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BUILDING A FOUNDATION FOR GOAL-ATTAINMENT AND PROBLEM-SOLVING IN
INTERDISCIPLINARY STUDIES: REIMAGINING WEB-BASED CORE CURRICULUM
THROUGH A CLASSICAL LENS

by

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ABSTRACT

The core curriculum of interdisciplinary studies undergraduate programs represents interdisciplinarity as a consciously applied process, whether individually or collaboratively, of drawing and integrating insights from various disciplinary perspectives toward complex problem-solving and innovation. At the front-end of these programs students are often introduced to interdisciplinarity through terminology, metaphors, concepts, and context that are intended to familiarize them with the process. This initiation usually precedes what will ultimately entail a limited number of upper-division courses within the several disciplines or areas that will encompass a unique plan of study characterized by its breadth. The philosophy underlying current pedagogy in interdisciplinary studies appears in many ways to mirror the cognitive habitudes and socio-cultural zeitgeist that have emerged with our increasing connectedness with and reliance on digital technology.

This dissertation proposes that through a revised front-end core curriculum revisiting both classical and Ramist pedagogy, and perhaps reframing how we think about interdisciplinarity itself, we need not sacrifice depth for breadth. Rather, we may be able to encourage a broadly applicable self-directed goal-centered mindset in our students that places equal emphasis on both breadth *and depth* in terms of deliberate knowledge acquisition. Through adapting the initial phases of a cognitivist instructional design model provisional week-by-week, curricular content is presented to illustrate how this endeavor might be realized within the context of interdisciplinary studies or like programs. This core curricular model is intended as an alternative well-suited to both the fully online and mixed mode format as well as the diversity of students within the typical undergraduate interdisciplinary studies program.

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I would like to thank my loving wife Susan for her boundless patience and indulgence throughout this process. I would also like to thank everyone else that has helped me along the way – by which I mean the *whole* way.

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LIST OF ABBREVIATIONS

ADDIE   Analyze, Design, Develop, Implement, Evaluate (instructional design model)

ASSURE   Analyze Learners, State Objectives, Select Media and Materials, Utilize Media and Materials, Require Learner Performance, Evaluate and Revise (instructional design model)

ASU   Arizona State University

BIS   Interdisciplinary Studies (ASU, UVa)

CDL   Center for Distributed Learning (UCF)

CMS   course management system or software

CSOF   Campus Student Organic Farm (Oakland)

FTIC   First Time in College

GEP   General Education Program

GTA   Graduate Teaching Assistant

IDS   Interdisciplinary Studies

IDSC   Interdisciplinary Studies (Auburn)

INTS   Interdisciplinary Studies (UT Arlington)

IQ   intelligence quotient

ISF   Interdisciplinary Studies Field (UC Berkeley)

LBS   Liberal Studies (Oakland)

LMS   learning management systems

LS   Liberal Studies

NAEP   National Assessment of Educational Progress

NEA   National Endowment for the Arts

NSSE   National Survey of Student Engagement

NYIT   New York Institute of Technology

PCA   Presbyterian Church in America

SARC   Student Academic Resource Center (UCF)

SF State   San Francisco State University

TBL   Team-Based Learning

UC Berkeley   University of California, Berkeley

UCF   University of Central Florida

UT Arlington University of Texas at Arlington

UVa   University of Virginia

VLE   virtual learning environment

CHAPTER 1: INTRODUCTION

Interdisciplinarity is a variously defined concept and process that involves drawing insights from more than one discipline and integrating those insights in some way or to some end, whether subjectively or objectively. While interdisciplinary pedagogy is becoming increasingly typical in higher education, interdisciplinary studies programs themselves may actually be on the decline (DeZure, 2012, pp. 374-375; Newell, 2012, p. 360, 363; Repko et al., 2014, p. 3). Several factors appear to be contributing to this possible decline. First, the wider arena of disciplines and programs of study are embracing interdisciplinarity and interdisciplinary research for themselves (Newell, 2012, p. 363). Second, interdisciplinary studies programs seem to take the brunt of criticism levied against interdisciplinarity itself, namely, that, in practice, it lacks depth, lacks consistency in both understanding and application, and that it "runs against the grain of Western thought…" (pp. 367-368). Thirdly, interdisciplinary studies programs are apt to be dismissed as mere fads or attempts to revitalize or legitimate liberal studies programs (pp. 361-362).

Moreover, in the United States today there seems to be growing concern that our Internet- and digital technology-immersed young people are actually falling behind both within and across the disciplines. Even as the Internet was experiencing its genesis, essayist Sven Birkerts said, "That our educational systems are in decline; that our students are less and less able to read and comprehend their required texts, and that their aptitude scores are falling like the index of consumer confidence" (Birkerts, 1994). An array of more recent studies serves to illustrate the reality of these apparently growing educational deficits among young Americans. Organizations such as the National Endowment for the Arts (NEA), the National Assessment of Educational Progress (NAEP), National Survey of Student Engagement (NSSE), Kaiser Family Foundation

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Program for the Study of Entertainment Media and Health, and the Bureau of Labor Statistics have all published such findings (NEA, 2007; Bauerlein, 2008, pp. 14-26).

More generally, basic knowledge acquisition skills, such as reading and reading comprehension have suffered in the American cultural milieu (NEA, 2007). Ironically, we may actually be reading more today than in years past, just not the extended, passive, contemplative, linear reading of the print era. Rather, through digital technology, we tend to read by scanning blocks of text, or *lexias*, with much of our reading being discursive, distracted, active/interactive, and conversational (Landow, 2006, p. 3). Although there is a solid argument for the inherently intertextual nature of knowledge acquisition as a patchwork of information filtered and organized largely subconsciously within our cognitive schema, the type of reading we predominately engage in today does not seem to afford the deep concentration that helps us understand and internalize knowledge within both our long-term and semantic memory to be accessed and, in the context of interdisciplinarity, applied to complex problem-solving (here and throughout defined as problems that have not been solved through disciplinary approaches, but demand the integrated insights of multiple disciplines) (Bloome & Egan-Robertson, 1993). Rather, our understanding is socially constructed in specific contexts that may not be transferable.

Reading, however, which has been central to learning and specialization in the print era, is only one aspect of the cognitive and behavioral shift brought about through the ubiquity of digital technology – a shift that may be affecting our ability to internalize knowledge. This dissertation asks and attempts to provide a broadly adaptable solution to the question: *How do we, as educators in the 21ˢᵗ century, [re]design core interdisciplinary studies courses to encourage undergraduate interdisciplinary studies majors to engage in the kinds of knowledge acquisition and retention that will enable them to use internalized knowledge and heuristics*

complemented by (but not supplanted by) external resources for solving complex real-world

problems? In short, many of the students that find their way into the Interdisciplinary Studies

(IDS) program at the University of Central Florida (UCF) and presumably into similar general

interdisciplinary studies programs at other institutions have already experienced difficulties

within disciplinary contexts. But is the fault with the students or the culture and educational

system in which they have been nurtured? Laying this potentially inflammatory question aside

for the present, these students are now in need of new strategies and new inspiration for thriving

in their academic careers.

In an atmosphere of digital interconnectivity and globalization, the future appears well-

suited for interdisciplinary studies programs to flourish provided they can continue to evolve in

ways that serve their students' future success. At UCF, the IDS major (formerly the Liberal

Studies major) remains a popular alternative to disciplinary degree programs albeit with

declining enrollment. According to the final Spring 2014 headcount published on UCF's

Institutional Knowledge Management website, there were 1740 IDS majors, making it the 5th

largest degree program at UCF. As of Fall 2015, however, that number had dropped to 1480 IDS

majors. Although many of these students have come to the program from other majors for

various reasons including academic deficiencies, there is a healthy diversity of students within

the program who go on to enter professional graduate programs in fields such as internal

medicine, pharmacology, occupational therapy, and law. Others go on to become business men

and women, entrepreneurs or begin careers in the military as commissioned officers. The

program also enjoys the matriculation of a colorful array of local business-owners, current and

former Cirque du Soleil performers, employees of NASA and SpaceX, current and former NFL

football players, and any number of non-traditional students with intriguing backgrounds that serve to enrich the program as a whole.

Within UCF's Interdisciplinary Studies Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) General Studies tracks, students are required to take two core Interdisciplinary Studies courses (*IDS 3933 – Cornerstone Experience* and *IDS 4934 – Capstone Experience*). These courses are designated "The Cornerstone Experience," or 'Cornerstone' for short (taken during the student's first semester in the program) and "The Capstone Experience," 'Capstone' for short (taken during the student's final semester). Cornerstone is designed to introduce students to terminology and concepts associated with interdisciplinarity. Capstone focuses more on helping students integrate their various areas of study toward the goal of innovation and creative problem-solving. Additionally, both Cornerstone and Capstone seek to provide students with resources to help them showcase their interdisciplinary education, along with skills, abilities and relevant experiences for specific audiences. In terms of interdisciplinary research, Cornerstone emphasizes identification while Capstone focuses on application. This distinction as it relates to curricular requirements will be elaborated upon later.

These courses, however, remain a work in progress, evolving with the current institutional culture and pedagogical zeitgeist. As such, they have faced consistent criticism from students. One common criticism, irrespective of instructor, is that these courses contain a fair amount of "busy work" – disparate low-stakes assignments which do not adequately provide students with a holistic perspective of their relationship or relevance within the overall course and to course objectives. Another common student complaint is that such assignments and the course content in general lack personal relevance; they do not apply to their particular situation. For instance, why would a non-traditional student with 20 years of office management

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experience need to learn how to write an effective resume or create an e-portfolio? In both cases, students sometimes fail to find value in what they are expected to do and learn in these courses, and, to varying degrees, resent that they are required to take them. This sentiment is not universal.

But the pedagogical challenges faced by such courses and their corresponding programs seem to run deeper. The cultural revolution that moves us away from specialized disciplinary problem-solving toward holistic system-level and integrative approaches to addressing real-world complex problems appears to be facilitated largely through the ubiquity of the Internet and digital technology, at least in American society. Indeed, the Cornerstone and Capstone courses themselves are offered exclusively in either mixed-mode or fully-online formats. Yet, while we now have unprecedented resources for research and problem-solving at our fingertips, coupled with new habits of mind conditioned by this technology, some believe there are drawbacks to this shift away from deep internalization of specialized knowledge toward a dependency on external resources (Foer, 2011, p. 19; Bauerlein, 2008, pp. 17-26; Birkerts, 1994).

One concern is that in sacrificing depth for breadth, we embrace a superficial resourcefulness that moves the center of gravity of knowledge acquisition outside of ourselves, rendering us increasingly subject to and dependent upon these external resources which can be manipulated at very high levels; or worse, taken from us. Early in the era of the Internet, Sherry Turkle made the following allusion to a perhaps new kind of subjectivity afforded by Internet technology: "It may…be possible to create an illusion of decentralized participation even when power remains closely held" (Turkle, 1995, p. 178). While addressing the ramifications of such a potentiality is not within the scope of this dissertation, there have been both predictions and suggestions within scholarly discourse that digital technology immersion may be correlated with

and, indeed, causally-related to certain behavioral characteristics and educational deficits among young people today which are cause for concern (Carr, 2011, p. 194; Small & Vorgan, 2008, p. 24-25). These arguments will be discussed further on.

In today's higher education culture (at least, perhaps, outside of the STEM disciplines), emphasis appears to be focused on realizing a socially-oriented poststructuralist or postmodern pedagogical paradigm complemented by Internet interconnectivity (O'Gorman, 2007, p. xvi). On top of this, the very nature and structure of the Internet (and, perhaps, to a lesser degree, prior electronic media and computer technology) affords a surface relationship, so to speak, with the interface while not encouraging an understanding of the underlying facts, logic, and processes that have made that interface possible (Turkle, 1995, p. 34). A pedagogical shift underlies the postmodern philosophical argument away from 'knowledge' as structured, imparted, and internalized toward 'information' as a fluid, interconnected, and open-ended "structure of possibilities" – no oxymoron intended (O'Gorman, 2007, pp. 8-9). In some ways, this 'staying on the surface' mirrors the perceptions held about interdisciplinarity itself.

