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From hills to halls: A modern parable of transitioning to academia

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Abstract: This reflective essay tells the story of the transition of a Hollywood director to the professoriate.

Keywords: film, arts, career development, professoriate, faculty development

Traditionally, the trajectory for most faculty careers has been straightforward: from PhD to tenure to retirement, the latter two often at the same institution. As many studies have noted, however, the conventional path is becoming less and less the norm as higher education faces a myriad of marketplace challenges (Simendinger, Pula, Kraft, & Jaspersen, 2000; Webb, 2009). It is becoming more commonplace for academics to change institutions or even change professions in mid-career, and a growing body of literature documents and analyses these transitions. There is another transition, however, that has received less scholarly attention. Particularly in professions in which there are shortages of trained faculty, more and more faculty are coming to academia from a foundation as a successful professional. While this phenomenon is not entirely new, particularly in applied fields such as health, business, law, and education (Barber, 2006; Butcher & Stoncel, 2012; Clement, 2012; Crane, O’Hern, & Lawler, 2009; Smith, & Boyd, 2012; Tysinger, Diamanduros, & Tysinger, 2010; Watson, 2008), the transition in the arts has not been addressed. This is the story of one such conversion.

Jack Sholder’s name may be familiar to those of you who are film buffs. As a filmmaker in Hollywood, he directed such films as *Alone in the Dark*, *Nightmare on Elm Street 2*, and *The Hidden*. In addition, he won an Emmy for his editing on the acclaimed PBS series *3-2-1 Contact* and has had three of his screenplays turned into feature films. His career is sufficiently extensive that the *Oracle of Kevin Bacon* rates him as a Bacon number of 2 (Oracle). It has been nine years since he made his last film, however, and today he serves as program director of Motion Picture & Television Production in the School of Stage & Screen at Western Carolina University, a medium-sized regional comprehensive university located in the rural mountains of western North Carolina. The story of his transition from the Hollywood Hills to the halls of academia, told in his own words and through scenes as if in film, provides us with a modern parable for the challenges and opportunities inherent in moving from professional to professor.

Jack’s Story

When I graduated from Antioch College, I basically had two things going for me. First, I had a degree in English literature and secondly, I was a very serious musician (a trumpeter). What I discovered was that film integrated these two facets. Film has a narrative structure, a story, and it has a kinesthetic element—a rhythm or flow – that is similar to music. Antioch did not have a film program at the time, so I just went ahead and shot some short films on my own, figuring it out as I went. A few weeks after graduating and moving to New York, a friend of mine, also an alumnus of the college, called me up and said that his girlfriend was working for a fledgling film distribution company, New Line Cinema, and maybe I should show them my films. I met the

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owner of the company. He wasn't interested in my short films but asked if I knew anyone who could edit a trailer for him. I immediately volunteered. My friend and I gained access to someone's editing room after they went home Friday night and by the time we emerged early Monday morning, we were close friends and remain so to this day. After years of minor successes New Line decided to start producing feature films. I pitched an idea to them and ended up directing my first feature film, *Alone in the Dark*. Then, after their success with *Nightmare On Elm Street*, I reluctantly directed the sequel, never seeing myself as a horror film guy. It was a big hit, and next thing I knew, I was in Hollywood.

Up to that point, I had never had a steady job in my life. When you work in film, you usually do one film at a time and you never know when, or even if, your next film is going to happen. A common strategy is to have three or four project going at a time and hope that at least one of them will get made. As a director, if I could do one film a year, I was doing alright. It was great when you were working, but when you are not working it could be very stressful. I managed to keep it up over the next twenty years, doing movies and TV for most of the studios and networks. Periodically, as the work started to taper off, my wife would encourage me to look for a teaching job so we could have some stability. Largely to mollify my wife, I would occasionally apply for these jobs with no real expectation of success. I do not have an advanced degree and I have never taken a film course in my life. Every six months, however, I would look at the job ads to see what was out there. One day, I saw this job at a school I had never heard of. They were looking for someone with a background in directing/producing to start a new motion picture program. Knowing it was a long shot, I sent a letter outlining my experience. They considered my life experience to be equivalent to a terminal degree and offered me the job. In 2004, we moved from Hollywood to Cullowhee, NC. I was a professor.

Scene 1: The Story Matters

When I first arrived on campus, there was no film major, so I was faced with building a motion picture program from scratch. In some ways, I was hampered by the fact that I had never gone to film school, and so I didn't know how the subject was taught. I looked at syllabi from several major programs and spoke to colleagues who'd gone into teaching, but I came to realize that my lack of background may actually have been an opportunity because it forced me to think very intentionally about every element of the curriculum design. First and foremost, I had to ask myself: what did I want students to learn? Like many people in Hollywood, my view of film schools was not very favorable. I had looked down on academics, believing that you would not really learn until you went out and practiced, as I had done. That being said, if I was going to take people's money to teach them film making, I needed to figure out what was important, how to teach it, and what they should know before they went into practice and learned the rest. There's a technical side to motion picture production, and students do need to be proficient at these, but technical aspects are constantly changing. What I chose to focus on was story. I have worked with top people including Academy Award winners, from actors to sound mixers, and what differentiates the run-of-the-mill from the really good ones was not just a mastery of the technical skills, but an understanding of the story that was so deep that they could make the technical side work its magic. The first class I created for the program was called *Storytelling for the Screen*.

Scene 2: Academia is not Hollywood

Even before I started teaching, I would soon discover that I had some hard lessons to learn: academia is not like Hollywood. As a director and editor, my primary responsibility was to the film and its audience. I wanted my films to appeal to a wide audience, and to earn their love, respect, and, of course, their money. In academia, it's less about the product than about the process. And ultimately it's about the student. My new goal was to turn out the best possible student that I could, and I began hiring colleagues for the program, starting with a screenwriter, a cinematographer, and a film studies specialist who could support me in that endeavor. A colleague once accused me of caring more about the program than the students. This is absolutely wrong. If you're a director, you have an enormous amount of ego attached to film you're working on. My ego is now attached to the program, but in a very different way. On one level, it's my program. On another and more realistic level, it's not just mine, it belongs to the faculty, the university, and the students. They've all been instrumental in getting it where it is, and I never could have gotten it there on my own.

As a film director, if I moved, someone would move my chair for me. Directors get many perks, from first class airfare to hefty per diems. That does not happen at a university, which is a much more bureaucratic institution. One of the first mistakes I made as a faculty member, for example, was to not understand how to navigate the hierarchy. In Hollywood, who you know and have access to is very important. If I can call the Chairman of the Board of New Line Cinema, I'm in a much better position than someone who can't. When I was hired, I developed a good relationship with the Chancellor of the University. I could, and did, call him for consultation on a variety of issues. At an early college meeting, someone asked a question, and I mentioned that I had learned the answer in a personal conversation with the Chancellor. It took me a while to realize that I was making everyone in the room pretty angry, especially the Dean. I've since learned that the Dean is an important person in my life and it is a good idea to keep him happy. I still have meetings with upper administrators, but not without letting the Dean know beforehand and debriefing him afterwards.

Scene 3: What Students Know (and Don't Know)

In my second semester at WCU, I taught my first classes and realized that my students had no technical background to do the work, so we added a course in introductory production skills, taught by our cinematographer. We would later add intermediary courses in each of the technical areas as well as courses on film history. In every technical course, it was always story first: "Here's how to use this camera and these lights. Now go out and tell a story with them." Beyond the curriculum, though, I began to understand more about teaching itself. I thought that I was well suited to being a teacher because I always liked to talk about what I did, even though much of it was instinctive. As both an editor and a director, I was always given an assistant, and I felt a responsibility to educate the assistant not only as payback for the grunt work but also to further his or her career. In an academic setting, I quickly learned that war stories and enlightened advice wouldn't cut it; you needed a pedagogy. At one point, we hired an adjunct who had a great deal of professional experience, but he made assumptions that the students should just know what he knew because to him it seemed obvious. If they didn't understand, he just assumed they were stupid. What I realized was the students didn't have any context for

understanding his stories. They were all told their work was no good, but not *why* it was no good. So they had to teach themselves.

No one had ever taught me editing or directing—I learned it by doing it. A normal career path for a film editor used to be you started as apprentice. You watched, learned, then moved up to assistant, and after some years to a full-fledged editor. As a director or editor, you work on instinct and feel. If you're off by a frame, a 1/24th of a second, it doesn't feel right. So my biggest challenges was taking my experience and moving it into a set of articulated principles that could be taught. I had to take all of those things that I used to do without thinking and give them a name. On one level, it felt like it had the mystery taken out of it. Part of, maybe even the best part, of the creative process is the non-rational aspect of it, but that can't be taught. I needed a blueprint for what and how I wanted them to learn so they could get to the next level. As an example, one of the things that I began to notice was, in editing there are a set of basic questions you ask yourself: when do you cut and why do you cut. When I first taught, I saw that often the students would cut to a shot and not hold it long enough, particularly in wider shots. I thought about why it didn't feel right, and then I realized: It's like reading. In a wide shot there is more information to take in so you need to hold it longer as a rule (often broken) because it takes more time to read than a close-up where there is less to scan. Students can get that.

Perhaps the biggest revelation I had was that the students didn't just need imparted knowledge. They really needed to know what to do with that knowledge. I feel that I was successful in my career because I learned in college how to think and how to learn. And everything I learned I've used on a film set. That's what I want my students to understand, and that's why I favor a liberal education background rather than a conservatory approach.

Scene 4: It's About Process

When the students made mistakes, it was tempting to take over and start directing their films for them. I learned from one of my experienced faculty members that there is a delicate balance between when you intervene and when you leave them alone to make mistakes. If they're about to step over the edge of a cliff, you have to stop them, but if they're about to step onto a cow pat, you have to let them. When I critique students' work, I tell them that filmmaking is not math. There's not always a right answer—but there's a better answer and a less good answer. I explain to them that this is my opinion that is based on my own experience, and here's *why* I have that opinion. I then give them a way to test those answers so that they can choose the better answer. Because we deal with creative processes, our egos are often wrapped up in our work. Blunt criticism can feel like a personal attack, and students have to learn to tell the difference. I always say it's about the work, not about you. The truth is that every step of a film production, from script to shooting to editing, starts off flawed, and you need to make it better through the process. So I only grade the final output. In class we screen everybody's work, and critique it together. I always give my interpretation last, because I don't want to influence what the students have to say. As a result of this process, of seeing film exercises that work and others that don't work, the students develop an ability to critique their own work. And they develop a point of view, which is essential to becoming an artist. The critical skill is the ability to look at the work and make it better. In film as in teaching, you have to be able to erase your mind, as if you've never seen it before, then look at it and say is it perfect? Does it work? Does it not work? Why not? And what can we do to fix it?

Scene 5: How Students Learn

When I first started teaching, I would often find myself pigeonholing students: this one has promise, this one does not, and so forth. As I began to teach over several years, however, my opinions began to change. While some of them had struggled as freshmen, I found that by the time they got to be seniors, all of them had become good filmmakers. It was a big revelation for me to see that students learn differently, and those that appear hopeless as sophomores can still become good students, solid filmmakers, and even leaders. Watching their transformations changed the way that I perceived students. It may seem obvious to those who have been in academia throughout their careers, but students can and do learn.

Because film production is inherently collaborative by nature, we usually assign team projects in our courses. It was my feeling that some people are good collaborators and some are not. Early on I had student team members critique the collaborative efforts of each other. At a conference I showed a student's negative evaluation of another to a colleague, and he asked me why I, as a teacher, had let the situation come to that point. My response was to say the student being evaluated was a bad collaborator. After some reflection, I realized the situation was more complicated than that. I needed to intervene in a way so that it *didn't* get to that point. More importantly, I realized that collaborative skills can be learned. Some people are naturally good at it, but others can develop collaborative skills over time. Part of my job – in a field where good collaboration is essential to making a living – was to teach those skills. Now, instead of refereeing accusations and counter-accusations, I listen to all the stories and watch as the stories become less emotionally charged and more focused on constructive criticism. We had a female student, for example with whom no one wanted to work. As a senior, she finally figured out what she needed to do, and it's like working with a different person. During her internship (on a low budget feature), she was given a great deal of responsibility and became very close to the director. This creates a kind of mutual reinforcement loop—she changed her behavior, the reward for her was great, and now she has become a leader in the program. Stories like hers happen again and again, which shows that even less tangible skills or traits can be learned.

Scene 6: The Classroom and the Studio

In Hollywood, everyone from the director to the production assistant tries to produce at the highest level on set, which is one of the pleasures of working in film. There are unwritten rules and etiquette that surround the hierarchy on a film set, just like in any business. There is an iron clad chain of command. If you break that chain, you'll lose your job. You have to learn when to talk and when to stay silent. Aspiring film makers need to know these rules. Because our program is taught by practitioners, we know what those rules are. We have it in our bones, so we can model that to our students, and I believe that is something that practitioners have to offer to the field.

We try to teach these values in such a way that it becomes an intrinsic part of how the students work. Seniors in the program, for example, have to complete a thesis project and even though they are heavily mentored, they run the entire production. It has been fascinating to watch how they come to own the process and how they begin to do our work for us. They're in charge and it's their job to show the upcoming students how to fit into that world. A major component of this is not just the transfer of technical skills, but also the attitude. On a set, there's always something to do. In Hollywood a production assistant who just sits around would be

unemployed, so on our sets the students call each other out if someone is not doing enough, isn't dressed properly, or is violating the rules in some way. The students are often tougher on each other than we are on them.

Scene 7: Assessment is not the enemy

When I first started, I thought writing a syllabus was basically a hoop to jump through; an unnecessary administrative affectation. By my third or fourth year, the value of good course design began to become more and more apparent. I met with one of our university's instructional developers to talk about my syllabus, and the experience opened my eyes. I began to see my course from the perspective of the student and made considerable revisions to the syllabus to reflect how I wanted them to spend their time. I think that there is often an assumption that students have nothing else to do besides our course and that everything we say is of equal interest.

Perhaps my biggest professional transformation as a teacher has been in assessment. Like many of my colleagues, I believed that I was the best judge of the quality of the students' work and that I knew good work when I saw it. That assumption slowly began to change because of several experiences. When students complained to me about an adjunct instructor, one of their primary objections was the fact that he required enormous amounts of work from them, but they would receive only a grade (usually a low one) in return and they did not understand what they needed to do to improve. One of my colleagues described this style of grading as "the Karnak method," i.e. simply imagining the grade out of thin air like Johnny's Carson's psychic. Despite this, I still found it difficult to believe that you could assess the quality of creative work in a structured way. What changed my mind? I had a very good student who started doing really poorly on all her quizzes. I asked her what was going on, and she said that because I had dropped the quiz grades from 10% to 5% of their grade, she decided that they were a lower priority for her and that she had to focus her time elsewhere. I started to use rubrics and grading structures as a means to provide clarity to the students on what they should value, what's important, and what they should spend their time doing. In my editing class, for example, we switched this year to a new editing software system. I needed to spend a great deal of time teaching them how to use it, so for that semester I pushed the quiz grade up to 40% because they needed to spend their time practicing in order to develop a baseline for the higher-level work. They realized that they'd better study. Rubrics are not the enemy of creativity, but rather a means of communicating about what matters in developing high-quality creative work.

Scene 8: From One Profession to Another

Even after teaching for several years, I remained a professional filmmaker but an amateur teacher. It took me quite a while to consider the idea that teaching is a profession and that you have to become as professional as a teacher as you were as a creative professional. When I first started, I was guilty of thinking of my new job as a step down from the old one. No one moves my chair anymore. Instead, I'm teaching students, flying coach, and seeing my name on committee rosters. Over time, though, I have been able to find a deep sense of satisfaction in what I do. I'm taking people and giving them opportunities that they wouldn't have otherwise. I'm teaching them things I wish that someone had taught me when I first started. It would have saved me much grief.

The ultimate goal of our program is to get students to think like filmmakers. We even have a freshmen-level course called “Thinking like a Filmmaker”. If I can get them to do that, then I think we have been successful. Now that we have had several cohorts of students graduate, we can see that they tend to do well in the industry. Feedback from employers indicates that they know how to behave on a professional film set and they understand what is expected of them, and not just on the technical side. They have the right attitude towards their work, from knowing the rules to seeing opportunities in even the most menial tasks.

In a sense, then, I have two professional identities: as a filmmaker and as a teacher. I confess that I had, and continue to have a great deal of respect for faculty in fields that seem to be naturally suited to the academic environment. I was less certain about academics in applied fields, particularly my own. Now, I hold them in much greater value. Some practitioners are awful teachers, inculcating methods and thinking that were around when they were learning and may now be out of date or out of use. And many academic filmmakers are fantastic at teaching and are on the cutting edge, both aesthetically and technically. I’ve learned from them and have really come to value them in a way I had not before.

In my mind, I remain a filmmaker first. I’ve always seen myself as an artist. I’ve always been attracted to things that are beautiful, from music and literature to art and the art of living. That’s been the thrust of my life since I was a child and it’s at the core of who I am. I wanted to make films not for money or fame, but because of the transformative power of the medium and its ability to move people emotionally and intellectually. Will teaching ever have as much power/meaning in my life as making films? Probably not. That does mean that it’s not something that I care about. Do I see myself as an educator? I take as an example the fact that almost every great musician has taught. It’s virtually an obligation to pass that knowledge on. I see myself as a filmmaker who’s teaching film making and who is hopefully good at it. If I can clarify and inspire and share my passion, then I am doing a good thing. When I walk onto a set of a senior thesis film, and I see students working cooperatively, creatively, together, I’m not only proud, I’m moved.

Scene 9: Professional Development

I made my most recent film in 2004 (though my contract does allow me time off to make more, so it may not be the last). My point of reference for films is the forty years around my professional career. Technically, filmmaking is a very different world today. I’ve only shot film, but the world has gone digital. From a practitioner perspective, I’m not as up on that field as I should be and probably never will be. The current environment is not part of my experience. On one level, I acknowledge that to some extent I’m teaching an older paradigm, but I think that the basic principles of filmmaking, like storytelling, are eternal and this can be seen in the continued relevance of such different genres as Shakespeare and Hitchcock films. Filmmaking techniques are changing all the time. Hitchcock films had a slower pace than the Bourne movies, but the basic principles remain unchanged. Regardless of the software or tools you use, you still are photographing light and you still have to be able to convey answers to questions such as what is the scene about? What is the theme or spine of the story?

There are things about storytelling that are profound. Story and character are what matter and resonate with audiences. If you think about the movies that you love, it’s the emotions that you remember. We strive towards teaching our students how to do that. That is what good directors direct. I am aware of the fact that on one level I’m not a current practitioner as a

filmmaker, but now I learn from my students. I have them talk to me about what films they value, what moves them, and I am able to develop my own professional awareness through them. When I give more of the teaching learning process over to them, we all get more out of the experience.

Final Scene: Lessons Learned?

This has been the story of the transition of a Hollywood filmmaker to university educator. As this essay shows, personal reflection has been an essential part of Jack's professional development as a faculty member. When he first shared his story over coffee, we became convinced that it could also be powerful if shared with others, as others have shared their reflections with Jack. Many of the revelations that have impacted his teaching career may not be new to those of you who also teach, but he had to learn them through experience and not from reading articles such as this one. The promise of the scholarship of teaching and learning is to bring reflection to a shared, collaborative level. We were initially uncertain about how this article would work and whether it would be of interest to others. We knew that higher education follows a constructivist model, i.e. the principle that knowledge is constructed and that different people construct it differently. While this is frequently applied to ideas about how students learn, it can also be applied to how faculty develop. As more and more faculty are drawn from the ranks of other professional careers, our perspectives on what we do and how we convey that to others, can hopefully move others to reflect on their own values, assumptions, and practices.

Jack is not the first person to reflect on turning from professional to professor (Faulkner, 2007; Fogg, 2002; LaRocco, & Bruns, 2006; Kinsey, Coleman, Christie, Culver, Erickson, Hunt, Williams, Smith, & Tareilo, 2006; Mangan, 2006; McCluskey-Tits & Cawthon, 2004), nor is his the first attempt to look at faculty development support for professionals in transition (Crane, O'Hern, & Lawler, 2009; Griffiths, Thompsons, & Hryniewicz, 2010; Thomsen, & Gustafson, 1997) but just as disciplines have signature pedagogies, so do professionals. Many of the lessons learned from his individual story reflect the distinctive challenges faced by faculty in the arts, from tensions between professionals and academics; effective peer critique; and assessment of creative work (Haugnes, Holmgren, & Springborg, 2012; Klebsadel, & Kornetsky, 2009). As we continue to examine and reflect on the increasing variety of routes toward academic careers, we should perhaps be cautious in aggregating these experiences, as the stories do very much matter.

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Deep and lifelong learning: When theory and SoTL intersect

Jane West¹

Abstract: In this reflective essay, a teacher educator describes her own transformation that occurred as a result of studying adult learning theory along with a group of doctoral students. In examining her habits of course design, she realized that her practices had departed from her ideals and that her course planning was guided as much by pragmatic schedule demands as by the conceptual development of her students. As a result, she redesigned her course in language and literacy for preservice teachers. After describing the existing course, the author relates how her thinking—and the course—were transformed by the intersection of three influences: her encounter with Ramsden’s (2003) androgogical theory of teaching and learning, her familiarity with a discipline-specific pedagogical theory, and her SoTL research on students’ needs as learners. Guided by these influences, she reconceptualized the language and literacy course with a renewed focus on the social constructivist goals of facilitating conceptual change through meaning-oriented approaches. The author attempts to make visible to the reader exactly how she made this transition to address both the theoretical and the practical dimensions of the course, rediscovering in the process the transformation that is possible when teacher education focuses as on the why as well as the how of teaching.

Keywords: transformation, constructivism, conceptual change, theoretical teaching

Teaching about teaching is always perilous. Like it or not, those of us who are teacher educators serve as exemplars, as models of practice—good practice, we hope. As we try to help new teachers learn the ropes, or experienced ones hone their craft, our practice is always under the scrutiny of our students and ourselves. Recently, two of my courses about teaching intersected in an unexpected way, resulting in a significant shift in my practice. In a discussion with students in my doctoral course on teaching in higher education, I had a moment of realization that made me flush with embarrassment. As a teacher educator of more than twenty years, I discovered that I had stopped practicing what I preached, at least in one important respect. In the press of daily professional demands, the theoretical, conceptual aspects of my teaching had somehow moved to the backseat, while I had allowed pragmatic considerations to take precedence in my course design. In my planning, I was organizing content not so much to support students’ conceptual growth as to cover topics, stagger assignment deadlines among courses, and work around conference trips. A renewed mindfulness about theory, combined with my practice of the Scholarship of Teaching and Learning, enabled me to recapture an approach that is consistent with my long-held beliefs about teaching and learning.

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I. Going Astray: The Course in Question.

The course at the center of my *disorienting dilemma* (Mezirow, 1991) was a course known at my institution as Language and Literacy II, the course in which pre-service teachers learn to teach literacy to children in upper elementary grades. For more than twenty years I have taught courses similar to this one. Each semester, I have revised some aspect of my approach, based on feedback from students, ever-changing external teacher certification standards, and my own professional judgment. Course texts, assignments, topic sequencing, learning tools, and content evolve a little every time I teach the course. Through the variation, a basic pattern in the structure of class meetings has persisted: A portion of each class meeting is devoted to writing workshop in the tradition of great teachers like Calkins (1994), Fletcher and Portalupi (2001), Graves (1983), and Harwayne (2001). My intent in using this process is that we all become engaged as adult writers and learners; we research and write about topics we care about, experience the joy of self-directed learning, develop awareness of our own literacy practices, and grow as readers and writers. We also develop first-hand understanding of writing workshop as an instructional practice—much as it might be executed with children. The remainder of each class meeting we spend thinking and talking about assignments and course texts, and engaging in a variety of literacy learning experiences similar to the ones in which children might be engaged in a language arts classroom. The course might be seen as the teacher education corollary to courses in other professional preparation programs that occur prior to clinical work, like a course on family therapy in which students engage in therapy themselves, or a marketing course in which students actively examine their own consumer behavior as the basis for their study. This course is the one that came to mind that day in class, as the group of doctoral students and I discussed theories of teaching and learning in higher education.

What I realized was that in recent years, as my class sizes had grown along with other professional responsibilities, I had fallen into the habit of constructing my course outline according to what was logistically easier to manage. I planned “backwards,” but not in the theoretically sound way that Wiggins and McTighe (2005) set forth, thinking first about learners’ understandings, and designing assessments around those in order for students to develop and then demonstrate the desired learning. My version of backwards design started with more practical concerns; learners’ conceptual development had almost become an afterthought.

Without intention, I had developed this routine for course planning: First, I determined the due dates for projects, tests, and other assessments, usually working backward from the end of the semester. Holidays, school breaks, and travel to conferences played a role in determining when my students would turn in their projects or take their exams. I also tried to coordinate across courses so that I did not have two classes submitting big projects in the same week. Then, I would consider what reading assignments and class experiences would help students develop the requisite knowledge and skills needed to complete their assignments and meet those deadlines successfully. I plugged those assignments into the class schedule, and voilà, my course plan was complete. The planning was nice and tidy.

On the pedagogical side, my process was anything but tidy. Assignment deadlines, rather than concepts and understandings, dictated the shape of the course. Never mind that the arc of the course may not have supported deep conceptual learning. Never mind that students might not have been able to synthesize the disjointed pieces of curriculum to form a cohesive, conceptually grounded whole.

II. Meeting Ramsden: A Theory of Teaching and Learning.

Then our university began offering a doctoral program in curriculum and instruction, and I agreed to teach a new course on issues in higher education. I selected two texts: *The Chronicle of Higher Education* (n.d.) and *Learning to Teach in Higher Education* (Ramsden, 2003). Reading Ramsden's book put me squarely in the hot seat. There I was, ostensibly teaching doctoral candidates how to teach college students, realizing all the while that my practice in the literacy course had strayed pretty far afield from what I knew about teaching and learning. As a card-carrying social constructivist (Vygotsky, 1978, 1986), I view teaching and learning as essentially collaborative enterprises. Human beings construct knowledge for themselves, in the context of their interactions with others and their membership within particular cultures and societies. We learn by doing, by trial and error, by watching what goes on in the world around us, by attending to models, by interacting with other human beings, and by actively seeking to make sense of all these experiences. My overarching goal as a teacher educator is to facilitate students' conceptual change, their ever-deepening understanding of teaching and learning. In my efforts to make my work load manageable, I had lost sight of that goal.

Ramsden, and my conversations with the doctoral students, reminded me of my core beliefs about teaching and learning and, specifically, about preparing new teachers to enter the profession. Among those core beliefs is the conviction that my job as a teacher educator is much more than providing my students with a toolbox of instructional strategies. My goal is to help them develop a deep conceptual understanding of how children learn and a firm theoretical foundation on which to build their teaching practice. An observer looking over my shoulder as I planned my literacy course would have been hard pressed to see evidence of that core belief. I felt like a big fake.

A. Ramsden's Theory.

In Ramsden's (2003) view, each of us has a tendency to take a particular approach to learning. That approach falls on a continuum from meaning-oriented to reproduction-oriented. Meaning-oriented learners have an internal focus; their intention is to gain deep understanding and to organizing the content of their learning into an integrated, coherent whole. Learners who are reproduction-oriented have a more external focus; their intention is to complete surface-level tasks (Ramsden, 2003, p. 47). Although the approach is in the hands of the learner, Ramsden posits a relation between instructors' theories of teaching and the likelihood that learners will take approaches that are either more deep or more superficial in nature. He outlines three general types of teaching theories. The first is a view of teaching as "the transmission of authoritative content," (p. 108) with its primary focus on the activity of the teacher. Teachers who hold the second theory view teaching as organizing student activity, "a supervision process involving the articulation of techniques designed to ensure that students learn" (p. 109). Teachers who operate in this theoretical realm are strongly student focused and are likely to include motivating students (through grades, for instance) and promoting student activity (employing experiential learning, or utilizing techniques that promote discussion) as central to their roles as teachers. Ramsden does not claim that those kinds of student activities are undesirable; rather, his point is that these teachers see it as their responsibility to orchestrate students' learning. Such a teacher might think, "If I lead students through these experiences, they'll learn."

Reading the description of this theory, which Ramsden calls “a transitional stage between theories 1 and 3” (2003, p. 110), I squirmed a bit, seeing myself on the page. As a teacher educator, I had become an adept organizer of student activity, a master orchestrator, busily guiding students through a series of experiences that should have resulted in their ability to be effective teachers of children and, more immediately, to demonstrate that learning through course assignments. I had become so convinced of the value of the activity itself that I began to lose sight of the conceptual underpinnings the activity was designed to develop.

Then along came Ramsden, with his ideas about students’ orientations toward learning and teachers’ stances on teaching, and I felt like the overweight doctor admonishing patients to watch their diets. I wanted to move out of this “transition stage” and live again in the world of Theory 3 teachers, whose goal is not to transmit information (Theory 1) or to organize activity so students learn something in spite of themselves (Theory 2), but instead “to make student learning possible” (2003, p. 110). Teachers operating according to this theory view teaching as

A process of working cooperatively with students to help them change their understanding. . . finding out about students’ misunderstandings, intervening to change them, and creating a context of learning which encourages students actively to engage with the subject matter. (Ramsden, 2003, p. 110)

The focus on what students are doing is still present, as in Theory 2, and there is a clear concern with content, as in Theory 1. The difference here is the simultaneous focus on teaching, students, *and* content, with a view of learning as “a change in understanding” (Ramsden, 2003, p. 6) rather than the completion of tasks or the reproduction of information.

This view of learning as changed understanding resonated with my social constructivist roots. From a social constructivist standpoint, learning is an internal act of meaning making (Vygotsky, 1978, 1986). This “meaning-forming” takes place within layers of social contexts and becomes transformative as we “reform our meaning-forming” (Kegan, 2009, p. 44). According to Kegan,

When a way of knowing moves from a place where we are ‘had by it’ (captive of it) to a place where we ‘have it,’ and can be in relationship to it, the form of our knowing has become more complex, more expansive. (Kegan, 2009, p. 45)

An example of this reformed meaning-forming occurred when I recently embarked on a quest to learn to make biscuits—the big, fluffy, golden ones I have eaten at many Southern tables throughout my life. My many attempts to make them had all resulted in failure of one kind or another. I sought the help of a chemist friend. Sitting at her kitchen table, we drank coffee as she taught me about acids and bases, gluten and protein, fats and leavening agents, ratios and mixtures. We consulted recipes and websites and charts. And then we designed an experiment to test our hypotheses about how to make the best biscuits ever. With her help and the guidance of a good cookbook, I made batches of biscuits, experimenting with fats and liquids, with pan types and dough handling techniques. Now I understand biscuits in a way that is quite different from my previous thinking. I know what each ingredient is contributes, I understand how the type of pan affects the way the biscuit cooks, I know why the butter should be kept chilled and the dough should not be over-handled, and I now know what the dough should feel like when it is mixed properly. My change in understanding—my transformation—has moved me from being *had by* a superficial knowing about baking to *having* more elaborated knowledge about how biscuits work. I still follow a recipe, but I’m in charge of my biscuits now, and am able to modify them to suit my taste at the moment. And my biscuits now are fluffy and golden, not dense and pale. This fundamental shift in thinking is much more than a change in behavior or an increase in

knowledge; it is epistemological change, a change in the way I understand (Kegan, 2009). Such transformations are supported when students who take meaning-oriented approaches meet teachers who focus on learners' understandings.

III. (Re)Conceptualizing the Course: Discipline-Specific Theory.

I began to think about what I could do to bring about that change in understanding for my students; this was my Theory 2 mindset refusing to shift, still focusing on orchestrating activity. So I went back to first principles. If I were to organize the language and literacy course conceptually, rather than for logistical convenience or task completion, how might that look? Coincidentally, the answer was waiting for me in my inbox. As part of my ongoing SoTL research, several times a semester I solicit feedback from students through an online survey, a modification of Brookfield's (1995) Critical Incident Questionnaire (CIQ). In Brookfield's CIQ, students have frequent opportunities to respond anonymously to questions about their learning: the moments when they feel most engaged or distanced in class, what teacher or peers do that help or hinder learning, what they find surprising. My variation takes Brookfield's idea of eliciting regular feedback, but I tailor the questions to suit each particular course, and I usually pose the questions three or four times in a semester rather than after each class meeting. The questions change, but in general, I ask students what their learning goals are, what's been helpful for them, what their plans are for meeting their learning goals, and how our work together in the course might help them meet those goals.

In studying this feedback from students over several semesters, I'd been struck by the similarities between what my graduate students identify as helpful for their learning, and what Cambourne (1988, 1995) identified as optimal conditions for young children's literacy learning. [See Table 1 for an overview of Cambourne's Conditions of Learning, along with examples of the ways these conditions surfaced in my students' thinking.] I was familiar with Cambourne's theory and always introduced it to my students as part of our course content on children's literacy learning. The parallels to my own students' needs, and to the conditions I tried to create in my classes through our literacy workshops, were intentional insofar as I sought to emulate good practices teachers might employ with children. However, the confluence of Cambourne's Conditions of Learning, my students' observations about their own learning needs, and my immersion in Ramsden's ideas generated new insight. The connection of a pedagogical theory within an androgogical context came as a surprise as I analyzed my students' reflections on their learning.

This serendipitous emergence of Cambourne's conditions in my students' written reflections provided the structure I needed for revising my course. Reorganizing the course conceptually, around Cambourne's seven conditions, provided an additional benefit. Like the dual purposes of conducting an authentic writing workshop, a focus on these conditions of learning would work on two levels: providing a rich learning context for us as adults to develop as writers, and serving as a model for creating fruitful learning contexts for children. Theoretically, Cambourne's work on children's learning is in sync with Ramsden's work on adult learning. Either explicitly or implicitly, both hold a view of learners as active constructors of meaning and of teachers whose role is to create opportunities for learning to occur.

One paradox is noteworthy: I had always maintained that I wanted my students to see the value of understanding theories of teaching and learning rather than to settle for the cute classroom activities they often sought. Yet I had moved further and further away from *teaching*

in a way that was theoretical. My teaching approach had been working against my goals. My own conceptual shift promised to help me realign my practice with my theory.

