our faculty are different because they truly care about the individual success of our students.

As marketers, we are fortunate to have an endless supply of stories and examples upon which we can draw to illustrate how learning at UM-Flint is a different experience than at other universities. The boundless creativity and energy that goes into so many classes produces a rich abundance of ways that learning takes hold at this premier urban center.

**What the Research says about “Research”**

It is true that on a strictly surface level, being known as a university that actively engages in research elevates that institution's perceived academic quality.

Beyond that, in much the same way we are able to boast about the level of faculty/student interaction, the marketing research supports our touting of the numerous opportunities our students have to participate in meaningful, hands-on research initiatives with faculty members. What is particularly special about UM-Flint is that these opportunities are available to students early in their academic careers. Not only do these research opportunities bring classroom knowledge to life in more immediate and relevant ways to those who take advantage of them, but they have a profound impact on students’ ability to distinguish themselves from candidates at other institutions when applying for graduate and professional schools, or interviewing for a job.

**Generation Civic Engagement**

For a long time, observers both inside and outside academia expressed skepticism about what was really driving the push for increasing “civic engagement.” Was it the heads of universities? Was it public relations departments? Or was it the students? Based on the hard data from the marketing research, today's young people have a genuine desire to make the world a better place.

Recent focus groups we have conducted with local high school students indicated that while many did not understand the term “civic engagement,” they did understand the concept of volunteering and learning-by-doing through service projects. The strong sentiment we heard is that they liked the idea of being part of something that “was bigger than themselves.”

For the growing number of students who fit this mold,
being able to engage in actual, results-driven actions aimed at improving a community like Flint is an extremely powerful idea. They see the challenges faced by local communities as part and parcel of the challenges faced by the entire world. They know what is said about Flint. They can determine what is myth and what is reality. They want to immerse themselves in the issues and work hard to find real solutions. This level of engagement helps young people forge their individual identities in relationship to the larger forces they are tired of feeling powerless to change. By connecting this institution to efforts that prove to young people that progress does happen, even in – or especially in – a community like Flint, we are tapping into the positivity, courage, and less-talk-more-action attitude this generation aspires to and respects.

Actions and Words

We know it is not enough to simply say the University of Michigan-Flint is a special place. We all have our own reasons for feeling affection for the place we learn, work and in some cases, live. However, we must show what is special about our beloved university. It is the old axiom “actions speak louder than words.” But, this research has given us the opportunity to have our words match and mirror our actions. The truth is, the everyday actions of our faculty, staff, students, alumni and donors are the brand of the University of Michigan-Flint. They deliver on the brand promise everyday. We are not a university that is built upon a foundation of meaningless, trendy words. We have concrete, compelling examples that show our university has something special to offer everyone. We hope you will keep us abreast of all the living and breathing examples that make the University of Michigan-Flint so uniquely appealing. By doing so, you will help us to show the full menu of what we have to offer as a premier urban center of learning, research and civic engagement.

Thinking about submitting an article?

SFAQ

(somewhat frequently asked questions)

How long should my manuscript be?

Since the length is somewhat dependent on genre, the manuscript should be as long as the writer deems necessary to explore her/his current thinking on the topic. Given the current format of this publication, a manuscript should not exceed 20 double-spaced pages.

Which genres are suitable for this publication?

The intent of this publication is to provide a venue for sharing viewpoints, perspectives, insights, challenges and the like related to teaching and learning. With that in mind, essays, letters, stories, and articles will be accepted. (Yes, even a haiku is acceptable since it could quite splendidly convey a matter of great import to teaching and learning!)

May previously published work be submitted?

Yes. Previously published work is perfectly acceptable as long as written permission is granted from the publisher. Depending on the topic of the work, you may be asked to provide a current context for the article and an accompanying reflection addressing why you find it suitable for this publication.

Who may submit a manuscript?

This publication is intended to provide a gathering place — a written agora, if you will, for the exchange of our individual perspectives, our unique observations on a subject, the matters that matter only to us. As members of an academic institution, including faculty, staff and administrators, I believe we have the responsibility to speak our minds and the obligation to be affected by others. The Scholarship of Teaching is a venue for exploring who we are as teachers and learners. With that in mind, any employee of the University of Michigan — Flint with the will to write on matters of teaching and learning may submit a manuscript for publication.

Will I be expected to revise my writing?

Generally speaking, revisions are not requested by the editor.
Blended Learning vs. Traditional Classroom Settings: Assessing Effectiveness and Student Perceptions in an MBA Accounting Course

By Clement C. Chen, Associate Professor, Accounting and Keith T. Jones, Associate Professor, Illinois State University

Abstract

A survey was conducted of Master of Business Administration (MBA) students in an accounting class at a university in the Northern United States to compare students' assessments of course effectiveness and overall satisfaction with the course. One group of students were enrolled in a traditional in-class section, and another group in a "blended-learning" section in which the primary course delivery method was online, but in which students met in class on a limited number of occasions. Overall perceptions of the course, instructor and learning outcomes were positive for both groups. Students also felt strongly that they would use the material in their careers. The majority of students in the blended learning section indicated that they would take another accounting course using that approach if it were offered. However, some interesting differences were noted. Specifically, students in the traditional setting were more satisfied with the clarity of instruction. On the other hand, students in the blended-learning section felt more strongly that they gained an appreciation of the concepts in the field. Blended-learning students also indicated more strongly that their analytical skills improved as a result of the course. The results suggest that the two delivery methods were similar in terms of final learning outcomes, but that both may be improved by incorporating aspects of the other.