While there are valid arguments that support the current pedagogical paradigm as it relates to digital technology (and, incidentally, interdisciplinary studies) – for instance, that it 1) frees mental resources; 2) encourages nonlinear, nonhierarchical, and non-sequential thinking; 3) opens up new possibilities for innovation; 4) affords multisensory engagement with the world (or at least the interface); and 5) that it blurs and levels the hierarchical relationship between author and reader, or teacher and student – arguments can equally be made against what has become, in essence, an extension of self into technology. These arguments are not new. While we might go as far back as Plato to examine such arguments, Ralph Waldo Emerson expressed these concerns two hundred years ago as the industrial revolution was in full swing. In illustrating his extended

argument that for everything we gain in technology we lose something of our individual character and ability, he states, "A Greenwich nautical almanac he has, as so being sure of the information when he wants it, the man in the street does not know a star in the sky" (Emerson, 2004, p. 133). Emerson's wit seems to point to this notion that we lose self-contained knowledge and skills as we become more dependent on external resources. An alternative way to think about technology is that it is the tool by which the craftsman, with pre-existing self-contained knowledge and expertise, performs his craft. This is not to say that the tool was not instrumental in gaining the knowledge and learning the craft. This way of framing technology, however, assumes that at least some domain-specific foundational and contextual knowledge is already internalized before the technology is employed to perform the craft (Bransford & Johnson, 1972; Overschelde & Healy, 2001).

In order to accomplish this foundation, a level of thinking, particularly about what we read, is required in which today's undergraduate interdisciplinary studies students often seem disinclined, and possibly even initially incapable of engaging (NEA, 2007; Willingham, 2009, pp. 3-9). While the educational goal might be to encourage *any* thinking as thinking in itself is a prerequisite for remembering and understanding, in this dissertation I will argue that notwithstanding its interdisciplinary character, our thinking (and by extension, our remembering and our understanding) needs to be goal-oriented and rooted within relevant and commonly-accepted disciplinary knowledge (Willingham, 2009, pp. 37, 61). At the same time, we must have an efficient means of fixing such knowledge and encouraging such thinking that responds to the proclivities of today's digitally-immersed students, and that is directly applicable toward solving a diversity of complex real-world problems.

Early in the history of interdisciplinary programs when scholarly literature focused specifically on what was characterized as an emerging phenomenon of interdisciplinarity, Jonathan Broido states, "there is very little in it that can be unequivocally described as clear-cut methodology" (Broido, 1979, p. 244). This statement in itself seems to allude to the inherent values of innovation and creativity that tend to characterize interdisciplinary discourse and associated achievements. Yet much of this early discussion of interdisciplinary methodology still focused on structures of disciplinary knowledge:

> The essential ingredient in disciplines and their subject matter can
>
> be brought out by uncovering their basic or underlying structures.
>
> These structures cut across conventional intra- and
>
> interdisciplinary lines of division. Within certain structures are
>
> invariants of the different ways in which a discipline may describe,
>
> or relate to, its subject matter, and therefore they capture its
>
> essense (p. 256).

I submit that these structural 'invariants' are the core disciplinary knowledge, knowledge that remains relatively constant, that is essential to the development of the individual interdisciplinarian.

The goal of this dissertation then is to create and support a goal-centered curricular model to be adapted to a core interdisciplinary studies course (to be completed at the beginning of the program when beginning specialized disciplinary coursework) that is practically valuable for students, easily implemented and modified by different instructors, and transferable between interdisciplinary programs. To this end, I will argue that we must revive and revalue certain out-of-favor pedagogical strategies, integrating them with their postmodern counterparts and digital

mediums, to *begin to* realize the interdisciplinary ideal of *informed* critical pluralism with regard to innovation and creative problem-solving (Repko et al., 2014, pp. 142-143).

CHAPTER 2: INTERDISCIPLINARITY THROUGH DISCIPLINARITY

Interdisciplinary studies programs along with themed interdisciplinary-oriented programs (i.e., environmental studies, women's and gender studies, neuroscience and psychobiology and others) began to emerge during the 1960s and seem to have proliferated during the 1970s and 80s. Area studies programs (i.e., American studies, African-American studies, Latin American studies, Asian studies) were the precursors of interdisciplinary studies programs, appearing first in the 1930s. Area studies programs would integrate the study of various cultural and social aspects of a geographic area (Repko, 2014, pp. 11-12; Klein, 1999, p. 7-8; Augsburg, 2006, pp. 10-11). Yet, the concept of interdisciplinarity and its practical reality seem to precede the term. For instance, in his influential 1852 essay "The Idea of a University," John Henry Newman writes "all branches of knowledge are connected together, because the subject-matter of knowledge is intimately united in itself…. Hence it is that the Sciences, into which our knowledge may be said to be cast, have multiplied bearings one on another, and an internal sympathy, and admit, or rather demand, comparison and adjustment" (Newman, 1905).

Descriptive terms such as integration, blending, and synthesizing are regularly employed to characterize the concept of interdisciplinarity, while interdisciplinary studies, itself, might be described as "a mode of curriculum design and instruction…" of which *interdisciplinarity* is the "intellectual essence." While the term interdisciplinarity might be applied to one-of-a-kind problem-solving situations (which would include innovation) or more broadly to systemic problems, it is also applied to cognitive processes (e.g., decision making, planning, sensemaking, causal reasoning) and, perhaps, even to abstract knowledge. Moreover, by extension, its application to cognitive processes would include "complex collaborative cognition," encompassing a body of research in itself (Fiore et al., 2010). In the abstract, interdisciplinarity

might also be considered a "philosophy or reflexive ideology" (Augsburg, 2006, p. 21). As suggested earlier, however, in the context of undergraduate interdisciplinary studies process-oriented textbooks and curriculum, interdisciplinarity generally seems to be applied more narrowly to the concept and process of approaching and solving complex-problems (Repko, 2014, p. xv; Augsburg, 2006, p. 15). Focusing on this aspect of interdisciplinarity may be merely for the sake of practical clarity.

Interdisciplinarity is contrasted with *disciplinarity* and the discrete discipline, which refers to a "branch of learning or body of knowledge" within a specialized field of study. Disciplines are familiar at all levels of education, and, in particular, in higher education as specialized fields such as psychology, biology, physics, or political science. Interdisciplinarians will argue that disciplines, at least in the modern sense, have been around little more than a century. Indeed, some would argue only since the Second World War (Jacobs, 2013, pp. 1, 27-28). Others suggest modern disciplines emerged with the natural sciences during the early 19th century (Augsburg, 2006, p. 8). These discussions of the history of disciplines as represented by interdisciplinary scholars seem to downplay the historical significance of disciplines in an effort to foreground interdisciplinarity. I would contend that while many of the disciplinary distinctions found within the modern spectrum are indeed relatively new, specialized fields of knowledge have existed throughout recorded human history, even if common first principles or a notion of unitary knowledge was believed to underlie all of them (Klein, 2005). At the very least, there were theologians, medical practitioners, engineers, military professionals, politicians, farmers, philosophers, skilled laborers, and artisans. Indeed, Marshall McLuhan and Walter Ong would tell us that the phonetic alphabet and the written word, itself a visual technology, is what

made specialized knowledge and the compartmentalization of knowledge possible (Ong, 2004, p. 43, 97; McLuhan & Zingrone, 1995, p. 94).

From the variety of definitions offered and compared within academic literature exploring interdisciplinary education and research, *interdisciplinarity* (and the associated 'field' of *interdisciplinary studies*) appear to mean different things to different people, particularly within higher education. For instance, interdisciplinarity might be defined or understood within historical, social or environmental contexts, as a universalized or generically applied mode of knowledge production, or as a manifestation of something much more project-specific (Vickers, 2003). As suggested above, although each scholar will use his or her own words, interdisciplinarity and interdisciplinary studies are generally defined in scholarly discourse related to undergraduate education as a *concept* and as a *process* of integrative thinking whereby the individual or the team is trained to habitually draw insights from multiple disciplinary perspectives such that a more comprehensive understanding is arrived at toward some endeavor of innovation or creative problem-solving in a complex material world (Repko et al., 2014, pp. 24-28; Klein, 2010, pp. 18-20).

I argue that interdisciplinarity, like religion, philosophy, or ideology, might be understood in one of two fundamental ways: either as a vehicle for self-directed inner growth and transformation that encourages the development of a wider more inclusive lens through which the individual might view the world, or as an outwardly projected paradigm for organizing and conditioning human resources to engage the world in certain collaborative ways. In the former, it would seem that interdisciplinarity becomes the inwardly-directed means for developing certain knowledge bases and habits of mind within the self, while in the latter, interdisciplinary knowledge is the realized outcome of outwardly-directed multidisciplinary

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collaboration predicated on receptivity and cooperation within a social milieu (Repko et al., 2014, p. 28; Fiore, 2008). Indeed, scholars who have published work in the field of interdisciplinary education seem to embrace one or the other of these orientations, or have entangled the two, placing individual transformation in the context of a social imperative.

As suggested above, interdisciplinarity framed as team research requires skillsets such as 'social intelligence' and resourcefulness as opposed to a diverse foundation of internalized disciplinary knowledge and habits of mind within the individual (Fiore, 2008). Each team member would represent their particular disciplinary perspective, but be receptive, cooperative, and malleable with regard to the disciplinary perspectives of the other team members. While initially differentiating between the terms interdisciplinary science and team science, and recognizing the existence of individual polymaths such as Leonardo da Vinci, cognitive psychologist and team science researcher Stephen Fiore concludes, "Interdisciplinary science is team science – it is team science because it is infeasible to conduct interdisciplinary research independently" (Fiore, 2008). Seeming to challenge this view while at the same time recognizing the connections between interdisciplinarity and collaboration, long-time scholar of interdisciplinarity, Julie Thompson Klein says, "Many believe that interdisciplinarity is synonymous with collaboration. It is not" (Klein, 2010, p. 19). At least some of the early interdisciplinary programs, such as the Gallatin School of Individualized Study established in 1971, seem to emphasize interdisciplinarity as an individualized and individual-oriented learning endeavor (Augsburg, 2006, p. 11).

Whether the emphasis is on creating multiple disciplinary foundations within the individual learner from which to draw insights, or habituating social intelligence and resourcefulness within the individual team member, it is important to recognize that in either

case, some level of personal transformation is involved, whether we are talking about the transformation of cognitive processes, transformation of worldview, or even transformation of consciousness itself. Moreover, either way the concept is applied, interdisciplinarity assumes that there are real-world problems such as those related to the environment, health, and politics that, hitherto, have not and cannot be solved from a single disciplinary perspective. One example might be global warming. Such problems are characterized as 'complex.'

Of the many definitions offered for interdisciplinary studies, the definition that seems most closely aligned with my purpose is "the capacity to integrate knowledge and modes of thinking drawn from two or more disciplines to produce a cognitive advancement" (Repko et al., 2014, p. 25). On one level, the personal transformation that takes place within the individual interdisciplinarian through the knowledge acquired and integrated is an end in itself. Consistent with John Henry Newman's characterization of knowledge acquired through education within the university presented over 150 years ago, "it is an acquired illumination, it is a habit, a personal possession, and an inward endowment…it implies an action upon our mental nature, and the formation of a character…" (Newman, 1905). Yet, while this may be true, and while Newman goes on to suggest that knowledge "is desirable, though notion come of it, as being of itself a treasure," interdisciplinary studies discourse would seem to support the argument that we do seek, through interdisciplinary studies programs, to encourage students to make practical use of their education, ideally, toward the good of our society or external world in some way. At the risk of resorting to a cliché, I am proposing that students will do this most effectively by "starting with the man [or woman] in the mirror."

As with ideology and educational paradigms in general, it is hard to escape binary distinctions and the problem of opposites when discussing interdisciplinary studies. Julie Thompson Klein illustrates this point when she states:

> The long-term trend in the history of undergraduate curriculum has been the growth of specialization and the proliferation of programs and courses. At present, though, there is an "historical reversal of this trend".... Increased crossing of disciplinary boundaries is shifting the defining metaphors of disciplinary practice. In recent disciplinary histories, descriptions of current practices, and reports of professional organizations, traditional images of *depth* and *compartmentalization* are being replaced by images of *boundary crossing* and *cross-fertilization* (Klein, 1999, p. 3).

But, has the pendulum of this reversal swung too far in the opposite direction? The logic behind disciplines appears to be the notion that through studying a microcosm, or by specializing in a certain aspect of the macrocosm, we can understand phenomena in certain and practically useful ways within that macrocosm – regardless of whether this knowledge represents an absolute truth. Interdisciplinarians and others, such as advocates of critical pedagogy (i.e., Henry Giroux), will argue that the disciplines that have emerged in today's educational system, particularly higher education and professional domains, are closed, elitist, and overly reductionist, which can lead to tunnel-vision and shortsighted consequences (Repko et al., 2014, pp. 30-31; MacArthur, 2010). The specialized nature of disciplines, the argument goes, results in 'disciplinary silos,' or proprietary knowledge whereby scholars are both ignorant of developments in other fields, and do not adequately share their own findings (Jacobs, p. 18, 2013). In short, disciplines blind us to

the broader context, to other perspectives, and to what is characterized as the increasing complexity and social-environmental exigencies of the 21st century world (Repko et al., 2014, pp. 78-80).