Table 1. Cambourne’s (1995) Conditions of Learning as Evident in the SoTL Data

Examples of the Conditions in My Students’ Responses	Examples of the Conditions as Enacted in Our Course
Immersion: Being “constantly bathed in that which is to be learned” (1995, p. 185)	
“I also benefitted tremendously from our extended in-class writing sessions. There is something powerful and inspirational about being in a room of writers. I enjoyed transferring that energy into my writing.”	In our weekly writing workshop we all read, wrote, talked about, and reflected on our writing, both individually and collaboratively.
Demonstration: “The ability to observe. . .actions and artifacts” (1995, p. 185)	
“I loved how you (Dr. XXXX) did every step along with us so that we had an example every step of the way.”	I made my own work as a writer public.
“I also enjoyed the article you read [to us] about the bus ride to New York. That really helped me see the importance of looking at all kinds of writing examples for inspiration. The descriptions the author used made me take a second look at all my writing and made me want to concentrate more on painting the perfect picture for my readers. I still have a lot of work to do on that.”	We used mentor texts for learning about good writing.
Expectations: “Messages that significant others communicate to learners” (1995, p. 185)	
“I think this was my only experience since grade school to really focus on HOW to write. Throughout my academic career I feel like I remember writing papers without anyone really telling me what elements to use, other than the stereotypical five paragraph essay. Maybe professors just assume that students learned these skills in grade school, but I in fact did not.”	We studied the processes and strategies writers used and made them explicit.
“Getting feedback and clarification on assignments helps me move in the right direction. I really like to know what I need to work on and how I can make my paper better, so teacher feedback is important to me.”	We worked on learning to provide concrete, specific feedback; students received specific feedback from peers and from me.
Responsibility: Learners’ decision about “what they’ll engage with and what they’ll ignore” (1995, p. 185)	
“Choice and creativity were the most valuable to me. I liked that I go to choose my topic. I liked that I thought about my connection to it. It made me want to learn about it and therefore inspired me to do a good job and take it to a higher level.”	Students had wide latitude for choosing topics for research and writing.
“I appreciated the time and choice to research what I was interested in. I had to self-regulate on time-management and with my writing if I were to hand in publications I’d be proud of.”	Students had freedom to decide how to use their workshop time in class.
Approximations: Learners “attempt to emulate what is being demonstrated” (1995, p. 185), without waiting until they have fully grasped it	
“I feel I learn better when the environment does not feel very stressful. This helps because I can focus on learning and not feel that mistakes are not allowed.”	We set a tone of “we are all learning”; I share my first-draft attempts; we engage in exercises in which we play around with sentences from mentor texts and attempt to use similar structures in short writing experiments.
“I feel that what we’ve done in this course so far has definitely given me new ideas about types of writing to try, and a great refresher on writing mechanics, and has reminded me not to be so	

critical of myself as I write, to give myself leeway & allow myself to make mistakes. I think the biggest challenge is often just writing something down, or typing onto the page.”

Employment: “Opportunities for use and practice” (1995, p. 186)

“I realize through this process that practice is important. In order to become better readers, writers and researchers, we must read, write and research. I understand that adequate time must be dedicated for this purpose during class.”

“The constant writing was most valuable to me because I never write for fun anymore. I write purely for class and work. But this process helped me get reacquainted with my [inner] writer.”

We spend about an hour (1/3 of the class) each week actually writing. Outside of class, we are all accountable for keeping writers’ notebooks, in which we keep our writing muscles warmed up several times a week.

Response: “Feedback or information that [learners] receive from the world” (1995, p. 1868)

“As a writer this semester, I have tried to push beyond my comfort zone. The personal narrative and even the [second paper] were hard for me to let go. I knew they would be critiqued and writing is so personal to me. Yet I grew in this writing process with the understanding that all reviews were to help me. I was able to risk trying new ideas and share my writing with others. I even let others read my drafts and accepted their comments without feeling strangled by harsh comments.”

We all share our writing, both in-progress and completed, with each other, and provide formal and informal response

Engagement: The learner’s active attention and participation (1995, p. 185)

“I’m more conscious of my writing. I think about what I’m trying to say, and what I want for my reader to know. I reread what I’ve written over and over again, and out loud! I attempt different ways to write something, I used to settle for the first or second version, and then ask a writing tutor if she/he could review my paper with me. I was listening to a review about Jodi Picoult’s new novel on NPR, they were talking about the research that she does for each of her novels. I thought, “that’s what I’m learning about!” Now I understand how important it is to research about the topic you want to know more about, and eventually write about. It seems obvious, but it wasn’t for me. I’m changing as I writer because I’m thinking more about HOW I write.”

We emphasize thoughtfulness about craft, audience awareness, and choice of topics we’re passionate about.

In restructuring the literacy course, I employed Cambourne’s theory to create “a context of learning which encourage[d] students actively to engage with the subject matter” (Ramsden, 2003, p. 110) rather than to focus primarily on completing tasks. Instead of working backward from assignments, my planning now proceeded from broad concepts—Cambourne’s conditions of learning—to particulars of language and literacy instruction, with assignments arising more organically from concepts.

This is how the revised course went: We began the semester by reading and discussing Cambourne’s (1995) *Reading Teacher* article, in which he lays out his theory, how he developed it, and its implications for teaching. I shared with students the parallels between Cambourne’s conditions and my previous students’ reflections about helpful conditions for their learning. Every aspect of the course now built explicitly on Cambourne’s model: On the new course outline, each of the weekly class meetings contained an integral focus on one or more of the conditions of learning; texts, discussions, our work together in class all emphasized those conditions, and course assignments incorporated students’ explicit application of the theory.

As we moved through the semester and built our understandings of the conditions of learning, we examined the ways in which the conditions were present in our own classroom context. For instance, the condition of literacy *demonstrations* refers to all the ways learners observe written language in use; through these demonstrations, children learn not only about particular texts, but also about how people use literacy (Cambourne, 1995). In our class focus on demonstrations, we read about the instructional value of reading to children and engaging them in rich discussions of those shared texts; we discussed sharing our work as writers with the children in our classrooms so that they may see our processes and struggles; and we practiced thinking aloud about our own reading in order to let children in on the strategies that successful readers use. In previous semesters, each of these practices would have been considered a separate topic, apart from the common theoretical underpinnings the practices share. Organizing the course by concepts rather than practices allowed us to see the practices differently, within the broader framework of which they are a part.

Soon, the walls of our classroom were lined with large posters on which students and I listed instructional practices that supported each of the conditions of learning. The lists grew along with our understanding of the concepts, as we made more and more connections among theory and practice each week. Our discussion of course texts always included our thinking about the conditions, and the workshops and other learning activities in which we engaged gave us yet another avenue for deepening our conceptual understanding. We viewed video clips of classrooms in which careful teachers worked to create the desired conditions. In previous semesters, students viewed many of those first-hand experiences and videos through the lens of How to Do It. Now, I am seeing more evidence that they also look through a lens of Why It Matters.

IV. Learning Through SoTL: Students' Transformations—and Mine.

On the surface, the shift in the course was subtle; in my thinking, however, it was monumental. By constantly bringing our focus back to the theoretical, even as we were becoming skilled at the how-tos of teaching children to read and write, I attempted to support students' deep engagement with big ideas. Exploring the use of a workshop approach to teach writing, for instance, took on a very different feel in the context of thinking through Cambourne's conditions. The explicit, intensive focus seemed to help students understand, for instance, why children's freedom to choose their own writing topics is so critical (the condition of *responsibility* for learning), and why children's writing must find its way to real audiences beyond the classroom walls (the condition of *authentic response*).

So there *was* activity that I orchestrated (Theory 2), and there *was* content that I made available (Theory 1). Additionally, I attempted to promote a culture of collaborative thinking, of tackling big ideas, and of valuing understanding over task completion as Ramsden whispered in my ear. Students' work at the end of the semester had not suddenly become ingenious, but it did, in general, reflect a better understanding, as compared to students' work in previous semesters, of how children learn and what teachers can do to make that learning possible. Additionally, the anonymous survey students completed at the conclusion of the course revealed some awareness of conceptual change. The final survey question was, "What else would you like me to know about your experience of this course?" In response, one student wrote,

This was an excellent model of how we should implement literacy time in our classrooms. All the steps it takes to organize a classroom library, construct a writer's

workshop and teach about research can be overwhelming, however the way you set the evenings up all *made sense*. *Looking at the greater picture* [emphasis added] we are walking away with so much knowledge, tools and resources that our heads could explode. I thoroughly enjoyed the class and will always go back to Cambourne and the reading selections you chose.

The following response from another student reveals a very different experience of the course from those reported by students in previous semesters:

It's a great method that you have come up with for this class...it is interesting, allows for personal freedom and growth, and with the group work and literature circle sharing, it makes me feel like *I am a part of something bigger* [emphasis added].

The reference to “something bigger” suggests an awareness that what we accomplished together was somehow unique in its impact on learners. Another student took a conceptual stance when she wrote,

The most valuable aspects of this workshop and research process were the conditions of learning. Using Cambourne’s model, I am better able to see how teaching should be presented to create deep and lifelong learning. This model really brings home the strategies and techniques used in this workshop.

Her reference to “deep and lifelong learning” is very much aligned with our semester-long focus on conditions of learning, and with my focus on making just that kind of learning possible for my students.

Finally, and perhaps the most compelling statement from a student, was this:

This process has *changed the way I think* [emphasis added] about teaching young students to read, write, and do research. Using Cambourne’s Model of learning, I feel that I am better capable of teaching students to read, write, and do research. I have a better grasp on how teaching should involve immersion in the content, demonstration of real-world situations, engagement with the material, high expectations, responsibility for one’s own learning, approximations of goals, and constant employment of strategies. If these things are present, students will be better able to learn in a meaningful and lasting way. As a teacher, I plan on incorporating all of these conditions in my classroom, not only in reading, writing, and research, but in all of the curricula.

Here was an explicit recognition of the change in understanding—the transformation—that was my goal. This kind of transformation most certainly did not happen for every student in the course, but it did happen for some, and I now have a path to follow with the students who come through my door the next time. And I can look at the way I am planning, structuring, and implementing course design and know that my work as a teacher has theoretical and conceptual integrity. Being mindful of a discipline-specific theoretical framework will continue to aid my transformation to a Theory 3 teacher who focuses first and foremost on students’ conceptual understanding.

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Faculty perceptions of critical thinking at a health sciences university

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Abstract: The fostering of critical thinking skills has become an expectation of faculty, especially those teaching in the health sciences. The manner in which critical thinking is defined by faculty impacts how they will address the challenge to promote critical thinking among their students. This study reports the perceptions of critical thinking held by health sciences faculty representing multiple disciplines. The results provide a working definition of critical thinking and its components, and indicate the importance that critical thinking is given in the education of health care students. Implications of these results for teaching and learning are presented.

Keywords: accreditation standards, critical thinking, faculty development, health care professionals, qualitative data, survey.

I. Background.

The inclusion of critical thinking among the goals of academia has become commonplace. Critical thinking is listed by the Association of American Colleges and Universities as one of the major intellectual and practical skills that should be fostered by postsecondary education (Association of American Colleges and Universities, 2011). Critical thinking is also acknowledged as a desirable outcome in many health sciences educational programs. The Standards for Accreditation of Medical Education Programs Leading to the M.D. Degree state that medical students should "acquire skills of critical judgment based on evidence and experience" (Liaison Committee on Medical Education, 2012, p. 7). The Accreditation Council for Pharmacy Education Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree state that teaching and learning methods should foster the "development and maturation of critical thinking and problem-solving skills" (Accreditation Council for Pharmacy Education, 2011, p. 20). The American Dental Education Association prominently featured critical thinking in a recent update on competencies for the new general dentist (American Dental Education Association, 2008). Similarly, critical thinking is emphasized in the accreditation standards of nursing (American Association of Colleges of Nursing 2008), podiatric medicine (Council On Podiatric Medical Education, 2011), and occupational therapy (Accreditation Council for Occupational Therapy Education, 2008).

The fact that nearly all health sciences programs recognize the importance of developing critical thinking skills is not surprising. Health care professionals need to develop good clinical reasoning and decision making skills to provide safe and effective care to patients. Lives depend on competent clinical reasoning, and critical thinking and reflective problem solving are cognitive processes which are involved in clinical reasoning (Facione & Facione, 2008).

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While health sciences programs, along with many other higher education programs, recognize the importance of critical thinking, unless there is clarity as to what critical thinking actually is it will be difficult to teach to students (Hatcher, 2000). Lack of agreement on the definition of critical thinking has been noted as a reason for the difficulty in teaching clinical critical thinking skills in nursing students (Allen, Rubenfeld, & Scheffer, 2004). Similarly, a clear understanding of the components or characteristics of critical thinking is needed to design proper assessments to measure student learning outcomes. Several educators assert that without a clear conceptualization over what constitutes critical thinking, valid assessment will remain problematic (Appleby, 2005; Gordon, 2000; Hatcher, 2000; Kennedy, Fisher, & Ennis, 1991). How faculty define critical thinking is therefore key to how it is taught and subsequently to how health science students apply it in the learning of clinical reasoning skills.

The literature provides various definitions of critical thinking from researchers in philosophy, education or critical thinking. Some nurse researchers conclude that the large number of reported definitions and attributes of critical thinking serve to decrease the likelihood of reaching a consensus (Turner, 2005). However, Halpern (1999) has stated that the various definitions of critical thinking include the same underlying principles. Others have also recognized commonalities in the many definitions and attributes associated with the concept of critical thinking (Jones, 2010). A review of the literature indicates that most researchers now agree that general principles of critical thinking exist, that these principles transcend subject matter and can be applied to more than a single subject (ten Dam & Volman, 2004).

The American Philosophical Association published a qualitative study that utilized a panel of experts from various disciplines to come to a consensus for critical thinking utilizing the Delphi method (Facione, 1990). This study has been noted as providing the most rigorously defined version of critical thinking (Oderda et al., 2011) and to be highly cited (Turner, 2005). The study defines critical thinking to be "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (Facione, 1990, p. 2). This report further states that critical thinking is essential as a tool of inquiry, and therefore it is a liberating force in education and a powerful resource in personal and societal life.

To come to a consensus definition of critical thinking as it applies to nursing, a group of expert nurses also utilized the Delphi method (Scheffer & Rubenfeld, 2000). They determined that critical thinking is an essential part of professional accountability and quality of care, and that critical thinkers exhibit the habits of mind of confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance, and reflection. Further, critical thinkers in nursing practice the cognitive skills of analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting and transforming knowledge. The authors conclude that the consensus definition of critical thinking will allow nursing practitioners, faculty and researchers to share a common language from which to design, utilize and assess this essential component.

Experts agree that critical thinking includes both cognitive skills and affective dispositions (Facione, 1990). Skills refer to cognitive processes of interpretation, analysis, evaluation, inference, explanation and self-regulation (Facione, 1990). Affective dispositions include inquisitiveness, desire to be well-informed, awareness to use critical thinking, trustful of reason, self-confidence in ability to reason, open-mindedness, flexibility, fair-mindedness, honesty to face personal biases, prudence in making judgments, and willingness to revise views

(Facione, 1990). Affective dispositions have also been referred to as intellectual traits (Paul & Elder, 2008) and as habits of mind (Scheffer & Rubenfeld, 2000).

Despite several substantial definitions of critical thinking and the stated importance of critical thinking to academia, educators display confusion and difficulty describing critical thinking. In 1995 Paul and colleagues conducted a study to assess the ability of faculty to teach critical thinking and problem-solving skills (Paul, Elder, & Bartell, 1995). An interview protocol was developed and used with faculty from education and subject matter areas of teaching in private and public California colleges and universities. The results indicated that although the vast majority (89%) of faculty interviewed claimed that critical thinking was a primary objective of their instruction, only 19% could give a clear explanation of what critical thinking was. A large majority of faculty claimed that students lacked appropriate standards to assess their thinking, but only a very small percentage of faculty were able to list any criteria or standards that they required of students, or to provide a reasonable explanation of the standards. The study also found that most faculty were unable to provide plausible examples of how they fostered critical thinking in the classroom, or name specific critical thinking skills they think are important for students to learn. The authors summarize the data by saying that "...most faculty have not carefully thought through any concept of critical thinking, have no sense of intellectual standards they can put into words, and are...in no position to foster critical thinking in their own students or to help them to foster it in their future students...". (Paul, Elder, & Bartell, 1995, third section, para. 13).

A more recent study surveyed clinician medical educators at five medical schools, asking for a definition of critical thinking and for actions that would describe a clinician who was thinking critically and one who was not (Krupat et al., 2011). The results indicated that the overwhelming majority (~85%) framed the definition as a process or ability, with a small minority describing it as a personality trait or disposition. However, the majority of actions describing an absence of critical thinking resulted from heuristic thinking and lack of cognitive effort, consistent with a dispositional approach rather than a lack of cognitive ability. The authors concluded that to foster critical thinking among medical students, clinician educators need to reconcile the definition of critical thinking with the manner in which it is put into action in a realistic clinical scenario. They also concluded that both disposition and ability are necessary for critical thinking and that neither is likely to be sufficient alone, consistent with critical thinking experts (Facione, 1990).

Midwestern University (MWU) is a health sciences university with individual colleges of osteopathic medicine, dental medicine, pharmacy, and optometry. In addition, the College of Health Sciences includes graduate level programs in podiatric medicine, occupational therapy, physical therapy, nurse anesthesia, physician assistant, and clinical psychology. It maintains two campuses; one in Downers Grove, Illinois and one in Glendale, Arizona. The MWU Vision states, in part, that the academic community should: "Nourish intellectual creativity and foster the critical thinking and communication skills that stimulate personal growth and engender professional development" (Midwestern University Catalog, 2012, p.5). As faculty at MWU, the authors are interested in fostering critical thinking skills and dispositions among students, faculty and staff. To that end, we facilitate campus-wide (Arizona) quarterly discussion sessions open to faculty and staff to explore critical thinking concepts.

The primary goal of this research is to determine how faculty that teach in various health care programs define critical thinking. A secondary goal is to determine faculty perception of the role of critical thinking in the education of health professions students. The results provide a

working definition of critical thinking among these faculty, allow comparisons to be made to expert definitions, and also present an opportunity to explore implications for teaching and learning.

II. Methodology.

A. Instrument and participants.

The purpose was to assess faculty definitions of critical thinking and the importance that it has in the education of health care professionals. To access faculty at two separate campuses, the researchers determined that using an online survey would be the most efficient method. Upon reviewing the literature for guidance, a paucity of studies describing surveys designed to determine faculty perceptions or knowledge of critical thinking was found. After reviewing a recent study (Krupat et al., 2011) which surveyed faculty at medical schools, and utilizing the description of critical thinking elements and standards according to Paul and Elder (2008), the authors designed survey questions to address the study purpose. A draft of the survey was developed and the wording and format discussed and revised until an agreement was reached on the final survey tool.

Following approval from the MWU Institutional Review Board, an email link was sent to a total of 550 faculty on both campuses with a request to voluntarily participate in the anonymous online survey. The email included the research purpose, description of the research, potential benefits to the faculty community, assurance of confidentiality as well as no risk to the participant. Survey items included demographic information about respondents including campus location, college affiliation, full or part-time work status, instructional content (basic science or clinical), terminal degree, faculty rank, and experience in university teaching. Nominal survey items (yes/no/unsure) were used to gather quantitative data, and open-ended questions were used to gather qualitative data.

B. Data collection and analysis.

This study employed a mixed methods design using a descriptive survey to collect information about faculty views on critical thinking at a health sciences university. The survey collected demographic data in order to identify the make-up of the responding sample. Cross-tabulation and Chi-Square analyses were used to determine frequencies and dependence of variables among the demographic sub-groups. Quantitative data were analyzed with PASW Statistics 18. Qualitative data were analyzed using the content analysis method, a qualitative research tool used to determine the presence of certain words or concepts within recorded communication. To conduct a content analysis, the text is coded into manageable categories (i.e., words, , phrases,) and then the presence, meanings and relationships of the coded text are analyzed in order to make inferences and to develop themes (Busch et al, 2012.) Response agreement among three participants is typically considered to represent a commonality (Creswell, 2009).

The researchers initially worked independently to code responses for each open-ended question, identifying words or phrases that provided an overall meaning to the response, and then grouping the responses according to meaning similarity, thus generating themes. The researchers met several times as a group to compare and discuss the identified themes until agreement was reached by at least three of the four researchers on the themes and sub-themes.

III. Findings.

A. Demographic data.

A representative sample of 133 faculty members (24%) responded to the survey, with a total of 85 respondents completing every survey item. Responses were approximately equally distributed between the Arizona and Illinois campuses (55% and 45%, respectively). The sample represented members from five colleges, including basic sciences (31%), pharmacy (26%), osteopathic medicine (20%), dentistry (17%), and optometry (5%). More than half of the sample (59%) reported that they were responsible for teaching clinical content.

B. Defining Critical Thinking.

To determine how faculty defined critical thinking, respondents were asked to finish the following survey item: "I would define critical thinking as". There were 83 short answer responses ranging from 5 words to 42 words, with the majority being 20 words or less. Three themes and two sub-themes were identified in the analysis, with 137 words or terms coded into one of the five themes (Figure 1).

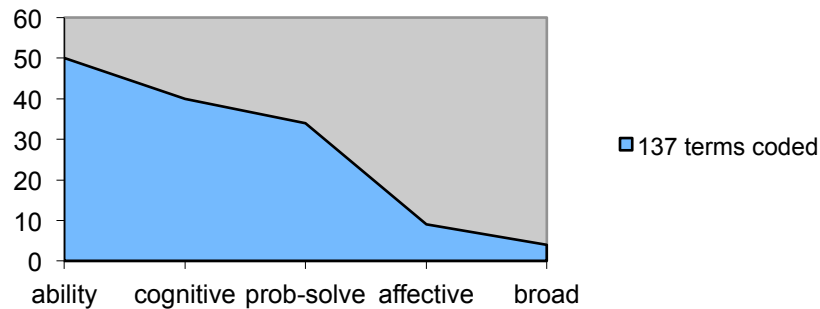


Figure 1. Five themes for defining critical thinking

The predominant theme is that critical thinking was viewed as an ability. Other defining words with similar meaning as 'ability' were process, skill set and action; over half of the respondents used one or more of these terms in their definition. The second theme entailed the cognitive processing of information or evidence. The most frequent cognitive term was analysis (27 responses), followed by evaluation (13 responses). 'Analysis of evidence' was also expressed as evaluating facts, extracting essential elements, and actively synthesizing information, with slightly more than half of respondents including these descriptors. The third theme was decision making or problem solving, with 34 respondents using these exact terms. 'Making reasoned decisions' had similar meaning as: derive conclusions, reach the best possible outcome, solve a complex problem or scenario, and selecting the most appropriate action; over half of the respondents shared these views. Therefore the main type of response could be summarized as an ability or skill to make reasoned decisions or solve complex problems based on critical analysis of available evidence. Approximately three quarters of the responses were of this type. The following quotes are indicative of this most common type of response.

- *"the ability to gather information, identify what pieces of that information are most relevant, to analyze that information, and come to a conclusion with regard to some decision involving that data."*
- *"the ability to extract essential elements of a question or situation, research those elements, select well founded information and synthesize an answer or conclusion"*
- *"the process of purposeful judgment that gives reasoned consideration to evidence, context, methods and criteria"*

A minority of responses did not fit the common type of response described above, and two sub-themes were noted. The first and largest sub-theme recognized the affective dispositions. These definitions emphasized having awareness of multiple contexts or perspectives, diverse or different points of view, personal bias, ethics, open-mindedness, and attitudes. The following responses are reflective of this sub-theme.

- *"ability to view topics from many contexts, ability to understand those with varied views have valid 'other' contexts, ability to learn over time and implement multiple new contexts to understand"*
- *"the ability to use judgment, ethics and knowledge to make clinical decisions using the best evidence available"*

The second and smaller sub-theme consisted of responses that summarized the overall thinking process and were framed in a broad, all-encompassing way. The following responses are representative of this sub-theme.

- *"thinking about thinking or reflective thinking focused on deciding what to believe or do"*
- *"thinking that assesses itself to improve its quality and fairness"*

The coded responses were also separated into clinical or nonclinical faculty and analyzed to determine if the identified themes were influenced by the subject matter taught. The responses were similar among clinical and nonclinical faculty in how critical thinking was defined, with no discernible differences.

C. Components of Critical Thinking.

To obtain additional information about critical thinking the survey asked: "Are there any components of critical thinking?" with a fixed response choice of Yes, No, or Unsure. There were 85 responses with 67 selecting yes and 18 selecting unsure. With respect to demographics, response on this item was dependent only on work status; part-time faculty were more likely to respond 'unsure' than would have been expected ($\chi^2 = 7.1[1]$, $p < 0.008$). Differences for campus location and years of university teaching experience were not statistically significant.

If respondents answered 'Yes' to this item, they were then asked to identify the components of critical thinking; 65 responses were obtained. The majority (~ 51%) mirrored the words used in the responses given for the question to define critical thinking, with three respondents answering simply by referral to their previous answer. There were three equally distributed main themes noted in the majority responses: 1) identification of a question or problem to be solved, 2) obtaining relevant data and information, and 3) analysis of data to reach a

conclusion, solution or outcome to the problem, and one sub-theme: affective dispositions (Figure 2).

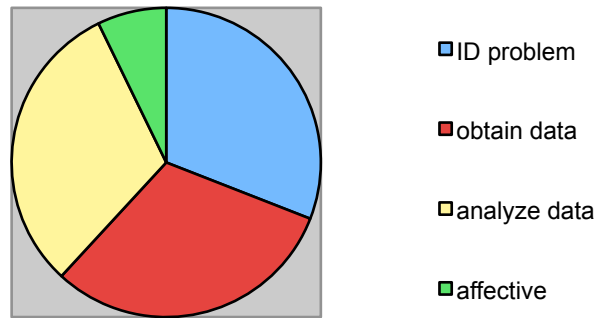


Figure 2. Themes and sub-theme for critical thinking components

The question or problem was also described as: dilemma, issue, or situation. Other descriptions of 'data' were: evidence, facts, knowledge, observation, reading, and listening. Several responses applied various criteria to the data, such as: valid, accurate, relevant, and prioritized. Other words used that had similar meaning to 'analysis' were: reason; apply; infer; synthesize; brainstorm; evaluate; formulate; compare and contrast; predict; and categorize. Other descriptors for 'conclusion' were: decision; implementation; possible results; answer; plan; course of action. The following quotes are representative of the most common type of responses.

- *"understanding the issue at hand, applying (often multidisciplinary) knowledge, and formulation of a plan of action to address the issue at hand."*
- *"Identify the question, assess multiple approaches that might provide a solution, and using experience and knowledge base at hand to determine a course of action."*
- *"1)gathering information by observation, reading listening, etc. 2)evaluating information 3)conceptualizing the information 4) analyzing information to generate a reflection as a guide to belief and action"*

Similarly to how critical thinking was defined, a minority of responses for the components of critical thinking described affective dispositions, either solely or in combination with components of the majority response (problem/question, relevant data and information, analysis to reach a conclusion). The descriptors used for these components included reflection, willingness to learn, affective domain, questioning attitude, and identifying assumptions and biases. The following brief response examples are reflective of this sub-theme.

- *"open mindedness, humility, honesty"*
- *"flexibility, creativity, objectivity"*

D. Critical Thinking Applied to the Education of Health Care Professionals.

After faculty provided their definition of critical thinking and its components, the survey addressed their view of the role of critical thinking in the education of health care students. Eighty one participants responded to the survey item: "Describe how critical thinking applies to the education of health care professionals." A majority (~ 53%) responded that critical thinking is "essential" in the education of health care professionals. Other words that conveyed similar meaning were:

imperative, necessary, needs to be taught, an inherent part, and integral. Explanations as to *why* critical thinking was thought to be essential were frequently given, and three sub-themes were identified: (1) for optimal patient outcomes, (2) to handle change (in an individual patient and in the global health care environment), and (3) to work well with patients (holistic) and with providers (interdisciplinary). There was significant overlap of the main theme and sub-themes throughout individual responses; examples are listed in Table 1.

Table1. The themes and sub-themes from responses on how critical thinking applies to the education of health care professionals, with sample statements.

Themes/Sub-themes	Sample Statements
Essential	<p><i>“It is an essential part of being able to accurately diagnose conditions, appropriately advise patients on treatment options and assimilate new medical developments and patient care information.”</i></p> <p><i>“Critical thinking is imperative to teach so that our students have the skills to become confident health care professionals.”</i></p>
Optimal outcomes	<p><i>“Health care professionals make decisions that significantly impact human lives, and so the ability to think well in order to make good clinical decisions is given high priority. Critical thinking goes hand in hand with good clinical decision making, and this is why it is so important in the education of health care professionals.”</i></p> <p><i>“The core responsibility of health care professionals is caring for patient. Information from and about these patients is often messy, incomplete, and poorly organized. In addition, information about best practices and care is often times similarly 'impaired'. Strong critical thinking skills are required to efficiently assimilate this huge volume of 'messy' information and select the most appropriate care plan for the patient - for each and every patient.”</i></p>
Handle change	<p><i>“Health care is always changing; therefore, education needs to instill critical thinking skills in students so they are poised to problem solve as new challenges within health care arise.”</i></p> <p><i>“Health care professionals must be able to critically think to determine a differential diagnosis and a treatment plan. It is also necessary to change course if unpredictable outcomes occur.”</i></p>
Work well with others	<p><i>“Health care professionals must be able to apply critical thinking to many different situations, including recognizing when a test result doesn't look right, when a colleague presents a flawed diagnosis, etc.”</i></p> <p><i>“Health care professionals need to use critical thinking in the development and implementation of treatment plans, applying theory and evidence to practice, establishing therapeutic relationships, working collaboratively with other disciplines, etc.”</i></p>

IV. Discussion & Implications.

A. Defining Critical Thinking and Its Components.

This study provides an assessment of the definition and components of critical thinking as perceived by faculty at a private, health sciences university. To our knowledge, this is the first study to survey health sciences faculty representing multiple disciplines about critical thinking. The main definition of critical thinking was described as an ability or skill to make reasoned decisions or solve complex problems based on critical analysis of available evidence. The majority of the faculty surveyed described the components of critical thinking to be identification of the problem, relevant data and information for this problem, analysis of those data, and an outcome or solution to the problem. The responses for the components of critical thinking generally served to support the definition and provided richer meaning and characterization to the definition. That critical thinking may be defined by its components is supported by the statement that the parts of thinking are fundamental structures of thought that are present whenever thinking occurs (Paul & Elder, 2006). Thus when discussing the majority definition of critical thinking, we refer to this richer and extended definition and include responses both from the 'definition' and from the 'components'.

Experts recognize that critical thinking encompasses cognitive or intellectual skills as well as affective dispositions or intellectual traits (Facione, 1990; Paul & Elder, 2008; ten Dam & Volman, 2004). Skills identified by experts include interpretation, analysis, evaluation, inference, explanation and self-regulation (Facione, 1990). The faculty in this study seemed to recognize four of these skills consistently: interpretation, analysis, evaluation and inference. Brief descriptions of these skills as described by Facione (1990) are provided here. Interpretation is to comprehend the meaning of a wide variety of data or situations, and to make appropriate categories or distinctions in order to understand the scenario. Analysis includes defining terms, comparing or contrasting ideas, and identifying the problem. It also assesses if information provides reasons to support (or refute) a claim. Evaluation brings the concept of assessment, what data are *relevant* to the question, how strong is the fit, and is additional information needed. Inference refers to making reasonable conclusions from the data and judgments, including thinking of a range of possible outcomes.

Overall, faculty recognized that a question or situation needed to be identified, that relevant data needed to be discerned and applied, and that multiple potential outcomes need to be considered. Faculty responses often mentioned the need to organize all of the data of a particular situation: *"ability to 'sort' important information from distracters in scenario"*. Determining the quality and relevance of the data was frequently found in responses: *"assessing accuracy and relevance of facts"*; *"to know what information is still needed to discover to continue"*; and *"to access and evaluate relevant literature"*. The idea of assessing risks and benefits also was mentioned and used to assess the validity of the possible outcome: *"...to step back from a problem, identify possible solutions, weigh the risks and benefits of each of the solutions and choosing the most appropriate solution based on those weighed risks and benefits"*. Concern about outcomes was common in responses: *"the ability to make connections and anticipate the impact of those connections"*. A representative response indicative of these three components is: *"Analysis of the issue; search for possible solutions; ranking the results and arriving at an evidence-based conclusion"*. Thus when viewed en masse, the responses seemed to indicate that the faculty had a reasonable understanding of critical thinking. One expert definition of critical thinking states that it is: *"thinking explicitly aimed at well-founded judgment (analysis), utilizing appropriate evaluative*

standards (evaluation) in an attempt to determine the true worth, merit, or value of something (creative component or outcome)" (Paul & Elder, 2006, p. xxiv). This definition seems to succinctly summarize the majority of responses from these faculty.

However, while the skills of interpretation, analysis, evaluation and inference were either mentioned or inferred in the majority of responses, the skills of explanation (stating or presenting the results of one's reasoning) and self-regulation (self-consciously monitoring one's cognitive activities) were not frequently found. And when the responses were viewed individually, fewer included all four components in their definition. The ability to clearly explain one's reasoning is an important skill, especially for students. Perhaps this skill is less recognized among faculty who view their role as a provider of facts and information to be learned. Another possibility is that the wording of the questions and the short answer response format did not promote inclusion of all six critical thinking skills when providing definitions. While the omission of two or more of the six identified skills could be interpreted in various ways, it does suggest that individual faculty may have an incomplete understanding of what constitutes critical thinking. This has implications toward the instruction of critical thinking; faculty cannot be expected to teach critical thinking well if they do not have a thorough understanding of what it is. It has been stated that some health sciences educational programs have done little to develop critical thinking skills in students (Blouin et al., 2009; Jenicek, Croskerry, & Hitchcock, 2011). However, we must first address faculty perceptions and understanding before we can expect critical thinking to be fostered in the classroom.

Although the majority of faculty in our study focused on cognitive skills associated with critical thinking, a small minority defined critical thinking with an emphasis on the affective dispositions or intellectual traits. Affective dispositions are an important aspect of critical thinking (Ennis, 1996; Facione, 1990; Paul & Elder, 2006; ten Dam & Volman, 2004). They may generally be understood to mean one of two things: 1) the likelihood that a person will use critical thinking skills, or 2) the likelihood that critical thinking skills will be used in a morally or ethically good way (Facione, 1990). One could think critically and use critical thinking skills effectively, but in a manner that would be considered unethical or amoral. It is this type of meaning that the minority response that focused on affective dispositions seemed to indicate. The responses expressed concern for removing personal biases, having a value system, being ethical, open-minded, honest, and humble. Our results are similar to those described in Krupat's study in which only a minority of medical school faculty defined critical thinking in affective dispositional terms (Krupat et al., 2011). However, experts point out that effective critical thinking encompasses both skills and dispositions and that neither is sufficient alone. (Facione, 1990; Paul & Elder, 2008; ten Dam & Volman, 2004). The limited recognition of the affective components lends further support to the need for faculty development opportunities to explore and apply principles of critical thinking.

We also found a second minority response who defined critical thinking using concise, summative statements: "*thinking that assesses itself to improve its quality and fairness*", and "*thinking about thinking or reflective thinking focused on deciding what to believe or do*". These minority definitions are similar to those of experts in the field, such as: "critical thinking is the art of thinking about thinking while thinking in order to make thinking better" (Paul & Elder, 2006, p. xvii). While distinct from the majority definition in the wording used, we felt these minority responses encompassed the elements of analysis (defining thinking), evaluation (assessing thinking), and outcome (improving thinking) that were more explicitly found in the majority responses. Although these responses were brief and concise, we were encouraged that some

provided a more global definition without framing it in a healthcare context, and which was reflective of recognized experts.