Introduction

As the UM – Flint increases its online options and professors work to adapt their pedagogy, important questions emerge. What works best in course design? Does the traditional classroom approach still work? Is online education also effective? In what ways? In this report, Associate Professor of Accounting Clement Chen reports on a study exploring some of these crucial questions. Specifically, he compares a traditional classroom approach with a combination of a traditional classroom meetings and online components. His findings, interestingly, suggest that in terms of student learning, perhaps it's premature to give up on the traditional classroom. He further finds that the two delivery systems in fact may have something to contribute to each other.
course delivery methods are when compared to the traditional classroom approach. Some research has examined the differences in effectiveness between courses that are completely online and those that use a traditional classroom, with mixed results. However, very little research has examined the differences between traditional in-class delivery and blended learning approaches. Therefore, we conducted a survey of students at a university in the Northern United States in order to assess the perceived effectiveness of the two course delivery methods.

Prior Literature

Results of prior distance learning studies are mixed. Some conclude that distance learning is at least as effective as traditional classroom learning (Dellana et al., 2000; Iverson et al., 2005; Sooner, 1999; Jones et al., 2005), while others have found that graduate students in traditional face-to-face courses outperformed those in web courses (e.g. Terry et al., 2001; Ponzurick, 2000).

Studies in distance learning with respect to accounting courses have primarily focused on overall effectiveness and have related primarily to courses offered completely online (Gagne and Shepherd, 2001; Vamosi et al., 2004). Again, the results are mixed. Gagne and Shepherd (2001) compared students’ survey responses in traditional and online sections of a financial accounting course and found no differences in final grades and overall evaluations of the course and instructor. However, in a study by Vamosi et al. (2004) of student perceptions in an undergraduate accounting principles course, students indicated that distance learning was less interesting and less efficient than traditional delivery, which might be associated with lower overall course satisfaction than they had anticipated.

Although the blended-learning method has become popular in both the corporate and academic world, little research has examined its effectiveness relative to traditional face-to-face instruction. In an MBA statistics course, Grandzol (2004) investigated student responses to blended learning and traditional delivery methods, but found inconclusive evidence about learning outcomes as measured by examination scores. Grandzol also found that students’ perceptions in terms of enthusiasm, preparation, grading, and clarity of instruction were similar for the two sections. In a descriptive study, Trasler (2002) argues that flexibility, variety and adaptability are key factors in attracting, retaining and motivating learners.

The distance learning research is relatively scarce in technical topics such as accounting. The current paper is primarily exploratory and comparative in nature and extends the literature by presenting survey results relative to a graduate accounting course. We assess the relative effectiveness of blended-learning and traditional classroom delivery along several important dimensions relating to the following general research questions:

- How does blended-learning compare with traditional classroom delivery in terms of student learning outcomes in a graduate-level accounting course?
- Are there differences in overall perceptions of the instructor and the course?

The following sections discuss our research methods and statistical results. We then summarize our conclusions and the primary implications of the study.

**Method**

**Subjects**

Student participants were enrolled in either a traditional classroom section (n = 38) or a blended-learning section (n = 58) of an MBA course that covered introductory material in financial and managerial accounting. The same instructor taught each class and administered the course in the same way, except for the method of course delivery. Using this approach allowed us to “control” for differences due to instructor, evaluation criteria, and other potential confounds. The traditional and blended-learning sections involved two separate sections over two semesters. Within delivery methods, we compared sections and found no significant differences between semesters on the survey item responses.

In addition to the survey items of primary interest, we collected information regarding age, undergraduate grade point average (GPA) and years of prior work experience in order to examine whether there were significant differences between the two delivery methods on potentially important demographic variables. The average age of student participants was 32 years (standard deviation = 8.24) and their prior work experience ranged from 2 to 36 years, with a mean of 9.79 years (standard deviation = 8.61). The average undergraduate GPA reported was 3.21/4.00 (standard deviation = 0.37). There were no significant differences between the two delivery methods with respect to these variables (p > .4 for all three variables).

**Course Administration**

The blended learning sections consisted of four on-campus meetings during the semester, one of which was at the beginning of the semester. All other “meetings” were online for two hours each week during the semester. The traditional section met twice each week for 75 minutes each.

The traditional and blended-learning sections were identical in terms of the factors that determined students’ grades and the relative weight of each factor. The instructor conducted classes in the traditional sections using a combination of lecture and class discussions, focusing the lecture on a summary of key issues related to particular topics. Discussions focused on illustrative examples from actual financial reports and cases assigned for a particular day. In the blended learning sections, the instructor conducted the four in-class meetings in the same way as those for traditional classroom sessions. Online class meetings...
primarily focused on specific student questions e-mailed to the instructor prior to online meetings. The instructor required students in the blended learning section to participate during online class meetings.

The course grade for both traditional and blended-learning sections was based on homework case performance (50%), examinations (40%) and class participation (10%). Students completed five homework cases in groups of four formed during the first class meeting. Each group made a single submission for each case. In the first meeting and in the course syllabus, the instructor told the students that they would assess the relative contribution of each group member by completing peer evaluations during the last class meeting. The instructor then adjusted individuals’ grades based on these peer assessments. The overall examination score consisted of two take-home examinations.