Such critical views of disciplines, however, are challenged by those who see disciplines as "complex, permeable and contested" or otherwise evolving (MacArthur, 2010). Allen F. Repko characterizes disciplines as "fluid and their boundaries porous" although he recognizes defining elements that often serve as the raw material of interdisciplinary research (Repko, 2008, p. xiii). The premise behind the following defense of disciplines is that modern disciplines, which naturally evolve over time as our knowledge increases and understanding develops, are a foundational necessity for interdisciplinarity to take place. As will be addressed later, the self-directed and individualized learning affordances of present online learning management systems (LMS) in higher education encourage an emphasis on interdisciplinarity and interdisciplinary studies, at least initially, as an individual-oriented endeavor of cognitive development. It will be argued then that the goal of undergraduate interdisciplinary studies programs is to encourage certain knowledge-oriented and goal-directed habits of mind and the efficient attainment of foundational disciplinary knowledge from multiple disciplines. It will further be argued that once foundational knowledge begins to be internalized, the integration and synthesis that constitutes interdisciplinarity will happen naturally on a cognitive level by virtue of the not-so-rigid character of disciplines as represented by Repko, Jacobs, MacArthur and others. Because of the inevitable complexity of interdisciplinary collaboration and the complex problems with which collaborative interdisciplinary research is concerned, interdisciplinarity *as* collaboration will be recognized as pertaining more appropriately to graduate-level education than to online undergraduate education.

Disciplinarity and Knowledge Acquisition

Another way to understand a discipline is, "as a broadly accepted field of study that is institutionalized as a degree-granting department in a large number of colleges and universities." This definition's implied economic emphasis on the institutionalized quality of disciplines presupposes the dissemination of practical knowledge instrumental to specific career tracks within associated professions, including the reproduction of undergraduate/graduate professors for the discipline through doctoral programs (Jacobs, p. 27-29, 2013). It would seem that, in their current manifestation, general interdisciplinary studies programs run the risk of retaining the economic interest of generating revenue for the institution while discarding the students' interest as it relates to coherently imparting the precise practical knowledge that will move students toward the achievement of specific educational and professional goals.

Like the character of the undergraduate interdisciplinary studies degree, career advisement often takes the form of an exploration of generalized possibilities. Any certainty of direction in terms of an academic or professional career path becomes the burden of the student entering what is still a largely specialized world. The consequence is that many interdisciplinary studies students with little more than a smattering of courses within thematically aligned areas of study feel as lost upon earning their degree as they did upon entering the program. To illustrate, I once asked my graduating Capstone students to raise their hand if they knew what they were going to do after graduation. Of a class of 35 students, four raised their hands. My professional experience as both an instructor and an advisor within UCF's Interdisciplinary Studies program indeed suggests that prospective undergraduate interdisciplinary studies students often lack a premeditated post-graduation goal or vision for their future from the outset. Consequently, these students often appear to have very little to fall back on in terms of specialized and transferable

practical knowledge, much less the ability to draw erudite insights from and integrate knowledge supposedly acquired by virtue of the several courses that make up their areas of study.

As such, the first objective of the Cornerstone course in interdisciplinary studies would seem to be to encourage students, as resolutely as possible, to settle on a specific professional or other post-graduation goal – one in which they can whole-heartedly invest themselves. This is not to suggest that the career or professional goal students set for themselves will necessarily be the 'right' goal for their lives in an ultimate sense – this would likely be a much deeper philosophical question. Nevertheless, research suggests that setting goals or perhaps, more precisely, framing challenging yet achievable goals appropriately, can be instrumental in improving student motivation (Gagné & Medsker, 1996, p. 171). Goal-setting theorists contend that having a goal, (ideally, invested with intensity and specificity) focuses attention on goal-relevant activities, serves an energizing function relative to goal-directed tasks, and promotes persistence and strategy development relative to the goal's attainment (Locke & Latham, 2002). Locke and Latham further suggest that, "Making a public commitment to the goal enhances commitment, presumably because it makes one's actions a matter of integrity in one's own eyes and in those of others." Past this, a fostered sense of self-efficacy will be important to helping students maintain their commitment to their respective goals. Supporting and encouraging students with regard to their goals, offering personal insights and resources, and perhaps more importantly, having students identify and begin a dialogue with role models already embodying the goal-state identity will be instrumental to fostering this sense of self-efficacy (Locke & Latham, 2002).

Commonly when students take the Cornerstone course, they will be at the beginning stages of undertaking upper-division disciplinary coursework. In addition to the goal-setting

theory research that aligns with a goal-centered curricular approach, having a fixed goal at the outset helps interdisciplinary studies students and advisors alike choose areas of study and specific courses that are going to be most relevant to attaining the foundational and practical knowledge necessary to reach this goal. Once the goal is established, the focus can then be on determining what foundational knowledge within the relevant disciplines is necessary, and how best to attain it. This will be no light task. There is a degree of complexity involved in comprehending multiple domains of knowledge encompassing a "volume of information…larger than any individual can master," and thereby constructing an integrated perspective of what matters most within each of these domains relative to one's desired end-state of being – i.e., one's individual identity (Klein, 1996, p. 53).

Nevertheless, while this progression would seem to be common sense, it is often not the practical reality of the interdisciplinary studies student's educational experience. Rather, in the Cornerstone course, the emphasis is, to a large degree, but not exclusively, on making distinctions between variously defined, nuanced, and often ambivalent interdisciplinary terms, and the concept of integrating knowledge students have not yet attained. While current interdisciplinary studies textbooks and curriculum does, to a certain extent, focus on identifying as well as applying an integrative interdisciplinary approach to research and problem-solving, what often appear to be lacking are the personal relevance and value associations that motivate and engage students. The argument presented here is that such approaches at times put the cart before the horse in that the singular interdisciplinary goal of integration (or synthesis) cannot happen without the aforementioned raw material of targeted disciplinary knowledge acquired within a goal-centered framework.

Moreover, the front-end emphasis appears to be one developing one's identity as an interdisciplinarian, often in the abstract, rather than, say, as an art therapist…or a cognitive scientist. One might argue that an e-portfolio component, as will be discussed later, is an effort to help students forge their individual identity in the context of their areas of study. Indeed, an e-portfolio would be instrumental in both establishing and showcasing one's individual identity to a post-graduation audience. The problem, however, is that if students are attempting to create their e-portfolio without having engaged in significant coursework within their areas of study, there is limited basis for supporting this identity. Questions of individual identity relative to students' areas of study and their post-graduation goal will have a direct bearing on both how they view themselves and how they market themselves to their prospective audiences. But students will need to know what internalized knowledge will constitute their post-graduation identity before they can adequately cultivate that identity and, finally, communicate that identity.

By foundational disciplinary knowledge, I am referring to that relatively stable core content knowledge that, to one degree or another, underpins all disciplines yet is specific to each discipline. Within these vast bodies of knowledge some aspects will be more essential and relevant to specific contexts and roles. Undergraduate interdisciplinary studies students are not provided with a compendium of what this core knowledge consists of within each discipline or major, nor do specific upper-level courses necessarily align with such knowledge. Moreover, much of this knowledge might be expected to have been learned through secondary school or through the General Education Program (GEP) courses taken during the first two years of college, before many students, especially those who would become interdisciplinary studies majors, have settled on an academic direction or career goal. From an instructor perspective, this assumption, as it relates to retained knowledge, often seems *not* to be the reality among the wide

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spectrum of interdisciplinary studies undergraduate students. Nevertheless, this reality places the responsibility of discovering what knowledge within the relevant disciplines is worth learning and internalizing squarely on the student.

Core content knowledge, and I daresay, 'facts,' within the STEM majors might be easier to establish than knowledge and facts within the social sciences or the humanities. For instance, it is certain disciplinary knowledge, both reasoned *a priori* (deduction) and derived from observed particulars (induction) – e.g., knowledge of the laws of physics, chemical reactions, and biological processes – that has enabled humanity to send its representatives to the moon and return them safely to earth. Yet, within the discipline of psychology alone, there are behaviorist theorists, constructivist theorists, cognitivist theorists, gestalt theorists, psychoanalytic theorists, and many, many more, all attempting to understand and explain human perception and behavior. Likewise, within philosophy, a multitude of philosophers have written treatises and developed systems to understand and explain the phenomenal world. While these theories, validated through selective observation, analysis, and replication, may conflict or exist autonomously, they all legitimately fall within the umbrella of single disciplines. Allen F. Repko explores several definitions of disciplines to extract what he characterizes as "the content of disciplines." To summarize, this content includes a body of knowledge, specialized vocabulary, an accepted body of theory, research strategies and techniques for replication and validation, identifiable subject areas, and a community of scholars (Repko et al., 2014, p. 88).

In her discussion of the nature of facts, Mary Poovey states, "what counts as a fact can never escape the idea that the knowledge that matters is systematic, not simply a catalog of observed but unrelated particulars" (Poovey, 1998, p. 1). What she appears to be saying here is that facts must be considered within both their context, and within the universal system to be

validated, and therefore worth learning. This thinking is not new, for "it is unscientific to study isolated parts without regard to the whole to which they belong…" (Katona, 1967, p. 296). Even so, the underlying intent of Poovey's *A History of the Modern Fact*, along with her diminishing the value of rote learning, seems to be to question the very idea of what Western society (particularly England) has considered the nature of fact for centuries, suggesting that facts are debatable, increasingly disputed, and at the very least viewable from more than one perspective…in short, *relative*. While this last point could be considered the very premise behind interdisciplinary studies, I contend that it is reason to capitalize on established knowledge from within and across disciplines rather than undermine it. Attempting to bypass this potentially paralyzing current of thought without discounting it, the notion that various points of view are equally valid, I seek to take a utilitarian approach to knowledge acquisition, focusing on useful knowledge, as opposed to 'fact' or 'truth,' as being the knowledge most worth learning in an undergraduate interdisciplinary studies program. For the Cornerstone course in particular, useful knowledge constitutes less that which would bog students down in debates about legitimacy or primacy, but rather that which has a proven track record, historically and broadly applied, and which will serve the student in acquiring more specialized knowledge within their areas of study. Is this sense, the aim is to teach students how to learn deeply and efficiently.

Past the Cornerstone course, the nature of useful knowledge will vary from discipline to discipline, and, again, will depend most heavily on the interdisciplinary studies student's established post-graduate academic or career goal. For instance, within the discipline of biology, it may be useful to know the fundamentals of the scientific method, laboratory procedures, the proper operation of safety equipment, and how to read/interpret data. But, relevant core knowledge within biology may vary depending on whether the interdisciplinary studies

undergraduate is planning to go on to medical school, or to immediately enter the field championing an environmental cause. In the former, an emphasis might be placed on learning the fundamentals of human anatomy, biological processes specific to humans, medical terminology, the nature of genetic mutations, and the difference between eukaryotes and prokaryotes. In the latter, one might learn the fundamentals of natural and artificial selection, factors that lead to the extinction of species, and the nature of specific ecosystems. Likewise, within the discipline of political science, it may be useful to know the structure of and rationale behind the American political institutions, the fundamentals of the legislative process, and the role of lobbying in political decision-making. Yet, depending on whether someone is seeking to go into domestic activism, work for a government agency or NGO within the international political sphere, or attend law school, the nature of useful knowledge will likely vary greatly. One's goal could mean the difference between choosing a course on constitutional law or a course on the politics of the Middle East. For those with a set goal, there are many resources available to help determine what type of knowledge will be most useful and essential. If one has a post-graduate goal, they can begin to create a plan for attaining the specific knowledge that they will need to acquire (ideally, to the point of automatic recall) to reach and indeed thrive in that goal state. Ensuring that such a goal is established and discovering the resources to determine what type of knowledge is going to be most useful and, indeed, essential toward reaching this goal will be a primary objective within the curricular model for the Cornerstone course in interdisciplinary studies I am proposing.

In short, because of the limited number of courses that interdisciplinary studies students will take within their several areas of study, they will need to know what knowledge is worth learning. Their motivation for learning this knowledge will come from and be tied directly to the

concrete and realizable post-graduation goal they have set for themselves. The self-directed

learning strategies imparted to them in the Cornerstone course will assist them in effectively and

efficiently internalizing the foundational disciplinary knowledge that will serve them later on as

they begin to apply an interdisciplinary approach to managing and solving those real-world

problems that are going to be of most interest and relevance to them.