B. Critical Thinking as it Applies to the Education of Health Care Professionals.

The majority of faculty surveyed identified critical thinking to be *essential* in the education of health sciences students. This result reflects the stated importance given to critical thinking by the health science professions as well as college and university accreditation agencies. Additionally, this result is in agreement with the survey of more than 22,000 full time faculty at four-year colleges and universities; nearly 100% considered development of student's critical thinking skills to be an essential goal for faculty (DeAngelo, Hurtado, Pryor, Kelly, & Santos, 2009).

Critical thinking experts also consider critical thinking to be essential for health care providers, and it has been described in this context as "the process we use to make a judgment about what to believe and what to do about the symptoms our patient is presenting for diagnosis and treatment" (Facione & Facione, 2008, p. 2). To make this judgment, the clinician should consider the symptoms and evidence in the context of the presenting scenario, use his/her knowledge and skills learned from training and experience, anticipate likely effects of any chosen treatment or action, and monitor the consequences of those delivered actions and care (Facione & Facione, 2008). The sample statements in Table 1 support *why* critical thinking is viewed as essential in the education of health care professionals and reflects the current focus of health care: optimal patient outcomes, being prepared to handle change, working as part of a health care team, and patient-centered care.

It is encouraging that most faculty recognize a common, essential goal of fostering critical thinking skills among students. It implies a willingness to learn more about critical thinking by participating in faculty development opportunities, reviewing the literature and exploring ways to incorporate it into teaching. To facilitate this essential goal, administrators must be willing to provide the necessary resources along with recognition of the time and effort required to integrate critical thinking within the classroom.

V. Limitations.

This study utilized a convenience sample of health sciences faculty within a single institution and the results may not generalize to other populations. Electronic access to an online survey was used to facilitate the number of faculty solicited. The survey was designed by the investigators based on the existing literature, but was not externally reviewed or piloted prior to use in this study. The qualitative responses submitted by the participants were limited to brief descriptions that required some interpretation by the researchers. Three responses were so brief that we were unable to discern meaningful content. More in-depth responses, with less need for researcher interpretation, could have been obtained from personal interviews; however this method requires considerable time and effort from both the subjects and researchers and was not feasible in our situation.

VI. Conclusion.

Critical thinking is recognized as important to student learning by the many educational entities that name it as necessary for successful programmatic outcomes. Experts acknowledge that critical thinking concepts and skills can be taught and learned. If faculty are charged to foster critical thinking skills as part of the curriculum, it is reasonable that they should have a clear and

cohesive understanding of what it is. The adage, you can't teach what you don't know, is appropriate. The majority of faculty in this study proclaim that critical thinking is essential to the education of health care professionals, inferring a willingness to teach it. The predominant way that faculty in this study described critical thinking is an ability to make reasoned decisions or solve complex problems based on critical analysis of available evidence. This description contained some of the expert-defined attributes of critical thinking but was lacking in others, particularly the affective components. This finding supports the need for ongoing faculty development opportunities that fully describe and clearly develop a deep understanding of the concept of critical thinking. These opportunities also need to provide practical methods that can be applied by faculty to promote critical thinking in the classroom.

The results from this study have implications for all faculty who want to improve student learning. Experts acknowledge that specific subject content can be learned only through careful (critical) thinking (Paul & Elder, 2006), indicating the intimate connection between learning of subject content and thinking ability. Superficial thinking leads to short-term retention and poor learning; deep thinking leads to substantive learning and comprehension. Therefore, the ability to promote deep learning is directly impacted by faculty knowledge and incorporation of critical thinking concepts. As faculty better learn about critical thinking and develop methods to foster it, student learning can be expected to improve and successful outcomes can be achieved.

The implications of this study for teaching and learning are summarized here.

1. Faculty should clearly understand and agree on what critical thinking is if they are to teach it.
2. Faculty should be prepared to teach critical thinking and recognize the importance it has to long-term learning.
3. Faculty development opportunities should include the learning and applying of critical thinking skills and dispositions to teaching in a context-specific manner.
4. Administrators should provide necessary resources and recognize the time and effort that will be required by faculty to incorporate critical thinking in the classroom.

This study sets the stage for additional exploration of the impact that faculty perceptions of critical thinking have on teaching and student learning. As this connection is strengthened and further understood, it can lead to evidence-based recommendations that foster and develop critical thinking among all students.

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Learning contracts in undergraduate courses: Impacts on student behaviors and academic performance

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Abstract: This project studied the effect of individualized, voluntary learning contracts for 18 students who performed poorly in the first part of the semester. Contracts were hypothesized to increase commitment and motivation, and lead to changes in behaviors and course performance. Self-reported prioritization and learning-related behaviors (completion of homework and course readings), recorded office hour attendance, and exam performance were compared with low-performing students who had declined the contract offer, low-performing students in a control group, and high-performing students. Students who had signed contracts attended more office hours, were more likely to prioritize homework and reading, and showed a trend for more improvement on exam performance. Ultimately, learning contracts can be a low cost, low effort tool to increase student commitment, boost academic performance, and encourage self-direction.

Keywords: Learning contract, commitment, motivation, self-direction

I. Background.

Halfway through his first semester teaching engineering at the US Air Force Academy, one of the authors noticed his students' grades were well under the course average in comparison to all the other sections of the course. Was it him? Were his students doomed for failure, or could something be done to alter their destiny? While, Toncar and Anderson's (2010) study spanning 14 years suggested student performance on the first exam is strongly correlated with and a reliable predictor of overall course performance, he did not want to passively accept that his students would continue to underperform. After some thought and further observation, he realized many of his students were intellectually capable; however, they were college sophomores who may not have yet developed the skillsets of independent, self-directed learners.

Self-directed learners have the ability to learn independently by self-diagnosing their existing comprehension and actively pursuing new information or experience to fill knowledge gaps. In contrast, many novice learners view the learning experience as a one-way knowledge transfer, and it takes time to break the dependence many students have on teachers (Parkhurst, 1922). Thus, one overarching goal for teachers might be to develop their students into self-directed learners. Learning contracts are one method to help develop self-directedness (Knowles, 1973; Mohammed, 2010), even though their use can be strange and awkward at first (Knowles, 1987). They can instill self-discipline to get work done on time, introduce structure to the learning process while being flexible enough to apply to a wide variety of students, and help students start taking charge of their own learning (Knowles, 1980b). For example, Williams and

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Williams (1999) found that the average student devoted more time to learning and developed better time management skills when they signed a learning contract. Additionally, a sample of counselor education students indicated that learning contracts provided them with opportunities for self-directed learning and fostered greater accountability, responsibility, and commitment (O'Halloran & Delaney, 2011). Contract learning places emphasis on teacher-learner interaction and subject matter in a way that can promote near-term academic success and lasting self-direction (Mazhindu, 1990). Chyung (2007) found that contracts may also encourage student motivation.

Academic success, self-directedness, and motivation seemed to be lacking in the author's example above, and, thus, learning contracts were implemented in the class. Following an initial positive experience that semester, the authors and some of their colleagues broadened the incorporation of learning contracts to three courses and more systematically investigated whether or not they could encourage self-direction through planting the seed of commitment, generating motivation, and ultimately bolstering academic performance of undergraduate engineering students.

II. Literature Review.

A. Commitment.

It's not uncommon for a student with high potential to underperform in the classroom. With many activities competing for a student's time, success comes with commitment. McKenzie-Mohr (2011) showed that commitment is most likely when the behaviors to which someone is committing are written, made public, and voluntary. Further, Firestone and Rosenblum (1988) suggested five strategies for maximizing commitment: relevance, respect, support, expectations, and influence. Our implementation of learning contracts was expected to support all of these criteria and strategies. Both the student and the instructor signed the contract, thus it was written and public (at least one person other than the student knew about it – the instructor). Students only signed if they wanted to do so; there was no penalty for not signing. The instructor provided relevance of the course material and support to the student to learn it. Mutual student-teacher respect was demonstrated through the process of individually creating and committing to the learning contract. The students each set their expectations for the next exam grade and put it in writing, and the learning contract overtly empowered them to take control of their learning behaviors to influence their grade. Not fulfilling contract requirements would not only break a self-promise, but would also break a promise the student made to the instructor when they both signed the learning contract. We expected the act of committing to the learning contract had the potential to drive motivation.

B. Motivation.

Motivation has been shown to guide the intensity and persistence of learning behaviors (Ambrose, 2010). Unfortunately, not unlike other school environments, some students in our courses did not want to be enrolled in the targeted engineering courses, and they were clearly not motivated. Some had declared a non-technical major and decided they were not going to apply themselves to an engineering course. Others were comfortable in technical courses, but perhaps the material was uninteresting to them and they decided to put their time and effort into other

courses. These unmotivated students were part of this study just like the many students who began with the motivation to work hard at the course material and genuinely wanted to learn and do their best.

We expected learning contracts to be motivational for several reasons. First, learning contracts highlight to students that deliberately performing certain learning tasks under their control such as reading, seeking help from peers, etc. would be likely to lead to academic success, rather than luck or chance, a link which has been shown as crucial to developing self-efficacy (Bandura, 1977; Elbow, 2009). Self-efficacy was made more likely through the customized plan that each learning contract student put together with the instructor. Self-efficacy, or self-confidence, can lead to an intrinsic motivation that can help drive the student to try harder (Bandura, 1977; Pintrich, 1994) and sustain behaviors that have been working for them (Ambrose et al., 2010). Self-efficacy is the most influential factor in ensuring a person's success in life (Costa & Kallick, 2004), and the stronger the efficacy expectations, the higher the likelihood of success (Bandura, 1977). Putting something achievable in writing, ensuring that is it clear and customized to the individual, having prior success, and believing success can be achieved again in the future can lead to further motivation for achievement.

Second, motivation will be enhanced in a supportive environment (Ambrose, 2010), which the face-to-face learning contract meeting and personalized contract text help make explicit. For example, Astin (1993) found that peer group interaction and student-faculty interaction are the first and second most positive contributors to self-reported intellectual and personal growth in the college environment. Related to positive interactions, Barlow (1974) found much higher levels of reported student-teacher rapport when learning contracts were implemented than when not. Instructor commitment can reinforce student commitment (Firestone & Rosenblum, 1988), which in turn will further enhance the positive motivational potential. For example, social work education students indicated they “felt bound and obligated by the mutual expectations,” and the learning contract motivated them to complete readings on time (Lemieux, 2001). Ultimately, however, we (instructors in general) hope that students choose to engage in behaviors that enhance learning, not because of a sense of obligation, but because they have internalized the benefits and have become self-directed learners.

C. Self-direction.

As college students, our participants were no longer novice learners, but likewise they did not universally exhibit a deep psychological need to be self-directing, bring resources from previous experience into the learning situation, learn in a life-centered manner, or seem self-motivated to learn, which Knowles (1980a) describes as characteristics of adult learners. Costa and Kallick (2004) asked, “Are [instructors] preparing students for a life of tests or for the tests of life?” Self-direction is a highly valuable skill that involves the ability to learn independently and possess metacognitive ability. Successful self-direction tends to develop as part of a maturation process when transitioning from adolescent to adult learning (Cross, 1981), but unfortunately, self-directedness does not always come naturally; rather many “students should be shown how to become independent” (Herber & Nelson-Herber, 1987). We viewed most students in our study as being in such a transitional period of developing responsibility for their own learning (Mazhindu, 1990). Because of its combination of academic rigor with a multitude of outside responsibilities and influences, the college environment can offer rich opportunities to help students develop the type of self-direction required in successful adult learners. Of particular

interest to the current study given that the learning contracts were used in engineering courses, Bary and Rees (2006) concluded that self-directedness is important to developing successful engineers.

Several behavioral characteristics have been associated with self-directed learning, the identification of which allows developmental efforts to be more targeted, increasing the likelihood of behavioral change (e.g. Buskist, Sikorski, Buckley, & Saville, 2002). For example, when comparing high-achieving high school students to other lower achievers, Zimmerman and Pons (1986) showed 93% of their 80 student subjects could correctly be classified into the high achieving or low achieving group simply by their self-regulation behaviors such as goal-setting, self-evaluating, organizing, seeking information, and seeking social assistance, all signs of self-directed learning. While rather rigid in nature, our learning contracts were designed to develop self-directedness through instilling self-directing behaviors in our students. For example, we explicitly encouraged the students to tap into the potential of peer teaching as well as instructor mentoring during office hours. Furthermore, our learning contracts encouraged completing assignments and course readings, developing time management and prioritization skills, and using self-evaluating skills to plan productive office hour sessions.

D. Incorporating Learning Contracts.

As summarized above, the existing literature suggests that learning contracts can be a means to get students on a path towards self-direction by increasing commitment and, thus, motivation and performance. With respect to implementation, however, there is a large amount of variance in practice. For example, the content of learning contracts varies widely (e.g. Barlow, 1974; Huff & Johnson, 1998; Williams & Williams, 1999; Chan & Wai-tong, 2000; Lemieux, 2001; Chyung, 2007; Litchfield et al., 2007; O'Halloran & Delaney, 2011), where students might chose a specific topic to explore, commit to a certain number of assignments and their due dates, or agree to an evaluation procedure and grading rubric. In our case, the topics and quantity of assignments were fixed by the instructor based on course requirements; instead, individualized choice within our contracts focused on the type, timing and frequency of learning behaviors. According to Boak (1998), the use of learning contracts with common texts, tasks, delivery, and assignments is an appropriate application for early undergraduate students, where the learner's level of understanding in the topic is limited.

Implementation of learning contracts can also vary with respect to when a contract is offered, which students are targeted, and whether or not participation is voluntary. Unlike many other learning contract applications (e.g. Huff & Johnson, 1998; Chan & Wai-tong, 2000; Chyung, 2007; Litchfield et al., 2007), our contracts were not offered at the beginning of the course; rather, they were offered approximately a third to half-way through the semester. By waiting to offer a contract until students had established a grade in the course (usually after the first exam), students had the opportunity to succeed or fail, and poor performers were targeted as those who needed help and might most greatly benefit from signing a contract. There are many examples of learning contract implementation where all students were required to sign a contract (e.g. Barlow, 1974; Huff & Johnson, 1998; Williams & Williams, 1999; Chan & Wai-tong, 2000; Lemieux 2001; Chyung, 2007; Litchfield et al., 2007), but because our study focused on learning behaviors, not course components or topics, we only targeted those students who performed poorly during the first part of the semester. Our decision to only target the lower performing students was supported by prior research (Dougherty, 1997; Williams & Williams,

1999; Lewis, 2004). Dougherty found that “interventions” when students performed poorly on organic chemistry exams helped boost academic performance on subsequent exams. We viewed the creation of each learning contract as an intervention, and the contract itself a get-well plan. Williams and Williams found that technology education students who performed at the lower levels gained more from learning contracts than those who performed well from the start. Further, Lewis (2004) had success with learning contracts in a college reading course by offering them only to students who performed poorly on a pre-test. The students in his experimental group significantly increased their scores on the post-test after signing a learning contract. Finally, in order to support the fostering of intrinsic motivation and development of self-efficacy rather than set a punitive tone, we made the signing of contracts voluntary. This voluntary nature was possible because the contract focused on behaviors that were under a students’ voluntary control, rather than aspects of a course structure, which would necessarily need to be determined for each student.

In a sense, learning contracts can be a way to establish a type of guided structure as described by Reeve (2006) in his study of rewards and motivation. He pointed out that, sometimes, instructors’ goals differ from their students, but by creating learning contracts, an instructor can establish conditions to make both the instructor’s target behavior (e.g. learning through reading and homework) and the students’ target outcome (e.g. a good grade) more likely. Thus, behaviors and outcomes would be mutually beneficial to the instructor and students. Aligned goals like these can lead to “powerful learning” (Ambrose, 2010) and increased self-efficacy.

III. Hypotheses.

Four hypotheses were developed to focus our understanding on how learning contracts might affect students. Because documented commitment can lead to motivation (Barlow, 1974; Boak, 1998), and motivation can encourage behavior (Ambrose, 2010), we hypothesized that signing a learning contract would increase the self-reported practice of course-related learning behaviors (likelihood to complete homework and read before class), and the prioritization given to these behaviors relative to others such as recreational or social activities (both as assessed using a feedback form). We also postulated students who signed a learning contract would be more likely to attend office hours than those who did not (all office hours meetings recorded by instructors). In turn, consistent with prior research (Astin, 1993), we expected they would show greater improvement following the first exam than those who did not sign a contract. Finally, because they had already shown poor performance and they had declined to make a contract commitment, we expected those students who were offered a contract but did not accept would show the least improvement from the first exam to the final.

IV. Method.

A. Participants.

A total of 204 students were enrolled in the participating courses, with a total of 18 signing learning contracts. There were eight students who refused a contract out of the twenty-six who were offered one. Four participating instructors across three courses (Engineering 101, Engineering Mechanics 220, and Civil Engineering 330) divided their students into experimental

and control groups. Engineering 101 (ENGR 101) is a freshman-level course mandatory for students of all majors, Engineering Mechanics 220 (EM 220) is a sophomore-level course also mandatory for all students, and Civil Engineering 330 (CE 330) is a junior-level course only required for civil and environmental engineering majors. If an instructor taught two sections, one each was experimental and control. If they only taught one section of a course, alternating students in an alphabetized class roster would be assigned to each group. Instructor judgment on the best way to implement the learning contracts in each particular course led to some variance in whether an individual exam or overall course average at some point in the semester was used as the contract discriminator; regardless of the specific discriminator, the threshold of 75% was determined to be appropriate across all the courses. This threshold gave us a reasonable number of students to target, while also avoiding the students whose grades were high enough that they would be unlikely to need or be receptive to the idea of a contract. Table 1 shows the number of students enrolled with each instructor, the number that signed contracts, and the discriminator for each course section.

Table 1. Students and courses involved in the study.

Course	Term	Instructor/ No. Sections	Total No. Students/ No. Offered Contract/ No. Signed Contract	Contract Discriminator
ENGR 101	Spring 2011	A/1	26 / 2 / 2	Course avg at lesson 32 of 40 less than 75%
ENGR 101	Fall 2011	B/2	47 / 6 / 2	Exam 1 (on lesson 17 of 40) less than 75%
ENGR 101	Fall 2011	C/2	44 / 2 / 0	Course avg at lesson 20 of 40 less than 75%
EM 220	Spring 2011	C/1	24 / 3 / 2	Exam 1 (on lesson 13 of 40) less than 75%
CE 330	Spring 2011	D/2	36 / 11 / 10	Exam 1 (on lesson 12 of 40) less than 75%
CE 330	Spring 2011	B/2	27 / 2 / 2	Exam 1 (on lesson 12 of 40) less than 75%

B. Materials.

Two forms were central to the study: the learning contract and the in-class feedback form. The first part of the contract incorporated several items based on previously identified best practices. The first sentence began with an admission that the student currently was not performing well and concluded with a statement that the student was willing to put in more time and effort to perform better. This admission required internal reflection as well as honesty and humility, similar to taking stock of “where they are at” as described by Malkin (1994) in the context of learning contracts in nursing school. The blunt admission statement was intended to ensure the student was aware of and prepared to face the problem, the first step to fixing it. The second part of the sentence was where the student voluntarily decided and explicitly committed to actively doing something to solve the problem as opposed to passively hoping the problem solved itself.

The following three sentences included explicit statements of behaviors that the student would agree to perform in his/her effort to improve in the course. These statements emphasized

the individual effort and the self-directed components of being academically successful. First, the contract required the students to commit to completing all assignments and readings. While it might be obvious to the students that completing assignments would help learning and their course grade, for many college students, the benefit of completing the readings often seems less clear (Hobson, 2004). However, we believe that reading is essential for the independent learner (Herber & Nelson-Herber, 1987), and hoped to help build good learning habits in the contract students.

The second explicit behavior included was that the student would ask others for help as necessary. This part of the contract did not specify who the “others” were. They could be classmates, other students, or the instructor. Many of our students have been successful in the past without seeking help from others, and they may view asking others for help as a sign of incompetence, or they simply have not made it part of their learning practice. The third explicit learning behavior included in the contract was that the student would come for office hours at a frequency of their choosing (they filled in a blank indicating their intended rate). The emphasis on interacting with others as part of their learning behaviors was based on evidence from peer learning as well as Herber and Herber-Nelson’s (1987) claim that having students “share their understanding of concepts” can become a motivational activity leading toward greater student independence. The paragraph closed with an explanation of the purpose of the behaviors, which was to ensure that the students “understand the concepts and have the chance to ask questions or get help with homework.”

Not only was student commitment a key component of the contract, but so was instructor commitment. We believed that the student needed to know he or she was not alone in the learning process, and thus, the contract emphasized the responsibilities of both parties in the student-teacher relationship. Using an explicit statement, the instructor committed to be available for the amount of time requested by the student “so that the material is learned.” This explicit focus on the instructor supporting the student’s learning completed a dual requirement identified by Firestone et al. (1987); they concluded that both a commitment to a student and to the role of teaching were necessary for effective learning to occur.

Finally, the contract specified that it would expire when two conditions were met: 1) the student achieved his or her personal goal for the subsequent exam, which they explicitly indicated on the contract —*and*— 2) the student informed the instructor he or she would like to terminate it. It was important to help guide the students in setting a challenging, but attainable goal based on their current course grade and how many more assignments were left in the semester. Our learning contracts were customized to each student based on their individualized course goals, and each contract prescribed a set of student and instructor responsibilities required to be successful. This practice follows Codde’s (2006) guidelines that stated learning contracts should be individualized, include what is to be learned, how it will be learned, and how it will be verified. The second condition reinforced both that the student was in control of the contract and that the commitment would be ongoing until the contract was actively cancelled. At the bottom of the contract were spaces to indicate the date and for both the student and the instructor to sign.

The in-class feedback form contained questions that asked students to self-report behaviors that occurred within designated segments of the course. The pre-semester form was worded in future tense and asked about intentions for the upcoming semester. It was shorter in that it did not ask any questions that made reference to being offered or signing a learning contract. The five questions on the short form asked students to report their completion of homework assignments (which were not graded in all courses) and reading assignments (indicate

number fully and partially completed for each), rate their likelihood to prioritize two types of learning behaviors (time to complete readings and homework, time to attend office hours) using a 5-point scale (never, rarely, occasionally, frequently, always), and finally, indicate whether or not it was important for them to do well in the class (no, somewhat, yes). No identifying information (name, code number, etc.) was requested on the forms. The form used at mid- and end-of-semester included two additional questions that asked students to identify whether or not they had been offered and accepted a learning contract. The questions on this form were worded so that students only reported behaviors that had occurred since the previous feedback form was collected.

C. Procedures.

Each instructor treated all students in their courses the same; they were taught the same material through the same methods and given the same assignments. At the beginning of the semester, before each exam, and on the last day of class, all students were given the in-class feedback forms. Students kept their completed forms so that they could be turned in as a bundle on the last day of class. This was done so that we could link data across the semester without asking for names or other identifying information. Prior to the time when learning contracts were offered to those students meeting the criteria given above, the short version of the feedback form was used. Following the offering of contracts, all questions were included on the feedback forms.

Following the first exam (or at the time indicated above in Table 1), students in the experimental group who earned less than a 75% were asked via email to attend a one-on-one meeting with the instructor to discuss how they were doing in the class. The meeting provided the instructor an opportunity to get to know each student and learn why each of them thought they were struggling in the course. During the meeting, the instructor introduced the concept of a learning contract and offered to develop a customized one with the student at that time. According to Barbour and Czarnecki (1973), a one-on-one student-teacher discussion is the key to a successful contract. In our study, this one-on-one meeting facilitated both “priming” and a “needs analysis” as described by Boak (1998). Priming involves a clear explanation of what a learning contract is and how it would be used, while the needs analysis customizes the contract and its specific terms and goals. Once both the instructor and student signed the contract, the student kept the original, the instructor a copy, and the contract was complete. On average, the initial meetings lasted 15 minutes. Students in the control group were not offered learning contracts; however, they were afforded the same instructor availability and access to peer and instructor assistance.

At no time during the semester did any instructor encourage or discourage the students to follow the learning contracts. Complete onus was on the student to come in for office hours and there was no explicit penalty for not following the terms of the contract or reward for following it. Office hours lasted anywhere from five minutes to an hour depending on student need. The instructors remained available to all contract eligible students regardless of whether they signed or denied the contract and regardless of how closely they followed it. Throughout the semester, instructors tracked how frequently all students attended office hours, and recorded first and final exam scores for analysis.

V. Results.

None of the eighteen students on contract chose to terminate their contract during the course of the semester. Overall, we had three types of data: self-report data from the feedback forms, recorded office hour attendance from the instructors, and grades on the exams. Because the feedback forms were anonymous, only two groups were compared: those on contract and those not on contract within the experimental group. Note that “those not on contract” included students with low scores who declined to sign a contract as well as those who scored high enough to not be offered a contract. These two groups were not distinguishable due to the wording on the feedback form that simply asked whether or not students were on a contract. Further, because many students lost the feedback forms they completed earlier in the semester, only the feedback forms from the last day of class were analysed. Additionally, one of the instructors neglected to hand out the final feedback form (ENGR 101, Spring 2011). Ultimately, we received 15 feedback forms from the “on contract” group and 50 from the “not on contract” group. Finally, we know at least one student mis-categorized his/her status as being on contract because three students indicated “on contract” responses in one particular section when only two students in that section actually signed a contract. There is no way to determine which of those three hadn’t signed a contract in order to re-categorize it, but it seems that at least in his/her mind, a contract existed, which may be the crucial aspect, i.e. a state of mind based on commitment to perceived expectations. Thus, rather than discarding all three, we kept all three in the learning contract data group.

A. Self-reported Completion of Assignments and Time Prioritization.

As expected, more of the students on contract reported completing all of the assigned homework during the final segment of the course than those not on contract (98% to 91%, respectively), while more students not on contract reported completing some or no homework. (See Figure 1a.) A 2-factor Chi Square analysis indicated a marginally significant difference $X^2(2)=5.6, p=.06$.

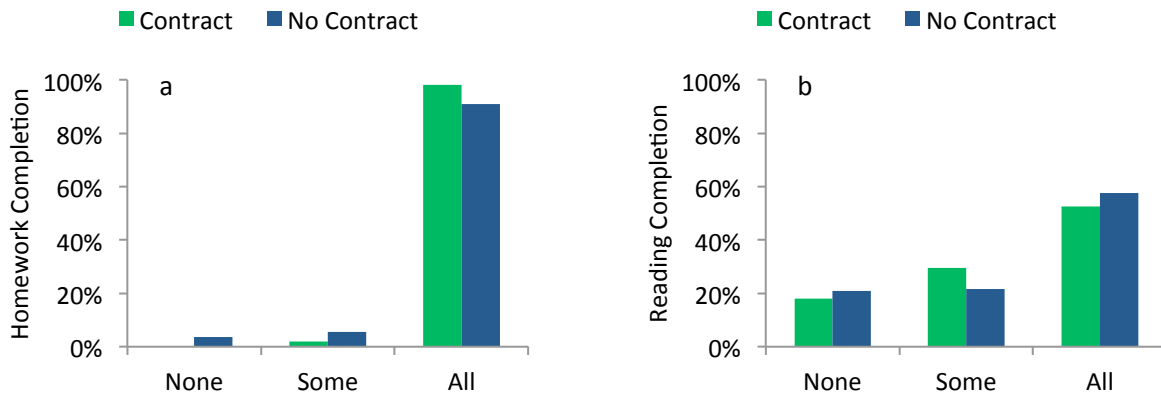


Figure 1. a) Self-reported percentage homework completion during final segment of course. b) Self-reported percentage reading assignment completion during final segment of course.

The results are less compelling with respect to self-reported reading behaviors, which may support the above presupposition that the value of homework completion and reading completion are viewed differently by students. More specifically, those not on contract reported

greater likelihoods to both complete all the assigned readings or none of the readings, while those on contract were more likely to complete some of the readings. (See Figure 1b.) One explanation for this is that the group not on contract included the students who scored well on first exam as well as those who performed poorly but declined to sign a contract. Those who scored well might have already had well-developed learning and study behaviors, which contributed to the relatively high percentage of students not on contract who reported completing all of the reading assignments. Meanwhile, those who declined the contracts might be least likely to complete the assigned readings; their poor performance suggests poor learning behaviors, and they did not commit to changing their behaviors. A 2-factor Chi Square analysis indicated no difference $X^2(2)=2.0, p=.43$.

An examination of the feedback form responses to questions about time-prioritization indicated that students on contract more often prioritized time for homework and reading, and for office hours than those not on contract. As shown in Figure 2a, 86.7% of students on contract responded that they either “frequently” or “always” prioritized time for homework and reading compared to 62.0% not on contract. A 2-factor Chi Square analysis indicated a significant difference $X^2(3)=23.6, p<.0001$. Figure 2b indicates similar time prioritization for attending office hours; 60.0% of students on contract responded that they either “frequently” or “always” prioritized time for office hours versus 42.0% of those not on contract. A 2-factor Chi Square analysis indicated a significant difference $X^2(4)=21.5, p<.001$. The statistical mode for students on contract was that they frequently prioritized time for both of these course related behaviors, while the mode for students not on contract was to occasionally prioritize time for both of these course related behaviors.

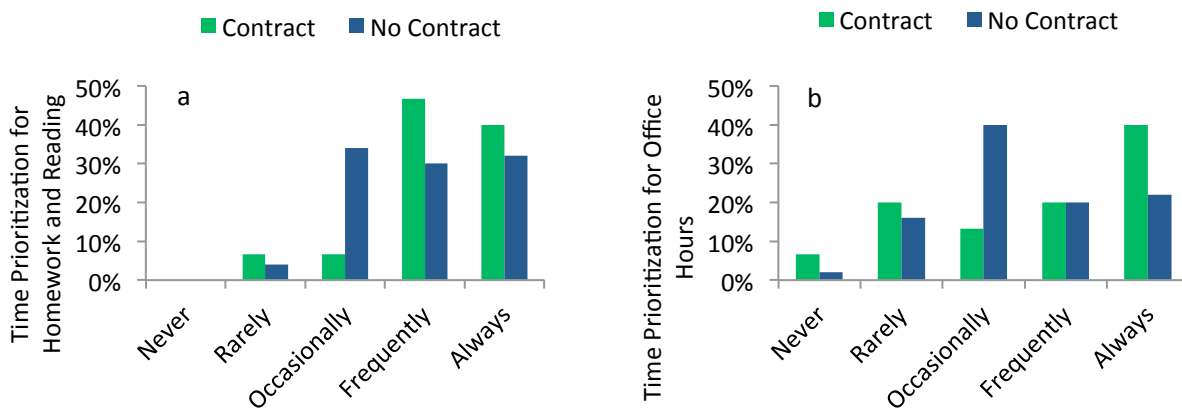


Figure 2. a) Self-reported time prioritization for homework and reading during the final segment of the course. b) Self-reported time prioritization for office hours during the final segment of the course.

B. Attendance at Office Hours.

Due to the anonymity in the feedback forms, office hours attendance was the most effective way to determine how closely students followed their learning contracts. “Success of contract learning depends on the student’s own enthusiasm and commitment to the agreement” (Mazhindu, 1990, p.106). Only one of the eighteen students who signed a contract came according to their prescribed contract frequency. With such a small sample size, however, we could not statistically determine whether those who more closely followed their contract

performed better academically than those who followed the contract less closely. Thus, we grouped all contract students together and compared them to the other groups. For these data, we categorized students into four groups: those who performed below 75% and who did sign a contract (On Contract), those who performed below 75% but declined a contract (Declined Contract), those who performed below 75% but were not offered a contract (Control Group Low Performers), and those who performed above 75% (High Scorers; combined from both the control group and the experimental group). Table 2 summarizes the office hours attendance for the four groups throughout the entire semester.

As expected based on both our initial prediction and the self-reported data above, students on contract more often met with their instructor during office hours. Overall, students on contract averaged 4.5 office hour sessions per semester, while the other groups averaged less than one visit per student. Especially notable is the fact that, among those who declined a contract, there were no office hour visits. Maybe they were embarrassed they declined the contract or maybe they felt like they were not welcome back in the instructor's office. Or, since most students not on contract did not attend many office hour sessions, those eight students are no different from the others not on contract.

Table 2. Office hour sessions comparison between groups throughout the entire semester.

Group	No. Students	No. Office Hour Sessions	Avg. No. of Sessions per Student
On Contract	18	81	4.5
Declined Contract	8	0	0.00
Control Group Low Performers	26	20	0.77
High Scorers	152	70	0.46

In order to test for group differences, we performed a 3-level, single-factor ANOVA using each of the six participating sections as the "participants" in the analysis, so that each section contributed an average number of office hour sessions per student for each of the four student groups. There was a significant difference in the average number of office hour sessions across the four groups, $F(3, 20) = 16.69, p < .0001$. A Tukey HSD post Hoc analysis indicated that the On Contract group attended significantly more ($p < .01$) sessions than the other three groups, and that the other three groups were not significantly different in their rates of attendance. This suggests the On Contract students were more self-motivated and willing to seek out assistance than their peers.

C. Grades.

For the purposes of analyzing grades, the participating students were grouped into the same four categories used above when analyzing the number of office hour sessions: On Contract, Declined Contract, Control Group Low Performers, and High Scorers. We calculated the mean raw improvement from the first exam (or appropriate discriminator) to the final exam for each of the four groups and conducted statistical analyses. See Table 3 for averages for all four groups.

Table 3. Grade improvement comparisons.

Group	Exam 1 (or discriminator) Avg.	Final Exam Avg.	Raw Improvement from Exam 1 to Final (positive number is good)	No. Students
On Contract	64.0%	71.2%	+7.2	18
Declined Contract	72.4%	76.7%	+4.3	8
Control Group				
Low Performers	67.5%	69.9%	+2.4	26
High Scorers	85.8%	80.7%	-5.1	152

Perhaps the most prominent observation is that the On Contract group improved 7.2 percentage points from the first exam to the final, starting lower and finishing higher than the Control Group Low Performers, who improved 2.4 percentage points. This supports our hypothesis that those who sign a contract would show greater improvement following the first exam than those who did not sign a contract. A 4-level, single-factor ANOVA showed a significant effect, $F(3,203)=10.42$, $p<.0001$. However, the only significant differences shown using the Tukey HSD post hoc were between those on not on contract due to high performance and both those on contract and those who declined the contract. In other words, there was no significant difference in the amount of change from exam 1 to the final between the low scorer control group and those on contract. However, fourteen of eighteen students (78%) on contract improved their grade while only sixteen of twenty six (62%) in the low scorers control group improved; these data suggest improvement at a 74% confidence interval using the sign test.

Contrary to our final hypothesis, the Declined Contract group did not show the least improvement from exam 1 through the final. The data in Table 3 also hint at why the eight students who declined the contract might have made that decision. While they were below the 75% performance threshold, their Exam 1 grades were significantly higher than those who did choose to sign the contract, $t(24)=-2.24$, $p=.01$ (using a t-test for unequal variances). We also acknowledge that some of the change that occurred between exam 1 and the final for all groups might reflect regression to the mean, with low scorers improving on average and high scorers showing an average decline. However, the pattern of significant group differences (e.g. those on contract different from high scorers, but those in the control group not different from high scorers) suggests that regression to the mean does not fully explain the data trends observed.