**Comparative Survey Results**

**General Course Effectiveness**

Table 1 shows the mean responses for several questions intended to provide different measures of the comparative effectiveness of the two alternative course delivery methods. Students responded to each of these items on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). We used t-tests to examine the comparative differences.

As shown in Table 1, both groups had fairly good perceptions of the course. Although the mean response for Item 1 was higher for those learning under the traditional classroom setting, the difference for that item is not statistically significant. A separate item (different scale) solicited students’ expected grades, and the responses were also not significantly different for that item. In addition, both groups indicated reasonably favorable responses in terms of learning from the course (Item 3). Again, the difference shown for Item 3 is not statistically significant. Therefore, overall learning and performance do not appear to be measurably different between the two groups. Additionally, students in both groups indicated a belief that the material they learned will benefit them in their careers (Item 6).

In terms of general satisfaction with the end results of the class, students in both sections indicated at least a moderate level of agreement that the class deepened their interest in the subject matter (Item 7). The difference in means was not significant for this item. In addition, the instructor appears to have been quite successful in motivating both sections of students to do well (Item 8) and in creating an enjoyable course (Item 9). Again, the differences for these items were not statistically significant.

A further look at Table 1 reveals some interesting differences, however. Despite the comparable end result and the fact that both courses had the same instructor, traditional classroom students appear significantly more satisfied with the clarity of the instruction itself (Item 5). However, students in the blended learning section indicated more strongly that they gained a good understanding of concepts and principles in the field (Item 4). Their overall perceptions of the instructor were more favorable than the perceptions of their counterparts in the traditional classroom setting (Item 2). This result is somewhat surprising and suggests that something else is offsetting the impact of being relatively less satisfied with clarity of instruction. Blended-learning students appear to have found the course more difficult (Item 11), perhaps related to their perceptions of instructional clarity during online meetings.

**Table 1: Comparative Overall Perceptions of the Course**

<table>
<thead>
<tr>
<th>Items</th>
<th>Blended Learning (n=58)</th>
<th>Traditional Classroom (n=38)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall, this was an excellent course.</td>
<td>3.88</td>
<td>4.12</td>
<td>0.25</td>
</tr>
<tr>
<td>2. Overall, the instructor was an excellent teacher.</td>
<td>4.56</td>
<td>3.82</td>
<td>0.01</td>
</tr>
<tr>
<td>3. I learned a great deal from this course.</td>
<td>4.22</td>
<td>3.87</td>
<td>0.21</td>
</tr>
<tr>
<td>4. I gained a good understanding of concepts/principles in this field.</td>
<td>4.16</td>
<td>3.58</td>
<td>0.03</td>
</tr>
<tr>
<td>5. The clarity of instruction was good.</td>
<td>3.45</td>
<td>4.50</td>
<td>0.01</td>
</tr>
<tr>
<td>6. I will use what I learned in Mgt 521 in my career.</td>
<td>4.12</td>
<td>4.00</td>
<td>0.80</td>
</tr>
<tr>
<td>7. I deepened my interest in the subject matter of this course.</td>
<td>3.66</td>
<td>3.50</td>
<td>0.75</td>
</tr>
<tr>
<td>8. I was motivated to do well in MGT 521</td>
<td>4.12</td>
<td>4.20</td>
<td>0.86</td>
</tr>
<tr>
<td>9. I enjoyed the class</td>
<td>3.97</td>
<td>3.75</td>
<td>0.38</td>
</tr>
<tr>
<td>10. MGT 521 was interesting</td>
<td>3.95</td>
<td>3.70</td>
<td>0.23</td>
</tr>
<tr>
<td>11. MGT 521 was difficult</td>
<td>3.76</td>
<td>3.10</td>
<td>0.03</td>
</tr>
<tr>
<td>12. I am confident in my ability to understand and apply concepts learned in this course.</td>
<td>3.95</td>
<td>4.16</td>
<td>0.33</td>
</tr>
</tbody>
</table>
Skill Assessments

Table 2 shows mean responses related to several skills commonly named as desirable for development in university curricula. Again, students responded on a scale from 1 (strongly disagree) to 5 (strongly agree).

Table 2: Learning Outcomes and Skills Assessments

<table>
<thead>
<tr>
<th>Items</th>
<th>Blended Learning</th>
<th>Traditional Classroom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. My writing skills have improved as a result of this course</td>
<td>2.33</td>
<td>2.30</td>
<td>0.88</td>
</tr>
<tr>
<td>14. My analytical skills have improved as a result of this course</td>
<td>3.85</td>
<td>3.25</td>
<td>0.04</td>
</tr>
<tr>
<td>15. My interpersonal skills have improved as a result of this course</td>
<td>3.20</td>
<td>2.80</td>
<td>0.24</td>
</tr>
<tr>
<td>16. My computer skills have improved as a result of this course</td>
<td>3.30</td>
<td>2.50</td>
<td>0.01</td>
</tr>
<tr>
<td>17. I am confident in determining what is relevant in solving problems.</td>
<td>3.93</td>
<td>4.28</td>
<td>0.20</td>
</tr>
</tbody>
</table>

As mentioned previously related to Table 1, blended-learning students appear to have found the course more difficult. Interestingly, however, blended-learning students indicated significantly more agreement that their analytical skills improved as a result of the course (Item 14). Since the sections differed only in delivery method, this difference is intriguing. Online or primarily-online delivery may place more burden on the learner in some cases than traditional classroom delivery because the student cannot rely nearly as much on class attendance to clear up questions on the material. Therefore, perhaps these students had to rely more on their own effort and had to find ways on their own to clear up confusing topics.