A Place for Classical Education in Interdisciplinary Studies?

When one thinks of classical education certain things might immediately come to mind:

the trivium- and quadrivium-oriented pedagogy of the medieval university, the learning of and

discourse in ancient "dead" languages such as Latin or Ancient Greek, the study of the works of

these ancient cultures' great sages, or a curriculum steeped in Christian ideology. The learning

strategies associated with classical education, discussed in available sources, primarily relative to

elementary and secondary education, are characterized by words such as: *recitation*, *repetition*,

memorization, and *drill and practice* (or derogatorily, drill and kill) (Ong, 2004, p. 55).

Commonly today classical education refers to a broad-based liberal tradition of learning

literature, philosophy, logic, history, and so forth, with not necessarily the most practical

applications for many non-academic career goals (Unger, 2001, pp. 227-228). In the context that

I will be using the term, *classical education* refers to the "curriculum that emerged from the

clerical and ministerial colleges of the Middle Ages" albeit tracing its roots to the works of

Greco-Roman antiquity (Unger, 2001, p. 227). These colleges were the precursors to the first

universities which also emerged in the Middle Ages, around the 12th century. These early

universities embraced a curricular structure based on the study of Greek and Latin language and

seminal works (Unger, 2001, pp. 227-228). Learned Latin, the writing descendant of Latin,

continued to be used for academic discourse in part because it afforded a degree of separation

from one's mother tongue, and therefore, a degree of objectivity (Ong, 2004, p. 112). It might be prudent to note, however, that I am not suggesting interdisciplinary studies curriculum be presented in Latin, merely that there are insights to be gleaned from the methods of the period.

In his historical account of interdisciplinarity, Wolfram W. Swoboda states "[universities] were not institutions of abstract learning but rather were intended to serve the direct needs of society" (Swoboda, 1979, p. 54). In other words, education in medieval universities was socially conscious and goal-centered. Then as today, relatively simple but demanding learning strategies such as drill and practice were integral to the process of learning. They were effective then and arguably still are today. To illustrate this point, in one year of deliberate training using the very same learning strategies espoused during the Middle Ages, freelance journalist Joshua Foer went from average guy to winner of the 2006 USA Memory Championship. Over the course of this year, in addition to Foer conducting his own research, he was studied by Florida State University expertise researcher K. Anders Ericsson. Foer states, "Memory training was considered a centerpiece of classical education in the language arts, on par with grammar, logic, and rhetoric." Foer goes on to say, "Students were taught not just what to remember, but how to remember it" (Foer, 2011, p. 95).

The memorization techniques embraced within these universities combined image, text, and spatiality to efficiently internalize large and stable bodies of knowledge within the individual learner. Today, these strategies appear out-of-favor in many academic milieus, and seem to be ignored entirely in interdisciplinary studies pedagogy. Yet, what I contend may be of practical value with regard to core courses offered primarily through online channels in an interdisciplinary studies undergraduate program is the espousing of those self-same learning strategies commonly employed within classical education during the Middle Ages, espoused by

the likes of Cicero and Quintilian during the Roman-era, reformed and systematized by Petrus (Peter) Ramus during the 16th century, and that prevailed (with exceptions) from ancient times through the rise of the modern era (Yates, 1992, pp. 228-229).

In *Picture Theory*, W.J.T Mitchell describes one technique by which memory was made integral to learning in medieval culture:

> [The] classical memory technique is a way of reconstructing
>
> temporal orders by mapping them onto spatial configurations (most
>
> notably architectural structures, with various "loci" and "topoi" or
>
> "memory palaces" inhabited by striking images and sometimes
>
> even words); it is also a way of mapping an oral performance, an
>
> oration from memory, onto a visual structure. Memory, in short, is
>
> an imagetext, a double-coded system of mental storage and
>
> retrieval that may be used to remember any sequence of items,
>
> from stories to set speeches to lists of quadrupeds (Mitchell, 1994,
>
> p. 192).

Recent studies suggest that this very same method prescribed within higher education disciplinary contexts improves the learning and retention (Qureshi et al., 2014; Shaughnessy & White, 2012). In one of these studies, researchers apply the method of loci to principles-level economics content knowledge while further suggesting that it is "adaptable to any discipline" (Shaughnessy & White, 2012). In the other study referenced here, medical students were better able to learn and retain knowledge pertaining to the endocrine system by employing the method of loci as compared with those who relied on other learning strategies. Moreover, the researchers' analysis suggests that prescribing the method of loci "increases students' motivation

and stimulates a better attitude to actively participate in the construction of personal knowledge"

(Qureshi et al., 2014).

An earlier study, however, suggests that younger students seem to be more apt to apply the method of loci correctly and effectively than older students. Here, the researchers suggest that one possible explanation for this variance is that older students might simply have a hard time letting go of already entrenched (and, perhaps, more conventional) learning strategies (Verhaeghen & Marcoen, 1996). Quintilian, whose *Institutio oratoria* was widely used in education during the Middle Ages, recommended, "mastering long texts by dividing them into small sections [chunking], copying them out and annotating them, reciting them quietly, and working at night when there are no distractions" (Carruthers & Ziolkowski, 2003, p. 18). Quintilian's preference, which would come to influence Ramus, was for order and repetition rather than artificial associations using images and places (Yates, 1992, pp. 228-229). 'Drill and practice,' memorization, and the imparting of those strategies to aid the process of learning efficiently while, perhaps, less commonplace in some learning contexts today are still employed in primary school (think multiplication tables), and widely in the military and the corporate world to develop applied proficiency and eventually automaticity/mastery in the most efficient manner possible, specifically using computer-based learning platforms.

To illustrate this point, in the U.S. military one with no prior ability might learn to type 30 words a minute in three to four weeks without looking at the keyboard using software that employs a "drill and practice" strategy. Through a combination of technology and human interaction, an intelligence analyst might learn geography, major lines of communication, and the capabilities of various airbases and ports of call within the various theaters of operation through simple repetition and informal verbal examination [retrieval practice]. This knowledge then

provides a foundation of strategic and operational awareness that affords the analyst's employment of reason and abstract thought, naturally integrative in character, in predicting behavior.

In the brokerage industry, over the course of several months one might use software containing practical exercises and daily proficiency exams, emphasizing repetition with subtle variation and graduated complexity to become a NASD-licensed professional with no prior business, retail or finance experience. In this role, registered representatives are not simply performing tasks requiring specific motor skills and automaticity, but through understanding market mechanics and the function and purpose of various investment instruments, are advising clients as to the risks and benefits of specific investments and helping them choose courses of action that move them toward their goals. It may be that conventional notions of rote memorization and repetition might be more effective for older students merely because that is to what they have been conditioned to respond within 20th century print-centric disciplinary learning environments. For older students there might be more of an inclination to view learning as a transactional and receptive endeavor as opposed to an active and creative one.

While it is the oft-stated goal of an interdisciplinary studies program to encourage students to think creatively, I would contend that learning is not always about creativity. I do not want my sons' pediatrician or pharmacist thinking creatively when she is administering drugs to treat my child's ailment; I want her thinking analytically, critically, and prescriptively. Here it might be important to note that, at least at UCF, Interdisciplinary Studies undergraduates do not necessarily go on to interdisciplinary graduate programs. Regardless of the direction in which an interdisciplinary student takes after graduation, in the "real-world" computers and classical learning strategies are still employed to instill foundational knowledge efficiently and train

practitioners to think critically in any number of highly responsible career fields under significant time constraints. In the field of interdisciplinary studies as well, I contend that technology can be used to enhance learning rather than merely facilitate it.

Robert M. Gagné and the Question of Indoctrination

Despite the practical realities of knowledge acquisition and application, the value of repetition in "strengthening learned connections" and "[improving] either learning or retention" has been questioned in modern learning theory and in various learning situations (Gagné et al., 2005, p. 5). Moreover, repetition in the behaviorist sense of a conditioned response to a given stimulus is criticized for making the learner, in a sense, a slave to the stimulus; from this perspective, freedom from the control of the stimulus comes through concept learning (Gagné, 1970, p. 182). Instructional psychologist Robert M. Gagné, whose work will be explored in more detail later on through the development of the curricular model, states, "Sheer repetition of verbal information, in a kind of 'overt rehearsal' does not necessarily lead to better encoding and retention" (Gagné & Medsker, 1996, p. 94).

Nevertheless, qualifications and distinctions between kinds of repetition and its effectiveness in learning are made throughout Gagné's work. For instance, Gagné suggests practice and reinforcement in the form of retrieval of information, does lead to "substantial improvement…in later recall of learned information." Additionally, Gagné cites an earlier study that demonstrates repetition in the form of recitation was clearly more effective than reading for the purposes of memorization (Gagné & Medsker, 1996, p. 94). In another discussion, Gagné states, "Practically speaking, repeated reading or hearing of an informational passage does improve its learning" most likely "due to variations in processing from one repetition to another" (p. 36). The supposition presented here is that there is an additive quality relative to factual

information/propositional knowledge acquired (as opposed to merely strengthening already acquired facts) through subsequent readings of the same material.

The debate between learning as the "recall of facts" versus critical thinking as the battle cry to "question everything" seems to continue at all levels and domains within the American education system. In a recent study on the effectiveness of online discussions as a vehicle for improving critical thinking, critical thinking is privileged as differing "from simpler, lower order thinking skills such as recall, understanding, and direct application of knowledge" (Szabo & Schwartz, 2011). Similarly, a recent book promoting the teaching of critical thinking and active learning in the nursing field states:

> Learning to think critically requires active student participation;
>
> students must become active creators of their own knowledge. At
>
> this time, it can be assumed most students have come from faculty-
>
> dominated classrooms in which the students have been the
>
> recipients of endless amounts of facts to be memorized and
>
> recalled for examinations (Billings & Halstead, 2013, p. 261).

There seem to be several problematic assumptions and at least one illumination amid the bias embodied in this statement, which might be argued to represent a general line of thinking with regard to the "social view" of education and "student-centered" learning. First, are students, undergraduate students in particular, actually "creators of their own knowledge"? Or, perhaps, is learning a process of acquiring knowledge, of recollecting eternal realities that already exist in the universe…what Plato characterizes as "a form of recognition of that which we had known in another existence" (McLuhan & Zingrone, 1995, p. 276). Second, does learning to think critically actually require "active participation," which in this and similar contexts can be taken

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to mean classroom interaction with other students? Or, might it be possible to actively acquire

preexisting knowledge as a motivated self-directed learner, and begin to think critically with that

knowledge (in this context interdisciplinary knowledge) as an individual? Over 70 years ago,

psychologist George Katona, implied that learning is always a participatory process influenced

heavily by the attitude of the learner. He states, "The learner is without doubt an intrinsic part of

the organization which results when the material is learned. He is not a foreign substance; he

participates in the organization in some way" (Katona, 1967, p. 296). This participation does not

assume an outwardly active engagement with the professor or fellow students. Rather, it

illustrates that internally organizing knowledge such that it is meaningful is also an active and

participatory process, albeit inwardly, and is paramount to understanding and knowledge

retention (pp. 254-257). In other words, it is still possible to be an active learner, participating in

the learning process, acquiring and organizing useful knowledge, independently. Such questions

for debate aside, Billings and Halstead's statement illumines what seems to be an important point

given the graduate faculty audience – critical thinking and the "creation of knowledge" in the

context of formal research tend to happen, with exceptions, at the graduate level or beyond,

rather than the undergraduate.

While one might expect that students graduating with an undergraduate degree from an

American university would, *and should*, have strong critical thinking skills, proponents of

classical education might suggest that critical thinking is not so much the process of learning as it

is its natural outcome. At first blush, such "drill and kill" strategies that are embraced within

classical education sound a lot like 'programming' students in a negative indoctrinatory sense.

Favoring and promoting such learning strategies might raise the question, are we programming

students to be robots, parroting back so-called knowledge as final and given? I contend that an

alternative way to frame such learning strategies, equally valid in higher education, is that through them we will be programming students to think for themselves, ultimately, with a degree of automaticity, drawing upon and integrating knowledge that has been willingly and proactively acquired. This is self-directed programming, and therefore not indoctrination, but liberation – students are in essence empowered to create themselves. This knowledge is "willingly and proactively acquired" because the students have been shown the value and relevance of such knowledge as it relates to achieving their individual goal, and have been persuaded of the essentiality of their taking an active role in acquiring it. I submit that this is the goal of an interdisciplinary education.