VI. Implications and Conclusions.

While the learning contracts only showed grade improvement at a 74% confidence interval, which may not be as high as typical statistically significant findings, for an implementation that is low cost, the potential is great, especially when combined with the highly significant shift in learning-related behaviors (e.g. homework completion, prioritization, attendance at office hours). These behaviors precede the actual performance increases, so with only about two months of time under contract, the grade shift may not have been fully realized within the bounds of the single semester. Despite the relatively short amount of time students were on contract in this study, the notion that the first test is a predictor of the final grade (Toncar & Anderson, 2010) need not necessarily be a student's destiny if an intervention such as a learning contract is used.

At the core of the learning contract is a plan to accomplish a goal via specific behaviors. The results of this study indicate a relationship between commitment, motivation, positive

decision making, taking action, and achievement. Research as noted earlier (e.g. Bandura, 1977; Pintrich, 1994) suggests achievement leads to increased self-efficacy. Therefore, we propose the student self-direction cycle as shown in Figure 3.

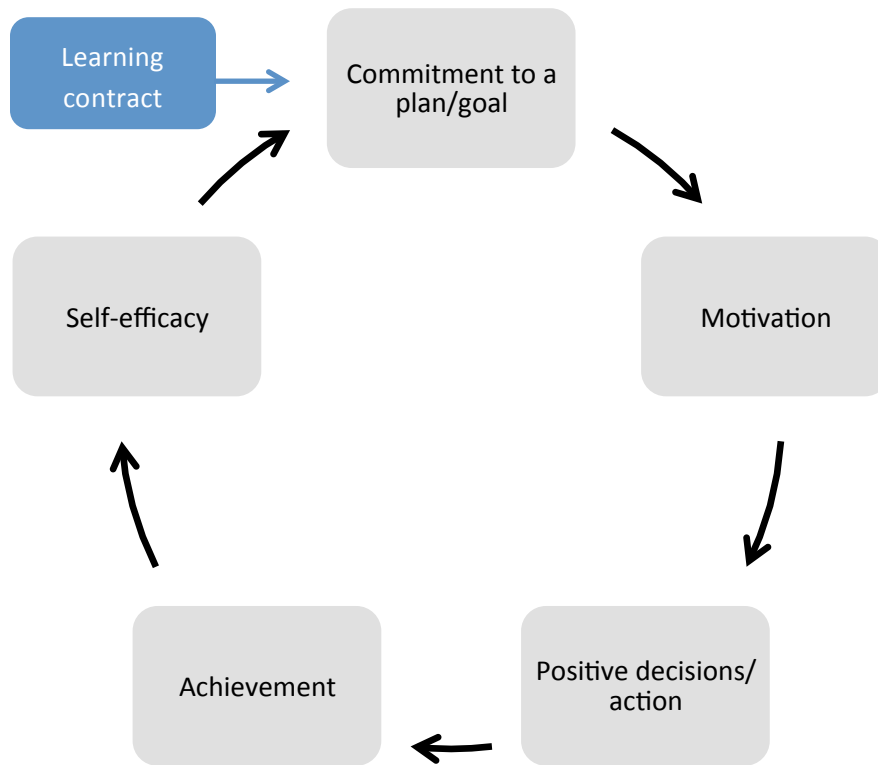


Figure 3. Student self-direction cycle.

While other sources of motivation besides commitment and other drivers for positive decisions exist, we suggest the above figure describes an important cycle that pertains to students' learning behaviors. Learning contracts were successful in providing an onramp to the self-direction cycle by acting as an avenue to commit to something. The commitment led to increased motivation, which helped students decide to practice course-related behaviors. The course-related behaviors outlined in the learning contract drove increased academic achievement. Self-efficacy can increase as performance increases, and the learning cycle can spiral all over again, channelling novice learners into self-directed adult learners.

Although our data support the benefits of incorporating a learning contract, there are many possible aspects of the learning contract process that could have mediated the observed benefits. First, the face to face meeting to create the contract might have helped establish rapport and create a supportive environment for effective learning. But, this initial supportive social exchange does not seem to be the crucial component, because those who declined a contract did not return for any office hours and they showed less (though non-significantly different) increase in grades than those on contract.

A second possibility is that solidifying the commitment on paper may have been the difference between good intentions and deliberate action, and could have been a motivator itself. The act of signing a contract was clearly important because those on contract outperformed the other three groups in grade improvement (though not significantly in every case). Further, while

almost one hundred percent of all students in the participating courses indicated on their end-of-semester feedback form that it was important for them to do well in the class, only those who signed learning contracts indicated they were more likely to prioritize time for course-related tasks like reading, homework, and office hours than the control group. They also took the time to follow through with their commitment and attend office hours. Therefore, we suggest the benefits of a learning contract are at least somewhat linked to the act of signing.

How much follow-through, and on which components (e.g. reading or meeting with instructor), is enough to yield improvement in course performance? Because our contract group sample size was relatively small, no relationship could be determined between how well students followed the contracts and their changes in behavior and grades. Anecdotally, the only student who completely followed her learning contract with respect to office hour meetings did not improve her grade; thus complete follow-through with respect to that component is certainly not a guarantee of academic success. Though not a unanimous conclusion from the body of literature, some previous research suggests hours spent studying is positively related to academic outcomes including graduating with honors, standardized test scores, and self-reported increases in cognitive and affective skills (Astin, 1993). Thus, some of the other learning behaviors targeted in the contracts may be more important than meeting with the instructor. Perhaps as the semester progressed, students better learned what they needed to be successful, and thus, deviated from the contract. For example, they might have realized that if they read more regularly, they did not need to attend as many office hours meetings as they first believed when they created the contract. An area of further research could be to study how the extent to which a learning contract is followed affects behavior change and grade improvement.

Another question stemming from this project is: What student and course characteristics might impact the benefits from learning contracts? Although not a focus of our implementation, because we incorporated learning contracts in a variety of courses, we were able to observe that student class year combined with some basic course characteristics influenced the likelihood to sign a contract. Students in the freshman level course (ENGR 101) were more likely to refuse to sign a learning contract when compared to the sophomore (EM 220) and junior (CE 330) level students; four of ten in ENGR 101 signed, two of three in EM 220 signed, and twelve of thirteen in CE 330 signed. About half of the assignments in the freshman-level course were group projects, whereas group projects represented a smaller percentage of the grade in the sophomore level course and none of the grade in the junior level course. It is impossible to determine whether the academic maturity of the student (class year) or the course characteristic (more individual or group work) was more influential in the rate of contract signing, but it would be of interest to examine in future studies. A better understanding of these factors would allow instructors to estimate the possible benefit of learning contracts when considering to implement them. Additionally, subsequent research might want to explore the ways learning contracts could be effectively used for groups of students who are working together on projects. To date, the learning contracts research is focused on individual impact.

Another important question to systematically address is how to best incorporate learning contracts across courses and over time in a student's academic career. For example, without prodding, one student in this study asked an instructor the following semester to establish a learning contract on the first day of class. This request was promising in the sense that he recognized the contract was successful, self-identified what he thought he needed to be successful again, and exhibited metacognitive awareness in doing so. However, it is unlikely that the same contract would yield the same benefits given his already accomplished gains in

self-regulation and learning behaviors from the previous semester. Rather, as a student matures into an adult learner, the amount of structure and the types of behaviors addressed in the contract should shift, ultimately leading the student to become self-directed learners who don't need contracts. This line of thought supports the research (Anderson et al., 1996; Barlow, 1974; Chan & Wai-tong, 1999; Williams & Williams, 1999) that contract individualization is critical to ensure the learning contract matches student need, because students in our courses will be at different levels of development with respect to self-directed learning. Further, as the student transitions into an adult learner, the learning contract could allow for more freedom of choice (e.g., Barlow, 1974; Litchfield, 2007), coupling an increase in commitment with the benefits of increased intrinsic motivation.

In sum, much has been learned about the potential benefits of incorporating learning contracts, but much is yet to be determined. Overall, our results show that learning contracts are a low cost, low effort tool that can increase student commitment, promote learning-related behaviors, and boost academic performance. We recommend that instructors consider using this tool in their courses where they sense student motivation and commitment might be lower than desired or when academic performance is poor.

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Graduate counseling students' learning, development, and retention of knowledge

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Abstract: The present study investigated 52 graduate counseling students' levels of ethical and legal knowledge (Lambie, Hagedorn, & Ieva, 2010) and social-cognitive development (Hy & Loevinger, 1996) at three points: (a) prior to a counseling ethics course, (b) at the completion of the course, and (c) four months later. Students' ethical and legal knowledge scores increased and they retained their learning; however, their social-cognitive development did not change. Implications for the scholarship of teaching and learning are discussed.

Keywords: counselor education and development, ethical and legal knowledge, scholarship of teaching and learning, social-cognitive development

Counseling is a complex and dynamic interactional process where counselors necessitate a specific knowledge base (e.g., ethical standards and legal statutes; Council for Accreditation of Counseling and Related Educational Programs [CACREP], 2009) and dispositions (e.g., adaptability, empathy, flexibility, wellness) in order to provide ethical and effective services to clients with diverse needs. Counselors scoring at higher levels of social-cognitive maturity (Loevinger, 1998) are more empathic, flexible, well, autonomous, and adaptive to stress than counselors are lower levels of development (e.g., Borders, 1998; Lambie, Smith, & Ieva, 2009; Sheaffer, Sias, Toriello, & Cubero, 2008). Therefore, graduate counseling students with higher levels of ethical and legal knowledge and social-cognitive development possess both knowledge and dispositions to support their effective work with diverse clients. Subsequently, graduate counseling preparation programs are tasked with promoting their students' counseling related knowledge and social-cognitive maturity. Nevertheless, investigation of effective pedagogy (the scholarship of teaching and learning [SoTL; Hutchinson, Huber, & Ciccone, 2011]) in counseling preparation programs to promote students' learning and development is limited.

The acquisition of counseling knowledge following the completion of a content specific course would logically result in higher achievement test scores; however, the retention of students' learning months following the conclusion of the course is unknown. In addition, social-cognitive development is difficult to promote in short periods of time (e.g., Lambie, Hagedorn, & Ieva, 2010); nevertheless, investigations of developmental growth within a sample of graduate students over an extended period of time (seven months) is limited. Therefore, this study sought to identify change in graduate counseling students' ethical and legal knowledge and social-cognitive development at three points: (a) prior to a counseling ethics course, (b) at the completion of the ethics course, and (c) four months following the completion of the ethics course; examining students' learning, developmental growth, and retention of knowledge.

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I. Ethical and Legal Knowledge and Social-Cognitive Development.

Scholars note the importance of *ethical and legal knowledge* (ELK) and *social-cognitive development* (SCD) in the preparation of graduate counseling students. Therefore, we review these two constructs to set the context for SoTL study that follows.

Counselors necessitate sound ethical (best practice for a profession) and legal (minimal acceptable practice tolerated by society) knowledge and the ability to utilize their counseling knowledge in their works with diverse clients (e.g., Lambie, Ieva, & Ohrt, 2012). In addition, CACREP (2009) requires that students in accredited graduate counseling programs are able to demonstrate a mastery of the ethical standards of their professional organizations and credentialing bodies, as well as the skills necessary to implement ethical and legal practices in their work with clients (*Standard, II.G.1.j.*). Therefore, counseling students need to acquire their ELK during their preparation program and retain their knowledgebase as they transition into practitioners.

Common ethical and legal concepts required for counseling students' ethical practice emerged when reviewing the counseling literature (e.g., American Counseling Association [ACA], 2005; American School Counselor Association [ASCA], 2010; Corey, Corey, & Callanan, 2010; Cottone & Tarvydas, 2007; Welfel, 2009). For example, ELK concepts consistent in the counseling literature include (a) confidentiality and privileged communication, (b) due process, (c) Kitchener's (2000) five moral principles (autonomy, beneficence, nonmalificence, justice or fairness, and loyalty or fidelity), (d) negligence and malpractice, and (e) abuse of children and the elderly. Graduate counseling preparation programs may infuse ELK throughout their curriculum and/or require a specific course in counseling ethics and legal practice (CACREP, 2009). Nonetheless, counseling students need to demonstrate a level of competency regarding their ELK (ACA, 2005; CACREP, 2009; National Council for Accreditation of Teacher Education, 2008), supporting their ethical delivery of services. However, there is a paucity of research examining pedagogy supporting graduate counseling students' learning and retention of ELK.

Counseling preparation programs may use various methods to disseminate ethical and legal information to their students. A common dissemination method of ELK is through the use of textbooks that supplement counseling students' course content (e.g., Corey et al., 2010; Stone, 2009; Welfel, 2009). To support students' ELK development, instructors may employ multiple pedagogical strategies in their counseling ethics courses, such as lecture, group discussions, and reviewing and processing case studies and ethical dilemmas (Vanek, 1990). It stands to reason that an effective approach to foster students' ELK is through multiple pedagogical strategies (e.g., role-plays, application of ethical decision-making models, and comparing and contrasting ethical codes with specific laws), matching students' different learning styles (e.g., auditory, visual, kinesthetic, reflecting, acting, reasoning logically, reasoning intuitively, and analyzing; Pritchard, 2008). Therefore, investigating students' learning and retention of knowledge per the pedagogy employed in graduate counseling ethics courses is warranted.

The application of counseling students' ELK correlates to their level of cognitive development (Rest, Narvaez, Bebeau, & Thoma, 1999). In addition, counselors' level of ethical reasoning relates to their cognitive development in that higher developmental levels increased their ability to analyze complex and fluctuating ethical dilemmas (Dufrene, 2000). Hence, counseling students' at higher levels of social-cognitive development theoretically are better able to apply their ELK in diverse situations (ethical decision-making; Lambie et al., 2012).

Social-cognitive development (SCD), or *ego development* (Loevinger, 1998), draws from other stage theories of human development (e.g., Piaget, 1955). In Loevinger's developmental theory, SCD is a holistic personality construct that incorporates cognitive, moral, self, interpersonal, and character development (Lambie, 2007). The SCD construct is the lens for which individuals make meaning of their experiences and emotions (Noam, Young, & Jilnina, 2006). As graduate counseling students' SCD matures, they progress towards more complex levels of meaning-making, impulse control, interpersonal relations, and intrapersonal congruence (Cohn & Westenberg, 2004).

Regarding the counseling preparation programs, levels of SCD "mark important distinctions in the ways, and degrees of complexity with which individuals understand the self, others, and social situations" (Bauer & McAdams, 2004, p. 115). As students' SCD matures, they become more flexible and adaptive to their environment and interpersonal interactions (Cook-Greiter & Soulen, 2007). Loevinger's (1998) theory delineates eight distinct SCD levels that are equilibrated structures that develop in an invariant hierarchical sequence, progressing to increased personal and interpersonal awareness, autonomy, ability to think complexly, and enhanced capacity to self-regulate (Manner, Durkin, & Nesdale, 2004). When students are at lower levels of SCD, meaning-making is simplistic; conversely, when students are at more mature levels, they are more attune to recognize incongruence and conflict, interdependency and mutuality, and systemic influences on their lives (Lambie et al., 2010).

SCD is an equilibration model wherein counseling students' growth relates to their adaptive responses (accommodation) and their interactions with the environment. Therefore, when students are confronted with experiences that are incongruent to their cognitive scheme, dissonance and developmental disequilibrium is evoked (e.g., ethical dilemma with no definitive solutions; Manner & Durkin, 2000). So as to restore equilibrium, students either adapt to their environment by assimilating the new information into their current schema (resulting in developmental stability), or they alter their schema to the new information (resulting in developmental growth; Lambie & Sias, 2009). Within a graduate counseling ethics course, the intentional introduction and discussion of complex ethical dilemmas (e.g., a case where a client's right to confidentiality conflicts with the counselor's duty to warn and protect) may induce disequilibrium, which may result in an assimilative and/or accommodative response.

Researchers have investigated the relationship between graduate counseling students' levels of SCD (Loevinger, 1998) and other desirable counseling constructs, such as counseling students' acquisition of counseling skills, effectiveness with clients, abilities to cope with stress during internship experiences and abilities, and levels of wellness (e.g., Borders, 1998; Lambie et al., 2009; Walter & Lambie, 2012). Nevertheless, change in graduate counseling students' SCD over an extended period of time in their preparation program has *not* been investigated.

II. Purpose of the Study.

Given the importance of ELK in graduate counseling preparation program, and the correlation between SCD and desirable counselor qualities (e.g., counseling skills and effectiveness; Borders, 1998; Lambie et al., 2009), we examined the influence of counseling ethics courses on students' acquisition and retention of knowledge and developmental growth in an effort to identify potential implications for pedagogy in graduate counseling preparation programs. In addition, we investigated potential differences in students' learning, retention of knowledge, and developmental growth between two sections of the counseling ethics courses to ascertain

possible pedagogical factors influencing students. Therefore, the two research questions investigated were: Are graduate counseling students' levels of ELK and SCD different at three points in their preparation program: (a) prior to a counseling ethics course, (b) at the completion of the ethics course, and (c) four months following the completion of the ethics course? and Are there mean differences in graduate counseling students' ELK and SCD scores who are enrolled in two different sections of counseling ethics courses?

III. Method.

A. Procedures and Participants.

The sample included 52 graduate counseling students at a large metropolitan university in the southeastern United States. Approval to conduct the study was obtained from the university's Institutional Board Review. To protect the rights and confidentiality of participants, participation was voluntary, students' names and identifying information were *not* collected, and none of the data collected was reviewed or scored until after the course was completed and grades had been submitted. We introduced the study and provided informed consent to potential participants (using a waiver of documentation of consent to participate in research), and then administered the data collection instrument packets three times (a) during the first class meetings of two counseling ethics courses (mid-May), (b) during the final class meeting of the two counseling ethics courses (early August), and (c) four month following the completion of the two ethics courses (mid-December). Specifically, during the first class meeting, envelopes containing a waiver of consent to participate in research form and the two data collection instruments were distributed to participants who were asked to write down the number of their envelope (e.g., #7A) somewhere in their personal effects. During the final class meetings, participants collected the envelope (which contained the same informed consent and data collection instruments) that corresponded to the number they wrote down from the first class meeting (e.g., #7A retrieved #7B). For the third data collection point, all the students enrolled in the two counseling ethics courses were invited to complete the assessment instruments (e.g., #7A or #7B retrieved data collection packet #7C) and offered a small incentive for their participation. Therefore, if participants chose *not* to partake in the investigation, they could simply leave the data collection instruments blank and the researchers were unable to identify their identity (data were kept anonymous to the researchers). Nevertheless, of the 82 students enrolled in the two counseling ethics courses, 52 students chose to complete the assessment instruments at the three different data collection points (which resulted in a 63.4% usable response rate).

B. Participant Characteristics.

Descriptive data and measures of central tendency indicated that the mean age of the 52 students was 25.54 years ($SD = 4.54$; range, 21-41 years). Men ($n = 7$; 13.5%) were less represented than women ($n = 45$; 86.5%). To support the anonymity of the students' responses, they were asked to self-identify their ethnicity or race as Caucasian ($n = 35$, 67.3%) or "Other" ($n = 17$, 32.7%; e.g., African American, Asian/Pacific Islander, Latino American, Native American). A total of 32 (61.5%) students that they were enrolled in the counseling ethics course for the Mental Health and/or Marriage and Family Counseling track and 20 (38.5%) students indicated that they were enrolled in the ethics course the for School Counseling track.

C. Pedagogical Intervention (Counseling Ethics Courses).

The study participants were enrolled in one of two 13-week counseling ethics courses within a CACREP accredited counselor preparation program (13 class meetings that were three hours and fifty minutes in duration). One course consisted of counseling students in the School Counseling track and the other had students in the Mental Health and Marriage and Family Counseling tracks. In this counselor preparation program, students enroll in the ethics course at around the midpoint of their program of study. Specifically, students were unable to enroll in the ethics course during their first semester in the program as they were required to complete two prerequisite courses prior to the ethics class; additionally, the ethics course were not taken late in the students' program of study as the course was a prerequisite for their clinical courses (e.g., Practicum and Internship). Each of the courses' objectives was aligned with the appropriate CACREP (2009) *Standards*. For example, one course objective was that by the conclusion of the course, students would be able to demonstrate their knowledge and ability to apply the ACA (2005) *Code of Ethics* with diverse clients in various settings (CACREP, 2009; "ethical standards of professional organizations and credentialing bodies, and applications of ethical and legal considerations in professional counseling" [p. 10]). The content in both courses was designed to cover the primary counseling ethical and legal issues (e.g., professional identity and competencies; ethical decision-making models; confidentiality and privileged communication; suicide and client violence; and abuse, neglect, and negligence). For further information related to the course content, please contact us for a copy of the course syllabi that delineates the course objectives, activities, and assignments.

Pedagogically, the two instructors for the counseling ethics courses employed multiple educational strategies to support their students' learning and development. Specific teaching strategies included (a) course readings, (b) lectures, (c) group discussions, and (d) role-plays to support the students' learning and development. In addition, the students facilitated a group presentation to their classmates on a specific ethical issue confronting counselors; identifying research, ethical codes of practice, legal statutes, and organizational policies that influenced counselors' decision-making when experiencing a similar ethical dilemma (student as teacher). Moreover, the instructors employed scaffolding to support the students' learning and developmental growth. Scaffolding educational content (a) provides clear and concrete directions, reducing students' confusion; (b) clarifies purpose; (c) keeps students on task; (d) clarifies expectations and incorporates assessment and feedback; (e) directs students to worthy sources; and (f) reduces students' level of uncertainty (Lambie et al., 2012). For example, the instructors introduced the concept of confidentiality to their students, providing them with a concrete understanding of the ethical principle. Next, the instructors facilitated a discussion concerning confidentiality and counselors, clarifying the students' understanding of confidentiality with practical case illustrations (e.g., parent wants counselor to break confidentiality and share what child-client expressed to counselor). After the discussion, students were provided different ethical dilemmas confronting counselors and they had to apply, analyze, synthesize, and evaluate the different ethical decision-making processes they would employ.

Student learning outcomes were evaluated through both formative and summative assessments. Students had required readings from the two counseling ethics textbooks and the instructors used formative assessments of students' learning of course content through weekly quizzes on the assigned readings. Furthermore, students completed a summative assessment where students systemically worked through an ethical decision-making process. Specifically,

the two instructor required students to research an ethical and legal dilemma confronting counselors (e.g., suicidal ideation, duty to warn and protect). Following the identification of the dilemma, students constructed a case illustrating the ethical dilemma and presented how they would work through the dilemma using ethical guidelines and legal statutes (federal, state, case). To further students' development, the two instructors required the students to develop an ethical dilemma related to confidentiality and a counselor, encouraging the students to identify their own solution and process for working through the dilemma. Therefore, the two instructors constructed the courses to promote both their students' learning of ELK and their developmental growth.

D. Instrumentation.

The two constructs investigated in this study were: (a) ELK (as measured by the *Ethical and Legal Issues in Counseling Assessment* [ELICA]; Lambie et al., 2010) and (b) SCD (as measured by the *Washington University Sentence Completion Test* [WUSCT]; Hy & Loevinger, 1996). The primary variables used to examine the constructs included Total ELICA scores (pre-test, post-test, and follow-up test) and WUSCT Total Protocol Rating (TPR) scores (pre-test, post-test, and follow-up test).

Ethical and Legal Issues in Counseling Assessment. The ELICA (Lambie et al., 2010) is a 50-item multiple choice assessment designed to measure graduate counseling students' ELK in 10 domains: (a) professional identity; (b) ethical and legal terms; (c) ethical decision-making principles; (d) confidentiality; (e) suicide and client violence; (f) abuse, neglect, and negligence; (g) counseling and educational records; (h) educational and civil right laws; (i) counselor development and wellness; and (j) discrimination laws and ethics. Sample items from the ELICA include:

1. When professional counselors are confronted with an ethical dilemma regarding confidentiality, the moral principle that should guide their decision-making is: (a) Justice, (b) Beneficence, (c) Nonmaleficence, or (d) Privileged communication.
2. This court case is most commonly related to a professional counselor's "duty to warn and protect": (a) *Davis v. Monroe County Board of Education*, (b) *Tarasoff v. Board of Regents of California*, (c) *Eisel v. Montgomery County Board of Education*, or (d) *Grant v. Board of Trustees of Valley View School District*.

The ELICA was constructed per the suggested eight steps for scale construction (e.g., determine what it is you want to measure, generate an item pool, have item pool reviewed by experts; DeVellis, 2012) and the item development aligned with Kline's (2005) nine rules to guide the development of sound scale items (e.g., deal with one primary principle in each item, avoid imprecise terms such as *frequently* or *sometimes*). The reliability of the ELICA was acceptable with an overall Cronbach's Alpha score of .70 with 64 counselor education students (Lambie et al., 2010), .70 with 28 school counseling students (Lambie et al., 2012), and .71 with 226 practicing school counselors (Lambie, Ieva, Mullen, & Hayes, 2011). In addition, we conducted a reliability analysis with our ELICA data and the results identified the need to remove 15 items to strengthen the internal consistency reliability for the three ELICA datasets (pre-test, post-test, and follow-up test). The internal consistency reliability of the 35 item ELICA with these data was moderate to questionable, with Cronbach's Alphas of .62 (pre-test ELICA), .70 (post-test ELICA), and .67 (follow-up ELICA). Nevertheless, the internal consistency reliability of the ELICA with these data appeared appropriate for a knowledge assessment measuring different domains of ELK with a sample of 52 (Streiner, 2003).

Washington University Sentence Completion Test. The WUSCT (Hy & Loevinger, 1996) is a semi-projective inventory consisting of 18 to 36 sentence stems with different forms for men and women relating to Loevinger's (1998) eight levels of SCD. The two WUSCT forms differ only in gender specific language such as "A man should always..." (Male) and "A woman should always..." (Female). The short-forms of the WUSCT (81-1; Hy & Loevinger, 1996) were used (18 sentence stems) for this study. In scoring the WUSCT, each sentence stem response is rated as a whole by its level of meaning, or what the person is saying, and is not conceptualized in relation to the other 17 responses. A total protocol rating (TPR) is then calculated using an algorithm reflecting the respondent's assessed place on Loevinger's SCD scheme, which includes the following levels: *Impulsive* (E2) – student functions based on physical needs and impulses, while being dependent on others for control; *Self-Protective* (E3) – student is opportunistic and adheres to traditions and rituals; *Conformist* (E4) – student accepts rules just because they are rules, and strives for social acceptance; *Self-Aware* (E5) – student has increased self-awareness and reflectivity, beginning to recognize multiple perspectives; *Conscientious* (E6) – student becomes self-evaluative and reflective, while recognizing multiple possibilities and a sense of choice, and thinks beyond own concerns; *Individualistic* (E7) – student has sense of individuality and greater tolerance of difference, while having increased awareness of own incongruence; *Autonomous* (E8) – student has deep respect for others' choices and need for autonomy with a high tolerance for ambiguity; and *Integrated* (E9) – student has become congruent and self-actualized—few people ever reach this level (Hy & Loevinger, 1996; Lambie & Sias, 2009). For our investigation, the two scoring raters were trained in scoring the WUSCT and achieved a high interrater reliability of .92 on a sample of 25 completed test protocols.

The reliability and validity of the WUSCT has been supported with diverse samples (e.g., Cook-Greiter & Soulen, 2007; Noam et al., 2006). For example, Lilienfeld, Wood, and Garb, (2000) concluded that the WUSCT "has demonstrated impressive construct validity..." and "is arguably the most extensively validated projective technique" (p. 56). In addition, the median interrater of the WUSCT is between .89 and .92 (Watts, Robinson, & Lupton-Smith, 2002).

E. Data Analysis.

A time series design was employed for our investigation as a single group of participants (graduate counseling students) had their ELK and SCD measured at three intervals of time during their preparation program (Gall, Gall, & Borg, 2007). In addition, we examined changes that occurred between initial assessments and following an intervention (counseling ethics course; Houser, 2009). Nevertheless, findings from a time series research design needed to be interpreted with caution because of threats to internal (e.g., history) and external validity (e.g., interaction of pretest and intervention; Gall et al., 2007).

After the data collection process, we scored the data and entered it into a database and analyzed by Statistical Package for the Social Sciences (SPSS, 2012) using a repeated measures analysis of variance (ANOVA), Pearson product-moment correlations (two-tailed), and post hoc ANOVA. Prior to the data analyses, we examined the data set to assess the fit between the distribution of the variables and the assumptions of the statistical analysis; no assumption violations were identified. A sample size of 52 graduate counseling students was acceptable for identifying a large effect size (power = .80) at the .05 level (Cohen, 1992).

IV. Results.

A. Ethical and Legal Knowledge.

The 35 items ELICA (Lambie et al., 2010) was used to obtain the graduate counseling students' ELK scores. The pre-test, post-test, and follow-up ELICA scores are presented in Table 1. The students' post-test and follow-up ELICA scores correlated to the section of the counseling ethics course they were enrolled: post-test ELICA ($r = .77, p > .001$; 58.98% of the variance explained) and (c) follow-up ELICA ($r = .51, p > .001$; 25.91% of the variance explained). Therefore, the students enrolled in the counseling ethics course for the School Counseling track scored higher on the post-test ELICA and follow-up ELICA than the students in ethics course for the Mental Health and/or Marriage and Family Counseling track $F(1, 50) = 71.80, p < .001$; $F(1, 50) = 17.53, p < .001$, respectively.

B. Social-Cognitive Development.

The WUSCT-Form 81 (short-forms; Hy & Loevinger, 1996) was used to obtain graduate counseling students' SCD scores. The pre-test, post-test, and follow-up WUSCT TPR scores are presented in Table 1. The median and modal pre-test, post-test, and follow-up WUSCT scores represented the SCD *Self-aware* (E5) level. The students' pre-test WUSCT scores correlated with the section of the counseling ethics course for which they were enrolled ($r = .32, p = .02$; 10.2% of the variance explained). Therefore, students in the counseling ethics course for the School Counseling track had higher pre-test WUSCT TPR scores than the students in the course for Mental Health and/or Marriage and Family Counseling track, $F(1, 50) = 5.65, p = .02$.

C. Differences in Ethical and Legal Knowledge and Social-Cognitive Development Scores.

We conducted repeated measures ANOVA to examine the interactions between the graduate counseling students' ELICA and WUSCT TPR scores and the three intervals (prior to a counseling ethics course, at the completion of the course, and four months following the completion of the course). The results identified an interaction between students' ELICA scores and the three intervals, $F(1.78, 90.59) = 34.23, p < .001$. Moreover, the interval of time (ethics course experience and additional semester in preparation program) accounted for 40.2% of the change that occurred in the students' ELK scores for these data. In addition, the results did *not* identify an interaction between counseling students' WUSCT TPR scores and the three intervals, $F(2, 102) = .505, p = .605$. Therefore, the students increased their ELK scores during their experience in the counseling ethics courses (pre-test ELICA, $M = 45.62, SD = 7.66$; post-test ELICA, $M = 54.15, SD = 7.53$) and retained their ELK four months after completing their course (follow-up ELICA, $M = 54.15, SD = 7.28$); however, their SCD did *not* change during the seven month period (pre-test WUSCT TPR, $M = 87.87, SD = 5.85$; post-test WUSCT TPR, $M = 87.08, SD = 6.29$; follow-up WUSCT TPR, $M = 87.23, SD = 6.10$).

Table 1. Ethical & Legal Knowledge and Social-Cognitive Development Descriptive Statistics.

	Ethical & Legal Knowledge (ELICA)			Social-Cognitive Development (WUSCT—Form 81)		
	Pre-test	Post-test	Follow-up Test	Pre-test	Post-test	Follow-up Test
Section 1: School Counseling Students (<i>n</i> =20)	<i>M</i> = 45.40 <i>SD</i> = 5.88 Min = 36.0 Max = 56.0	<i>M</i> = 61.40 <i>SD</i> = 4.73 Min = 46.0 Max = 68.0	<i>M</i> = 58.80 <i>SD</i> = 7.77 Min = 30.0 Max = 68.0	<i>M</i> = 90.20 <i>SD</i> = 5.92 Min = 81.0 Max = 105.0	<i>M</i> = 86.90 <i>SD</i> = 6.77 Min = 74.0 Max = 102.0	<i>M</i> = 88.95 <i>SD</i> = 7.25 Min = 79.0 Max = 113.0
Section 2: Mental Health Counseling Students (<i>n</i> =32)	<i>M</i> = 45.75 <i>SD</i> = 8.68 Min = 20.0 Max = 60.0	<i>M</i> = 49.62 <i>SD</i> = 4.96 Min = 40.0 Max = 58.0	<i>M</i> = 51.25 <i>SD</i> = 5.25 Min = 38.0 Max = 62.0	<i>M</i> = 86.41 <i>SD</i> = 5.40 Min = 74.0 Max = 96.0	<i>M</i> = 87.19 <i>SD</i> = 6.07 Min = 72.0 Max = 101.0	<i>M</i> = 86.16 <i>SD</i> = 5.08 Min = 75.0 Max = 96.0
Total Counseling Students (<i>n</i> =52)	<i>M</i> = 45.61 <i>SD</i> = 7.66 Min = 20.0 Max = 60.0	<i>M</i> = 54.15 <i>SD</i> = 7.53 Min = 40.0 Max = 68.0	<i>M</i> = 54.15 <i>SD</i> = 7.28 Min = 30.0 Max = 68.0	<i>M</i> = 87.87 <i>SD</i> = 5.85 Min = 74.0 Max = 105.0	<i>M</i> = 87.08 <i>SD</i> = 6.29 Min = 72.0 Max = 102.0	<i>M</i> = 87.23 <i>SD</i> = 6.10 Min = 75.0 Max = 113.0

Note. ELICA = Ethical and Legal Issues in Counseling Assessment; WUSCT—Form 81 = Washington University Sentence Completion Test, short form; TPR = total protocol rating.

D. Correlation between ELK and SCD Scores.

We used a Pearson product-moment correlation (two-tailed) to examine the relationship between the counseling students' ELK and SCD scores. The post-test ELICA scores had a positive relationship to the students' pre-test WUSCT TPR ($r = .289, p = .032$; 8.4% of the variance explained). Therefore, the students with higher SCD scores before completing the ethics course had higher ELK four months after the completion of their course (increased retention of learning). In addition, the follow-up WUSCT TPR scores had a positive relationship to the post-test ELICA ($r = .279, p = .045$; 7.8% of the variance explained) and follow-up ELICA ($r = .277, p = .047$; 7.7% of the variance explained) scores. Thus, the students scoring higher in SCD four months after completing their ethics courses possessed higher levels of ELK after completing their courses (learning) and a semester later (retention of knowledge).

V. Discussion.

Our investigation was conducted to examine two faculty members' pedagogical practices (instruction of two graduate counseling ethics courses) and graduate counseling students' acquisition and retention of knowledge, and developmental growth; aligning with SoTL (Hutchinson et al., 2011). To date, no studies have investigated graduate counseling students' ELK and SCD at three different points in the preparation program over an extended period of time (seven month). Thus, we sought to examine graduate counseling students' acquisition of knowledge, retention of learning, and developmental growth over an extended period of time to assess student learning outcomes and faculty members' pedagogy (SoTL).