Not surprisingly, blended-learning students indicated more strongly that their computer skills increased as a result of the course (Item 16). However, likely due to students’ preexisting level of comfort with computers, neither group indicated a very high mean response. In any case, computer skill enhancement was not a primary objective of the course. Likewise, although enhancement of writing skills is universally believed an important result of college curricula, neither group of students appeared to perceive improvement in this area (Item 13). Again, however, writing skill enhancement might reasonably be expected only as a secondary objective of most accounting courses. Finally, neither group indicated very strongly that their interpersonal skills improved as a result of the course.

Both groups of students indicated that they were reasonably confident in determining what is relevant for solving problems. Problem-solving ability is generally regarded as an important skill to be developed in today’s business curriculum. The Association to Advance Collegiate Schools of Business (AACSB) suggests problem-solving skills as an example of a desirable goal for undergraduate programs and explicitly calls for graduate programs to further these skills in their students (AACSB 2006). The American Institute of Certified Public Accountants, in its “core competency framework”, also explicitly calls for problem-solving skills as necessary for all new entrants into the accounting profession, regardless of the sector in which they work.

Isolating Blended-Learning Students

To further assess students’ perceived effectiveness of online instruction compared with traditional in-class delivery, we also asked those enrolled in the blended learning class two other questions designed to examine their general impressions about the quality of online course delivery. Students responded on the same five-point scale discussed earlier for the other survey questions. Table 3 shows these items, along with the mean responses.

Table 3: Online Class Delivery vs. Traditional In-class Delivery – Responses of Blended-Learning Students

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. I find online class delivery of accounting materials at least as effective as traditional in-class delivery</td>
<td>2.52</td>
</tr>
<tr>
<td>19. I find online class delivery is more effective than traditional in-class delivery</td>
<td>2.16</td>
</tr>
</tbody>
</table>

As shown in Table 3, students in the blended learning section indicated on average that they do not generally find...
online course delivery itself to be as effective as the traditional classroom setting. A response of less than “3” indicates at least some level of disagreement with the statement. These responses suggest that, if the end result in terms of learning and satisfaction with the course are approximately equal to that of traditional classes, then something outside of the instruction itself contributes to their satisfaction with the course and instructor. In addition to the responses shown above, 90% of the students in the blended learning section indicated that they would take another accounting course using that delivery method, if offered. Perhaps because of the convenience and flexibility of the course, this delivery approach would not deter the majority of students in future courses.

As suggested by Chen, Jones, and McIntyre (2004), a well-researched phenomenon known as a “halo effect” (e.g. Cooper 1981) may occur in which some aspect of a course or instructor outside of the instruction affects students’ overall rating of the instructor and the course. For example, the convenience of the course or the promptness with which an instructor responds to email questions may outweigh other factors and affect a student’s overall perceptions.

Interestingly, a separate item also indicated that students in the blended-learning section on average contacted their instructor significantly more often outside of “class” than did students in the traditional section (5.6 times vs. 1.8 times). Students from both sections indicated that the predominant form of contact outside of class is via email. If the instructor is prompt and helpful in his/her responses to these inquiries, the “halo effect” theory would suggest that this aspect alone can offset other perceived deficiencies. However, we cannot conclude definitively from this study exactly what other aspects are driving these interesting and conflicting results.

Limitations, Summary, and Conclusions

This survey was administered at only one school and involved one MBA course in accounting. Therefore, inferences cannot necessarily be made about other courses, institutions and instructors. Although this approach may be seen as a limitation, it was necessary because an important goal of this study was to be able to make meaningful comparisons between two delivery methods. The traditional and blended-learning sections were taught by the same instructor and differed only in the delivery method, although two sections of each delivery method were used and we found no differences due to semester. Grading and other course administration procedures were carried out the same in both courses. Therefore, we were able to be reasonably certain that the differences observed are primarily attributable to the differences in course delivery method. Otherwise, different instructors, universities, and course designs, and course subject matter could account for differences observed. Certainly, additional future studies are warranted in other courses and at other institutions in order to assess whether the results are similar to those from this study. In addition, future research should compare courses taught solely using a web-based approach and those using a blended learning approach to determine if the blended learning approach adds any incremental effectiveness. Still, this study provides some early evidence on the latter question and we can glean several insights from this survey, summarized in the following paragraphs.

Benefits of Traditional Delivery

In terms of course performance and overall course satisfaction, students learning under the two course delivery methods did not appear to differ significantly in their assessments. Students in both sections indicated a strong amount of utility from the course in terms of usefulness to their careers. The latter finding is consistent with the results of the study by Chen, Jones, and McIntyre (2004) referred to earlier. That study found that, although undergraduate students did not believe strongly that the first college accounting principles course would help them to do well in their careers, graduate students had significantly better perceptions of that course’s usefulness to their careers than did undergraduate seniors who were near graduation. Graduate students are often older and have more exposure to the “real world” than undergraduates. Therefore, they may have a better appreciation for the relevance of accounting principles to the environment in which they operate.