In summary, I have offered a brief history of interdisciplinary studies and interdisciplinarity contrasting these concepts with disciplinarity and our modern notions of disciplines. In doing so, I have explored the different ways in which we understand and apply interdisciplinarity. I have further attempted to defend disciplines and the deliberate acquisition and internalization of core knowledge inherent within these disciplines as an indispensable component of an undergraduate interdisciplinary education. I have suggested that traditional learning strategies from the classical period that were embraced fully in the Middle Ages, such as drill and practice, and visual-spatial techniques for memorization are still effective ways to efficiently gain and retain this knowledge. Finally, I have attempted to alleviate concerns that such pedagogical strategies will produce a passive, indoctrinated or otherwise narrow-minded learner. In the following chapter, we will take a closer look at current pedagogy in higher education.

CHAPTER 3: APPROACHES TO LEARNING IN HIGHER EDUCATION

Pedagogy and relevant learning theories will vary depending on the disciplines involved. For instance, in *A Handbook for Teaching & Learning in Higher Education*, "curricula in sciences and engineering are…predominately linear in nature," with "lecture…the main way of delivering 'content'…." Moreover, "there are basic underpinning concepts that have to be mastered before further study can be considered" (Overton, 2003, p. 258). In the arts, humanities and social sciences, pedagogical approaches appear to place a higher emphasis on the "validity of personal opinion, subjectivity, individual experience and creative skepticism…." These fields are characterized as continually evolving, and therefore "require active, participating students, for discussion and argument…." Nevertheless, even here, the point is made that in order for students to properly engage in these fields of practice, they will still need "an optimum balance between grounding in knowledge, and the establishment of the necessary tools of analysis, including the acquisition of a critical, theoretical or analytical vocabulary" (Martin, 2003, pp. 302, 310).

The aim of this chapter is to explore common approaches to learning and associated learning theories in American education that will be relevant to the development of a curricular model for teaching online interdisciplinary studies core courses in such a way as to encourage maximizing disciplinary learning within the constraints of a limited undergraduate interdisciplinary framework. Instructional design learning theories and approaches to online learning in particular will be discussed and applied later on. Because of the sheer number of competing schools of thought and philosophical approaches to teaching and learning that have emerged since the Enlightenment, i.e., romanticism, progressivism, positivism, behaviorism, constructivism, rationalism, associationism, cultural transmission, situated learning, experiential

learning, and so on, the focus in this discussion will be on those approaches that appear most immediately relevant to current practice in higher education (Innes, 2004, p. 2; Fry et al., 2003, p. 10-12). At the risk of being accused of oversimplification in a world of gray-scales, blurred boundaries, and overlapping theories, I argue that behaviorism and constructivism still represent the appropriate dichotomy for framing a discussion of the present pedagogical debate in higher education (Fang et al., 2012). Yet, as will be seen more clearly over the course of this and later discussions, a cognitivist information-processing orientation will be most relevant to the pedagogical approach to interdisciplinary studies I will be proposing. Socratic (dialectic) pedagogy persists and certainly deserves acknowledgement, but I propose that it is, generally speaking, more appropriate for graduate-level discourse than for the internalization of foundational knowledge appropriate to an undergraduate education (Boghossian, 2006).

While constructivism is consistently prominent when discussing current trends in higher education pedagogy, and behaviorism still figures prominently in some fields, the many variants and derivatives of both perspectives necessitate a particular attention to isolating the commonly-held tenets most relevant to interdisciplinarity (Garrison & Akyol, 2013, pp. 104-105; Fang et al., 2012; Fry et al., 2003, pp. 9-10; Innes, 2004, p. xi). Theories of constructivism share the notion that knowledge is constructed by learners, whether as individuals or in collaboration, rather than transmitted (Jardaneh, 2010; Boshossian, 2006). Constructivism is experience oriented. Much of the seminal literature on constructivism pertains to early childhood education, but the theory is applied in higher education as well. In short, constructivism posits that through a process of *assimilation* and *accommodation*, new experiences alter one's consciousness (or, cognitive schema) expanding and adapting it to the surrounding world (Jardaneh, 2010).

While 20th century theorists such as Jean Piaget and Jerome Bruner have been instrumental in furthering constructivist theory, the notion of experience-based socially-oriented educational practices could be traced at least as far back as philosopher Jean-Jacques Rousseau and later, educational reformer John Dewey. In his 1762 novel *Émile, or On Education*, Rousseau makes a strong one-sided argument for an experience-based natural education as opposed to traditional instruction. Harboring a disdain for reading and classroom learning, Rousseau states, "It is only by long experience that we learn to make the best of ourselves, and this experience is the real object of study to which we cannot apply ourselves too early" (Rousseau, 2012, p. 119). Later, Rousseau states, "for our real teachers are experience and emotion, and man will never learn what befits a man except under its own conditions" (Rousseau, 2012, p. 152). Similarly, in *My Pedagogic Creed*, Dewey famously states, "I believe that education, therefore, is a process of living and not a preparation for future living" (Dewey & Small, 1897). Throughout his works, Dewey emphasizes the social imperative of education.

I am in not disputing the validity of the constructivist or Romantic point of view, but I do suggest it is one-sided. The various constructivist theorists and educators appear to understand that in a complex world such as that of the 21st century, learners would still need some external basis, or disciplinary raw material, from which (or, on which) to construct their meaning and understanding (Innes, 2004, p. 1, 3). In other words, in the analogy of construction a strong foundation would need to precede the constructs. The point is made, however, that constructivists tend not to subscribe to a *theory first, then practice* model of learning. Constructivists reject the practical efficacy of theory and knowledge received *a priori*, whether through instruction or one's own rational faculty, in favor of that grounded in experience (Innes, 2004, p. 5). The premise of this view is that meanings do not exist independently of one's own

experience, seemingly disregarding the value and validity of experiences and meanings achieved over the course of thousands of years of recorded human history (Fang et al., 2012). In other words, we are not born blank slates, nor are we born into a world without meaning.

Behaviorism, on the other hand, is usually explained and at times denigrated as a strategy for conditioning mindless behavioral responses to external stimuli, as a means of controlling and calculating behavior irrespective of the subject's mental state, and devoid of the subject's understanding (Fang et al., 2012; Jardaneh, 2010; Boghossian, 2006). In this almost totalitarian characterization of behaviorism, understanding is the sole-domain of the conditioner, who is assumed to be external to and possibly even far removed from the learner; in some contexts, it may be just that. More to the point, however, behaviorists hold that knowledge is objective and acquired (Boghossian, 2006). If the learner is self-motivated and the conditioning self-imposed, I submit, seeking to restore faith in the *theory first, then practice* paradigm, that in such circumstances the subject's understanding may actually precede the conditioning. In other words, the learner's motivation and purposefulness in self-directed learning is the direct result of understanding the value and practical applicability of what they are to learn. This view necessarily moves away from behaviorism toward the domain of cognitivism, a psychological perspective that expands on behaviorism to incorporate mental processes in determining behavioral responses (Harasim, 2012; Jardaneh, 2010).

The history of Western education and its traditional emphasis on the lecture format and textbooks might suggest that collaboration characterized by active participatory physical activity are not necessarily requisite for acquiring foundational knowledge, given a motivated learner. While the constructivist view appears to be currently in vogue in higher education, the debate seems to evoke a 'which came first' argument with a certain paradoxical validity to both

positions. Yet, while the constructivist view rejects the pedagogical value of an experienced master/teacher imparting knowledge to the inexperienced disciple/student, as well as the abstract reasoning of the interested learner, I argue that *theory* as individualized goal-oriented research into the value and relevance of foundational knowledge drawn from multiple disciplines and *practice* as efficient iterative mental exercises which lead to memorization, internalization, understanding and automaticity are compatible with the constructivist view. What the teacher is teaching in this circumstance, is how to find that aforementioned value in what is to be learned such that the learner is self-motivated to learn it, as well as imparting the strategies to help the learner learn it as efficiently as possible. In this sense, the instructor is still the facilitator, but of self-directed learning whereby the learner thinks about what they need to learn within disciplinary contexts to be most effective and marketable with regard to their chosen academic/professional goals.

Approaches to Teaching Interdisciplinarity

While interdisciplinary pedagogy does not lay claim to a specific learning theory, discussion of teaching and learning within the context of interdisciplinarity or interdisciplinary studies programs often takes the tone of constructivism. Interdisciplinary students invariably are called upon to be "active agents in the learning process rather than passive recipients of information" (DeZure, 2010, pp. 372, 375). Additionally, consistent with a constructivist characterizations of learning, "new insights are weighted against one another and against antecedent commitments about the subject matter under study" (Mansilla, 2010, p. 289). Empathy, that subjective ability to relate to others, is considered an essential element of interdisciplinarity, though this too would seem to depend on the context. Interdisciplinarity as "Propositional knowledge in the disciplines and the development of deductive and inductive

reasoning skills" is considered inadequate in itself by those who place an emphasis on the

subjective (Mansilla, 2010, p. 293). Others, however, possibly including some constructivists,

might argue that knowledge is grounded on propositions (the objects of belief) – or, stated

differently, that propositions are the building blocks of the known ("Epistemology," 2015).

While a deeper philosophical discussion about the status of propositions or the different types of

propositional knowledge within epistemology (or our epistemologies) is outside the scope of this

dissertation, I would be remiss not to recognize that some theorists, perhaps such as Deleuze and

Guattari, embrace a more relative, temporal or contextual view of propositions within their

epistemological arguments.

Scholars of interdisciplinarity do seem to agree on a pluralist epistemological framework

that does not privilege one disciplinary perspective over another (Mansilla, 2010, p. 294). Allen

F. Repko espouses an interdisciplinary ideal of *critical pluralism* – *""reasoned judgment" where

ideas are judged "better" or "worse" depending on the appropriateness or quality of reasoning

supporting them*" (Repko et al., 2014, pp. 142-143). Yet, notwithstanding those theorists, such

as Henry Giroux, who appear to take a more anti-disciplinary stance as opposed to an

interdisciplinary one, empirically validated propositional knowledge is still an essential element

of interdisciplinarity. To this end, there is much theoretical discussion of the defining elements

of disciplines within commonly used interdisciplinary studies textbooks (pp. 85-116). Within the

courses themselves, however, the discussions and curricular applications tend to be more general

for maximum applicability to a diversity of students facilitated by instructors who may have

limited disciplinary expertise within many disciplines.

Two textbooks that are commonly required in interdisciplinary studies core courses, and

indeed, have been used in UCF's Cornerstone and Capstone courses for years, are *Becoming

Interdisciplinary: An Introduction to Interdisciplinary Studies by Tanya Augsburg, and

Interdisciplinary Research: Process and Theory by Allen F. Repko (Hansen, 2015; Dennison,

2014; "UNIV 2190 Syllabus," 2008). The first six chapters of *Becoming Interdisciplinary* cover

"Understanding Interdisciplinary Studies." Within these chapters can be found a history of

interdisciplinary studies, essential terms associated with interdisciplinary studies, how one might

describe interdisciplinary studies to someone unaware, characteristics of interdisciplinarians,

readings illustrating how to create a personal narrative as an interdisciplinarian, and advantages

or disadvantages to interdisciplinary studies (Augsburg, pp. 1-102). While these may be

necessary topics for discussion, these chapters seem to encompass most if not all of the

theoretical material covered in the Cornerstone course.

UCF's Cornerstone course begins with theoretical discussions of interdisciplinarity,

including distinctions between different categories or subcategories of interdisciplinarity. These

distinctions include multidisciplinary, transdisciplinary, and cross-disciplinary. Metaphor is used

to frame these distinctions, and examples of what these distinctions look like in the real-world

are incorporated into these discussions. The material covered in the latter of these chapters is

applied as exercises in creativity and reflection; students construct an e-portfolio to showcase

their education and experiences for perspective audiences integrating text and images within an

electronic platform. What seems to be lacking from the curriculum, with the exception of

perhaps a single assignment that asks students to analyze the disciplines that will make up their

plans of study, is a concerted effort to understand what types of knowledge it will be essential for

students to learn and retain as they begin their disciplinary coursework. Students are generally

not asked to undertake serious interdisciplinary research in Cornerstone, which makes sense

given that they often have not taken courses within their disciplines. The Repko discussions on

research (and indeed, the entire Repko text mentioned above) would seem more appropriate for the Capstone course or senior thesis.