The findings identified a significant increase in the students' ELK from before completing an ethic course to the completion of the course (learning) and the students' retained their knowledge acquisition. However, the students' SCD did *not* change over the three data collection points (seven month period). The increase in students' learning based on their enrollment in a counseling ethics course was congruent with previous findings (Lambie et al.,

2012; Lambie et al., 2010); yet, the retention of students' learning four months after completing their course offers new insight as graduate students' retention of knowledge was *not* examined before. In addition, the results identifying no change in the counseling students' SCD was congruent with previous findings (e.g., Lambie et al., 2010) and inconsistent with other research (Cannon & Frank, 2009). Specifically, Cannon and Frank identified differences in WUSCT scores for counselor education students' participating in their internship experience using a *Deliberate Psychological Education* program (Mosher & Sprinthall, 1971); however, the incongruence in findings may be attributed to differences in our sample size ($N = 52$) as compared to Cannon and Frank's intervention participants ($N = 8$). Therefore, the promotion of adult learners' (graduate students) SCD may be difficult because Loevinger's developmental domain is a holistic personality construct that appears to stabilize in educated adults. Nevertheless, we conducted a Pearson product-moment correlation to examine the test—retest reliability for the WUSCT TPR pre-test and follow-up test scores, identifying questionable test—retest reliability ($r = .56, p < .001$). Therefore, when examining for changes in mean WUSCT TPR scores (pre-test, $M = 87.87$; follow-up test, $M = 87.23$) there appears to be *no* differences; however, the test—retest reliability analysis identified some differences in the individual graduate students' WUSCT TPR scores. Consequentially, promoting SCD growth in a large group of adults learners ($N = 52$; per our findings) may be difficult; nevertheless, educators may be able to advance SCD in small groups of students ($N = 8$; Cannon & Frank, 2009).

The identified strong relationship (58.98% and 25.91% of the variance explained) between the students' ELICA scores and the section of the counseling ethics course they were enrolled in supports that the students enrolled in the ethics course for the School Counseling track learned more than the students in the course for the Mental Health and Marriage and Family Counseling tracks. Differences in learning between the students enrolled in the different sections of the ethics course may be attributed many different factors such as student attributes, class sizes (school counseling, $N = 25$; mental health and marriage and family counseling, $N = 57$) and/or pedagogical differences between the instructors.

The findings identifying a relationship between the students' ELK and SCD scores support that these two desirable counseling student qualities influence one another. Specifically, students ELK acquisition and retention of their learning related to their SCD, which was congruent with previous findings (Lambie et al., 2010). Therefore, counseling students scoring at higher levels of SCD possess desirable counseling qualities such as increased empathy, flexibility, perspective-taking, and self-care (Borders, 1998); and they may also acquire and retain increased levels of ELK as compared to students scoring at lower levels of development.

A. Implications for Counselor Education and Development.

This study's findings offer implications for SoTL. First, graduate counseling students' ELK may be increased and retained based on their participation in counseling ethics courses. Therefore, a primary goal of the counseling ethics courses and preparation program was met as demonstrated by the students' increased level of ELK both after completing the course and four months later. SoTL researchers may want to conduct similar time series design investigations to examine other areas of their curriculum to assess the impact of specific courses on their students' learning outcomes and development. In addition, graduate counseling preparation programs accredited by CACREP (2009) are required to assess their students to insure they "demonstrate the professional knowledge, skills, and practices necessary to work in a wide range" of counseling

settings (p. 17). Therefore, assessing counseling students' learning outcomes and retention of their knowledge acquisition is an attribute of educational programs that are accountable in higher education and SoTL (Hutchings et al., 2011).

The identified between differences in the students' ELK acquisition and retention and the counseling ethics course section they were enrolled suggest that possible student attribute variations and/or instructor pedagogical differences and/or class sizes influences student learning outcomes. As our results identified that graduate counseling students' ELK acquisition and retention, and SCD growth (Cannon & Frank, 2009) may be influenced by class size, program in higher education may want to evaluate their students learning outcomes (course pre-test, post-test evaluation) and assess the impact of class size on their knowledge acquisition (possible covariate).

The correlation between the students' SCD and ELK acquisition and retention of learning scores suggest that counseling preparation programs may want to promote these two desirable student qualities, given either that the constructs appear to influence one another or that an additional variable, not yet investigated, might influence both of these constructs. We endorsed that instructors in counseling programs work to promote their students' SCD as our findings supported that higher SCD is related to increase ELK acquisition, and previous research correlates SCD to higher levels of empathy, flexibility, and wellness (e.g., Lambie et al., 2009).

B. Limitations of the Study.

In interpreting our results, limitations warrant consideration. First, convenience sampling (participants from one university) and the sample size ($N = 52$), restrict the generalizability of the findings. Second, there are inherent limitations in a time series design, as other extraneous factors may have influenced the students and may have contributed to the actual increase in their ELK. For example, the students may have been enrolled in other courses that presented information relating to counselors' ethical practices, impacting their acquisition of knowledge.

C. Recommendations for Future Research.

In spite of the stated limitations, this was the first SoTL investigation to examine graduate counseling students' ELK and SCD at three points in their preparation program and the possible influence of pedagogical factors on student learning outcomes. In addition, our findings offers suggestions for future SoTL research, including (a) the necessitate for closer examination of the specific pedagogical strategies employed by the two instructors to discern if difference in the student learning outcomes were based on the instructors' teaching and/or student attributes, and/or class size; and (b) the need for qualitative inquiry investigation graduate counseling students' experiences in counseling ethics courses may provide meaningful insight to support their instructors pedagogy and their student learning outcomes.

Counseling students' ELK and SCD is important to their service delivery to future clients. We investigated students' ELK and SCD at three points in their preparation program; as well as the potential relationship between the students' ELK and SCD. We found that our students increased their ELK at the conclusion of the ethics course and retained their learning four months later; however, their SCD did *not* change. In addition, the students in the two sections of the ethics counseling courses ELK and SCD scores were different, supporting that

possible student attribute variations and/or instructor pedagogical differences and/or class sizes may have influences students' acquisition and retention of knowledge.

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Physics identity development: A snapshot of the stages of development of upper-level physics students

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Abstract: As part of a longitudinal study into identity development in upper-level physics students a phenomenographic research method is employed to assess the stages of identity development of a group of upper-level students. Three categories of description were discovered which indicate the three different stages of identity development for this group of students: Student, Aspiring Physicist, and Physicist. The stages of identity development were distinguishable by the variation in their career definitiveness, their metacognitive level, and their assessment of when has become a physicist.

Keywords: identity development, STEM students, phenomenography, professional development

I. Introduction.

The majority of papers that focus on identity development in the realm of physics have in the past focused on gender differences in identity development or on the lack of people of various ethnic backgrounds choosing to take physics as a major (Hazari et al., 2010, Basu, 2008; Buck et al., 2006). Recently the focus of identity research in the domain of physics has shifted to focus specifically on how a student transforms from a physics student to a physicist. This development of the professional identity of a physicist is a fundamental part of student development and has been asserted to be a strong influence on retention of students in a discipline (Pierrakos et al., 2009). Understanding identity development and encouraging ones perceived association with a particular community has been touted as a possible solution (Barton & Yang, 2000) to the problem identified by the National Science Board (National Science Board, 2006, 2008) that physics has an underdeveloped growth rate when compared to all other fields. Both understanding how and helping students to develop an identity within the social world of physicists may stimulate this stagnant growth rate. In this paper, “identity” refers to both one’s self understanding about and actual ways in which one is positioned - both by others and by institutional representations - within some social world. The social world in this case is the social world of physicists. The research presented in this study is primarily interested in exploring the major influences from the experiences of upper-level physics students that affect identity development.

II. Identity.

In a review of previous literature on identity development it is apparent that there are many factors that have been indicated to affect identity development. According to Hazari et al. (2010) the primary influencing components of a student’s identity are “(i) interest (personal desire to

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learn/understand more physics and voluntary activities in this area), (ii) competence (belief in ability to understand physics content), (iii) performance (belief in ability to perform required physics tasks), and (iv) recognition (being recognized by others as a physics person).” Hazari et al. (2010) indicate that there are four categories of factors that can influence identity development: curriculum elements (Crouch, Fagen, Callan, & Mazur, 2004; Adams et al., 2006); learning environment characteristics (Sadler & Tai, 2001; Haussler & Hoffmann, 2002); teacher characteristics (Sadler & Tai, 2001; Haussler & Hoffmann, 2002); student characteristics (Cleaves, 2005; Tai et al., 2005; Hazari et al., 2007) and out of school experiences (Stake & Mares, 2001; Jones et al., 2000).

Rather than attempting to focus an investigation into all previously identified elements this study instead focused on using the phenomenographic research method to ascertain upper-level physics students’ own experiences and the factors more specifically applicable to them as upper-level physics students. For example, career choice and the effect of career aspirations on a student’s identity was a topic that came up in students’ descriptions of why they chose to major in physics. It has been found in the past that college students were of the opinion that a career in the physical sciences is likely to affect one’s ability to achieve interpersonal goals due to the perceived commitment needed for such a career path (Morgan et al., 2001). It has also been found that there is a strong link between level of identification with being a physicist and whether or not a student had chosen a physical science career (Barton & Yang, 2000; Chinn, 2002; Cleaves, 2005; Shanahan, 2007). In a longitudinal study that examined national data on identity development in the subject of Math, it was found that students’ eighth grade career interests were a very strong predictor as to their chances of receiving a bachelor’s degree in the physical sciences (Tai, Liu, Maltese, & Fan, 2006). In engineering, students’ career intentions have demonstrated to be an influence on self-identification (Meyers et al., 2012). Personal interest in physics (Adams et al., 2006) and having significant subject-related experiences such as projects or research experience (Meyers et al., 2010; Pierrakos et al., 2009) has also been found to affect student identity development.

III. Metacognition.

Biggs (1985) describes metacognition as making sense of one’s experience of learning. Ramsden (1985) has argued that raising students’ awareness of approaches to learning is an integral part of teaching and Entwistle (1987) argues that students may develop a deeper approach to learning through the application of metacognition. Metacognition involves two separate but inter-related processes. One of these is concerned with the students’ own knowledge about their cognitive processes as well as an awareness of how compatible these processes are with a given learning situation. The other process involves the regulatory component consisting of the array of actions and activities in which individuals engage when performing a task, and are commonly grouped into planning, monitoring, and evaluating (Sandi-Urena et al., 2012).

Case and Gunstone (2002) make the argument that metacognitive development can be viewed as a shift in the approach to learning of a student. They also argue that metacognitive development can be identified as developments in students’ conceptions of learning, improvements in the organization of their own learning, and a move towards self-assessment and personal development with regard to views on the purpose of learning and long term career goals (Case et al., 2001). Metacognition is also considered a common characteristic of expertise across domains (Lasry et al., 2009). So, personal development and expertise across domains relate to

identity development, although it has also been posited that metacognitive development is a necessary precursor to professional identity development (Brown, 2009). If so, this indicates a relationship between one's level of metacognitive development and one's identity development within a social world. Metacognition also has an obvious relationship to Perry's Model of Intellectual Development (Perry, 1970, 1981). Perry's model characterizes the transition stages through which college students evolve as they progress through their academic career. Since metacognitive development is the process of increasing one's awareness about learning and understanding and one's own cognitive processes, it makes sense that the way students transition through Perry's stages is the process of metacognitive development. Perry's Model of Intellectual Development and progression through the various stages could be tied to an individual's identity development.

IV. Phenomenographic Research Methodology.

The phenomenographic research methodology shares its origins with approaches to learning research, which started in Marton and Saljo's seminal research study (Marton & Saljo, 1976a, 1976b). Since then, the phenomenographic methodology has become a widely used methodology for research on learning and teaching (Bowden et al., 1992; Dall'Alba et al., 1993; Walsh et al., 1993; Ramsden, 2002; Entwistle & Ramsden, 1983; Prosser & Trigwell, 1999; Laurillard, 2002; Ramsden et al., 1993; Olympiou & Zacharia, 2012; Lee et al., 2008). A phenomenographic study usually focuses on a relatively small number of subjects and identifies a limited number of qualitatively different and logically interrelated ways in which a phenomenon or a situation is experienced.

This idea of qualitatively different ways of experiencing a phenomenon has been validated and reinforced by the theory of variation and awareness (Marton & Booth, 1997; Trigwell & Prosser, 1997; Bowden & Marton, 2004; Marton & Tsui, 2004; Marton & Pong, 2005). This theory is the basis for 'new' phenomenography and states that there are a limited number of qualitatively different ways in which something that is experienced can be understood. The limit is set by the constituent parts or aspects of the experience that are discerned and appear simultaneously in people's awareness. A particular way of experiencing something reflects a simultaneous awareness of particular aspects of the phenomenon. Another way of experiencing it reflects a simultaneous awareness of what aspects (more aspects or fewer aspects) of the same phenomenon are experienced (Marton & Booth, 1997). Therefore, it is the variation in the way in which aspects of a particular phenomenon or object are discerned, that constitutes an individual's experience of that phenomenon (Linder & Marshall, 2003).

If learning is the discernment of the variation of critical aspects of an experience and it can be divided into the sub-categories of how (approach) and what (concept) with each of these sub-categories having both structural (what is done) and referential (and why) aspects, then an investigation into students' identity development would be an examination of the variation in the critical aspects of the elements that influence identity development (structural) and the critical aspects of the intention underlining these elements (referential). A common practice in phenomenographic research is to present the 'themes of expanding awareness' which are structural groupings of aspects of variation discerned through analysis (Akerlind, 2005).

V. Objective.

The objective of this study is to qualitatively assess the different stages of development students occupy in regard to identity development at a particular instance in their course progression and to identify the elements that influence student identity development that students are most aware of.

VI. Design of Study.

The primary data for this analysis comes from semi-structured interviews with students who were recruited from upper-level physics courses in electromagnetism or mechanics. The students were recruited via a sign-up sheet that was sent around in both the electromagnetism and mechanics classes and were told that they would receive the monetary reward of \$10 if they participated in a study which involved being interviewed about some of their thoughts about physics. This method of recruitment reduced the risk of selection bias. We developed a 45-minute semi-structured interview protocol drawing on identity formation, epistemological sophistication, and metacognition literature. By epistemological sophistication we use Elby and Hammer's definition (2001) in that we "believe that students should come to understand scientific knowledge as fundamentally tentative and evolving...subjective in the sense that it reflects scientists' perspectives...individually or socially constructed...see scientific knowledge as a coherent, hierarchical system of ideas...view learning science as making sense of new ideas for themselves." The initial protocol was adapted from the literature outlined in sections II-IV, however, the interview was piloted on several occasions before employing it on the cohort of students that the results of the study originate from. This was an attempt to make the interview more focused on particular aspects of identity development. The interview started by asking the students to describe their history with physics starting with when they first got interested in the subject. This type of question is broad enough that it gets the students talking about their previous experiences and often offers the interviewer several opportunities to ask follow-up questions based on the interviewees responses. Follow-up questions for each broad question are part of the protocol but the phenomenographic interview approach often allows these questions to occur organically from interviewees' responses. Other examples of lead questions are: could you describe the characteristics of a physicist? or could you describe the expected career path you intend to take? Interviews, which were videotaped, began with a discussion of the student's prior history with physics up to the time of the interview and segued into questions about present physics experiences in class and attitudes in physics, future career plans, research history, and finally a discussion about knowledge, learning, understanding, and how truth is defined. Thirty students chose to participate in the study. The interviews were carried out over a two-week period near the end of the second semester. The sample was comprised of 10 female and 20 male interviewees. All respondents were over the age 18 and we obtained approval to conduct our research from the Institutional Review Board (IRB) of our university and all interviewees signed consent forms to participate in the study.

VII. Data Analysis.

The responses to the questions were analyzed initially by an individual researcher and the robustness of the categories was tested by a fellow member of the research team. The robustness testing and the analysis process are discussed in detail below:

- Each transcript was read repeatedly, often in one sitting, in order to become acquainted with the transcript set as a whole.
- For each sitting of the transcript the focus of awareness was on one particular aspect of the video. For example, on one occasion the focus may have been on how the students described their first experiences with physics, on another occasion careful attention would be paid to aspects of physics that the students liked that was focused on and on yet another occasion, the focus would be on students' conceptions of understanding.
- The next step was to make a set of notes that recorded all information that was perceived to be critical to the students' stage of identity development.
- The analysis moved to seeking out the critical similarities and differences between the notes. However, the focus was not solely on the notes and instead involved working concurrently with the notes, transcripts, and videos as the notes often lacked the depth of completeness that the videos contained.
- Cases of agreement and variation of discerned critical aspects within the notes/transcripts pertaining to the students' stage of identity development were identified.
- The variation of critical aspects was then utilized to preliminarily form descriptions (an outcome space) of the different stages of identity development.
- Once tentative categories had been constituted, the categories and the transcripts were examined for structure of the categories. In searching for the structural aspects of the approaches, it was important to identify what was focused upon within each overall meaning. In other words, the themes of expanding awareness that were present in each preliminary category were sought, which served to distinguish between the categories and further identified the hierarchical structure.
- For each category constituted, the groupings of notes were re-examined to find cases of both agreement and contrast within the notes. This was to ensure that the categories actually did describe the variations in the stages of identity development of this set of students faithfully and empirically.
- The last step was to give the transcripts and preliminary categories to another member of the research group who then examined the robustness of the categories with discussion and further development of the categories resulting.
- Extracts and statements were taken from the transcripts which would give substance and support to the categories.
- Finally, once the categories were felt to be robust, the researchers returned to the interview transcripts and placed each individual student into one of the three categories based on how well they fit into each category. In cases of disagreement the researchers engaged in a negotiating process in order justify a student's inclusion in one category over the other, however, this only occurred on one occasion and overall the researchers were in agreement over the allocation of students in each category.

VIII. Results.

A description of each of the categories of the stages of identity development in upper-level students is shown below. Table 1 presents the hierarchy of the categories and the themes of expanding awareness. The themes of expanding awareness are the commonalities that relate the categories together but it is the different ways in which the students describe and experience these commonalities that distinguishes between the levels of the categories. So the categories are inherently related given the commonalities between them but are distinguishable via the variation within the themes of expanding awareness. For example: the variation in metacognitive level highlights the increasing level of sophistication of each category and also distinguishes each category from the others in a critical manner. The analysis of the interviews revealed three categories that describe the variations in the stages of identity of upper-level physics students.

Table 1. Table of category of stage of identity development (horizontal) and themes of expanding awareness (vertical) and also indicates number of students that occupy each category at the time of interview. With all of the stages discerned from the data they were titled with appropriate names and are described in detail below.

	Student	Aspiring Physicist	Physicist
Career Definitiveness	No specific career chosen	Plan that lacks specifics	Specific job chosen
One is a physicist when...	Obtaining an amount of knowledge	Contributing to generation of new physics knowledge or practicing physicist	I am a physicist
Metacognitive Level	Lack in self awareness	Evolved sense of awareness	Complete self-awareness
No. of Students	12	13	5

A. Student.

Overall this categorizes students who are only at the beginning stages of identity development in physics. They do not identify themselves as physicists and are unsure about what it is that physicists do or what it would mean to be a part of this cultural group. In regards to the themes of expanding awareness for this group of students, the different elements and the relationship between them display a pattern of lack of definitiveness on their part about their career choice. This lack of definitiveness manifests in their unspecified future plans:

Interviewer: From that research experience did your perception of physics change?

Jeff: Yeah, yeah, perception of how it's done. When I first came I tried to get with [a cosmologist]...

Interviewer: Uh huh.

Jeff: and he was having me read books and derive derivations. It was the first time I ever... I ever really understood a derivation. Talking to him about the reality of the field and you know, the reality of a lot of the physics fields, is what turns me off. I don't want to be cooped up in a lab or in front of a computer. I want to be

outdoors more. Really, I want to be a musician. If I did it again, I'm not sure I would do it.

In regards to their metacognitive level the students are less evolved than the other stages of identity development. They also have an unsophisticated conception of understanding when compared to the other categories often resorting to the anecdote of 'you understand a concept when you have the ability to explain it to someone else' with little expansion on this explanation when pressed.

Pierce: To kinda, be able to explain it to someone who doesn't have that knowledge, they can kind of take something else away from it too.

Interviewer: So to understand something in physics is to be able to explain it?

Pierce: Yeah.

(Pierce was probed further in regards to this concept of understanding but was unable to give any more detail of his process of gaining an understanding or elaborate on how understanding is being able to explain a concept to another.)

A clear indicator that can be used to ascertain one's metacognitive level is the capacity to identify the need for different approaches to learning in different learning scenarios but the "I am student" stage of identity development offers no evidence of having this ability. One area that they are definitive in is that it takes some level of completed course work or obtainment of a certain amount of knowledge before one is a physicist often indicating getting a PhD. For example:

Interviewer: And what makes him a physicist?

Will: The mastery of it. We just did electricity and just seeing my professor doing it up on the board and how much he knew about it... just the amount of knowledge.

Similarly it is the obtainment of a qualification:

Interviewer: The way you talked about a PhD... that seems as if it's a long term ambition that you have held. So why do you think that is?

Troy: Um, I don't know. I don't see myself as a physicist yet, um, I sort of feel that if I don't get a PhD I'll never, you know I want to learn all that stuff. I want to learn the higher level physics.

Interviewer: Right.

Troy: And I want to be a physicist and that's part of being a physicist. You get a graduate degree.

In summation these students are missing an overall awareness of their place in a society of physicists and a lack of metacognitive development as well as determining that to become a physicist one must gain a certain amount of knowledge.

B. Aspiring Physicist.

This category of stage of identity development in physics is characterized by students who identify themselves to be on the path to being a physicist but are not yet there in their opinion. These students do not identify themselves as physicists because of the conceptions of what it means to be a physicist that they have developed from their past experiences.

Sam: I like to say I am an aspiring physicist, not a physicist. I'm still in classes... if they are doing research of some sort... whether it is experimental or theory... if you're not practicing, you're not a physicist anymore.

They often describe experiences they have ascertained from working in research groups, summer internships, or summer research programs. In essence they are of the opinion that one is not a physicist until you are doing research or contributing new knowledge to the physics community. This is evidenced in their career definitiveness as opposed to the “Student” category where they are unsure of their next step after obtaining their degree and the “I am Physics Student” category of students who are definitive in that they want to obtain a PhD level of education but have not yet narrowed down the area of physics in which they wish to obtain this qualification.

In regards to the metacognitive level of these students, they are much more aware of the approach that they take to their exams and classes, indicating that they have the ability to ascertain either what a lecturer is looking for in an exam or expects from them in class and adjust accordingly. They have the ability to adopt a surface approach to a learning environment or exam but also indicate that they would much prefer to gain an understanding. They indicate a preference for gaining an understanding but if it is not rewarded or if they do not have enough time to do so they will resort to a more rote learning-based approach.

Shirley: The EP1 and EP2 exam approach is kind of... there are a lot of old tests circulating for those classes and the old tests are very similar to the new/ You have your hands on old tests studying for the exams, it's pretty straightforward what you should do. Uh, physics 3 and mechanics were a very different experience for me. The tests that they had was not at all representative of the test that they give. And in mechanics class he doesn't even give us old tests to look at so I would approach that by going over all the homework, reading through the notes, and... um... trying to make sure I understand.

These students also have a more sophisticated conception of understanding than the “I am student” category, indicating that understanding of a concept is relating it to other concepts, being able to apply it in different situations, and also being able to look at it from multiple perspectives.

In this section Abed is talking about understanding in physics:

Abed: I think to understand something, a lot of it has to do with understanding how it relates to some other things.

Interviewer: Okay.

Abed: That would be a very big part, you know. You can understand if you know how to use it. That's just one example.

Interviewer: Right.

Abed: But I think knowing how to use something is not understanding it completely. For example, I know how to use that camera, but that doesn't mean I understand it in a deep sense. But in a deeper sense you understand how the thing relates to the other thing or you can understand how it can be derived from simpler principles. Or if... you know... you get.. you can see it, maybe from a variety of different ways.

In summation this category of students believe that being a physicist involves doing research and contributing new knowledge to the physics community and since they are not doing this yet, they cannot classify themselves as physicists but they are much more self-aware of how they learn and more definitive about what they want to do.

C. Physicist.

This stage of identity is at the top of the hierarchy of categories and hence is the highest level of identity development found amongst this group. That is not to say that it is definitive in its completeness in regards to a description of what it entails to have achieved complete inclusion into the society of physicists as it based on just this group of students. Not all of the students in this category outwardly admit to being a physicist but their descriptions of physics and what being a physicist entails would match those of experts. These students do not describe or attribute that their conceptions of physicists necessarily come from previous experiences; however, they do (unlike the other categories) display a very concrete definitiveness in career choice which they have held for a very long time.

Annie outlines that she wishes to use her physics degree to become a meteorologist and is very interested in the science-based aspects of meteorology.

Interviewer: So that seems to be a very clear plan. It seems like you decided on this a long time ago.

Annie: Yeah.

Interviewer: So when did that decision actually happen?

Annie: I did... When I was little, my mom tells this story all the time... she makes fun of me. Like when I was little, on mornings, on Saturday mornings, I would be up and watching the weather channel and I would have my crayons out and I would draw warm fronts and cold fronts and the stuff that they were putting on the screen. I knew all about it, so my mom was just... And when I was in middle school, I did Science Olympiad and I did meteorology. And it's funny cause... we did an awards ceremony... at the end I got most likely to be a meteorologist.

In regards to the metacognitive level of these students it is very similar to "I am Physics Student" in that they can identify that different approaches may be needed for different exams and classes and ascertain what different lecturers are looking for but maintain that they are always looking to obtain a deep understanding of the material.

Craig in discussing exams and his philosophy in regards to them.

Craig: I think I knew less how to study for an exam in [physics 1] and [physics 2] than I do now. I would say that in EP1 and EP2 I just worked as many problems as I could so that I would know how to work. So if I see... say I see a weird problem on a test that is a hybrid of two problems, I can still apply my knowledge of having solved such a vast amount of problems. It's an engineering approach... take a couple of data points and hope your curve encompasses everything. In this class (mechanics) I have been more focused on, okay understand the basic concepts that we have covered... I was always trying to understand. There's no shortcuts.

Interestingly, these students describe that they may not have possessed this ability before beginning college and they may not have identified or known how to strategically study for an exam. This indicates a sort of awareness of one's own learning, the identification of problems with one's own approach, which indicates the high level of metacognition that students in this category possess. At several points they indicate times where they have evaluated their learning and emphasized the importance of the ability to self-assess.

Craig is talking about what he interprets as the lecturer's expectations of him in his mechanics class:

Craig: He's trying to actually get us to where we're critically thinking about the solutions that we get, because sometimes I think you believe whatever you get. But... but he'll ask "why do you think this is good? Does it solve your initial conditions?"

In regards to their opinion on what makes one a physicist these students have a much more inclusive or simplistic view of what it means to be a physicist. Anyone can be a physicist as long as they are interested in it.

Interviewer: Why are they a physicist?

Jed: Why are they a physicist? Just liking it really, I mean anyone can be a physicist if they show interest in it. I mean people think you need a lot of schooling to be a physicist but anyone can be a physicist, anyone can be a scientist really it's just whether or not you have that interest in it in my opinion..

Interviewer: Given that definition you must consider yourself a physicist.

Jed: Yes, I definitely do.

IX. Discussion.

For this cohort of upper-level physics students, the three factors that influence their identity development distinguished from their discussions on identity are: career definitiveness, idea of when one is a physicist, and metacognitive level. The different levels of metacognition as an influencing factor in identity development correlate with previous research of Brown (2009) and Lasry et al. (2009). In many ways metacognition is, in essence, an indicator of the amount of awareness one has. It makes sense then that the more aware a student is, the more they may have examined what it means to be a physicist and hence become more attuned to what being a physicist means and when and how one reaches that level. In regards to practical application, metacognition has been shown to improve through instruction (Schraw et al., 2005; Schraw et al., 2006; Kipnis & Hofstein, 2008). So, course designers should attempt to integrate metacognitive instruction/self-reflection into a physics course to aid in the development of students' awareness that could encourage identity development and their study skills. The quality of learning has been indicated to improve when students are in a learning environment that promotes the development of metacognition (Davidowitz & Rollnick, 2003; Larkin, 2006).

Of the other two influences on identity development that were discovered in this paper, career definitiveness can also be encouraged by a physics department. Helping students to identify early on or even giving them enough experience and information on potential careers may help them to form a professional physics identity faster. Becoming attached to a particular field of physics at the earliest stage possible may result in the development of one's identity as a physicist. What this means for colleges is that perhaps if students are encouraged to explore and are educated on the different areas and facets of physics that they could choose to have a career/study in, they may develop an identity as a physicist earlier. Giving students the opportunity to experience subjects in a research capacity or offering the opportunity to upper-level physics students to join research groups will undoubtedly help them develop their identities as physicists as they are exposed to the reality of what being an experimental physicist actually entails. The "Aspiring Physicist" category of students began their interest in high school and referenced having good teachers who bred life into the subject. This indicates the importance of a

good teacher and that outreach programs to middle schools and high schools by university physics departments should be encouraged in order to facilitate a positive interaction with physics as early as possible.

The different levels also clearly distinguished between different levels of ideas as to when one becomes a physicist. The student conception of gaining a certain amount of knowledge correlates well with their metacognitive level of believing that knowledge is bestowed by lecturers. It is also clear why research would be the point at which one becomes a physicist for the "aspiring physicists" as they are definitive in their belief that they want to go to graduate school and contribute new ideas in that capacity. It would seem that the students who are already physicists at this point in their academic career have firm ideas of where they want their career to go but that getting there does not mean they will be a physicist. They already believe themselves to be physicists, and therefore they do not need to become physicists at a future date.

As previously attested, Kroger (2007) outlined that identity development studies should be carried out longitudinally in order to fully understand the process one goes through in developing an identity. As indicated in the introduction of this paper this is just the first part of a longitudinal study with this group of students as they continue through upper-level physics classes and into their careers as physicists. When this group of students is revisited in the future, the different stages of identity development that they occupy may have completely evolved. Eventually, we argue that by examining upper-level physics students and identifying how they form their identities in the future it is hoped that we can understand how to encourage more students into taking physics as a major. Future work should also include an investigation into how the experiences of these physics students and how the categories that they occupy influence them over the course of their studies.

X. Conclusion.

The stages of identity development for a group of upper-level physics students were identified resulting in three primary stages. The main differentiation between stages is: career definitiveness, level of interest, and metacognitive level. These stages were found to not correlate with epistemological sophistication as students exhibited a uniform level at this stage in their physics career.

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Increasing student evaluation capacity through a collaborative community-based program evaluation teaching model

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Abstract: The evaluation literature reflects a long-standing interest in ways to provide practical hands-on training experience in evaluation courses. Concomitantly, some funders have shown rising expectations for increased accountability on the part of Community-Based organizations (CBOs), even though agencies often lack the associated funding and expertise required. This paper describes a training evaluation model, developed and refined over the past ten years, that partners student needs for real-world evaluation experience with CBOs needs for technical expertise and assistance in conducting evaluation activities that support program improvement. The process of developing and implementing the model is presented, and content analysis of ten years of student feedback is summarized.

Keywords: capacity building, community partnership, nonprofit community agencies, content analysis, course evaluation

I. Introduction.

In recent years the topic of nonprofit accountability has received increased interest and attention. In a statewide survey of North Carolina nonprofits, 61% of the 271 agencies surveyed indicated that evaluation activities had become more extensive, comprehensive, or rigorous in the past years (Murphy & Mitchell, 2007). At the same time research on nonprofits' evaluation capacity suggests significant constraints to their ability to address these mandates (Carman & Fredericks 2009). A study of evaluation practices in Canadian nonprofits found 37% identified a lack of internal capacity, such as staff and time, with 31% indicating a lack of skills and knowledge in conducting evaluations as major challenges (Hall, Phillips, Meillat, & Pickering, 2003). With increased expectations on the part of some major funders, professional degree programs have seen an expansion in the market for skilled evaluators. Efforts to incorporate real-world experiences in program evaluation curriculum have been a focus across professional training programs including public health (Fierro & Christie, 2011; Davis, 2006) social work (Jacobson & Goheen, 2006; Anderson, 2003; Margolis, Stevens, Laraia, Ammerman, Harlan, Dodds, & Pollard, 2000; Lundahl, 2008) and education (Gredler & Johnson, 2001; Kelly & Kaczynski, 2008).

The most common methods used for providing practical hands-on training experiences include simulations, role-playing, course projects, and practicums (Trevisan, 2002; Trevisan, 2004, Lee, LeBaron Wallace, & Alkin, 2007; Gredler & Johnson, 2001). However, few articles both describe a practical training approach and assess student responses to it. Further, no model was identified in the literature that had been implemented in both graduate and undergraduate

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level courses. Therefore, this article has two goals. First it aims to describe a pedagogical model called Collaborative Community-based Program Evaluation (CCPE) that responds to the need for nonprofits to engage in evaluation activities while at the same time providing the real world experience and training students need. Second, this study also provides preliminary findings from an analysis of students' responses to CCPE as a model for teaching graduate and undergraduate students' program evaluation.

CCPE is based on university level course instructors and students partnering with community-based agencies on evaluation projects that support students' learning critical evaluation skills essential for meeting the demand for nonprofit evaluators. The goals are to create a mutually beneficial collaboration that increases both agency's evaluation capacity and students' individual evaluative capacity, and to increase student motivation, interest, and evaluation skills through working with a "real world" community partner. Content analysis of student responses to course evaluations from 12 graduate and 7 undergraduate courses was conducted to assess CCPE's utility in preparing students for real world experiences in the field of evaluation and its effectiveness at increasing student interest in program evaluation research.

II. Background and Significance.

Hatry, Wholey, and Newcomer (2010) identify two primary reasons for evaluation activities: 1) to achieve greater accountability in the use of funds and 2) to improve the effectiveness of programs. While evaluation scholars and agency administrators view improving agency program effectiveness as the more important of the two (Carman, 2010; Ebrahim, 2005; Wholey et al., 2010) the literature suggests that most agencies have a primary focus on mandated external reporting to funders (Benjamin, 2012)—activities that often do not lead to program improvements. In a survey of 178 nonprofits, Carman (2007) found that 8 of every 10 community-based organizations reported reviewing programs and assessing whether they were meeting program goals and objectives (accountability), but far fewer organizations were engaged in evaluation and performance measurement activities with 41% using a performance measurement system and 65% conducting a formal program evaluation of any of their programs. A second study reaffirmed this focus with executives identifying the most frequent use of evaluation being for accountability purposes, including reporting to funders (87%) and reporting to the board (84%) (Murphy & Mitchell, 2007). These discrepant priorities lead to nonprofit administrators preferring formative evaluations that help them know how to better operate their programs, while funders want summative evaluations that identify, "What did we cause?", the answer to which does not improve agency services (Snibble, 2006).