Based on the results of this survey, however, the traditional classroom setting continues to add value in terms on instruction clarity. Students and instructors alike may simply be more comfortable with the classroom environment because it has always existed. This environment allows the instructor to explain more informally how to work accounting problems and s/he is not encumbered by the need to explain material using a computer keyboard. The instructor can perhaps more easily circle numbers or point to items of emphasis while using a traditional board at the front of a classroom.

Benefits of Blended Learning

The blended learning approach may offer incremental value in terms of learning and gaining an appreciation of the concepts in the field. Perhaps students using this mode of delivery, simply by virtue of using their computer more extensively in the learning process, use more resources from the web and broaden their understanding by retrieving more resources such as outside articles illustrating the concepts taught. If this is the case, then it is likely that instructors could enhance the traditional classroom approach by requiring more use of the web. This increased web emphasis may encourage students not to rely as extensively on mere classroom attendance, which sometimes amounts only to passive participation. Also, online “meetings” sometimes force students to be more prepared and to participate more actively in the learning process than they might while sitting in the classroom. They may therefore be less likely to become detached
and passive in the process. Of course, some instructors are very adept at incorporating active learning techniques and are able to minimize or even negate the tendency for students in the classroom to become detached. To the extent that differential appreciation of the concepts is attributable to greater student involvement, these instructors will be effective in closing the gap and helping students to develop this deeper understanding.

Based on these results, blended learning does not appear to impede students’ development of certain skills considered important by accrediting bodies such as AACSB International. Students’ perceptions of their general ability to determine what is relevant in problem solving were not significantly different between those participating in the two alternative delivery methods. Blended-learning students actually had stronger perceptions of their improvement in analytical skills than did students taking the same class in a traditional classroom setting. Although this study does not offer definitive evidence, the latter finding may be related to their perceptions of gaining an appreciation of the concepts, discussed in the preceding paragraph.

**Tradeoffs**

The results of this study suggest that there are tradeoffs in the processes for the two delivery methods examined. The authors believe that traditional classrooms will continue to offer benefits that arguably cannot fully be obtained in any other manner, but that any gaps in process effectiveness will continue to be narrowed as technology becomes friendlier for both instructor and student. Blended instruction does not appear to impair students’ performance and may indeed enhance their appreciation of the concepts in some cases. In addition to the benefits for students, courses that incorporate online instruction offer a “win-win” situation for accounting programs and professors. As stated previously, students in the blended learning section indicated they would take another course using that method if offered; therefore, accounting program administrators have the opportunity to maintain or increase enrollments. This delivery method also offers professors increased flexibility in that they may operate from home in some cases, thereby freeing up commuting time for research and other pursuits.

Both course delivery approaches examined in this study serve vital purposes in today’s increasingly competitive education marketplace, and perhaps both can continue to improve as instructors learn from both delivery methods. In order to adequately equip students for the business environment in which they will operate, programs must not merely offer convenience at the expense of effectiveness. At least for the course sections discussed in this paper, this trade-off does not appear to have occurred. In any case, the goal for educators must be to continuously improve in whatever delivery method they are using in order to ensure that their students are gaining the necessary knowledge and skills.

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**References**


Using Metacognition to Improve Student Learning in Mechanical Engineering Classrooms

By Quamrul Mazumder, Assistant Professor
Mechanical Engineering

Word of Introduction

In a field not usually noted for its emotional dimensions, Quamrul Mazumder, Assistant Professor of Mechanical Engineering, is possessed by the notion of passion. In a 2007 study titled “Factors Affecting Passion Towards Learning in Engineering Classrooms,” he concluded that passion was not found to be a pre-requisite for learning, but asserted that “infusing passion for engineering may not only inspire students to learn, it will likely sustain them throughout their career.” Prof. Mazumder conscientiously reflects on his teaching practice and the learning methods he implements. The paper included here, probing metacognition as a problem-solving technique for his engineering students, is a continuation of that commitment.

Abstract

It is conceivable that over the next decade, all students will have access to some form of internet-based device while attending classes. The work presented in this paper investigated how web-based metacognition tools influence student capacity to self- assess their understanding (learning), student regulation of their learning (confidence level), class dynamics (reaction) and instructor methods. Student self-assessment associated with specific lecture slides were collected and compared with content-specific questions later in the examination. A set of online questions were used to evaluate student understanding on specific materials presented in the slides. Students were also asked to self-assess their confidence level in their answers. A web-based metacognition tool “LectureTools” was used to collect student responses. Correlation of correct answers with the self-assessment is presented to reflect on what the student thought they understood versus the outcome of their exam scores. The study evaluates how students may regulate their own learning and improve their ability to self-assess their understanding more critically. The ultimate goal is to empower students to become better learners by self-assessment and evaluation of their own knowledge.

Index Terms—Engineering Education, motivation, metacognition, classroom engagement, assessment

Introduction

The objective of this two-phase, sequential mixed methods study is to explore participant views toward learning to develop and test an online metacognition instrument. The first phase will be an investigation of metacognitive strategies through an online tool “LectureTools,” used by engineering students. This will compare pre- and post-test questionnaires to exam scores in an introductory engineering course. Results from the above investigation will be used to determine whether using metacognitive approaches improve learning, confidence levels of the students’ knowledge and performance in the tests and quizzes. During the second phase, the study will also investigate how a computer-based, interactive metacognition tool can be used to improve student learning, and a set of strategies will be developed along with a set of tools to evaluate metacognition improvement over the course.