A more recently published (2014) Repko text titled, *Introduction to Interdisciplinary Studies*, seems to represent a middle ground between the Augsburg text and Repko's *Interdisciplinary Research*. To an extent, Parts I and II of this text parallel *Becoming Interdisciplinary* in terms of topical content and focus, although Repko seems to offer a somewhat more advanced exposition. Part I attempts to facilitate the development of a conceptual understanding of interdisciplinary studies through examining what it looks like in practice, exploring how it is defined, and providing a history. Later, in Chapter 5 of Part I, Repko discusses academic disciplines in some depth (pp. 85-119). Rather than titling the second part of his text "Doing Interdisciplinary Studies," as Augsburg does, Repko titles his Part II, "Thinking Critically about Interdisciplinary Studies." The premise of Repko's discussions in Part II is that disciplinary perspectives are "partial" rather than "big picture." He expands on this idea by suggesting that disciplinary perspectives are neither "wrong" nor "right," which seems to favor a relativist's diplomacy if not a critical theorist's battle cry of "question everything" – an absolute directive which I would argue needs moderation, especially in the undergraduate classroom (p. 141). This Repko text does contain a chapter devoted to developing *adequacy* (as opposed to mastery) within relevant disciplines, but this discussion is in the context of the interdisciplinary research process itself (i.e., situational adequacy developed during the research process), rather than in terms of developing (multi-)disciplinary adequacy as a necessary precursor to engaging in interdisciplinary research (Repko, 2014, pp. 44, 145, 197-224).

Part III of this Repko text focuses on "Interdisciplinary Research and Writing." While the discussions of Part III are somewhat more accessible than those of the *Interdisciplinary*

Research text, this material might still be more appropriate for the Capstone course or senior thesis as it engages in the research process. Again, my experience has been that students entering an interdisciplinary studies program just aren't there yet. I will say, however, that I have experienced considerable success employing this Repko text in my Cornerstone sections in the past as students seem to have found it both accessible and engaging. There will be more discussion on texts and curricular approaches employed in interdisciplinary studies or like programs at various other institutions later on in Chapter 6.

Within UCF's Interdisciplinary Studies program, there are many students with a STEM orientation, and even more who focus on some aspect of the biological or physical sciences as a pathway to a graduate school in the medical field or a career focused on protecting the environment. Yet, there seems to be little emphasis on preparing these students to build and reinforce a strong foundation of knowledge within these areas of study past taking a few requisite courses. Within *The Oxford Handbook of Interdisciplinarity*, currently not a required text of UCF's Cornerstone or Capstone courses, there is discussion of the interdisciplinary achievements that have arisen from integrating biology and medicine, biology and chemistry, biology and engineering, and biology and mathematics (Burggren et al., 2010, pp. 120-128). These discussions would be invaluable in helping interdisciplinary studies students specializing (if the term is even appropriate) in these areas determine what type of information is going to be most essential to building a disciplinary, and indeed, interdisciplinary foundation of core knowledge, and its applicability. Yet, these discussions would not be universally applicable to all interdisciplinary studies students, and they say little or nothing about how to do this over five to six courses per area of study. Rather, the discussions emphasize collaboration among "teams

of scientists" or "interactions between biologists and engineers" (Burggren et al., 2010, pp. 124-125).

Within the social sciences, also encompassing a large segment of UCF's Interdisciplinary Studies students, core knowledge is often the product of historical accounts (i.e., area studies) and quantitative research methods, or 'objective' scientific research. While statistics and the social sciences in themselves represent interdisciplinarity or at least cross-disciplinarity, a previously mentioned subset of interdisciplinarity whereby the social sciences are viewed through the lens of the computational sciences, other partnerships such as psychology and economics extend the interdisciplinary scope of the social sciences to other fields entirely (Calhoun & Rhoten, 2010, pp. 106-114). While there is a tension between humanistic and behaviorist approaches to the social sciences, discussions within the Cornerstone and Capstone courses at present seem to largely take on a humanistic orientation, with general participatory discussions (either asynchronously through discussion boards, or in mixed-mode sections, within the classroom) of the current state of society and the environment relative to areas of study, specific complex problems facing our world, and recent innovations in different arenas. The strength of these discussions lies in the various ways the concept of disciplinary integration and integrative thinking are illustrated in real-world scenarios. Yet, these discussions seem to remain on the surface of the issue, rarely venturing deeper than a cursory treatment of the disciplinary assumptions and theories that might be involved in addressing the problem or controversy from an interdisciplinary perspective.

Within the Interdisciplinary Studies core courses at UCF, students are expected to develop and revise an e-portfolio in order to give them a tool for showcasing who they are both within and outside the classroom for perspective audiences (whether academic or professional).

This e-portfolio amounts to a navigable website that combines text and images, ideally, in a creative and stylish presentation such that it tells the story of the student across multiple 'content pages,' painting an integral picture of the student as an interdisciplinarian. At a minimum, the e-portfolio would have an introduction page, a personal or professional statement, a resume, a Course Study page (that documents the student's academic plan and past courses), and three titled content pages. These content pages could focus on topics such as the student's academic, professional or extracurricular experience, volunteer work, community involvement, academic interests and accomplishments, skills, talents, abilities, etc. The idea is that content page topics would be carefully chosen with the perspective audience in mind such that they demonstrate value for that audience. Because of the individualized nature of each interdisciplinary studies student's program of study, and the unique characteristics, experiences and goals of these students, every e-portfolio will look different and serve different purposes. As such, assessing the e-portfolio can be a somewhat subjective affair, but there are efforts to employ rubrics that make assessment at the very least fair. Regardless of how it is or isn't utilized after graduation, the e-portfolio is an exercise in creativity and design, which could be argued to be applicable to any interdisciplinary studies student.

The Theory of Multiple Intelligences

The diversity of interdisciplinary studies students necessitates an acknowledgment of those learning proclivities that are thought by some to vary within the individual learner. In the 1980s, Harvard psychology Howard Gardner published his theory that our understanding of intelligence, as had been tested in intelligence quotient (IQ) tests throughout the 20th century, was too narrow of a conception of intelligence. Rather, Gardner argued that each of us is intelligent in different ways, initially delineating seven basic 'intelligences.' The number of

intelligences that comprise Gardner's *Theory of Multiple Intelligences* would grow to at least eight over the next decade. These include linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalist intelligences (Armstrong, 2009, pp. 5-6). Along with this open-ended pluralistic view of intelligence, Gardner's conceptualization of intelligence has become increasingly contextualized, going as far as suggesting that intelligence should not be considered as an individual property or properties, but as a distributed property relative to not only the individual's social and cultural context, but also to the external resources available to the individual (Lazear, 1999, p. vii). This notion seems to support an individual-oriented approach to undergraduate education, especially as it relates to IDS students.

It is important to recognize that Gardner's use of the word *intelligence* could easily be characterized as an individual's *talent*, *aptitude* or *competency*, as Armstrong points out, or in the distributed sense, in terms of *opportunity* and *utility* (Armstrong, 2009, p. 8). Thus, Gardner's theory appears to be in large part an effective semantic reframing of what we already knew, but in such a way as to undermine the 'privileging' of a print-centric linguistic/logical-mathematic definition of intelligence. Ideally, IDS majors will naturally gravitate toward those areas of study that cater to their strengths and interests. Nevertheless, given the aforementioned diversity among IDS students and their academic focuses, Gardner's theory is an appropriate theoretical support for the development of both interdisciplinary and as we will see later, web-based interdisciplinary studies core curriculum.

This does not mean that it will necessarily be possible to cater to all the intelligences specified by Gardner within the curriculum of interdisciplinary studies core courses offered through online or mixed-mode formats, but it may be a basis for students to better know their

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own preferences relative to knowledge acquisition within various disciplinary and technological contexts later on. As is already demonstrated in current online instructional practice, it is possible for online learning platforms to offer multi-modal learning environments incorporating visual, auditory, and textual content, as well as facilitate primarily asynchronous social interactions among instructors and peers. In the curricular model I am proposing, students will not just be recipients of information through these modes, but will be experimenting with classical and creative strategies that integrate image and language to efficiently internalize information. Additionally, students will seek to verbally engage and interact with authorities and professionals within fields relevant to their post-graduation goal.

In summary, I have looked at current approaches to teaching and learning in higher education, particular from the behaviorist and constructivist perspectives. I then discussed current practice as it relates to interdisciplinary studies pedagogy and curriculum, particularly within UCF's Interdisciplinary Studies program. Lastly, I have acknowledged the necessity of seeking to accommodate the different ways in which we learn as we consider the diversity of interdisciplinary studies students and the constraints of online learning. In the following chapter I will delve deeper into the pedagogical debate that underlies the different approaches to teaching and learning in higher education.

CHAPTER 4: INTERDISCIPLINARITY AND THE PEDAGOGY DEBATE

In his work *E-Crit*, Marcel O'Gorman, himself a Director of an interdisciplinary program levels criticisms against disciplinarity and what I refer to as traditional pedagogy, of which the general sentiment appears to be shared among at least some contemporary scholars within the liberal arts and humanities. By 'traditional' I merely mean conventional, 'conventional' being those pedagogical strategies which, though surely once novel in themselves, have been broadly employed in American culture from before the time of its founding through the greater part of America's 20th century ascension to world superpower. With exceptions, I tend not to use the word 'conventional,' because, arguably, in today's changing academic milieu what was conventional is no longer. O'Gorman refers generally to such traditional approaches and their adherents as belonging to the "Republic of Scholars," a pejorative designation for seemingly all print-centric scholarship. His argument is that such approaches are linked to the biblical exegesis of the Reformation and to *Ramism*, the logic of and pedagogical approach instituted by Peter Ramus in the 16th century which has influenced traditional pedagogy in a number of ways (Mack, 2011, p. 7; O'Gorman, 2007, p. 7, 21). In this chapter, I will argue that Ramus' method does continue to have value as one of several potential developmental strategies within interdisciplinary studies undergraduate programs providing curricular structure essential to that very intellectual journey of discovery for which we seek to prepare interdisciplinary studies students to efficiently undertake within the context of a limited number of disciplinary courses.

Of the Republic of Scholars, O'Gorman says, "with its faith in transparent language, scientific proof, and the text-based, linear, sequential essay, [the Republic of Scholars] provides the methodology and discourse for all who wish to maintain affiliation within the academic apparatus" (p. 24). In short, O'Gorman argues against what has been the common methodology

and language of academic discourse, and in so doing, those learning strategies by which we have traditionally disseminated, internalized, and applied knowledge. O'Gorman joins a host of other recent critics of Ramus's scholarship and influence, including those who suggest that it is actually Ramus's pedagogical approach that has "dumbed down generations of university students" (Mack, 2011, p. 7).

O'Gorman, however, does not criticize without offering, in his words, a decidedly poststructuralist and 'post-Ramist' alternative to traditional research methodology (O'Gorman, 2007, pp. xiii-xvi, 46). Although O'Gorman frames his approach as an attempt to "bridge the gap between print-centric and computer-centric practices," what his methodology actually represents is a complete departure, a shift to the opposite pole, so to speak, and a comprehensive Derridean deconstruction of convention predicated on privileging the heretofore 'abject' side of those modernist binary oppositions that proponents of deconstruction find so oppressive (p. 95). O'Gorman's mounting of such a virulent campaign against a singular figure in the history of modern pedagogy begs an investigation into what Peter Ramus actually advocated, and why, relative to knowledge acquisition not only in the realm of rhetoric and dialectic, but for a wide range of subjects for which he would eventually write textbooks (Ong, 2004, p. 132).

A survey of scholarly discussion of Peter Ramus' legacy, suggests he desired to make education more efficient by cutting out that which was of no practical value (Triche & McKnight, 2004). Ramus is regarded as the father of the modern textbook as a self-contained corpus of everything that needs to be known about a given subject (Ong, 2004, p. 132). Writing during the mid-16th century, Ramus was influenced by Aristotelian, Ciceronian and Stoic philosophical perspectives, placing an emphasis on reason *then* experience, or theory *then* practice (Sellberg, 2014). As we have seen earlier, this would appear to be the antithesis of the

experience-oriented constructivist approach to education. While much could be said about Peter

Ramus's criticism of Aristotelian philosophy and the philosophical debates in which he was

embroiled during his lifetime, (or, as O'Gorman chooses to discuss, his unhappy demise) of

primary relevance and of potential practical value to the discussions that follow is Ramus' efforts

toward curriculum reform.

Despite the present perceived limitations, Ramus's method is directly relevant to at least

one aspect of the pedagogical approach already embraced within the current Cornerstone and

Capstone curriculum. Ramus' methodology, which consists in analysis followed by *genesis* (or

synthesis) has already been implemented within these courses with varying degrees of success

(Ong, 1958, p. 263). The basic methodology is discussed by Walter J. Ong who quotes Ramus'

actual writings (which, of course, were originally rendered in Latin):

> Logical analysis is the process by which a given example of
>
> discourse already composed is examined in terms of the laws of
>
> the art, the question is extracted, then the invention studied, and the
>
> place from which the argument was drawn looked for (p. 264).