While nonprofits recognize the importance of measuring program outcomes, they face two significant hurdles. First, they lack the financial flexibility or support for evaluation activities. Many funders require program evaluations but rarely provide funds or grants to collect this information (Carman, 2007). Hall et al. (2003) found less than half of the 322 non-profit funders surveyed reported providing separate funds for evaluation or allocating project funds for evaluation purposes. A second hurdle is that agency executives and their staff may have limited or no formal training in evaluation and yet are expected to collect and report performance/evaluation data to stakeholders (Christensen & Ebrahim, 2006). The most frequent barriers to conducting evaluation activities reported in a sample of 271 agency executives were lack of funding (53%), insufficient staff (45%), and lack of affordable technical assistance (40%) (Murphy & Mitchell, 2007).

As a result, the agency's need for technical assistance and program evaluation resources provides a real world opportunity for emerging practitioners to engage in CCPE. Through the course students develop technical and analytic evaluation competencies as well as interpersonal skills needed for conducting evaluation studies (communication, negotiation, conflict, collaboration, and cross-cultural sensitivity), topics seldom addressed in evaluation curriculums and even more rarely provided opportunities to apply. Further, this model provides entry-level evaluation training that includes the professional interpersonal skills needed to interact with clients and stakeholders, skills that have been identified as key competencies desired by employers but lacking in existing evaluation training (Dewey, Montrosse, Schroter, Sullins, & Mattox, 2008; Simons & Cleary, 2006; Taut & Alkin, 2003). The next section describes the CCPE approach, created and refined over the past ten years, followed by preliminary analysis of students' and agencies' responses to the collaboration experience.

III. The Collaborative Community-Based Program Evaluation Model.

A. Steps to Developing a Collaborative Community-Based Program Evaluation.

Collaborations represent a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals. Essential characteristics of collaboration include: 1) joint action for mutual benefit; 2) interdependence and reciprocity; 3) mutual authority; and 4) shared responsibility, risks, resources, and rewards (Mattessich, Murray-Close, & Monsey, 2001). To maximize the likelihood of a successful collaboration the instructor needs to invest a significant amount of time prior to the course, developing a relationship with an agency partner identifying both parties' respective interests, concerns and available resources, as well as negotiating roles and responsibilities with the goal of developing a set of group projects that are appropriate in size and scope for the time available. Based on past experiences teaching the course, the instructor developed a list of criteria that identifies the resources and commitments an agency needs to provide in order to provide a good fit with the goals of the class (See Appendix 1).

While the criteria list is used to guide agency choice for both undergraduate and graduate courses, there are differences in emphases. At the graduate level, there is more of a priority to work with agencies that have existing data that can be analyzed in the multiple SPSS computer labs, since a primary goal is to develop the professional competencies of MSW students in the program administration and policy concentration. For the undergraduate class, the primary objective is to develop general research methods and data collections skills within the context of program evaluation that undergraduates apply to profit and nonprofit agencies. For both courses, the objective is to engage students in hands on "real world" experiences that simulate the experiences they will encounter within an occupational setting. Typically only one agency is a collaborator in both the undergraduate and the graduate class. The graduate class is capped at 25 students, whereas the undergraduate class is typically capped between 32 and 45 students. On two occasions two agencies have been used for the undergraduate class, to ensure enough evaluation questions for students to address.

A combination of methods are used to identify potential community agencies including recommendations from agency staff, board members, funding organizations, students with experience working or volunteering in the program, faculty colleagues, web searches, and when available, a university's service learning program or community-based learning department can

be a valuable source. One or two quarters before the class the instructor contacts a potential agency to determine if the agency has program evaluation needs they are unable to address with their current evaluation capacity and that might be appropriate for the given class. The instructor communicates to the agency the purpose of the course, the number and educational level of the students involved, course learning objectives, and provides a brief description of the CCPE process. The instructor emphasizes that a utilization-focused evaluation approach (Patton, 2008) is used whereby the instructor and students provide support and consultation in addressing the agency's program evaluation need. Furthermore, the instructor explains that CCPE provides an opportunity for students to gain real world skills at the same time that the agency receives a quality program evaluation that will have utility for the agency. If, following this initial phone conversation, agency staff express interest in further exploring collaboration and the instructor believes there is a good likelihood that the agency would be a good match, an initial meeting is scheduled at the agency. Conducting the meeting at the agency allows the instructor to get a better sense of the agency size, programs, how its location may influence student access, check availability of meeting space for interviewing and an opportunity to be introduced to other agency staff.

A set of questions, derived from the criteria for agency selection, are used to structure the initial meeting (See Table 1). These questions identify the instructor's interests in the collaboration but also provide a vehicle for finding out what commitments and resources the agency is expecting from the class. The purpose of the first planning meeting is to identify the program evaluation interests, questions, and how the agency plans on using the program evaluation research. An important question the instructor asks the agency representative is "What final products are needed for this collaboration to be considered a success by the agency?" The agency's ability to respond to the question helps guide the process. While program staff are often familiar with gathering information on program inputs and outputs and tracking data for billing purposes, they often have little experience with process evaluation and thinking about how research could be designed to improve the quality of their program. In some cases program staff may not have a college background or familiarity with research methods. This means the instructor needs to play an active role in helping shape a general staff request such as, "We want to find out if youth attending our arts and community service based program are more involved in their community following the program," and tease out what specific types of data would be most useful, their rationale for wanting information, and helping identify the range of options for data collection and measurements choices. Taking along copies of student group reports from past classes is helpful in giving examples of different types of data collection methods and presentation of findings in addition to demonstrating the quality of student work.

Table 1. Questions for Preliminary Community Agency Meeting.

1. What questions are important to you as an agency?
2. How many clients do you serve on an annual basis?
3. What data is currently available for analysis?
4. How will you use the findings?
5. What methods for collecting data from clients would be permissible?
6. Will the director and program staff assist in the coordination of data collections between class and clients?
7. Does your program have a logic model? If not would you be willing to work with the instructor to draft one?

8. Does this partnership have the approval of the agency leadership?
9. Does the agency agree to pay incentives if needed to help recruit client participants?
10. Will the director and contact person agree to attend the second and last class session?
11. Is the agency an organization that serves marginalized communities and do they lack the capacity to evaluate the questions they have identified?

Following the initial meeting the instructor creates a summary that is distributed to all meeting participants of research questions and possible projects the group discussed and any guidelines they agreed to on how they will work together. Participants are asked to review the summary and make any revisions so they can ensure the document represents shared commitments and understandings that will guide the partnership. Often times a second meeting is needed to further refine and specify the questions that will form the basis for the student projects. By the end of this iterative process, through meetings and email exchanges, the agency and instructor have clearly outlined in writing the specific projects that will be available for class members to choose from and the processes that will guide the work. The project list is distributed to students at the first class session. The CCPE group project is the major assignment and provides a focus for sequence of topics and activities for the ten-week quarter (see Appendix 2, which also includes recommended content for a semester length class). Early on in the course, the instructor shares with the students the process involved in engaging the agency and clarifying their information and program evaluation needs as well as the agreements that will guide the collaboration.

For the graduate class these projects fall within 3 research methods categories: survey, focus groups and/or interviews, and secondary data analysis. For the undergraduate class, the agency and instructor identify the agencies key knowledge and program evaluation needs with the goal of implementing a data collection strategy. This can include program evaluation, model comparisons, outcome assessment, and descriptive and explanatory evaluation questions. At the undergraduate level at least 1 data collections strategy must be a survey in order to introduce students to survey research methods. Initial experiences teaching the undergraduate and graduate course made clear that having a logic model prior to the start of the course was of critical importance for any program we were evaluating. A logic model provides a visual illustration of the logical linkages among program resources, activities, outputs, clients served, and short, intermediate and longer term outcomes (McLaughlin & Jordan, 1999; W.K. Kellogg Foundation, 2004; Knowlton & Phillips, 2009). If the partnering agency does not have a logic model for their program to be evaluated, the instructor for the undergraduate or graduate course co-creates one with program staff. Having a program logic model serves a number of purposes. First, a program logic model helps ensure there is a shared understanding on the part of the program staff and class members on how the program operates and this is one way to help guarantee that course deliverables are helpful to agencies. Second, because a logic model visually depicts key aspects of the program it is a strong tool for communicating with diverse stakeholders— those who have varying world views and different levels of experience with program development and evaluation; an important consideration when working with small, community based organizations. In the undergraduate course, where there are often four group projects with eight program evaluation questions pursued by the class, a logic model helps organize possible research questions identified by students and is useful in focusing the research questions and projects that students generate.

Prior to beginning the class projects, the instructors follow the same human subjects procedures used in research projects to attain IRB approval. The section of the Federal Register that pertains to the Department of Health and Social Services Protection of Human Subjects defines research as, “a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge” (Human Subjects Protection, 2009). Because the program evaluation activities we engage in with a community partner are for the agency’s internal purposes, are not designed to add to generalizable knowledge, and will not be published, they are not considered research under Part 46.101 of this regulation (Human Subjects Protection, part 46.101, 2009). In spite of the fact that our evaluation activities are exempt and so do not require IRB Board Review, course instructors follow the protocols that govern research that is reviewed by IRBs including participant consent forms and protection of confidentiality.

B. First Day of Class.

Once projects have been identified, the instructor in both the undergraduate and graduate course meets with students on the first day of class and shares with them: information on the program the students will be evaluating, 1) background on the agency, 2) summary statistics from the agency, 3) population served by the agency, 4) programs offered by the agency, and 5) contact information for the agency. Often this information is shared in a packet format, and students are given a short period of class time to review the material and course syllabus. The instructor describes the activities carried out the prior quarter to begin building the agency/class collaboration, how the instructor identified the agency partner, steps involved in developing a relationship with the program director and processes that culminated in the list of group project topics distributed during the first class session. Students also sign a confidentiality agreement that prohibits sharing any client or staff information gathered during the evaluation without authorization. The agreement states that a violation of confidentiality will result in a failing grade for the course.

While there are many similarities in the implementation of the CPPE model across educational levels, there are some notable differences. Students enter the graduate level course having completed a statistics and introductory research methods course. Following a brief overview of the history, services provided and populations served by the agency program partner, each of the possible group projects are discussed in detail. Once students have a clear understanding of the focus of each project they self-select themselves into one of four or five groups based on their interest in the topic and/or the data collection method. Project options always include a range of research methods so that students can pursue their interest in quantitative or qualitative methods. After class members have chosen from among the project topics, they meet in their project groups to share contact information, available times for meeting outside of class, formalize ground rules for how the work group will operate, and identify a group member who agrees to act as the group’s liaison with the project staff identified as the agency contact for that group roles. They also develop a list of questions to ask agency staff who will attend the first half of the upcoming second class session.

The undergraduate research class is an introduction to research therefore a detailed outline of the project is provided by the instructor that includes two very broadly written research questions per project. Students must decide which specific program evaluation project and question most aligns with their interests. Most students identify a project and question relatively

easily. During the second half of the class (after students have identified their project and question), they meet in their groups to develop a group contract and resume. The group contract and resume is designed to insure that all members understand their roles and responsibilities and to identify the unique skills each member brings to the group. Students are asked to respond to four questions as a group: 1) What are the individual strengths or skills in our group? 2) What type of communication methods will we use? 3) What are the group expectations around participating in group meetings, timelines, and deadlines? 4) What role will each member fulfill (facilitator, project manager, editor, etc.). This information is then written in the form of a contract, signed by each member of the group, forwarded to the instructor and posted on the group Blackboard discussion board. This is especially important given the enormity of the project for undergraduate students and the need to clearly outline group participation expectations. Students are then asked to develop interview questions for a session with the agency partner. The instructor delivers an online group assessment four times throughout the quarter that allows students to provide feedback on their group member's participation. The feedback on this survey is used by the instructor to insure that each member is participating fully and to guard against social loafing.

C. Agency Interview and Class Sessions.

An introduction to the agency partner occurs during the second-class session in both undergraduate and graduate classes. Agency program staff attend the class to 1) meet the students with whom they will be interacting, 2) describe in person their agency, services, constituents, etc. 3) describe how they intend to use the evaluation report findings and 4) describe why student's projects are important to the functioning of the agency. Students then have an opportunity to pose questions to program staff that were not addressed in the agency information packet provided during the first class session. This class session is critical for engaging students in the process. By the end of the session students identify feeling a stronger sense of responsibility and commitment to the final products.

For both undergraduate and graduate courses, class time includes a combination of lectures, group discussion, computer labs, and project group work. Working in small groups, all class members conduct evaluation activities with the same agency program. A utilization-focused evaluation perspective with its emphasis on addressing specific, practical needs of the users of the evaluation, and joint control over the research and ongoing participant involvement undergirds both courses (King, Cousins, & Whitmore, 2007; Patton, 2008). For the graduate course, project groups may focus on specific aspects of the evaluation process, such as developing and piloting a measure or analyzing existing pre/post data. The focus is on development of specific knowledge and skills regarding important evaluation relevant topics including conducting a content analysis, completing an evaluation program audit of evaluation practices at their practicum agency, statistical analysis of quantitative data and responding to challenging ethical scenarios

In contrast, the undergraduate course has all students engage in all stages of the program evaluation process, including identifying relevant theories, conceptualization and operationalization of variables, development of research questions, survey design, data collections, data cleaning, storage, and analysis, and dissemination. Instruction for undergraduates is based on a progressive model where students first receive a lecture on the

concept and then engage in a group activity to reinforce the concept. This process is repeated until all the research steps are covered and a final report is provided to the agency.

D. Agency Presentations.

In both undergraduate and graduate courses students completed a final written report, and to develop a 15- to 20-minute formal PowerPoint presentation of their major findings and recommendations that is to be presented on the last day of class. Members of multiple agency stakeholders groups often attend including agency executives, board members, program staff, volunteers, and program participants. Stakeholders have an opportunity to ask questions of the students and make comments on the findings. The group PowerPoint presentation includes identifying the project group's evaluation questions, variables of interest, data analysis approach, significant findings, limitations of the analysis, and suggestions for utilizing the project findings. Students receive verbal feedback from the agency and verbal and written feedback from the instructor on the presentation and written report. Each student group provides the agency a copy of the PowerPoint, a written evaluation report, covering all aspects of the evaluation process as well as an executive summary and data analysis details so that agencies can replicate student research findings. To date undergraduate and graduate classes have produced over 25 projects through partnerships with 12 community agencies. These projects include instrument development, needs assessments, assessing service delivery, comparing service delivery models, customer satisfaction surveys, and outcome evaluations. Table 2 includes a list of typical projects.

IV. Evaluating the Success of Collaborative Community-Based Program Evaluation.

A. Methods.

A university wide Instructional Assessment Form that includes open-ended questions was distributed to students on the final class day. To identify what aspects of the course were most important to students, responses to the question "What aspects of this class contributed the most to your learning?" were transcribed and content analyzed from 12 graduate level and 7 undergraduate level courses held between 2000 and 2011 (533 students). To assess inter-coder reliability, the degree to which coding of text by two coders were similar, the co-authors independently examined 15% of all responses, drafted a set of emergent categories, then met to compare proposed codes and agree on an initial master list of codes. After the initial draft codebook was developed, an iterative process of coding, reliability assessment, codebook modification, and recoding was used. After three coding rounds, inter-coder reliability was conducted to validate the coding scheme. Using SPSS, Cohen's kappa (Cohen, 1960) was calculated resulting in a kappa of .85, an excellent level of inter-coder reliability (Lombard, Snyder-Duch, & Bracken, 2002). Each author then coded half of all student responses.

V. Results.

Table 3 summarizes the results of a content analysis of 553 student responses to the question "What aspects of this class contributed the most to your learning?" The unit of analysis is a text segment; therefore, the sample size (n) represents the number of text segments coded for each

row category by the total graduate sample and undergraduate sample. Of the four overarching categories, professional application represented 234 of the 553 (42.3%) of the coded segments. This is a good indicator of the importance of the CCPE model.

Table 2. Illustrative Evaluation Projects.

- Assessment of an educational model designed for students with family members receiving treatment for life threatening illnesses.
- Assessment of the utility of an early childhood education brochure.
- Evaluate the impact of agency programming on youth's feelings of empowerment and identity, use of time, values and risk behaviors.
- Six month follow up telephone interview with summer camp attendees.
- Analysis of pre and posttest results of camp program serving marginalized youth.
- Pilot evaluation of mentors' experience participating in a positive youth development program.
- Development and pilot testing of caregiver satisfaction measure for a community-based youth counseling program.
- Assessment of prescription medication and medical care use by homeless youth.

A. Professional Application

Real world hands-on experience was a category of professional application mentioned frequently by graduate (46%) and undergraduate (38%) students:

“I loved the applied (experiential) learning. Plus it makes me feel more connected to the UW when I can conduct meaningful research. We’re a research institution are we not?”
(Undergraduate)

“The actual applied hands-on learning was amazing, it facilitated the most challenging, but educational experience I’ve had by far”. (Graduate)

“Learning how ‘real’ processes play out in the ‘real’ world”. (Graduate)

While working as part of a research team was an important factor for some students at both educational levels, undergraduates mentioned it more than twice as often (43%) as did graduate students (17%). Responses were coded as “Part of a research team” when a student’s response focused on the process or interactions within their team. While the most frequent comment was simply, “working in” or “group work,” one student contrasted the experience with her other courses, “Group work. It makes the class interesting and on your toes! It is a unique class, much different than other classes this class made me feel independent by working on group project. “Two undergraduate students provided a bit more detail that hints at the challenging nature of the project: “Group experience was good. We could help each other muddle through,” and “Group work was most helpful because I had a social support network.” While undergraduates stressed the support provided, a graduate student’s comments, “Group members’ strengths and ability to teach and share what they know,” suggests peer learning may play a larger role at the graduate level where students are more likely to bring additional professional practice experience.

Table 3. Percentage and Frequency of Text Segments from Student Responses to the Question, “What Contributed Most to Your Learning?”

Coding Categories	Total Sample		Graduate		Undergrad	
	n	%	n	%	n	%
Professional Application	234		128		106	
Real World/Hands-on	99	43	59	46	40	38
Work with Agency Partner	32	14	23	18	9	8
Increased Confidence	15	6	12	9	3	3
Increased Interpersonal Skill	1	0	1	1	0	0
Highly Motivating	11	5	4	3	7	7
Transformational Learning	6	2	5	4	1	1
Part of Research Team	68	29	22	17	46	43
Increased Presentation Skills	2	1	2	2	0	0
Teaching Strategies	113		73		40	
Course Structure	35	31	16	22	19	48
Group Presentation	14	12	12	16	2	5
Lecture	19	17	5	7	14	35
Class Discussion	17	15	13	18	4	10
Guest Presenter	7	6	7	10	0	0
Course Materials	21	19	20	27	1	3
Class Assignments	109		65		44	
Data Analysis (Qualitative & Quantitative)	41	38	29	45	12	28
Group Project	68	62	36	55	32	72
Instructor Characteristics	97		79		18	
PE Expertise-Experience	9	9	8	9	1	5
Knowledge	6	6	5	5	1	5
Responsiveness	33	34	30	33	3	14
Accessibility	21	23	18	20	3	14
Instructor Attitude	15	13	10	11	5	24
Teaching Skill	13	12	8	9	5	24

B. Teaching Strategies.

Of the four categories, teaching strategies showed the most variation between graduate and undergraduate students’ perspectives of what contributed most to their learning. A course structure that closely integrated lecture and application for each step in the evaluation process was more often important to undergraduates (48%) as compared to 22% of graduate students:

“I love the setup of the class, instead of lecturing the whole quarter we actually got to conduct our own study”. (Undergraduate)

“Going step-by step with support. Able to ask questions (Undergraduate)

“The instructor did a fabulous job breaking points down and applying it to our project”. (Graduate)

Lectures, which generally play a larger role in introductory undergraduate classes were also key to undergraduate students learning (35%) while much less so for graduate students (7%). What was most important to graduate students in terms of delivery methods were course materials including the program evaluation text, handouts, and required supplementary articles on different evaluations studies (27% compared to 3% for undergraduate).

C. Class Assignments.

While important to both groups, undergraduates (72%) more often noted the importance of carrying out of the program evaluation as compared to graduate students (55%). It may be that the CPPE model supported developing higher level cognitive skills than is usually found in undergraduate courses (Anderson & Krathwohl, 2001), a possibility suggested by a student's remark, "The group project forced us to apply what we learned and not just regurgitate info during a test." Graduate students (45%) were more likely than undergraduates (28%) to remark on the value of the data analysis assignments.

To ensure all graduate students had experience with different types of analysis, a qualitative coding exercise, in addition to computer lab exercises that required using SPSS with an existing sample of the agency's data were assigned early in the quarter to give students practice in analyzing data prior to gathering their project data. Illustrative student comments in response to the question of what aspects contributed most to your learning included, "The hands-on practice of SPSS" and "Being in the computer lab and using SPSS where we were able to get one-to-one help" as well as "coding qualitative responses".

D. Instructor Characteristics.

With only 10 weeks to complete their evaluation projects students felt under considerable pressure for fast turnaround and often requested consultation with the instructor or feedback from an agency liaison on a weekly basis. For graduate students, the instructor characteristics mentioned most frequently as contributing to their learning were responsiveness to student needs (33%), with comments such as, "following up with students to ensure understanding" and instructor accessibility (23%) including meeting outside of class. A student commented, "Instructor spent many hours with us outside of class helping us to figure things out;" and another wrote, "Knowing that the professor was there to answer questions." Undergraduate students most often remarked on the instructors' attitudes (24%) in terms of her "enthusiasm" or "energy" and teaching skills (28%) particularly her excellence in communicating and attention to different ways of learning.

D. Agency Responses.

Systematic data on agency partners' experience with the class has not been collected. However, some comments, which are uniformly positive, from agency staff, executive and board members have been saved by the instructors over the last 10 years. Agencies frequently request to continue working with the class during the upcoming academic year and increasingly the instructor is working with the same agency for two consecutive classes, offered once per year to further strengthen their evaluation capacity. Comments from agencies illustrate that the work students produce is not only beneficial for program development but for accountability as well. An agency commenting on the benefit of the shared work noted, "The results of your work will have great impact! They will be reported on our website and to community leaders and partners. Your recommendations will guide our decisions on scaling and enhancing the project next year." Another comment highlighted the mutual value of the collaboration: "Thank you for partnering with (the Agency) on our (the Project) work. I think both sides really gained from the experience. I have a nifty report with very good data that I can use to target our efforts."

A Clinical Director of a multi-service center remarked at the conclusion of the course that the benefits of the collaboration extended beyond the evaluation report: “I’ve come to appreciate how this program speaks to something far greater than just the individual tasks undertaken by the students. It’s an alliance between a community’s service providers and the educational system that prepares them. Connecting all this focused academic energy with real — and somewhat overwhelming — issues within the community offers multiple benefits. The students get a chance to see some things that are likely not covered in their textbooks, and we get access to an incredible amount of intellectual power, energy, and research tools that we could never afford on our own.” In addition to the instrumental use conveyed in the prior statement, involvement in an evaluation may lead to process use, changes in the thoughts and behaviors of individuals, which then impacts organizational change (Preskill, Zuckerman, & Matthews, 2003). An agency partner, commenting on the partnership captures both: “It has left us with practical resources that are already positively impacting the families we serve. From opening up a dialogue with families through the survey to finding ways to get better information from our data, we’re right at the genesis of something that feels more structurally sound than what we had before.”

After a decade of offering the course, former students, who are now program directors and board members of nonprofit agencies frequently ask if their agency can become a site for partnering with the class. Former students recognize the significant contribution CCPE classes can make in preparing students for program evaluation and for helping their agencies achieve their program development and accountability needs.

VI. Conclusion.

The purpose of this article was twofold; to describe the CCPE pedagogical model in sufficient detail that instructors interested in conducting a collaborative community based program evaluation course could confidently implement the model and second, to examine data gathered over the past decade from student perception of CCPE’s impact on their learning. We conducted a content analysis of course evaluations from twelve graduate level and seven undergraduate level courses, held between 2000 and 2011, focusing on the question “What aspects of this class contributed most to your learning?” Results of this analysis indicate that both undergraduate and graduate students overwhelmingly identified that the aspect of CCPE that contributed most to their learning was the real world experiences, followed by working on a research team. These findings show that students believed this pedagogical model was useful in preparing them as evaluators. Further, the findings reveal that working with a community partner was both engaging and fueled their motivation for completing the class work.

Because we saw the enormous amount of work students put into their evaluation projects, far surpassing the time commitment and energy seen in other courses and considering that students are usually unhappy with the standard lecture based research classes, we expected more comments referring to the course as highly motivating. Typical responses included a graduate student who remarked, “I love that we were working with real data for a real agency. This made my learning and work seem way more relevant and really motivated me to do my best,” and another mentioned, “I was more invested knowing that we were positively contributing to an organization.” As we reviewed the individual comments we realized that the nature of the question, “What contributed to your learning?” pointed students toward mentioning different dimensions of the class rather than student attitudes. That is, an individual’s motivation may have been articulated in their desire to act on behalf of the agency and therefore coded as the

working with an agency partner. Despite the limited textual support for motivation, CCPE, as a pedagogical model, contributed to students viewing themselves as being well prepared by real world experiences.

We would be remiss if we did not note the increased demands on the instructor implementing this approach to teaching collaborative community based program evaluation. Adopting the CCPE model significantly increases the demands on the instructor when compared with more traditional courses that do not involve ongoing community agency collaborations. For example, providing students with real world evaluation experiences requires preliminary work identifying and working with a community partner, meeting with students regularly, juggling the teaching of theory with practice, reviewing many drafts of a final product and ensuring the program evaluation needs of the agency are addressed require time above and beyond that of a traditional course. Additionally, faculty using this model must anticipate dedicated supervision and planning time over and above what is required for other courses. This is critical when multiple course projects must be completed within an academic term. One approach to help minimize some of the additional time demands on the instructor is to work with the same program for two years so that the upfront time on engagement, relationship building with staff, and becoming familiar with the program's data collection systems are activities that do not need to be repeated during the second year of working together. Agencies usually request to work with the instructor for another year since their evaluation efforts can benefit from additional support and it provides an opportunity for additional kinds of analyses such as completing pre and post measures the second year using a measure developed during the first year of the collaboration. Additionally, given the emphasis on university/community partnerships the first author has received support for a TA to assist in the data collections and data analysis process in the classroom. Universities may find providing funds for a teaching assistant a good investment to provide support for community based learning.

This study is not without its limitations. Given the preliminary nature of these findings, gathering additional quantitative information on students' perception of the utility of this approach as well as their feedback on how to strengthen the course would be helpful. Secondly, a comparison of the outcomes of this model to the outcomes of a standard research course would provide a more comprehensive understanding of the impact of this approach on student learning. Thirdly, asking our community partners to provide structured feedback on their experience of the collaboration and ways they intend to use the results would help with further developing the curriculum. Lastly, following up with community partners a year after the end of the class to see if they did use the results as they had intended and if there were other ways in which our collaboration had influenced the program's attention, focus and involvement in evaluation activities will add to our understanding of factors that influence the use of evaluation results, and development of program's evaluation capacity.

Appendices

Appendix 1. List of Criteria Used for Selection of Agency Partners.

1. Agency serves a minimum of 30-40 clients annually so there are sufficient numbers to calculate statistical significance.
2. Preferable if agency has an existing data set that has not been analyzed that can be used in class computer labs so that students receive experience in quantitative analysis using SPSS with the programs' data.
3. Agency is interested in evaluation questions that include qualitative and quantitative data collections strategies or a combination of both. Multiple data collections methods are used so that students can gain experience with different approaches.
4. Program has a logic model or program leadership is willing to develop a draft logic model prior to the quarter when the course is taught.
5. Agency executive is interested and supportive of evaluation partnership and informs board of the collaboration.
6. Agency staff is willing to serve as liaisons to student project groups and respond by email, phone, or in-person meetings with student groups during the quarter.
7. Program director and staff commit to attend the second-class session, to share information about the program and answer students' questions and attend the last class session to hear student's PowerPoint presentations of their group project findings.
8. Program staff agrees to help coordinate and set up schedule for data collection requiring interviews, focus groups, etc. with clients or staff.
9. Agency agrees to pay for an incentive (providing food at focus group, fast food gift card; childcare, transportation), if that is needed to recruit client participants.
10. Agency is a community based grassroots organization that lacks capacity to address evaluation questions they have identified.

Appendix 2. Course Activities and Topics for Ten Week³ Undergraduate and Graduate Courses⁴.

	<u>Undergraduate</u>	<u>Graduate</u>
Week 1	Overview of program/List of projects Sign confidentiality form. Students choose group project. Meet in groups to develop group resume & contract. Develop questions for program staff. <i>Begin research on topic.</i>	Overview of program/List of projects Sign confidentiality form. Students choose group project. Meet in groups. Develop questions for program staff.
Week 2	Staff attend class, answer student questions. <i>Lecture on levels of measurement.</i> <i>Begin literature review.</i> Lecture on survey development. <i>Groups begin identifying research questions and hypotheses.</i>	Staff attend class, answer student questions. Lecture on survey development.
Week 3	Develop survey questions. <i>Finish draft 1 of literature, submit for feedback.</i> Develop qualitative questions. Agency recruits research participants. <i>Draft survey questions.</i> <i>Lecture on research design and sampling.</i>	<i>Ethical and cultural concerns in PE.</i> <i>Discuss completed "Practicum Evaluation Audit" assignment.</i> Agency recruits research participants.
Week 4	Send draft of survey questions to program staff for vetting. <i>Forward draft research design and sampling method.</i> <i>Prepare for midterm exam.</i>	Send draft of survey/focus group questions to program staff for vetting. Qualitative Methods & Content Analysis. <i>Computer session 1 & lab assignment.</i>
Week 5	Based on agency and instructor feedback survey and qualitative questions are revised. Develop consent form. <i>Forward survey to agency for dissemination.</i>	Based on agency and instructor feedback survey and qualitative questions are revised. Develop consent form.
Midterm exam		
Week 6	Lecture on data analysis. Lecture on SPSS. Begin data analysis. <i>Submit draft research methods section to instructor for feedback.</i>	Lecture on data analysis. Computer session 2 & lab assignment. <i>Implement focus groups/individual interviews or disseminate self-administered surveys.</i> <i>Lecture on evaluation designs.</i> <i>Computer session 2 & lab assignment including reliability analysis.</i>
Week 7	Data analysis & interpretation. Develop tables and graphs. Develop results section.	Data analysis & interpretation. Input data, transcribe interviews.
Week 8	Continue data analysis and results. Develop conclusion and suggestions. <i>Submit part 3 of report for instructor feedback.</i>	Develop tables and graphs. Draft report and PowerPoint (PPT).
Week 9	Begin PowerPoint presentation development. Instructor feedback used to revise PPT presentation. <i>Use instructor feedback to revise part 3.</i> Submit full report for instructor feedback.	Dress rehearsal of PPT presentation. Instructor & class feedback used to revise PPT presentation.
Week 10	PPT presentation to agency stakeholders. Final presentation feedback from instructor. Final group project reports given to staff.	PPT presentation to agency stakeholders. Final presentation feedback from instructor and students. Final group reports given to program staff during week following last class.

Offering the course in a 15 or 16 week semester would allow students to more effectively integrate and consolidate their learning than is possible in a 10 week quarter. When offered on a semester basis, implementing the CCPE model would benefit from additional attention in the following areas: 1) alternative ways to approach literature reviews to strengthen different aspects of group projects, 2) review and critique of potential measures for groups projects, 3) practice and receive feedback on reporting written findings and interpretations, 4) discuss initial findings with agency program director prior to class presentation, 5) examine alternative methods to use graphs and figures to report results and 6) use class time for group project teams to share progress with other teams and provide consultation and peer review to each other throughout the course.

⁴ Items in italics are topics or activities that vary between courses.

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An assessment of reading compliance decisions among undergraduate students

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Abstract: Research suggests that reading compliance among undergraduate students is low. This study assesses the factors that influence students' decisions to comply with their assigned course readings using two theoretical underpinnings: students' self-rationing ability of time and construal effects on their decision process. Data collected through focus group discussions with undergraduate students and analyzed using qualitative methods suggest that both these behavioral economics theories may provide valuable insight into students' decision-making behavior related to reading compliance. The study found that students' decisions to read are influenced by both personal and external factors, several of which pertain to their instructors. Students also admit that lack of time and inability to self-ration time towards reading tasks are factors that negatively impact their reading compliance behavior. The study also found evidence of construal effects in the students' understanding of the potential benefits of reading compliance, given that several of these benefits would occur beyond their immediate future. The conceptual mapping of the results leads to several propositions for future research.

Keywords: reading compliance, construal level theory, behavioral economics, self rationing inefficiency, time management

I. Introduction.

Research suggests that reading compliance amongst undergraduate students is low and that it negatively impacts scholarly performance (Hobson, 2004; National Survey of Student Engagement, 2001) and previously held beliefs that undergraduate students possess appropriate reading abilities are being challenged (Bean, 1996). While precise data on reading compliance is scarce, it is likely that the lack of reading compliance is of significant concern to college and university instructors (Baier, Hendricks, Gorden, Hendricks, & Cochran. 2011).

Reading course assigned readings is one of the tasks that students are asked to perform in preparation of their classes. It is a task that, in essence, requires the student to make a conscious decision about reading his/her assigned course materials. At face value, this may appear to be a simple decision: students most likely understand the value of getting a course qualification and therefore reading their course materials helps them accomplish this objective. However, the reality is that students are faced with several options to spend their limited time (an economic resource). They can spend time on other academic activities, non-academic activities and on working to pay for their educational expenses to name a few. Students must decide to allocate time among these competing activities of varying importance and urgency and reading their course assignments is one of them. This makes reading compliance a more complex decision

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than it appears to be at the surface. Interdisciplinary research also suggests that individuals' ability to make complex decisions of resource allocation (such as time) to activities that do not necessarily result in immediate benefits is limited (Fujita, Trope, Liberman, & Levin-Sagi, 2006). In fact, individuals have been shown to be inefficient in rationing of resources such as time (Wertenbroch, 2002).

The purpose of this study was to assess the factors that influence the undergraduate students' decision process to comply with their course assigned readings. We pursue this purpose through the lenses of two behavioral economic theories: self-rationing theory and construal level theory. Based on prior studies on reading compliance and on behavioral economic perspectives of individual decision-making, this study focused on the following research questions:

1. What factors influence undergraduate students' reading compliance decisions?
2. How does time available impact students' reading compliance decisions?
3. What are the benefits that students associate with reading assignments?
4. How can reading compliance decisions of undergraduate students be improved?

A better understanding of the factors that influence students' reading compliance behavior could allow instructors to intervene effectively so that reading compliance increases. Overall, the study contributes to the topic literature by investigating whether self-rationing of time and construal effects might impact students' reading behaviors.

II. Literature Review.

A. Reading Compliance in Higher Education.

Reading compliance in higher education has received considerable attention in the literature and scholars from several disciplines, predominantly from psychology, have investigated the effectiveness of various methods, both positive and negative, on stimulating reading compliance among college students. In a summary study, Burchfield and Sappington (2000) looked at compliance with required reading assignments in introductory to graduate-level psychology courses between 1981 and 1997. Using a sample of over 900 students, they found that reading compliance had declined over the period under study. However, they also found that compliance improved as a function of increasing class level, with seniors complying better than freshmen. They advocated a renewed emphasis on reading compliance and recommended regular sampling of reading compliance among students by means of surprise quizzes. A study by Connor-Greene (2000) reinforced the strategy of using quizzes to increase reading compliance. In this study, the instructor replaced regularly scheduled exams with short, daily essay quizzes. When students had regularly scheduled exams, only 16% of students read before each class. After the change to daily essays, 92% of students reported reading before class.