This study focuses on four areas of students self-assessment or evaluation using web-based metacognition tools: (1) learning (which meta-cognitive strategies are employed by students while learning), (2) confidence level (measures the relationship between students meta-cognitive strategies and their performance), (3) reaction (differences in meta-cognitive strategies between the more accomplished students versus less competent students), (4) instructional methods (how students engage meta-cognitive strategies when the methods and materials being presented are already familiar to the students).

A preliminary analysis of the level of understanding of the course material is presented in this paper, by comparing pre-test and post-test scores to academic performance using examination scores. The analysis may provide understanding of the effect of metacognition on student learning and academic performance.

Background

The term “metacognition” was first introduced by Faywell as a problem solving technique in 1976 [1]. Metacognition was also described as second-order cognitions such as thoughts about
Metacognition has been widely used in science education research as knowledge, awareness and control of one’s learning that includes knowledge about the nature of learning, learning strategies and individual learning characteristics [13]. Improving metacognition skills consists of helping learners to be aware of their own learning and how the learners engage with the learning process, by asking evaluative questions and thus control their level of understanding. The reflective research model is grounded on metacognition and refers to “shift away from standard teaching method of directed transmission to actively engaging students in their learning from rote memorization to open thinking via questioning and reflection of ideas”[14]. Effective use of metacognition requires teaching concepts of metacognition to the students, then motivating them about how it can improve their learning behavior and end results. Most of the engineering students and even professors lack knowledge and understanding of such a learning technique and how this can be effective. In a recent introduction to an engineering class, only one out of thirty-three students had heard the term “metacognition,” the student who had changed his major from psychology to engineering. It is perceived as a specialized area of psychology with little or no understanding of how it can be broadly used to improve student learning.

The purpose of this study is to determine if students who use metacognition strategies are more likely to improve their ability to acquire knowledge compared to those who do not use these strategies. However, the question remains: are students aware of these strategies or do they need to be taught the techniques to recognize their true potential? Are they able to facilitate this process on their own or should they be aided through the use of technology such as LectureTools? This study explores the learning process, metacognition and whether an interactive metacognition tool can facilitate self reflective learning.

Teaching about Metacognition

As most engineering students and instructors are not even familiar with the term “metacognition,” it is unlikely that they will effectively use the strategies during the learning process. The first step in evaluating metacognition is to gain a better understanding of the conceptual framework and perceived benefit students can gain from using metacognition techniques. Enhanced metacognition itself is a learning outcome, as well as the critical impact it can have on the content-based learning outcome [15]. Enhanced and appropriate metacognition abilities will only be achieved by means of an integrative perspective and bond between content and context [16].
Metacognitive strategies such as concept-mapping, peer discussion and an emphasis on qualitative reasoning were implemented in a large physics lecture class [17]. Students demonstrated more sophisticated conceptions to deep approaches to learning as well as positive views towards the content of the course. Effective use of metacognition strategy also requires course content to include cognitive learning with content that should be neither already understood nor totally unfamiliar. To promote metacognition in classroom the rate of coverage should also be slower than in the traditional classroom [18]. Students’ learning is nonlinear with slower progress at the beginning followed by rapid learning during later stages. A positive atmosphere of trust between the instructor and student is another critical parameter for success in implementation of metacognition strategies.

The metacognition strategies were taught in the introductory engineering class using a web based tool, LectureTools. Each student in the class was provided with a laptop computer through which they can register and access LectureTools.

**LectureTools**

LectureTools (http://www.lecturetools.org) was originally developed by Professor Perry Samson of University of Michigan using PHP scripting with MySQL, and later improved in 2007 using Symphony web application framework [19]. The driving reason for the development of LectureTools was the desire to increase options for student response to instructor questions, beyond what is available in traditional clicker systems such as free response questions, image-based questions and association questions. Some of the currently available features of LectureTools include: (1) typing notes synchronized with the lecture slides (2) self-assessment of students’ confidence in understanding the materials being discussed (3) pose questions for the instructor and/or teaching assistant during the lecture (4) view answers to questions (with answerers’ names removed) as posed by the teaching assistant/ instructor during or after the class (5) pop-up the slide, draw on it and save the drawing (6) respond to instructors questions (7) view podcasts (if any) that are that are uploaded by instructor (8) print lecture slides and notes for off-line review.

To allow real-time feedback from students about their self-assessment of level of understanding of the materials being presented, students were asked to assess their confidence level in the level of their understanding. Student’s pre-test and post-test scores during each class were compared to evaluate their ability to answer questions in the subsequent examinations.

**Methodology**

**Experimental Design:**

The study was based on a repeated measure design (pre-tests core, post1 score, post2 scores, pre-test confidence, post1 confidence, post2 confidence). Students’ scores and confidence levels were measured for six consecutive weeks to determine a correlation among them. Pre-test and pre-test confidences were measured at the beginning of the class prior to lecture, Post1 test was conducted immediately after presentation and discussion of the course materials; post2 test was after group discussion among peer students in the class. The objective was to evaluate whether students’ self-assessment of their knowledge, understanding and confidence level of their knowledge changed during the class and changed over the course. The second analysis was to evaluate whether there is any correlation between a student’s score and confidence level during class and their academic performance measured during an examination, such as a quiz.