This analysis is followed by genesis/synthesis, a process of composition whereby one imitates

the form and method of the previously analyzed work, in essence, reversing the process, but with

original content and arguments drawn from original sources. Ong points out that this basic

method is standard Renaissance pedagogy, but that Ramus' description of the process adds a

formulaic "assembly-line" quality (p. 264). Indeed, Ramus' method has been characterized as

"an intellectual short cut that suppressed the metaphor of education as an intellectual journey

characterized by lengthy, rigorous study…" (Triche & McKnight, 2004). Raphael Hallett

expounds on such criticism of Ramism thus:

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The historiography of Ramism has described with a mixture of

regret and suspicion the dual influence of 'method' and 'print' on

the evolution of scholarship in the sixteenth century. It typically

declares that these arts suffer forms of reduction, simplification

and sterilization due to the claustrophobic confines of printed

handbooks, and due to the dubious ambition to render artistic

traditions accessible and applicable to a print-hungry mass-market

of scholars and readers…(Hallett, 2011, p. 96).

As suggested, these characterizations seem intended to merely denigrate Ramus's contributions

to curricular design and the textbook paradigm, as well as a broader "Gutenberg mentality."

In Cornerstone, students complete an Interdisciplinary Analysis project whereby they

analyze a previously published peer-reviewed article on a subject that is relevant to their areas of

study, career aspirations, and interests. Students are specifically asked to analyze the author's

approach in terms of interdisciplinarity, investigating bibliographical sources from which

insights are drawn, integration of these insights within the methodology or discussion,

organization of content, and so forth. In Capstone, students investigate a pre-approved complex

real-world problem of their choosing in the form of a literature review, coupled with a service

learning/observational research requirement, with the goal of developing a conceptual

framework for addressing the problem through an interdisciplinary approach. As suggested

earlier, the goal of the Cornerstone project is identification; in Capstone, the goal is application.

In terms of Ramus' analysis exercise, Ong states that the results varied widely during his time,

from simplistic summaries to greatly expanded and enriching commentaries (Ong, 1958, pp.

264-265). Similarly, both the Interdisciplinary Analysis (Cornerstone) and Interdisciplinary

Research (Capstone) projects have produced widely varying results. While this strategy has

engaged some students, the quality of submissions suggests others have not been reached. While

more needs to be done to engage all students, this does not necessarily warrant a complete

departure from Ramus' theory and practice. Within the body of this dissertation, a more in depth

treatment of Ramus' method and the outcomes of its application in 19th and 20th century

pedagogy will be undertaken in an effort to support this argument. Next, however, I briefly

revisit the current state of online pedagogy, both in general and within the context of the IDS

program.

Online pedagogy seems to follow the evolution of American classroom pedagogy toward

a 'social view' of learning. Early proponents of learning in the virtual classroom argued that

"technology supports collaborative learning, heterogeneous groupings, problem-solving, and

higher order thinking stills" in ways that students physically present in a classroom with an

instructor do not – the presupposition being that in the virtual classroom, instructors will have

less opportunity to be the dominant presence (Van Dusen, 1997, pp. iii-iv). Rather than the

Cartesian premise of "I think, therefore I am," the premise of 'being' becomes "We participate,

therefore we are" (Brown & Adlers, 2008). As suggested earlier, underlying this view seems to

be that unless we are actively participating in the discovery of knowledge through collaboration,

we aren't learning. Scholars who support this shift toward participatory learning argue that

students in higher education are more engaged and learn more in group contexts (i.e., weekly

study groups, group projects, etc.) than through focused individual study. Underlying such

arguments are the principles of democracy and social 'justice' and equality (Barton, 2005).

Since at least the 1990s, in the student-centered classroom, whether face-to-face or

online, scholarly discourse has characterized the teacher as 'facilitator,' with students being

encouraged to take responsibility for their own learning, often through creative and critical collaboration (Fang et al., 2012; Van Dusen, 1997, p. iii). This trend seems to continue into the "problem-centered" classroom, yet an effort does seem ongoing to bring 'teaching' back into the fold of learning (Hewett, 2010, pp. 97-101). Nevertheless, like the Internet itself, the higher education classroom, seems to have moved from a space for acquiring information and knowledge, to a space for sharing and collaboration – viz. Web 2.0 (Brown & Adler, 2008). The limitations of this collaboration within current LMS platforms will be discussed in the following chapter.

In online courses, students are necessarily given weekly graded assignments to keep them engaged – a source of resentment and frustration among some students (Moore & Kearsley, 2005, p. 176). Currently, in both the Cornerstone and Capstone courses (as with online courses more generally), weekly online discussions requiring both initial and response posts, and peer reviews whereby students critically evaluate each other's work, are standard protocol for maintaining this engagement both with the course content and with each other (Ko & Rossen, 2010, pp. 72-73, 77; Moore & Kearsley, 2005, p. 149). Individual or collaborative writing assignments and projects, as well as quizzes and/or tests are also incorporated into the curriculum to varying degrees depending on the course or instructor preference. Most or all of these activities will involve internal and external resources such as textbooks, PDFs, library resources and article database, podcasts, etc. While students are expected to adhere to specific deadlines, these deadlines appear to give students license to wait (often literally) to the last minute – perhaps an indicator of student interest and motivation. Moreover, it often appears students only read those posts to which they respond.

While there is a wealth of scholarly literature outlining elaborate strategies for engaging students in online courses and facilitating effective online pedagogy, the practical reality of online courses appears to be much less sophisticated. Once course content has been released to students instructors might take a more passive role remaining accessible to address coursework-related questions and the inevitable personal, interpersonal, or technical issues that arise, but otherwise leave the course on autopilot. Often in the Cornerstone and Capstone courses, students are encouraged to seek out help first from their peers through discussion forums specifically set up for this purpose. Some instructors may take a more proactive/interactive approach, attempting to engage students through asynchronous or synchronous communication modes, such as participation in chats, online discussion forums, or even video conferencing, but this appears to be the exception, and it is not entirely clear if these efforts enhance the student experience or perception of learning. This is not to say that online courses are inadequate as a learning environment. Rather, I will argue that, in many ways, they seem like the ideal platform for teaching the concept of interdisciplinarity and its practical applications. While not necessarily ideal for real-time and hands-on collaboration, online learning environments do seem to afford the potential for effective knowledge delivery (through easy to access videos, recorded lectures, charts, texts, etc.) so long as students are stimulated to engage with the material (Kay & Kletskin, 2012).

While, functionally, this format, and these modes of communication, have worked to move a considerable number of students through online courses, benefiting both universities and students, economically, spatially, and temporally, the amount of learning that is actually taking place appears debatable. In Capstone, for instance, IDS students often demonstrate a minimal familiarity with even basic concepts related to interdisciplinarity that, according to established

course objectives, they have supposedly learned in Cornerstone. While there is a wealth of applicable theoretical and practical discussion of concepts and real-world scenarios related to interdisciplinarity contained within the existing textbooks used in these courses, much of this content is necessarily glossed over in favor of more stimulating topics in the interest of keeping students engaged and, I daresay, 'happy.' As was suggested earlier, this may be symptomatic of online education in general as motivation to learn and apply interdisciplinary concepts in substantive ways appears to be lacking among students in both Cornerstone and Capstone. The challenge, then, appears to be generating student interest, while at the same time integrating academic rigor – by this I mean, preparing the soil for internalization of disciplinary knowledge in Cornerstone, and in Capstone, applying that knowledge through structured exercises in conceptualization and creative problem-solving.

The question arises whether this lack of motivation is simply a characteristic common to 21st century university students, a symptom of instructor disposition and pedagogical culture, or representative of a deficiency in the specific curriculum associated with these courses that can be addressed to enrich the student experience – *or a combination thereof*. While there are suggestions that digital technology is correlated, if not causally related, to certain behavioral characteristics such as short attention spans, a need for instant gratification and constant multitasking it would seem the imperative underlying these notions is to meet students where they are, cognitively speaking (Small & Vorgan, 2008, pp. 24-25). It would seem equally important, however, to show students the value of traditional pedagogical strategies in knowledge acquisition, such that, seeing the value of these strategies in terms of practical outcomes, they might be willing to embrace them – even if it means conditioning themselves to think in ways that the Internet and digital technology do not afford.

To illustrate this point, Indian-Americans represent less than one percent of the population of the United States. Yet, Indian-American children have won 11 out of the last 15 Scripps National Spelling Bees. If winning spelling bees was the extent of Indian-American academic and professional achievement within American society it might be easy to reject this anecdotal statistic as having any relevance to practically applicable learning, particularly within higher education. However, Indian-Americans go on to further represent "one of the wealthiest and most educated diaspora groups" within the U.S. population, with over 300,000 Indian-Americans working in Silicon Valley, and 43.6 percent employed in either managerial or professional specialties (Sahay, 2009, p. 163). Additionally, according to the U.S. Census Bureau, while the median household income of the U.S. population (in 2012 inflation-adjusted dollars) was $51,371, Indian-Americans' median household income was $96,782 (U.S. Census Bureau, "American FactFinder" website). Returning to the publicized scholastic feats of Indian-Americans, similar patterns of Indian-American youth disproportionately outperforming their peers can be seen in "geography bees, math competitions, and science Olympiads." In 2013, "one fourth of the top 40 finalists in the Intel Science Talent Search Competition, formerly known as the "Junior Nobel Prize," were children of Indian-American parents, as were the winners of the Siemens Talent Search," as were, recently, "five out of the last 8 winners" of the National Geographic Bee (Ghosh, 2015, pp. 35-36).

What makes this phenomenon interesting is not that Indian-Americans might be successfully assimilating into a Western, colonial, or puritan educational/cultural milieu, but the arguably out-of-favor study habits through which they are excelling – specifically, drill and practice, memorization, and logic. This point is not intended to stereotype Indian-Americans; after all, not all Indian-Americans excel, and Euro-American contestants prepare for scholastic

competitions in the same way (Ghosh, 2015, p. 47). Rather, I am using this undeniable pattern to

defend learning strategies that have been historically integral to education, but that have faced

considerable criticism in the present American educational milieu as leading to factual

knowledge without meaning or understanding (Willingham, 2009, p. 94, 107). In other words,

the suggestion appears to be that the knowledge acquired in this manner, supposedly out of

context, cannot be drawn upon toward practical problem-solving or domain-related activities

later.

Indeed, rote memorization with no ability to apply the content memorized toward any

scholarly or practical end was demonstrated in studies of the 'Shass Pollak,' early in the 20th

century. These 'Talmudic Poles' memorized the over 5000 pages that make up the Jewish

Talmud to the point of being able to successfully identify where each word fell on a page, but not

much else (Stratton, 1917). In discussing these singularly-focused mnemonists, the suggestion

was further made that "such extraordinary powers of memory may exist in a kind of intellectual

disproportion where there is no corresponding development of other powers – where, indeed,

there may be an actual stunting of other powers and interests…" Nevertheless, Cognitive

Scientist Daniel T. Willingham refutes this notion, suggesting that not only is factual knowledge

(here taken to mean commonly accepted background knowledge within disciplinary domains)

necessary for effective critical and logical thinking to take place, "rote" knowledge (knowledge

with *no* understanding or context) is probably very rare (Willingham, 2009, p. 37, 94). In

defense of the Shass Pollak, I surmise that it was never their intention to interpret or evangelize

the Talmud for profit or social prominence, merely to internalize it for its spiritual nourishment.

While the Stratton points out that none of the Shass Pollak every rose to scholarly prominence,

what is glaringly missing in the discussion of the Shass Pollak is any commentary on their

quality of life as it relates to spiritual well-being, family, a sense of belonging, personal fulfillment, etc. As for spelling bee contestants, learning the context of a word, its etymology, meaning, use, etc., is essential to learning how to spell the word, and thus, probably shouldn't be considered rote at all. Incidentally, at least one of the recent winners of and a regular contender in the USA Memory Championship, not to mention a successful risk management consultant, happens to be Indian-American.