Sappington, Kinsey, and Munasac (2002) reported on two studies on reading compliance. They found that college students tended to resist required reading assignments. The article suggested that instructors might consider using surprise quizzes, despite their hesitancy to use them, to illustrate the benefits of reading preparation to students and to emphasize the students' responsibility in the learning enterprise.

Kouyoumdjian (2004) also focused on surprise quizzes and compared the influence of infrequent and minimal-weight unannounced quizzes to a cumulative exam on students' self-reported motivation to attend class and to keep up with class reading assignments. Students rated

the use of these quizzes favorably and indicated that they were helpful as motivational tools to attend and prepare for class.

Several studies suggest that most students opt to read assignments before exams rather than keep up with the regularly scheduled reading assignments (Clump & Doll, 2007). In one study, 27% of students reported completing the assigned reading before each class, while 70% of students postponed the reading assignments until an exam (Clump, Bauer, & Bradley, 2004).

Using an alternative technique, Uskul and Eaton (2005) assigned students in a personality psychology class long-answer questions that were graded, in an attempt to increase the likelihood of students reading assigned class material in a timely manner. They evaluated the effectiveness of this technique by analyzing exam scores and student evaluations. Students performed significantly better on the exam questions that were related to the topics covered by the long-answer questions than they did on exam questions related to other topics. Students also reported having read significantly more of the assigned material when there was a long-answer question assigned and they evaluated the method positively and recommended its use in future classes.

Johnson and Kiviniemi (2009) investigated the detrimental effect of students not completing reading assignments or only doing so immediately before an exam on learning and course performance. Their study examined the effectiveness of compulsory, mastery-based, weekly reading quizzes as a means of improving exam and course performance and found that completion of reading quizzes was related to both better exam scores and overall course performance.

In their study on reading behaviors in graduate school McMinn, Tabor, Trihub, Taylor, and Dominquez (2009) surveyed a total of 744 graduate students enrolled in American Psychological Association-accredited doctoral programs. Their study found that the reported amount of assigned reading varied widely, with an average of 330 pages per week. Compliance ratings suggested that, even in graduate school, only about half the assigned reading was completed thoroughly. Yet, among graduate students thorough reading was more common than skimming or not reading assigned material at all.

Lineweaver (2010) developed an online discussion assignment as a required component of a cognitive psychology course in order to increase the number of students who read the text before class and to promote student interaction about text material. The author found that this assignment had a limited effect on examination performance, but also determined that students completing online discussions were more likely to read the textbook in advance of class, reported reading it more carefully and reported understanding lectures better and feeling more prepared for exams. These results supported previous studies that suggested that online discussions could be an effective tool in undergraduate psychology courses.

Another tool developed was the Textbook Assessment and Usage Scale (TAUS) by Gurung and Martin (2010) who used it to measure students' textbook evaluations and reading behavior. They found that student gender, student perceptions of the quality of visuals, pedagogical aids, photographs, writing, and course design all predicted student text reading behaviors and exam scores.

Lei, Bartlett, Gorney, and Herschbach (2010) found that college students were not inclined to read because of low self-confidence, a disinterest in the research topic and subject matter and because they underestimated the significance of completing the required reading. College instructors were found unmotivated to reinforce student reading for fear of poor student evaluations, the low developmental level of students, the low motivational levels of both students and instructors, as well as the instructors' expectations and beliefs.

Marek and Christopher (2011) took another approach. In order to investigate undergraduate students' perceptions of the role of the textbook in psychology courses, they surveyed 311 psychology students using an online survey. In the survey, the students answered questions about textbook importance, usage, and preferences and about scenarios that described a textbook as a resource or central course element. They found that, if an instructor expected students to read and understand textbook material before class, the students perceived that they would learn less, enjoy the course less, and find the course more difficult than if an instructor described the textbook as a resource to which students might refer for clarification.

Finally, Coulter and Smith (2012) assessed the value of mandatory pre-class readings (PCRs) and pre-class quizzes (PCQs) in a therapeutics course by correlating performance on PCQs to examination performance, and evaluated student satisfaction of these assessments via a class survey. They found a positive correlation between student PCQs and examination grades. The results of the student survey showed student satisfaction with these techniques to enhance reading compliance: students considered both PCRs and PCQs to be beneficial.

Although most studies found reading compliance increased with short quizzes and other assessments, a minority of studies discovered no relationship. For instance, Culver (2008) reported on a study designed to investigate practical and effective methods of increasing reading compliance, reading comprehension and meta-cognitive reading strategies primarily among freshman and sophomore undergraduate psychology students. Results suggested that a majority of college undergraduates read their course textbook two hours or less per week. Whereas undergraduates scored relatively high on comprehension, their performance on the teacher-made comprehension tests based on textbook material was very low. The threat of a random quiz had no statistically significant effect on reading compliance, comprehension, or meta-cognitive reading strategies.

B. Behavioral Economics - Applications to Reading Compliance.

Theories that integrate concepts from economics and psychology are loosely defined as Behavioral Economics. This is a growing field of study that increasingly gathers evidence to demonstrate how individual decisions may be biased due to emotions and social influences, or are based on heuristics (Camerer & Loewenstein, 2003). Students are no different in their behaviors and therefore also prone to such cognitive biases. This section of the literature review provides background literature on two theoretical perspectives from behavioral economics in particular: self-rationing inefficiency of resources and construal level theory.

C. Self-Rationing Inefficiency.

People constantly make consumption choices about resources at their disposal such as money, food and time in the context of certain global constraints. For instance, our food consumption choices are constrained by annual income, calorie requirements and life expectancy. Economists have long believed that such choices of resource consumption are based on our utility maximizing behavior, subject to current and discounted value of future resources available (Ando & Modigliani, 1963). In other words, choices are made based on the value that is placed on things both now and in the future (Frederick, Loewenstein, & O'donoghue, 2002). However, anecdotal evidence and growing research in behavioral economics suggests that most consumers may not be using such sophisticated decision-making processes to make their choices (Ariely &

Wertenbroch, 2002; Frederick, Loewenstein, & O'donoghue, 2002). This is largely because they tend to discount the future and therefore place higher value on current consumption, especially if future benefits of forgoing current consumption are hard to evaluate, as is the case with saving for retirement, for instance. In order to avoid over-consumption as consumers we tend to use more local constraints to curb current consumption (Ariely & Wertenbroch, 2001). One such local constraint is mental budgeting, or allocating consumption to categories with certain limits (Thaler, 1980). Still, anecdotal evidence suggests that even these mental budgeting techniques may be inefficient to help consumers self-ration their resource consumption. It is possible that behavioral traits such as impulsive, compulsive, or restrained consumption may decrease or increase self-rationing efficiency, with or without mental budgeting.

Self-rationing is defined as the ability of individuals to make optimal consumption choices of resources (such as time, money) based on budget constraints (Wertenbroch (1998). For instance, students are constrained by time available for academic and non-academic activities. Traditional, normative economic theory predicts that students will make choices of time consumption from several competing alternatives based on the ones that maximize their utility. However, recent studies have found that individuals may be self-rationing 'inefficiently' causing it to be only partially successful (Heath & Soll, 1996; Leclerc, Schmitt, & Dubé, 1995; Thaler, 1999; Carrillo & Mariotti, 2000). Wertenbroch (2001) suggests that consumers are ill-equipped to make distributed, moment-to-moment choices subject to the global constraints that normative theory predicts.

Self-regulation is a concept closely related to self-rationing. Self-regulation has been studied in context of *Executive Functioning*, cognitive systems that control and manage other cognitive processes (Baumeister et al., 2008). Extensive research has been conducted to study the relationship between Attention-Deficit/Hyperactivity Disorder (ADHD) and self-regulation of cognitive in Executive Functions (Barkley, 2010). Recently McClelland and Cameron (2011) found a relationship between academic achievement in elementary schools and self-regulation ability of students.

D. Construal Level Theory.

Construal level theory (CLT) is a theory in social psychology that describes the relation between psychological distance and the extent to which people's thoughts are abstract or concrete. CLT has been presented as one explanation of individuals improving or deteriorating self-control (Schmeichel et al., 2010). Psychologically distant things are those that are not present in the direct experience of reality (Loewenstein, Read, & Baumeister, 2003). The general idea is that the more distant an object is from the individual, the more abstract it will be thought of. The opposite relation between closeness and concreteness is true as well (Trope & Liberman, 2010). According to construal-level theory, events that are distant in time tend to be represented more abstractly than events that are close in time (McCrea, Liberman, Trope, & Sherman, 2008).

Construal level theory (CLT) posits that temporal distance influences the evaluation and choice of future events by systematically changing the way they are construed (Liberman, Trope, & Stephan, 2007). Individuals form higher-level construals of distant--future events than near-future events. High-level construals are schematic, abstract and include central features of events, whereas low-level construals are less schematic, more concrete and may also include incidental, peripheral features of events. Judgment and choice regarding the more temporally

distant events are based on higher-level construals of events (Liberman, Trope, & Stephan, 2007).

While no direct investigation has linked CLT to academic achievement, Schmeichel et al. (2010) demonstrated the impact of high and low level construal on tasks associated with executive functioning. Consistent with earlier findings, their study found that higher-level construal improved performance on tasks that required inhibition (self control) and goal maintenance. Lower level construal improved tasks for activities that required immediate responsiveness.

Both self-rationing and construal level theories can provide valuable perspectives on students' decisions to complete reading assignments, particularly because these decisions involve time: the use of time for reading and the effect of time before benefits of these readings are realized. There is scarcity of literature in assessing factors that might impact student decisions of reading compliance in these contexts. For instance, the results of reading compliance may not always be close unless directly related to student grades. If the perceived results of reading compliance are distant, this construal effect may influence student decisions to comply with reading assignments.

III. Subjects and Methodology.

A qualitative methods approach, using focus group discussions, was used to assess factors that influence the undergraduate students' decision process in complying with their assigned course readings (Stewart & Shamdasani, 1990; Krueger & Casey, 2009). Qualitative methods, such as focus groups, can provide a rich description of complex phenomena and can explore these complexities to generate hypotheses (Sofaer, 1999; Creswell, 2009). Focus groups have been used extensively in exploring such phenomena and in generating hypotheses from participant opinions, attitudes and stated attributes of discussion issues (Fern, 1982; Krueger and Casey, 2009).

However, several concerns have been raised with regard to the focus group process as well (Flores & Alonzo, 1995; Kitzinger, 1995): whereas a focus group discussion is a convenient way to collect data from several participants simultaneously and it enables the interviewer to solicit and encourage participation from those who might otherwise be reluctant to respond, an obvious negative is the risk of "group-think" in which the respondents are biased in their answers by the responses of their peers and dominant group opinions may silence dissenting opinions. Moreover, participants may be reluctant to share their opinions and true feelings with others in an open discussion.

Study subjects were recruited from the undergraduate student body of the lead author's department at a large Northeastern university in the United States. The university's Institutional Review Board approved the study protocol. Students were invited to participate in a focus group discussion via email. Those who responded were later sent the day, time and place for the focus group meeting. Initially the researchers had planned to conduct three focus group discussions, yet ultimately, two focus group meetings were conducted with a total of 18 students. The students were offered pizza and non-alcoholic beverages, along with a \$20 cash incentive, for their participation. The response rate among the students initially contacted was lower than those in recent qualitative studies of student perceptions (Rich, 2005; Wilson et al., 2005). Several students indicated that they had been unable to fit the scheduled focus group discussions into their calendars.

Data collection tools were developed by the research team to investigate the factors influencing students' reading compliance decisions, and the research team for the student focus groups developed semi-structured discussion guides. A panel of experts reviewed the interview guide from the perspectives of psychosocial behavior, behavioral economics, reading compliance determinants and education. The guided approach to focus group discussions allowed for the *a priori* development of a general list of topics and questions to be covered in a pre-determined sequence (Patton, 2002; Wolff, 2002). Major constructs of interest served as topics that included reading compliance, procrastination, incentives and disincentives to read and reading support.

Students were asked to comment on their perceptions of benefits from reading their assignments and to identify the opportunity costs related to time spent on reading. Time questions explored perceptions about the length of time spent on reading and how time available influenced reading choices.

Reading choice questions explored preferences for reading certain types of assignments versus others, the methods or processes used to make the reading choices, attitudes towards complying with reading assignments and the potential challenges of reading compliance. The questions were integrated with the focus group moderator guide. The advantage of this guided, or semi-structured, discussion approach was the somewhat systematic data collection during the focus group discussion. Additionally, this approach provided focus to the discussion while still allowing for conversation to flow for flexibility, situational sensitivity, and open-ended responses (Patton, 2002; Wolff, 2002).

Two student focus groups were conducted on the university premises during a weekday at the convenience of the students. One member of the research team conducted the focus group discussion and the graduate student in the room documented participant observations. Each interview and focus group discussion was digitally audio-recorded as well. The audio files were transcribed by an experienced transcriptionist and reviewed in their entirety by the data collectors.

Saturation was employed to improve the credibility of the qualitative research. Qualitative data collection was concluded when no new themes were emerging from the data (Merriam, 2002; Newman, Newman, & Newman, 2011). This was assessed through an ongoing process of data analysis and discussions between the two researchers. The process helped identify when this point was reached to conclude the qualitative data collection phase. The researchers used several qualitative methods to reach methodological triangulation to answer the research questions (Morse, 2010; Teddlie & Tashakkori, 2009). For instance, findings from the content analysis (Hsieh & Shannon, 2005) were used in conjunction with participant observation and the researchers' interpretation of participant responses. In addition, this study employed investigator triangulation: three investigators independently analyzed the student focus group data using a common set of codes, identified emerging themes and then categorized those themes to represent emerging concepts. The researchers met and discussed their notes and interpretations. This led to a combined transcript of themes and related concepts that emerged from these discussions and researcher interpretations. Such an approach ensured that the findings were reliable and comprehensive (Teddlie & Tashakkori, 2009). The resulting concepts and their interactions were then mapped using third-party software (CmapTools[®]) (Novak, 2010; Zeilik, 2012). The mapping software also enabled the researchers to generate ensuing propositions for future research.

IV. Results.

The following section reports on the results of the qualitative data analysis of the student focus group discussions. Results are categorized into the four major constructs that guided the discussions: reading compliance, incentives/disincentives, procrastination and support/time management. An integrated map of all constructs with their resulting relationships is presented in Concept Map 1, which presents an overview of all the relevant issues (See Figure 1).

Concepts and relationships that emerged under each of these four individual constructs are presented separately in Concept Maps 2-5. Concepts highlighted in yellow represent those that were commonly agreed in both the focus groups. The construct text font in red are the ones where there was a disagreement between the two focus group discussants – that is, one group agreed with that construct statement while the other group did not agree with it. The concept maps were used to describe the resulting relationships between the concepts. In addition, the result descriptions also include direct student quotations from focus group discussions. The description of the concept maps, together with the supporting quotations from student focus group discussions were then used to derive propositions for future research. These propositions are included in the results section and 1 at the end of this section presents a selection of relevant student quotes (See Table 1).

Construct 1: Reading compliance. Students were asked to comment on the challenges related to reading compliance and if they could be encouraged to improve compliance (See Figure 2). Participants stated that they felt that reading assignments were time consuming (both focus groups, here on 2FG). Furthermore, they commented that the availability of a book to read the assignments from (when they were associated with a text book) also influenced the degree of their reading compliance (2FG). In a related comment, students felt that textbooks were expensive and that purchasing them caused financial hardship.

When questioned on how they could be encouraged to complete reading assignments, the participants felt that short quizzes (2FG) and in-class discussions (2FG) associated with the assigned readings could encourage them to increase their reading compliance. It was also felt that ensuring that readings were recent (2FG) and interesting (2FG) to a student audience would encourage students to read in preparation for class. Students specifically identified case studies, magazine and news articles as relevant and recent sources and as the types of reading assignments they preferred.

A few students commented, and several others agreed, that being called upon in class (2FG) to answer questions related to the reading assignments would also encourage them to complete their readings. Moreover, it was felt that adding a participation grade (2FG) to the discussions that were associated with reading assignments would be helpful as well. Some students indicated that the use of student response systems, such as clickers, had a positive impact on the completion of assigned readings before each class period. This comment was interesting, because some students indicated that even when answering anonymously, they felt a need to have an informed response to the question posed by the instructor.

Students also indicated their preference to being prompted by access to and availability of the reading materials in the library reserve. As the price of some textbooks is very high, and the applicability of the text for the student beyond the course is unknown, a text in the library reserve provides a cost-free alternative to purchasing the text. Even with a text on reserve, students pointed out that the library often times only had one copy available so access could still be an issue.

Table 1. Selected Quotes from Student Focus Groups.

Reading Compliance	Incentives-disincentives	Procrastination	Support and time management
<p>“Often-times the professor takes his lecture straight out of the book, so there’s no reason to even read the book, when he lectures that way.”</p>	<p>“... being called on you want to know your material so that’s one of the classes I actually do readings for.”</p>	<p>“... if you have enough time you’re going to (read the assignments), if you don’t it’s kind of like you’re just going to wing it.”</p>	<p>“Sometimes you just don’t have enough time, like have the intention to read it but as far as assignments go, that’s an easy one to skip.”</p>
<p>“The chapter could be really long, meanwhile the professor goes over it in 5 minutes and you just spent 2 hours reading that chapter.”</p>	<p>“... short quiz on (the reading assignment) and usually it’s worth it to read just to like have that boost in your grade to do well on that quiz.”</p>	<p>“Reading is the first thing to get cut from the list if you don’t have time.”</p>	<p>“I know teachers that they think to some of my roommates don’t read for all their classes but they read for the ones they like professor.”</p>
<p>“... don’t really sort of get in to reading until you get into junior or senior year and then it’s kind of a big shift from what you are used to so they don’t do it it’s not in their schedule, they don’t make time for it, but if it’s like you start out in the lower level classes you have to read you have to do all the assignments... you’d be more used to the time management.”</p>	<p>“I think the teacher needs to stress the importance (of reading assignments).”</p>	<p>Personally, I put (reading assignments) off as long as I can, because between other class homework and clubs and other activities I’m involved in, if I didn’t put off the reading until like the night before it’s due for a specific class, like I’ll do that.”</p>	<p>“... if a big (event) is coming up I want everything done I don’t want to have to worry about... my homework that’s due on Monday</p>
<p>“... if a professor is going to repeat his lecture, basically from the book, I’m not going to read the assignment...”</p>	<p>“I used to have a professor that when we talked about a reading if it was obvious that somebody didn’t read she would ask them to leave, I mean that’s a pretty strong penalty.”</p>	<p>“I go to the library and a lot of (books) are on reserve so you just do 2 hour check-out and I find that if I’m at the library you know I’m going to read it because I have nothing else to do and the book is there so I figure I’d do it then.”</p>	<p>“... even if they had the time to read or but at the same time they have to be interested and get engaged in all these other things you have to want to do it that just can’t be accomplished by solely time management.”</p>

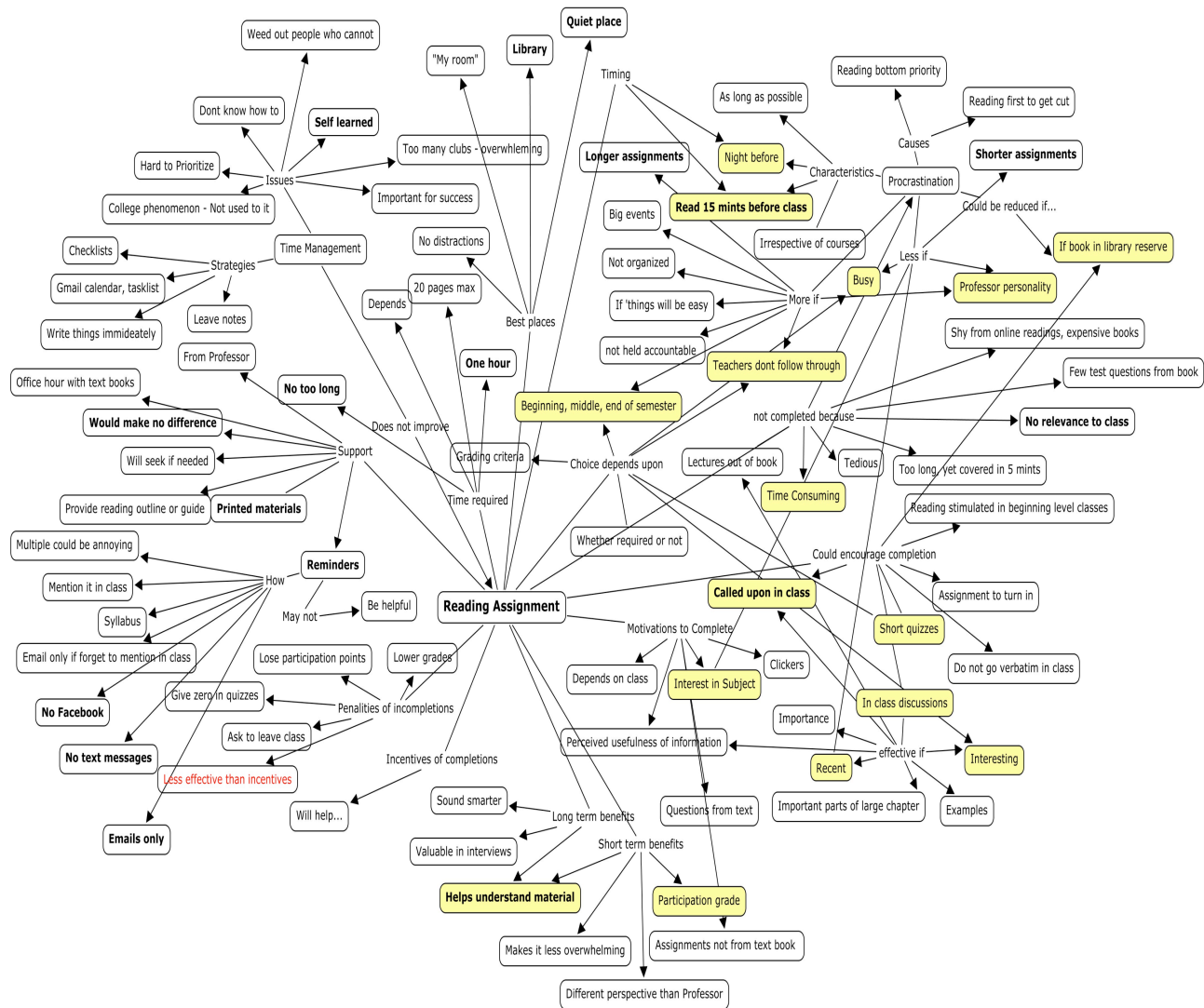


Figure 1. Overall Concept Map.

With the rise of devices like smart phones and tablets, some students might opt to purchase e-books to support their coursework. No students indicated leveraging different devices to purchase or access course texts, yet in an annual survey of student technology use at the researcher’s institution, nearly a quarter of students indicated using e-books and suggesting that the majority of reading e-books takes place on a desktop or a laptop computer.

Finally, the students felt that reading compliance was also related to students’ interest in the subject (2FG). If they were interested in the subject they would complete their reading assignments. In summary, students felt that reading compliance was impacted by several factors, both those related to the instructor and the environment (follow through with assignments and quizzes) and others that were more specific to the students (interest in subject, perceived usefulness of information).

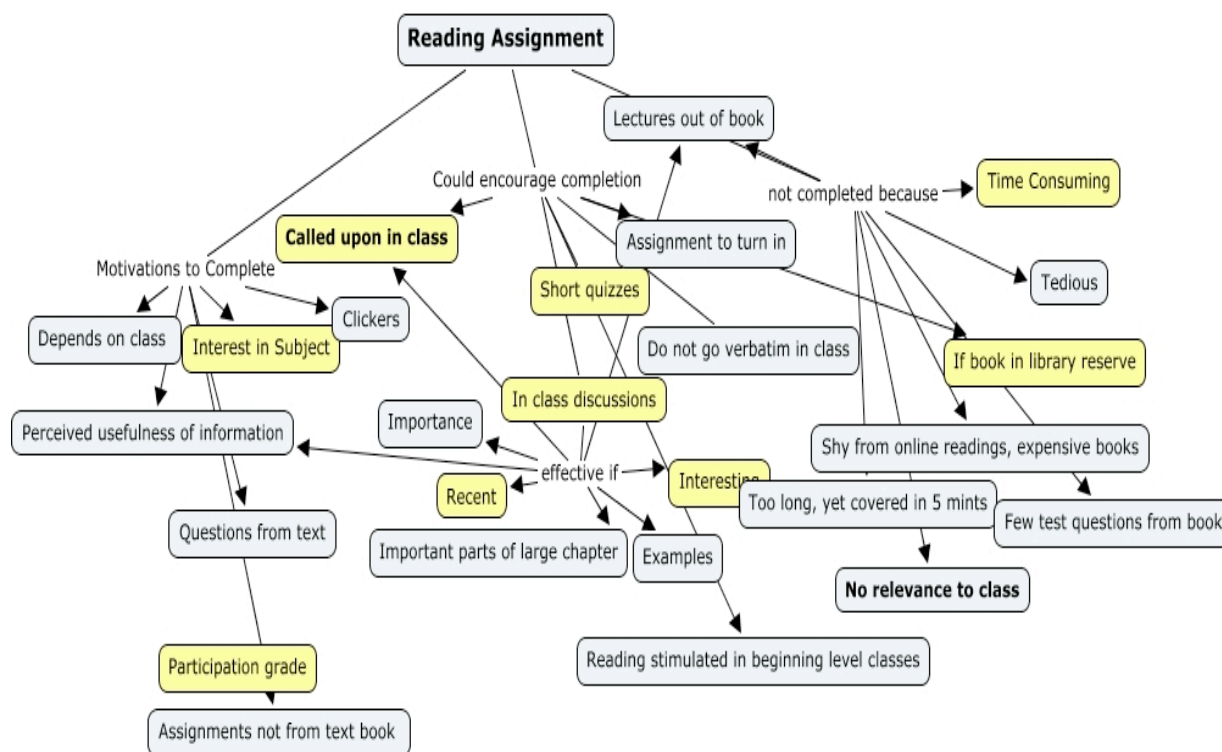


Figure 2. Reading Compliance Concept Map.

Propositions for reading compliance. Based on the interpretation of responses associated with reading compliance, the following propositions could guide future research:

1. Reading compliance will increase when students' perception of information usefulness and relevance increases;
2. Availability of library reserve books will impact reading compliance rates.

In view of the inconclusive evidence related to the effect of quizzes, we also propose the following:

3. Reading compliance will increase for 'higher relevance' reading assignments that are followed up with short quizzes than those readings considered 'lower relevance' by students.

Psychological distance dimensions of construal level theory provide support for these three propositions (Trope & Liberman, 2010). For instance information usefulness and relevance are close indicators of the benefits of reading compliance. On the other hand, book availability in the library could represent a spatial closeness of the reading material and an environment conducive towards complying with the assigned readings.

Construct 2: Incentives, disincentives and negative incentives. Students were asked to provide their opinions on what they thought were the benefits of reading assigned materials and how incentives and disincentives could improve their reading compliance (See Figure 3). The participants appeared to be aware of the short-term benefits of reading, such as the material helping them understand the concepts (2FG), an improved course grade (2FG), and the potentially useful information that readings could provide in upcoming job interviews. However,

when they were asked to comment on the long-term benefits of reading, most were unsure about what those benefits might be.

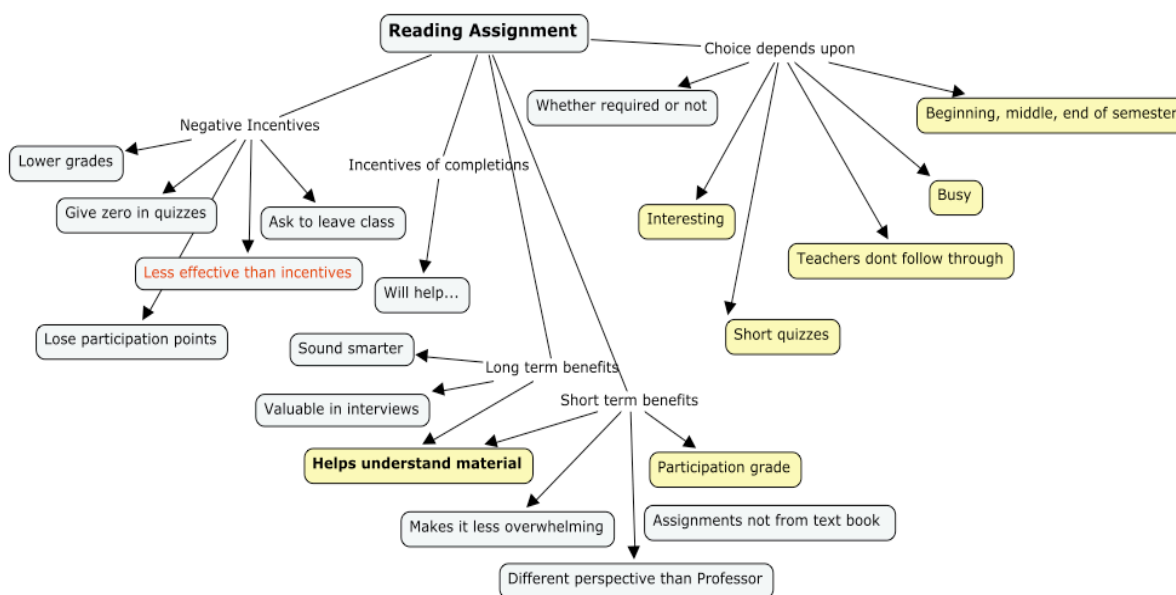


Figure 3. Incentives, Disincentives, Negative Incentives Concept Map.

The discussions on the issue of incentives and disincentives identified several strategies that might be used to enhance reading compliance. Some students felt that incentives would be more helpful in enhancing reading compliance, while others felt that disincentives would be more effective in stimulating them to read. Incentives brought up in the discussion included instructors giving a participation grade for discussions associated with reading assignments. Interesting reading materials (2FG) and instructors building on reading assignments in class discussions and lectures (2FG) were also viewed as incentives.

Some students cited random, surprise quizzes as disincentives. Specifically, if the instructor threatened a quiz, but then proceeded to not administer it some students chose not to read at future occasions. Students also identified a lack of enthusiasm on the part of the instructor as a reason not to read. Finally, if instructors spent the majority of a class session reviewing the readings, the students felt that completing the readings before class was unnecessary.

Other disincentives included being called upon in class and the potentially resulting embarrassment of not having read the assignments. Students also cited a possibly lower grade on short quizzes as a disincentive for not completing their reading assignments. These might better be classified as negative incentives; these strategies motivated students to complete reading assignments but also presented a potential negative penalty to the student for disregarding the readings. Overall, students were in agreement that certain incentives or negative incentives could provide encouragement or motivation to complete reading assignments given their busy schedules (2FG), especially during certain times of the semester (2FG). Students cited very specific disincentives, often directly related to instructor behaviors and teaching strategies, which influenced their decisions to not complete assigned readings.

In these self-reporting situations, several problems might occur, as identified by Bong (1996). Students might be tempted to justify their behavior in the eyes of the interviewer, rather

than volunteer their true thoughts and opinions. This could be a possible reason why several different reasons were brought up as to why they preferred not to read: some stated they did not read if the material was not relevant in their eyes, whereas at other times the fact that their instructor reviewed the materials in great detail in class was a deterrent.

However, the discussions were not conclusive on whether the beginning or the end of the semester were more hectic and therefore ideal for emphasizing incentives versus disincentives in stimulating reading compliance. Students indicated a wide variety of times throughout the semester that were very busy yet in many cases these times differed not on their academic calendars but on the types of student social activities they engaged in.

Propositions for incentive-disincentive. The following propositions were developed based on the discussion associated with incentives and disincentives of reading compliance:

1. The impact of incentives and negative incentives will be higher than the impact of disincentives to increase reading compliance.

In self-rationing literature, incentives can help alter behavior, particularly with the use of certain strategies such as pre-commitment (Hoch & Loewenstein, 1991). Therefore, an additional proposition for future research would also be supported with the self-rationing literature:

2. Pre-commitment will incentivize and lead to increase in reading compliance.

Construct 3: Procrastination. Focus group discussions also included questions that inquired whether students procrastinated in completing reading assignments (See Figure 4). There appeared to be wide variation in the level of procrastination. For instance, some students commented that completing reading assignments 15 minutes (2FG) before class was not unusual while others indicated that they usually completed their reading assignments the night before class (2FG). The participants felt that the level or amount of procrastination was dependent upon several factors. For instance, instructors not building on assigned readings in class encouraged students to procrastinate or not comply.

The timing of the semester also contributed as a factor (2FG). However, opinions varied on whether earlier or later in the semester meant more or less procrastination. The students are enrolled at a university with a plethora of student organizations, each holding events throughout the semester. Depending on which organization a student is involved did seem to impact reading compliance decisions, but no common time period in the semester emerged that negatively impacted reading compliance for the majority of students. The respondents also felt that the instructor's personality (2FG); shorter reading assignments and easy access to the book in library reserve (2FG) reduced procrastination and enhanced compliance. Interestingly, students felt that if they had a busy schedule (2FG) it seemed to reduce their tendency to procrastinate on completing their reading assignments.

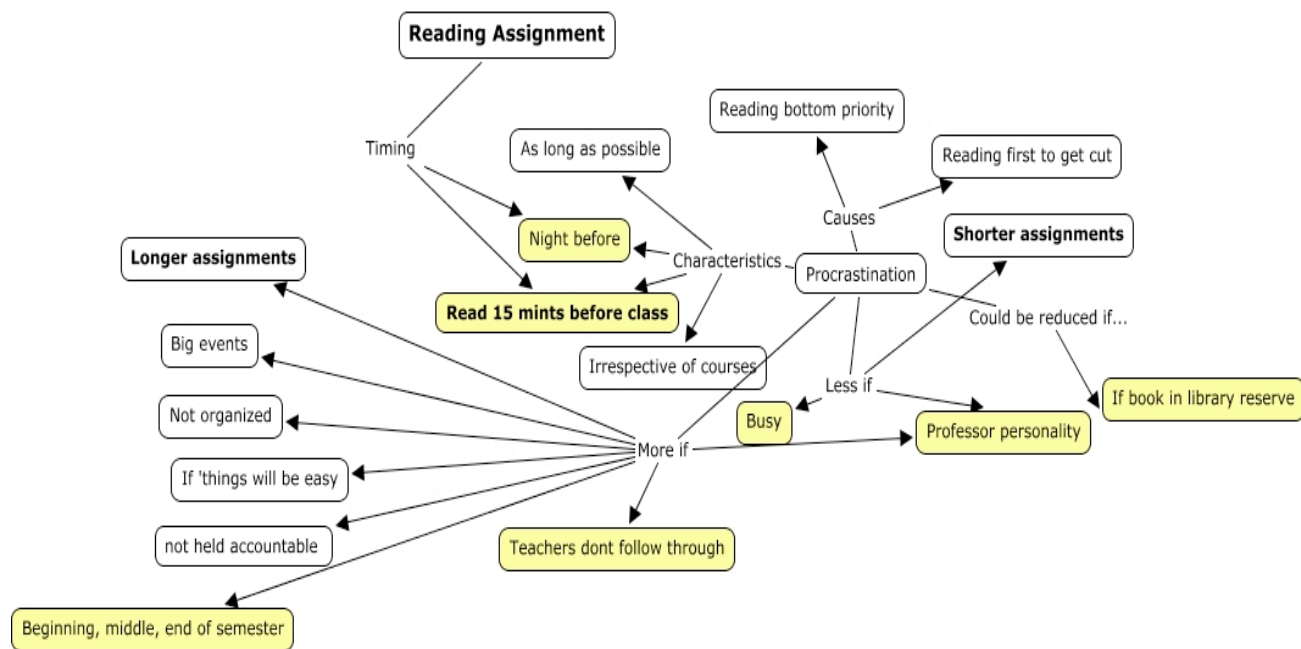


Figure 4. Procrastination Concept Map.