Students were taught how to self-assess their level of understanding by preparing their own test questions and answers before the exam to regulate their own learning. The questions asked by students during the class discussions, along with the answers, were provided to all students which might also enhance their level of understanding.

**Participants**

Participants were 29 male students and 4 female students between 20-30 years of age. All students were enrolled in EGR102: Introduction to Engineering, a first-year course required of mechanical engineering students at the University of Michigan-Flint. Out of 33 participants, 26 were engineering majors, with 7 students who have not yet decided their major field of study.

**Experimental material and procedure:**

Before conducting the study and during the first class, a lecture on metacognition was presented, to provide fundamental concepts, strategies, and benefits one could gain by using it. Instructions were provided on the online metacognition tool, LectureTools, and how to use its different features using laptop computers. The class used a laptop cart that contains 30 laptop computers that students can check out for use during the class. The remaining three students brought their own laptops for use in the class.

Prior to the lecture or classroom discussion of a topic, participants were asked to complete a pre-test questionnaire, designed to measure their level of perceived ability and confidence in the subject matter. Next, the instructor presented the material where students participated through discussion and by submitting questions using LectureTools. Following the lecture and discussion, they were asked to complete a post-test questionnaire (post1), designed to assess the level of accuracy of their knowledge about the subject matter and their confidence level. After the post-lecture test, students gathered in groups of three to four and discussed each question and their individual answers, providing rational explanation of why he or she had higher or lower level of confidence of their answers. The group members then answered the questions individually and
indicated their level of confidence. It was observed that overall accuracy and confidence level had changed through these processes.

The data was analyzed using Pearson correlation with six different variables: pre-test score, pre-test confidence, post1 score, post1 confidence, post2 score, and post2 confidence. The results of the six variables were compared to each other to determine any correlation among them. The analysis results were used to determine any correlation between scores and confidence levels to evaluate how accurately students are able to self-assess their level of understanding. The results were also used to observe the changes in level of understanding and confidence levels between pre-test, post1 test and post2 tests.

A second analysis was performed to determine the correlation between weekly pre, post scores and confidence levels with examination scores of quiz one. The results of the pre-test, post1 test, post2 tests were compared to exam scores to determine how well they performed in the examination compared to their self-assessment during the classroom session. The next phase of this study will involve an experiment with a control group, using learning instruments to determine if metacognitive strategies improve learning among students at the University of Michigan-Flint.

**Results**

Our model’s assumption is that low perceived ability impedes performance and that high-level absorption advances achievement to areas of their strengths and students improve their metacognitive abilities in the classroom by increased confidence level after the post2 test. The results of pre-test and post-test score data for a week with students’ self-assessment of their confidence level of the correctness of their answers are presented in Figure 1. The expected outcome line shown in the figure is a perfect agreement line between students’ scores and their self-assessment of confidence level of correctness of their answers. The mean scores and confidence levels of 33 students for 6 weeks of study are presented with 95% confidence level error bars in Figure 2. The mean score and confidence levels increased from approximately six to nine demonstrating a 50% improvement during the class. This overall observation demonstrates the level of improvements using metacognition strategies in the classroom.
The changes in scores and confidence levels for all 33 students in 6 weeks presented with 95% confidence level error bars in Figure 3. It appears that there is a consistent level of improvement between 2.5 and 4 points across a six week period, with higher scores and confidences in Week One compared to Week Six. One of the possible explanations for this difference in scores may be attributed to the fact that the students may be more familiar with the materials presented in Week One compared to Week Six. Although a downward trend is observed, the incremental changes in scores and confidence levels are highest during Week Four. The mean scores and mean confidence levels are presented separately for each week in Figure 4 and 5 showing consistent improvement in both students’ scores and their confidence levels of their level of understanding.

The first of the two analyses performed on the preliminary results of the metacognition research was performed using SPSS software. The Pearson correlation analysis among six different variables shows significant correlation between pre-test score and pre-test confidence \( r = 0.425, p < 0.01 \), between post1 (after lecture) test score and post test confidence \( r = 0.480, p < 0.01 \), between post2 (after group discussion) score and post2 confidence levels \( r = 0.374, p < 0.01 \). The highly significant level of correlations can be interpreted as students’ ability to self-assess their knowledge and level of understanding of the materials discussed in the class. The analysis results are presented in Table 1.

The second statistical analysis using SPPS was performed to determine any correlation between pre and post test scores and confidence levels to academic performance as measured by a quiz conducted during Week Five of the class. The results are presented in Table 2 below. The mean scores of pre- and post-test results for each student were compared with their quiz scores using Pearson correlation analysis showing no significant correlation \( r = 0.217, p = 0.225, r = 0.017, p=0.923 \) and \( r = 0.078, p= 0.666 \) between academic performance and students’ self-assessment during classroom.

**Conclusion**

Introduced in the first phase was an experimental paradigm evaluating the study of metacognitive behavior. Overall performance was based on each participant’s assessment of their knowledge of the subject matter. It was hypothesized that the students’ confidence level would affect the actual score they received on their exams. It was compared to their actual performance based on exam scores. No significant main effect was revealed linking the pre- and post-test scores and students’ self-assessment of their confidence levels of knowledge. Our argument that low perceived ability impedes performance and that high level absorption advances achievement was not
supported. However, it is important to note that our sample size was very small, meaning that the results of the early phase of this study have very low statistical power. It is important to emphasize that students were chosen to participate from the Engineering 102 class; this is not representative of the entire population at UM-Flint. Further studies in this area will conduct more random assignments when selecting samples for these studies.

Additional studies need to be conducted to determine if students use of metacognitive strategies improve their knowledge and academic performance. Secondly, will they enhance their abilities if they were to use the online metacognitive instrument, LectureTools, to facilitate the learning process? These theories will be explored in phase 2 of this study. Since many of the metacognitive strategies can be taught to students, perhaps it would be plausible for educators to incorporate new methods and tools to facilitate the use of metacognitive strategies which can improve student achievement.

Acknowledgments
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cognition training on academic self-efficacy of selected underachiev-
ing college students’’ Arkansas State University, 1999

Scholarship of Teaching

Table 1: Pearson Correlation among Pre/Post Test Scores for Six Weeks (n=198)

<table>
<thead>
<tr>
<th>Quiz</th>
<th>Pre-test Score</th>
<th>Pre-test Confidence</th>
<th>Post 1 Score</th>
<th>Post 1 Confidence</th>
<th>Post 2 Score</th>
<th>Post 2 Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz 1</td>
<td>Pearson</td>
<td>1.27</td>
<td>.001</td>
<td>.017</td>
<td>.324</td>
<td>.078</td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.225</td>
<td>.995</td>
<td>.923</td>
<td>.066</td>
<td>.666</td>
<td>.150</td>
</tr>
<tr>
<td>Pre-test Confidence</td>
<td>Pearson</td>
<td>.361</td>
<td>.705</td>
<td>.189</td>
<td>.369</td>
<td>.061</td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.039</td>
<td>.000</td>
<td>.293</td>
<td>.035</td>
<td>.735</td>
<td></td>
</tr>
<tr>
<td>Post 1 Score</td>
<td>Pearson</td>
<td>1</td>
<td>.238</td>
<td>.640</td>
<td>-.103</td>
<td>.403</td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.162</td>
<td>.000</td>
<td>.568</td>
<td>.020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 1 Confidence</td>
<td>Pearson</td>
<td>1</td>
<td>.323</td>
<td>.632</td>
<td>.099</td>
<td></td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.006</td>
<td>.000</td>
<td>.585</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 2 Score</td>
<td>Pearson</td>
<td>1</td>
<td>.553</td>
<td>.761</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.769</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 2 Confidence</td>
<td>Pearson</td>
<td>1</td>
<td>.073</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.687</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 2 Confidence</td>
<td>Pearson</td>
<td>1</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).

Table 2: Pearson Correlation between Academic Performance and Pre/Post Test Results (n=33)

<table>
<thead>
<tr>
<th>Quiz 1</th>
<th>Pre-test Score</th>
<th>Pre-test Confidence</th>
<th>Post 1 Score</th>
<th>Post 1 Confidence</th>
<th>Post 2 Score</th>
<th>Post 2 Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz 1</td>
<td>Pearson</td>
<td>1.27</td>
<td>.001</td>
<td>.017</td>
<td>.324</td>
<td>.078</td>
</tr>
<tr>
<td>Sig (2-tailed)</td>
<td>.225</td>
<td>.995</td>
<td>.923</td>
<td>.066</td>
<td>.666</td>
<td>.150</td>
</tr>
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<td>Pre-test Confidence</td>
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<td>.361</td>
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<tr>
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<tr>
<td>Post 2 Confidence</td>
<td>Pearson</td>
<td>1</td>
<td>**</td>
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<tr>
<td>Sig (2-tailed)</td>
<td>.000</td>
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</table>

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Call for Manuscripts

The Scholarship of Teaching is a publication of professional reflection about all matters relating to teaching and learning. Original essays, commentaries and articles reporting informal research on your teaching may explore what you find compelling, perplexing and inspiring about your work in and outside the classroom. Previously published original articles may be reprinted with permission.

Theme for the Winter, 2011 Issue:

How Do Teachers Learn?

We expect our students to accept our teaching. Most of us are passionate about their learning, and we trust – sometimes in the face of distressingly contradicting evidence – that they know how to learn from us. We expect them to be learners.

But how about our own learning processes, especially as teachers? What do we do to keep our teaching practice vigorous and effective? Most of us find ways to learn from our experience and bring those observations back into our work. The next issue of The Scholarship of Teaching aims to capture some of those lessons. Questions to stimulate your thinking:

- Where - or to whom - do you go for inspiration for your teaching practice? What theorists, scholars, mentors or wise men or women help you make sense of your classroom experiences and challenges?
- How have you learned from your students? In what specific ways have your students shaped your teaching practice? (This is in part what we were hinting at in the Fall 2010 Cloth Bag “One Continuous Mistake: Classroom Debacles and Their Rewards.”)
- How has your “non-teaching” life informed your teaching life? How have the personal pleasures, complications, changes and significant events of your “outside” life affected how you teach?
- How does your scholarship and/or community engagement inform and affect your teaching?
- What does it mean to your teaching to be in Flint and at UM – Flint in particular?

Submission Guidelines:

Please submit your manuscript electronically to janworth@umflint.edu or in hard copy to Jan Worth-Nelson, Thompson Center for Learning and Teaching, 241 French Hall. Final manuscripts must be sent electronically. Articles using references may follow either APA or MLA format. Manuscripts will not be blindly reviewed.

Deadline for Submission: March 4, 2011