Propositions for procrastination. The discussion results and interpretations led us to the following propositions:

1. Procrastination will increase around major non-academic events on campus.
2. High academic and non-academic load will reduce procrastination.
3. Conveniently accessible reading materials will reduce procrastination.

Ariely & Wertenbroch (2002) argue that self imposed deadlines, especially those that are costly, will likely not be most effective. Imposing reading compliance deadlines around major non-academic events can be perceived as costly. Therefore, we expect higher procrastination around those events. Similarly, Ariely & Wertenbroch (2002) argue that externally imposed deadlines are far more effective in maximizing self-control. We therefore expect that higher loads in both academic and non-academic activities will reduce procrastination, as these pre-commitments will be largely externally imposed deadlines. The third proposition is consistent with earlier discussion on perceived reduction in spatial dimension through the arguments of the construal level theory (Trope & Liberman, 2010). We expect lower procrastination in lower perceived spatial distance, that is, of the reading material availability.

Construct 4: Support and time management. Finally, participants were questioned on whether they would like support to help them complete their reading assignments and to help them learn how to manage time effectively for this purpose (See Figure 5). While some students felt that support might not make a difference, others felt that reminders from the instructor or teaching assistant could help them improve their reading compliance. Most agreed that the time required to read their assignments was usually not too long, normally in the range of an hour or so. However, this would probably be different depending upon the student's major. Several students also felt that time management was a "self learned" process. That said, they indicated they would be receptive to reminders, though only via email, and not through social networks (such as Facebook) or via text messages. Printed materials that provided support to improve reading compliance were also identified as possibly being helpful to the students, such as how to

effectively skim long passages. Furthermore, the students felt that they found the library to be good place to read. Overall, while some students indicated that support to improve reading abilities would impact compliance, others indicated that such support might not be helpful.

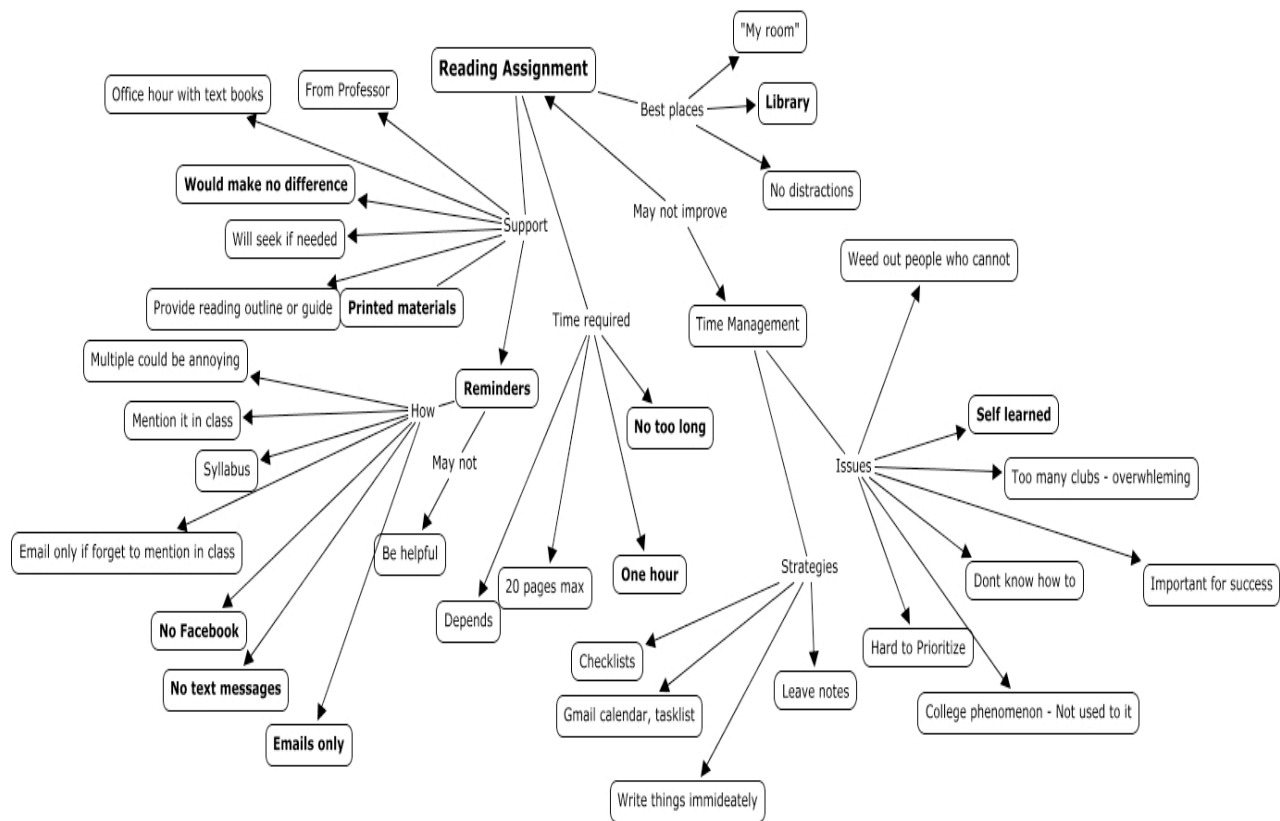


Figure 5. Reading Support Concept Map.

Propositions for Support and Time Management. The following two propositions were developed from the resulting data and information.

1. Increased support to improve reading abilities will have a positive impact on reading compliance;
2. Just-in-time reading reminders provided by the professor will have a positive impact on reading compliance.

As discussed earlier, construal level theory argues that perceived closeness of tasks to be completed will increase the perception of concreteness (Trope & Liberman, 2010). We propose that improved abilities will increase concreteness of reading compliance, that is, bring a closer understanding of the process of completing the task (reading compliance). The second hypothesis for this construct is supported by both construal level theory and self rationing as it not only relates to spatial closeness (Trope & Liberman, 2010) but also to either self-imposed or externally imposed deadlines (Ariely & Wertenbroch (2002).

V. Discussion.

The purpose of this study was to investigate factors that impact students' decisions towards reading compliance. In particular, we were interested in the effects of self-rationing effects of time and the construal effects related to the perceived benefits of reading compliance. We looked at the effect of available time in the students' decision-making process and the role of incentives and disincentives in getting students to comply with their reading assignments.

Qualitative results of this study suggest that several varied factors impact students' decision to complete reading assignments. While several of these factors were related to the course and the instructors, others were dependent upon the students themselves. For instance, students were of the view that if instructors did not follow through on reading assignments there was less motivation for them to complete their assignments. Prior research also emphasized the role of graded reading assignments, class discussions, and participation grades in reading compliance (Janick-Buckner, 1997; Gross Davis, 1999; Monaco & Martin, 2007). On the other hand, students stated that if the readings were not engaging they were less likely to complete them. There were indications that students preferred certain types of readings to others; there was a slightly higher preference for 'non-text book' readings such as case studies and articles as compared to textbook readings.

Students in the focus group discussions felt that both incentives and negative incentives could motivate them to complete reading assignments, while disincentives led to students not completing the readings. Several suggestions came up, such as participation points as examples of incentives, and quizzes and being called upon in class as examples of negative incentives. Earlier research found that surprise quizzes could be effective in emphasizing students' responsibility and thereby be effective in ensuring that assignments are completed (Sappington, Kinsey, & Munsayac, 2002). Other incentives that could be incorporated relate to the students' understanding of the benefits of reading assignments.

Our analysis of the qualitative data suggests that students appreciate short-term benefits more so than longer-term benefits, which are less clear to them. Our findings are supported by earlier research that shows the importance of illustrating the practical benefits of reading preparation (Sappington, Kinsey, & Munsayac, 2002). These findings are also consistent with the construal effects that may be acting upon students. If students perceive that benefits of reading assignments are too far in the distant future they may not find it justifiable to place a priority on those reading assignments and therefore may decide to allocate time towards other competing demands on their time (Trope & Liberman, 2010).

The purpose of our study was also to investigate whether the availability of time and the subjects' ability to self-ration their time had an impact on their reading compliance behavior. Our analysis suggests that students feel the pressure of time, particularly when deciding to complete reading assignments. Several factors were cited by the students: the multitude of academic and non-academic activities and the relatively low priority placed on reading assignments both contribute to less time being allocated towards completing reading assignments. Students also noted that they were prone to procrastination, particularly in view of the fact that reading assignments was relatively low on their priority list. While some students suggested that time management was a self-learned skill, others agreed that students could seek assistance to learn how to enhance their reading compliance.

Several other factors were identified in our data analysis of student discussions that impact reading compliance. Students mentioned that certain types of readings, such as case

studies and articles, were preferred over textbooks. And some of them felt that the instructor's actions impacted students' reading compliance, such as the instructor's policy of sharing slides, following through on reading assignments and generating interest about the reading assignments among the students.

V. Limitations and Future Research.

The purpose of this research was to assess factors that influence reading compliance among undergraduate students. This study chose a constructivist view and therefore adopted a qualitative approach to assess these factors influencing reading compliance. While such an approach allowed us to connect seemingly disparate constructs to reading compliance, we also note certain limitations of this study. The number of focus groups was small and the number of student responses was small as well. Furthermore, students self-reported their reasoning for reading compliance. Even though the purpose of this research was not to generalize, we note that these results cannot be generalized beyond the scope of the study. In fact, research propositions should be leveraged to either enhance them and/or investigate and verify them.

Based on the focus groups, as well as prior research, certain strategies can be further investigated to assess whether they would improve reading compliance. The strategy mentioned most by students in this research was the use of small, low-stakes quizzes. Although quizzing appeared to be a motivating factor, the use of surprise quizzes was viewed negatively by some students and cited as a disincentive to complete class readings. Also, prior research presented earlier hinted at a relationship between surprise quizzes and lower instructor ratings by students (Sappington et. al., 2002). Future research could investigate the effectiveness of leveraging weekly reading quizzes, or other low-stakes assignments such as a discussion question that is worth a very small number of points if answered correctly. While connecting a small number of points to assignments related to reading led to positive reading behavior, students also cited non-graded activities, such as in-class discussion and answering questions via clicker response systems as motivating factors to read. These, and additional forms of active learning that build upon or gauge understanding of reading assignments, are worth investigating as strategies to improve reading compliance.

Students also identified specific experiences that acted as disincentives to read course materials. Several of these focused on instructor behaviors, such as reviewing the readings in detail in the classroom, often in the form of a lecture. Some students also neglected to read assignments if the instructor appeared not interested in the course material in their eyes. Another common theme revolved around the specific assigned reading assignments. Students specifically identified relative, applicable readings as motivating factors to complete reading assignments. Examples included news articles and websites, journal articles and case studies. Students still understood and valued a course textbook, so long as it was relatively up-to-date and included practical applications of the content presented.

This study used the lenses of self-ratification theory (Wertenbroch, 2001; McClelland & Cameron (2011) and construal level theory (Loewenstein et al., 2003; Liberman et al., 2007) to examine reading compliance. Future research could investigate these theories as a way to understand and then enhance reading compliance among students, specifically by illustrating the long-term benefits of completing course readings. Aside from immediate benefits of reading, such as doing well on a quiz, preparing for an interview was the only somewhat long-term benefit identified by students. Future research could also investigate the long-term importance of

course readings, such as being more knowledgeable, having a deeper understanding of a topic, the ability to draw connections between seemingly disparate topics and the ability to apply a wide range of knowledge to existing challenges. Our discussions indicated that even though students felt that reading of assigned materials did not usually take too long to complete (at least for this study sample) the students left the readings sometimes until right before the class. Providing a perspective of time rationing, and the awareness of actual time needed to complete assigned readings may encourage students to complete reading assignments sooner than later. Furthermore, linking long-term benefits of reading, such as vocabulary development and analytical thinking (Cunningham & Stanovich, 2001) could also be argued to be a benefit. Given the relevance and significance of the impact of this line of research, we believe future studies can make meaningful contributions in improving students' reading compliance and overall academic accomplishments.

VI. Conclusion.

In summary, the results of the analysis of the focus group discussions of undergraduate students suggest that several factors impact students' reading compliance decisions. There seems to be some evidence that students may not be self-rationing their time effectively. Moreover, the emphasis placed on short-term benefits of reading compliance and their limited understanding of the long term benefits suggest that students may be experiencing a construal effect in completing their readings. We believe that it may be worthwhile for future investigations to continue exploring these theoretical explanations of student's reading compliance decisions. A simplified view would be to categorize these factors into those pertaining to students versus those related to their environments and to their instructors. However, there were also indications of some complex interactions among these categories that warrant further investigation. Based on our analyses we presented several propositions for future research.

This study was qualitative in nature and its purpose was to gain an improved understanding of the factors influencing reading compliance decisions among undergraduate students. We recommend that future research investigate more conclusive verification of such factors. We also believe that the findings of this research may guide faculty development efforts around reading compliance. Over the last five years, the teaching center at the researchers' university is seeing an increased interest in reading compliance, with faculty often commenting that a majority of students come to class unprepared for activities based on course readings. Other universities likely would be facing similar issues related to students' reading compliance. By leveraging some of the strategies discovered through the focus groups discussions and discussed in the literature on the topic, such as using quizzes identifying relevant and recent readings and working to incorporate (but not repeat) the reading material in lectures (Connor-Greene, 2000; Sappington et al., 2002; Kouyoumdjian, 2004; Johnson & Kiviniemi, 2009), teaching centers can better guide faculty in developing strategies to enhance student reading compliance. We believe efforts can be adopted to develop strategies that will improve reading compliance among undergraduate students using novel concepts presented here that focus on available time and an appreciation of long-term benefits.

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Book Review

Learner-Centered Teaching: Five Key Changes to Practice

Anna W.E. Fahraeus¹

Citation: Weimar, M. (2013) *Learner-Centered Teaching: Five Key Changes to Practice*. 2nd ed. San Francisco: Jossey-Bass. ISBN: 9781118119280.

Publisher description: In this new edition of the classic work, one of the nation's most highly regarded authorities on effective college teaching offers a comprehensive introduction to the topic of learner-centered teaching in the college and university classroom, including the most up-to-date examples of practice in action from a variety of disciplines, an entirely new chapter on the research support for learner-centered approaches, and a more in-depth discussion of how students' developmental issues impact the effectiveness of learner-centered teaching. *Learner-Centered Teaching* shows how to tie teaching and curriculum to the process and objectives of learning rather than to the content delivery alone.

In 1991, Jonathan W. Zophy wrote a short article for the Teachings Innovations column in *Perspectives* where he repeated some of the things he had written about a decade earlier in *The History Teacher*. In his article, he talks about the resistance among faculty in making the move from a teacher-centered approach that views students as passive recipients of knowledge to a learner-centered approach that views students as active learners and classrooms as marked by somewhat chaotic discussions. This idealized view of an egalitarian learning environment that de-emphasizes the role of the teacher and stresses processes over product as students take control over their own learning is, however, only tangentially similar to Maryellen Weimar's (2002) book-length manifesto *Learner-Centered Teaching: Five Key Changes to Practice*. She presented a method that is much more complex than Zophy's advocacy of a return to Socratic teaching. Where Zophy's work seems today to be idealistic and hard to implement, Weimar's vision seems fairly realistic. She set out a theory and a methodology that targeted the key issues in the classroom that needed to change to make the ideal of creating classrooms that support student self-responsibility and learning more accessible.

One of the central points in Weimar's (2013) revised version of her book, however, is that things have not changed. Teaching is still often focused on what the teacher knows and on unilateral transmission followed by recitation and evaluation rather than on the facilitation of learning (p. 65). She states that classroom observation shows that teachers continue to be lecture-focused even after attending workshops on learner-centered methods (p. 67). So, one of the things she does in the updated book is to ask why teachers are resistant to change in the classroom. Here, her conclusions run surprisingly – or perhaps not so surprisingly – parallel with the same observations made by Zophy (1991): teachers want to show what they know, there is too much content to cover, using new methods is initially awkward and uncomfortable, and stepping out from behind the lectern often increases the teacher's sense of vulnerability because teaching becomes less scripted (pp. 70-71).

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Weimar then proceeds to set out seven principles that should guide the implementation of learner-centered teaching. Below they are set out with a summary of her clarifications:

1. Teachers let students do more learning tasks, i.e. let them summarize, draw conclusions, pin point difficult areas in the reading, etc.
2. Teachers do less telling, i.e. get better at asking questions.
3. Teachers do instructional design work more carefully, i.e. create more in-class assignments that help students apply cognitive skills to relevant material.
4. Faculty more explicitly model how experts learn, i.e. are willing to share their own learning process and thought process in answering unexpected questions.
5. Faculty encourage students to learn from and with each other (self-explanatory).
6. Faculty and students work to create climates for learning. This is less fuzzy than it sounds. It is about e.g. giving students options so that they accept responsibility for their learning.
7. Faculty use evaluation to promote learning, i.e. use peer assessment and feedback as a point of departure for a discussion.

These principles are linked both to her definition of what learner-centered teaching is and the five key practices that need to change. Her definition is set forth in five points at the beginning of the book: it engages students in learning, i.e. does not allow them to be passive; it motivates them by sharing some of the control over what happens in the classroom and what assignments they do; it encourages collaboration; it includes specific learning skills instruction and promotes student reflection on how and what they learn (p. 15). Getting students to think about what they are reading is something we all want. Each point is, however, interwoven with the others. Getting them to think about what and how they read is connected to getting students to be active since the aim in learner-centered teaching is to make them independent confident learners even outside the classroom (p. 9). In order for this to happen, they need to learn how to reflect on how they learn as well as on what they are learning. In order to do this, they need to learn about cognitive skills. It is a win-win situation if we making learning skills explicit in the classroom. As students come to understand how they learn, it makes learning skills consciously accessible to them. This is Weimar's theory.

The five key practices are well-known and have not changed since the 2002 edition. What has changed is that the implementation chapter 'Making Learner-Centered Teaching Work' has been removed and while some information has been put into individual implementation sections, Weimar has left most of it out in favor of making a plug for her 2010 book *Inspired College Teaching* (Jossey-Bass). For those unfamiliar with her earlier work, the key practices that need to change are: the role of the teacher towards facilitation of learning rather than transmission of knowledge; a shift in the balance of power in the classroom; faculty attitudes towards content; facilitation of increased student responsibility for learning, faculty attitudes towards the purposes and processes of evaluation.

Two of these areas are more provocative and tend to raise more hackles among faculty than the others: the issue of content and the idea of giving students more power. One of the core ideas in Weimar's learner-centered teaching philosophy is that a university education is not only about learning a specific area of expertise. That is important but there is another primary focus: learning to learn. A successful teacher makes herself (or himself) redundant. That's a scary proposition to accept at face value in a time when university administrations are increasing in size and teachers and departments must justify their existence, let alone the need for more funding and more time in the classroom. However, it misses Weimar's point. She is not saying

that students are independent learners but that they need to become more independent and that teachers have the key role in making that happen.

Weimar's manner of presenting why faculty attitudes towards content needs to change is candid but also evidence that she knows about negotiation technique. She begins by acknowledging that, "Coverage does not necessarily equal learning, something most teachers recognize" (p. 115). This is an affirmation. She then makes the observation that most of us have heard or said variations of, "Students may fail to learn or understand what we have covered, but that is their problem – not ours." This is a second affirmation, but then she states boldly, "Less often do we confront ourselves with the fact that when little or no learning results from teaching, teaching serves little or no purpose" (p. 116). This deflates the whole support of the faculty position. What makes it work is that she does not argue that teachers are wrong; it is the responsibility of students to learn. However, she circumvents the traditional question of covering content by advocating a change in attitude toward content based on viewing it as one of wheels on a two-wheeled cart. Both wheels have to function for the student's education to be successful. She states that, "learner-centered teachers opt for those instructional strategies that promote deep and lasting learning" (p. 123). They are willing to cover less in order to ensure that students remember more and know how to apply what they know.

Weimar points out that changing the balance of power in the classroom is central because research does not support education programs where teachers have all the control over what and how students learn. She cites Singham's (2007) article, "Death to the Syllabus" in *Liberal Education*: "a detailed, legalistic syllabus is diametrically opposed to what makes students want to learn. There is vast research literature on the topic of motivation to learn, and one finding screams out loud and clear: controlling environments have been shown consistently to *reduce* people's interest in whatever they are doing" (p. 90). Thankfully, Weimar does not leave the reader to wonder how power can be shared; she sets out clear examples of how to share decisions about activities, assignments, course policy, content, and evaluation. She also highlights that it is not about ceding all control to students. She states openly that that would be detrimental. She admits that it is a difficult issue to decide how much control to give students and that different students may need different amounts of control to feel motivated (p. 109). Even though she has cited research in Chapter Two that states that students do better in terms of grades and are more motivated by being allowed to make some of the decisions, she also says that there is not enough research and that principles and guidelines are needed to "establish professional norms and standards" (p. 109).

Chapter Two is without a doubt the biggest change and addition in this new edition of *Learner-Centered Teaching*. Weimar encourages faculty to read Paul Pintrich's 2003 review in the *Journal of Educational Psychology* of research on motivation because student passivity is a well-known and serious problem and because traditional methods of teaching have now been proven to exacerbate the problem (p. 37). She also recommends two book-length reviews of active learning: Michael Prince's (2004) *Journal of Engineering Education* and Joel Michael's (2006) *Advances in Physiology Education*. She recommends Prince for clarity and his separation of collaborative and cooperative learning from problem-based learning methods. She promotes Michael in part because he focuses on reflective learning and because he distills five principles that support active learning:

1. Learning involves the active construction of meaning
2. Learning facts and learning to do are two different processes—which explains why students can seem to understand but still fail to apply theory

3. Students need practice in extrapolation and transfer of knowledge
4. Learning with others is more effective than learning alone
5. Meaningful learning is facilitated by articulating explanations to one's self, peers, or teachers (pp. 40-41)

As a whole, this chapter is devoted to research about learner-centered methods and the mounting evidence that it has very practical and beneficial effects for students. I have chosen to focus on the reviews Weimar specifically recommends but there are many other studies in the chapter. She begins by stating openly, however, that no comprehensive overview is possible and that the nature of the research is qualitative so no quantitative analyses are possible. She focuses on three main areas of research: deep and surface learning, faculty orientations to teaching, and self-regulated learning. Across the board, the results support a learner-centered approach. The studies have control groups which use traditional methods and the data produced is not anecdotal or based on one or two classes but on much larger groups of students. She looks at research about what makes the methods work (design features), learning outcomes that are affected, reviews how the methods are tested, and the kinds of evidence available. Her point is that research about effectiveness should guide teaching and that it can motivate change if faculty are exposed to the research. This chapter alone is worth the cost of the book.

One other concrete example of the findings in this chapter is the efficacy of three different group structures or methods. These results are significant because most teachers will supplement their lectures with some type of group assignment, and it seems to matter which type is chosen. The research states that PBL or Problem-based learning does not translate into better exams, but it does develop positive attitudes and foster deep learning; i.e., it helps students retain knowledge (pp. 44-45). POGIL or Process-Oriented Guided Inquiry Learning does increase overall scores, the rate of failing students drops, and they do better on exams. It also reduces absenteeism and motivates students to be active in class (p. 45). Peer-Led Team Learning increases grades and the research indicates that students achieve higher results on the same exams that are administered to students taught with more traditional lectures (p. 46).

Anyone who opens Weimar's book will quickly realize that I have not followed her structure in this review. I have instead wanted to highlight some of the key issues that she deals with and the changes she has made to the 2013 edition. The disposition in the book is that she begins by looking at her own journey in becoming a learner-centered teaching advocate. She describes it as a gradual process. Chapter One continues by looking at the theories behind the approach: attribution theory, radical and critical pedagogy, feminist pedagogy, constructivism and transformative learning. All the theories are significant but as she sets out some of the principles of attribution theory, the reader is reminded that teachers can build self-efficacy in students because it is an acquired rather than an innate ability but that admitting a lack of knowledge is a position of vulnerability which is why comparisons with others should be discouraged and student ability to control some aspects of their learning should be reinforced (p. 17).

The closest Weimar gets to being vague is at the end of Chapter Three when she talks about when and how to intervene. She argues that because it is best to let students arrive at their own conclusions that sometimes teachers need to let them produce poor results. The case in point that she uses is a group assignment where students waste time reading a memo silently and then passing it to the next member in the group. She discusses how she thought about intervening but didn't because she did not want to tell them what they were doing wrong. I disagree with how she handled it but to her credit she does not appear satisfied with it herself either and states

bluntly that she does not have the answers for when and how to intervene (p. 86). She does state that telling students what they are doing wrong might be appropriate occasionally but that it makes them reliant on the teacher. True enough, but I do not think failing to help them see what they are doing wrong is a better option, so perhaps she is right that there is no clear answer, and each teacher has to decide in each situation what is the lesser of two evils.

After the research and the key changes, Chapter Eight deals with 'Implementing the Learner-Centered Approach.' Weimar talks about why and how students and faculty resist non-traditional teaching methods and how to overcome their resistance. The main key is frequent and explicit communication and encouragement as well as asking for feedback but, and this is important, the feedback questions should focus on how they are experiencing their learning rather than on the teacher. This is compelling because university administrations are keen on student evaluations and quality control, but Weimar's work and the research that backs up learner-centered approaches implicitly suggests that it is important that the questions that are asked focus on how students experience the learning process rather than on the teachers as such. Concepts such as self-regulation and choices and their link to student responsibility for learning come back here as foundational principles that mean that teachers need not accept all the criticism as valid. My own experience is that students are surprisingly honest about their own input and its effect on their results. Weimar suggests talking directly to students rather than just eliciting written feedback. She suggests that the appropriate attitude for faculty is to approach their own teaching as a "work in progress, one that you expect will evolve and change over time and in response to student feedback" rather than as something done once and that is being evaluated as a finished product (p. 211). Dealing with faculty resistance is about being armed with knowledge about the research that backs up the methods you choose to use.

Chapter Nine focuses on developmental psychology and its implications for university teaching. Weimar reviews what is known, e.g. that students do not mature at the same pace and that sometimes there are set backs: "Sometimes progress is slow and steady, sometimes there's a growth spurt, and sometimes there's no sign of movement. These variable rates of growth can be seen in individual students as well as in the class a collective entity" (p. 219). Why is this important to know? One of the benefits of considering students in this light consciously is that it supports the idea of sharing power gradually with students. Weimar cites "Teaching Learners to be Self-Directed" by Grow (1991) which describes four stages in young adult growth towards independence:

1. Students are dependent and need explicit instruction and coaching to move forward.
2. Students are interested and begin to set goals for themselves. Teacher enthusiasm is motivating to these students.
3. Students are involved and begin to see themselves as participating in their own learning process. They should be asked for progress reports to support their own goal-setting.
4. Students are self-directed. They can set their own goals and standards that they want to meet.

These stages are recognizable to anyone who has been teaching for a few years and thinking about how students are different and approach learning differently. To connect the differences to developmental psychology supports teacher patience and the need for teachers to plan assignments and activities that take the different stages into account. Weimar discusses the use of a progressive design model in basic tasks, targeting learning skills more systematically, and considering the implications of student developmental psychology of students for overall

curriculum design. At the close of this chapter, which is the final chapter in the book, she addresses faculty who are new to learner-centered approaches. She gives concrete advice: to begin with activities or assignments where the chance of success is high; to start modestly; and to balance student needs against your own. The book includes two appendices. The first is material from Weimar's own Communication class and supplemental material that can work to guide a teacher through the construction of her course including activities, participation policies, grades, etc. The second is a resource section for developing learning skills.

I have aimed to give a presentation that highlights some of the content in the context of the current climate of increased emphasis on quality and justification of what we do and how we do it. I have, therefore, wanted to give a taste of some of the findings that have direct implications for teaching. The language is very accessible while the presentation remains scholarly in terms of support. The plethora of concrete examples serves well to illustrate the theory and principles she presents. Despite the number of newer books on the learner-centered approach, Weimar's book will remain a valuable contribution to the practice of teaching and the added section on research and its implications give the second edition additional value as an initial summary resource for arguments that support the learner-centered approach.

Mission

Founded in 2001, the Journal of the Scholarship of Teaching and Learning (JoSoTL) is a forum for the dissemination of the Scholarship of Teaching and Learning in higher education for the community of teacher-scholars. Our peer reviewed Journal promotes SoTL investigations that are theory-based and supported by evidence. JoSoTL's objective is to publish articles that promote effective practices in teaching and learning and add to the knowledge base.

The themes of the Journal reflect the breadth of interest in the pedagogy forum. The themes of articles include:

1. Data-driven studies: formal research projects with appropriate statistical analysis, formal hypotheses and their testing, etc. These studies are either with a quantitative or qualitative emphasis and authors should indicate the appropriate domain. Acceptable articles establish a research rigor that leads to significant new understanding in pedagogy
2. Reviews: Literature reviews illuminating new relationships and understanding, meta-analysis, analytical and integrated reviews, etc.
3. Case studies: To be considered a case study, a manuscript should focus on an intense analysis of a specific teaching situation or problem that led to a solution. Case studies should have the following components: description of the teaching situation or problem, solution or solutions attempted, quantitative or qualitative analysis of the effectiveness of the solution, reflection on the implications and possible generalization to other settings or populations
4. Invited Comments: Comments about previously published manuscripts
5. Invited Essays: Discussion of a topic not tied to a previously published manuscript

Submissions

Authors are encouraged to submit work in one of the following categories:

- Data-driven studies: formal research projects with appropriate statistical analysis, formal hypotheses and their testing, etc. These studies are either with a quantitative or qualitative emphasis and authors should indicate the appropriate domain. Acceptable articles establish a research rigor that leads to significant new understanding in pedagogy.
- Reviews: Literature reviews illuminating new relationships and understanding, meta- analysis, analytical and integrated reviews, etc.
- Case studies: To be considered a case study, a manuscript should focus on an intense analysis of a specific teaching situation or problem that led to a solution. Case studies should have the following components: description of the teaching situation or problem, solution or solutions attempted, quantitative or qualitative analysis of the effectiveness of the solution, reflection on the implications and possible generalization to other settings or populations.
- Invited Comments: Comments about previously published manuscripts
- Invited Essays: Discussion of a topic not tied to a previously published manuscript.

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Style Sheet for the *Journal of the Scholarship of Teaching and Learning*

John Dewey¹ and Marie Curie²

Abstract: This paper provides the style sheet for the Journal of the Scholarship of Teaching and Learning. Manuscripts submitted for publication should adhere to these guidelines.

Keywords: radiation, metacognition, identity theory, constructivism, educational philosophy.

I. General Guidelines for the Manuscript.

Submissions should be double-spaced. The final manuscript should be prepared in 12-point, Times New Roman, and single-spaced. Page setup should be set for US Letter. All margins should be 1 inch. The text should be fully left- and right-justified. The title (in 16 point bold) and author's name (in 12 pt. bold) should be at the top of the first page. The author's name should be followed by a footnote reference that provides the author's institutional affiliation and contact information³. The abstract should be indented 0.5" left and right from the margins, and should be in italics.

Except the first paragraph in a section subsequent paragraphs should have a 0.5" first line indent. Use only one space after the period of a sentence (word processors automatically adjust for the additional character spacing between sentences). The keywords should be formatted identically to the abstract with one line space between the abstract and the keywords. Authors should use keywords that are helpful in the description of their articles. Common words found in the journal name or their title article are not helpful.

Pages should be unnumbered since they will be entered by the Journal editorial staff. We will also insert a header on the first page of the article, as above.

References should be incorporated in the text as authors name and date of publication (Coffin, 1993), with a reference section at the end of the manuscript (see below for the desired format for the references). Titles of articles should be included in the references in sentence case. Unless instructed otherwise in this Style Sheet, please use APA style formatting. Footnotes should incorporate material that is relevant, but not in the main text.

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Major section headings should be flush-left, bold-faced, and Roman numeral numbered. Major section headings should have one-line space before and after. The first paragraph(s) of the article do not require a major heading.

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Sub-section headings should also be flush-left, in italics, and alphabetically numbered. Sub-section headings should have a one-line space before and after. Sub-sub-sections should appear at the beginning of a paragraph (i.e., with an 0.5" indent, followed immediately by the text of the sub-sub-section), with the heading also in italics.

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Tables and figures should be inserted in the text where the author believes they best fit. They may be moved around a little to better correspond to the space requirements of the Journal. If necessary, tables and figures may occupy an entire page to ensure readability and may be in either portrait or landscape orientation. Insofar as possible, tables should fit onto a single page. All tables and figures should be germane to the paper. Tables should be labeled as follows with the title at the beginning (in bold), with data entries single-spaced, and numbered. Column labels should be half-line spacing above data.

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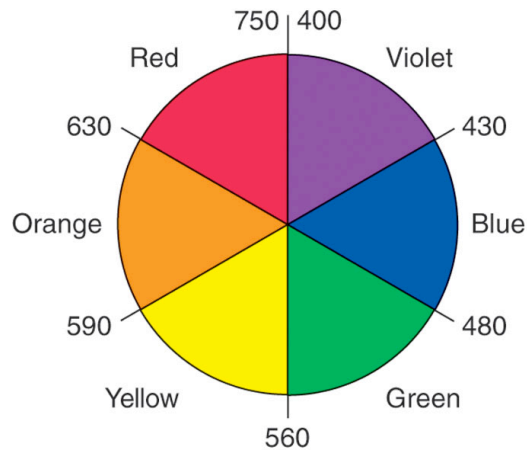


Figure 1. Color wheel with wavelengths indicated in millimicrons. Opposite colors are complementary.

Acknowledgements

Acknowledgements should identify grants or other financial support for this research by agency (source) and number (if appropriate). You may also acknowledge colleagues that have played a significant role in this research.

Appendix

Please insert any appendices after the acknowledgments. If more than one appendix, please change the area heading to **Appendices**. They should be labeled as follows:

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