In short, current trends in American higher education appear to respond to the predispositions of today's students (and educators), sacrificing individual-oriented discipline and rigor under traditional authority structures in favor of egalitarian-oriented group collaboration. One handbook on learning goes as far as calling individualism a disease of Western education (Meier, 2000, pp. 15-16). The predominance of the social paradigm appears especially evident within interdisciplinary curriculum, with a special emphasis on empathy and conscientiousness (Repko et al., 2014, p. 53). The shift away from individualism and individual achievement within specialized domains toward collaborative achievement across disciplinary boundaries seems to correspond directly to Marshall McLuhan and Walther Ong's theory that society is moving into an era of re-tribalization and secondary orality. Delving further into the societal implications of this potentiality would constitute its own dissertation.

As previously mentioned, with regard to disciplinary knowledge, Allen F. Repko states that the requirement for entry-level interdisciplinary work is "adequacy, not mastery" (p. 145). Indeed, specialized disciplinary knowledge and perspectives are criticized for being too reductionist, prone to tunnel vision, a hindrance to creative breakthroughs, and basically ignorant of other perspectives and outside concerns (pp. 78-79). I would argue that a potential unintended effect of such criticism is the devaluing of the very disciplinary knowledge that serves as the

foundation for interdisciplinary problem-solving, and which constitutes the raw materials of an interdisciplinary studies student's formal education. While theory and analysis toward goals of identification and familiarity are important objectives for an introductory course in an Interdisciplinary Studies program, it would seem of equal importance to instill strategies for maximizing disciplinary knowledge acquisition. This means demonstrating the value of those, perhaps, out-of-favor learning strategies that can be employed by students to internalize knowledge as they begin disciplinary coursework within their various areas of study. Because students in interdisciplinary studies programs will be completing less coursework within specific disciplines than someone in a traditional disciplinary major, strategic knowledge acquisition and retention would seem doubly important.

Although deconstructionist theorists, such as O'Gorman, attempt to "blur the boundaries" of just about everything, I would argue that this notion has become to a certain degree cliché and not necessarily appropriate in interdisciplinary contexts. An effective interdisciplinary education requires maintaining and even reinforcing certain distinctions. This position does not seem inconsistent with Allen F. Repko's interdisciplinary ideal of *critical pluralism* (Repko et al., 2014, pp. 142-143). In terms of IDS courses, one such distinction would be modes of writing – for instance, distinguishing the formal, detached, and objective writing of academic discourse from subjective, and personally invested, rhetorical or reflective writing. An IDS student needs to be able to do both, and, moreover, to understand in which situations one or the other is called for. One frustration from an instructor perspective within both the Cornerstone and Capstone courses is that student research project submissions sound more like unsupported and impassioned manifestos than formal academic writing. Yet, such writing is not entirely misguided. In addressing complex real-world problems associated with the environment,

sustainability, health, social ills, and so forth, IDS students feel inclined to communicate a sense of urgency. Yet, students do not seem to understand, at least initially, that passion is not necessarily the way to reach a rational audience, or vice versa. What making this distinction requires of instructors, then, is encouraging habits of mind that would enable IDS students to distinguish on a meta-cognitive level between more and less "objective" and "subjective" modes of thinking as they communicate with various audiences and engage, collaboratively, in creative problem-solving.

In summary, we have discussed what seems to be, ideologically speaking, a polar shift away from traditional approaches to learning exemplified by the reforms of Peter Ramus toward a postmodern/post-structuralist view of education that corresponds to the nature and affordances of the interface as well as, perhaps, our evolving cultural zeitgeist. This view of education is predicated on principles such as active participation, social engagement, and open-endedness. I have further examined what this notion of education looks like in practice within UCF's Interdisciplinary Studies core courses. Yet, using the peculiar achievements of the Indian-American demographic within American society to illustrate my point, I have also suggested that there may be a highly effective alternative approach to learning well-suited to online education. In the following chapter, I take a closer look at the affordances and limitations of online learning in the context of current practice.

CHAPTER 5: APPROACHES TO ONLINE LEARNING IN HIGHER EDUCATION

The discussions thus far of online education have offered an overview of approaches to online education relative to current practice within the context of UCF's Interdisciplinary Studies program's Cornerstone and Capstone courses. The objective of this chapter is to explore current qualitative and quantitative research related to the affordances and limitations of current online learning technology, as well as best practices among online educators, and these findings' potential applicability to a cognitivist-oriented curricular model for designing transferable core interdisciplinary studies program courses. As previously alluded to, the goal for student outcomes will be to increase the intrinsic motivation of students throughout their undergraduate education to gain and retain the foundational disciplinary knowledge that will be necessary for them to reap the fruits of interdisciplinarity in practice as they move on to graduate school, industry, the non-profit sector, or entrepreneurial endeavors.

In this context, *affordance* refers to those aspects of online instructional technology that deal with how course content is presented (*modality*), instructor provided versus student generated information (*agency*), mechanisms through which users may synchronously communicate or impact/alter content (*interactivity*), and the ability of users to move through and find information so as to use it in a meaningful manner (*navigability*). In a recent University of Kentucky study, researchers suggest that "the one affordance that seems to have the greatest impact on how information is received and processed in a digital environment is modality" (Limperos et al., 2015). In online education, *modality* generally refers to video, audio, pictures and text. *Limitations* in this discussion will refer to the feasibility (or lack thereof) of practically

incorporating certain instructional features into course design based on both research and experience.

While online education can take on many forms in this age of digital technology, for the purposes of this dissertation, *online education* (used interchangeably with *online learning*) refers specifically to online courses offered as part of an accredited (interdisciplinary studies) degree program through a state university system or in a comparable private college or university. As core courses within an interdisciplinary studies program might be expected to be offered in either a fully-online or mixed-mode (also referred to as *blended* or *hybrid*) format, distinctions may be made between these two formats. As previously implied, the *mixed-mode* format combines elements of both the face-to-face and online formats. In the mixed-mode format, students generally meet face-to-face once or twice during the week.

In the fully-online format course content will be delivered entirely online, but in the mixed-mode format content might be presented in-class. In either format graded coursework is generally submitted online. Exceptions to online submissions would apply specifically to the mixed-mode format where students might be expected to deliver in-class presentations or participate in in-class discussions. Otherwise, student (or faculty) expectations that a fully-online or mixed-mode course will be the same as a traditional face-to-face course will likely be frustrated (Keengwe & Kidd, 2010). While formats such as video-streaming and reduced seat-time also integrate elements of in-class and online instruction, they do not seem to be commonly employed to facilitate interdisciplinary studies courses. As such, these formats will not be discussed.

Limiting the focus to this facet of Internet-based distributed learning environments, there appear to be two primary aspects of online learning that must be considered, first separately, and

then integrally: *the technology* and *the content*. Factors related to the technology, such as cost and capabilities, will most likely have to be considered at the institutional level before factors specific to the program and the courses. Once the platform for course delivery is determined, within those constraints, factors such as learning objectives, assessment, external resources, and the appropriate modes for delivery of course content can be considered. Technology and course content would then be considered integrally relative to these course objectives, structure, time constraints, the characteristics of the students, and other design elements.

The technology varies, to some degree within the institution, and more than likely across institutions, but will involve some type of Learning Management System (variously referred to in literature and practice as *a course management system* or *software* (CMS), *virtual learning environment* (VLE), learning platform or online delivery system). Often, additional outside Web 2.0 resources will also be incorporated into the course content (Shearer, 2013, p. 251; Ko & Rossen, 2010, p. 8). In both respects, this technology employed is not standard or static. Although the features and functionality between LMS platforms are generally similar if not the same, the lack of LMS standardization within higher education may pose a challenge for developing a curricular model that is easily transferable between undergraduate interdisciplinary studies or other interdisciplinary programs (Kats, 2013, pp. 2-3). This is because 'easily transferable between programs' necessarily means easily transferable between LMS platforms. For example, UCF used the Blackboard LMS prior to making a university-wide shift to the Canvas LMS. While UCF's Center for Distributed Learning (CDL) helped facilitate this transition, there were significant and numerous compatibility and coding issues with preexisting pages transferred from the Blackboard LMS to Canvas. In most cases, it became necessary to delete and completely recreate the pages in Canvas which has less HTML functionality, not to

mention a significantly different layout which, at times, caused navigation menu options to be duplicated on different areas of the screen.

In another example specifically within the Interdisciplinary Studies core courses at UCF, within the Cornerstone and Capstone courses, students developed their e-portfolio in the Sakai software platform until its use by the university was discontinued, at which time the e-portfolio project moved to the publicly-available Google Sites platform. Many students who had created their initial e-portfolio in Sakai during the Cornerstone course had difficulty retrieving their content once its use was discontinued, and even if they were able to retrieve their content, they ended up having to create an entirely new e-portfolio in Google Sites in the Capstone course. Still, one way to increase transferability of content and avoid compatibility issues might be a heavy reliance on external resources. But this strategy invites its own array of problems, not the least of which is the integrity of the course. Instructors would potentially no longer have control of course content or a self-contained vehicle for keeping track of coursework and student communications.

Regardless of the LMS employed to facilitate online courses, one might reasonably expect it to be capable of certain functionality, such as the ability to "post lectures or graphics, moderate discussions, invoke chat sessions, and give quizzes" (Ko & Rossen, 2010, p. 8). Instructors will have the ability to manage and create content, store content, customize displays, embed hyperlinks to internal and external resources, facilitate asynchronous and synchronous instructor-student and student-student interaction, and test, assess and track student achievement (Kats, 2013, p. 3-4). Additionally, though coursework is completed online, it is reasonable to expect that students will be reading and consulting textbook content in either a book or e-reader format, as well as accessing the Internet. While the content has also evolved over time, based on

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program assessments and student feedback, it has in large part transcended the technology shifts within UCF's IDS program.

Affordances and Limitations of Online Learning

Approaches to online education appear to embrace a behaviorist/constructivist dichotomy in much the same way one might frame teaching and learning approaches more generally. On the one hand, "Information processing perspectives, rooted in objectivist epistemology, assume meaning exists independent of the individual; individuals acquire and comprehend this meaning to become knowledgeable and productive…," while on the other hand, the constructivist perspective describes a process whereby "we acquire, update and revise new knowledge, [which increases] the number and strength of associations and representations…" (West et al., 2013, p. 126). In practice, both of these perspectives generally seem to be embraced, with varying degrees of success, through various forms of collaboration and assessment. The reason for this variance may have something to do with both motivation and the cognitive demands of the technology (West et al., 2013, pp. 128-131). First-hand experience, both as online instructor and student, suggests that interpersonal friction and social loafing pose challenges specific to collaboration in online learning environments, particularly as the complexity of the group-oriented endeavor increases. Informally, my Interdisciplinary Studies students have indicated that they are adverse to 'group work' in general, but do enjoy low-stakes discussions and value peer feedback.

Research supports the notion that students generally view online discussion forums positively albeit with frustration when there is not adequate peer participation and professor presence (Beckett et al., 2010). In one open-ended survey, the student responded, "It was generally a very useful tool to get to know others, to hear (and in some vicarious ways

experience) what is happening in the lives of fellow students – how they came to the journey they are on, how they handle various situations, what they have learned, etc." (Beckett et al., 2010). While students considered participating in online discussion forums worthwhile activities, the same study suggested that students did not think that it improved their academic writing. It would seem there needs to be a distinction made between the type of writing that takes place within a discussion forum, and the formal academic writing that students are expected to employ in research contexts.

In terms of professor presence within online discussions, research suggests that a reasonable 6.25 hours per week is optimal for best results in terms of student performance and participation (Cranney et al., 2011). Nevertheless, grading multiple discussion posts from 50 or more students each week would be taxing for any instructor without the help of teaching assistants. Effective rubrics that provide students both up front and throughout the course with a detailed breakdown of assessment criteria (i.e., as relates to quantity, quality, timeliness, and writing proficiency) may be a way to lessen this burden while at the same time setting clear expectations for students (Solan & Linardopoulos, 2011). Instructor contributions to discussion chains might then be made selectively with personalized feedback reserved for the more high-stakes course requirements. Of note, while professor presence is shown to have a positive influence on student performance and participation, the researchers that consider the role of professor presence suggest that, "More research needs to be conducted to better determine if the instructor's participation in the discussion form truly motivates students" (Cranney et al., 2011).

Nevertheless, online learning research has explored the role of both extrinsic and intrinsic motivation relative to both student satisfaction and student success, both of which move the paradigm away from behaviorism into the realm of cognitivism (West et al., 2013, pp. 129-130).

Extrinsic motivation deals with curricular requirements and making the grade, while *intrinsic motivation* deals with the individual's goals and personal interests. Studies suggest that some instructional formats and communication strategies may be more motivating for online students, such as video-based instruction rather than text-based instruction, email communications containing both goal reminders and words of encouragement, but there are also studies that suggest that online learning in general may decrease student morale (West et al., 2013, pp. 129-130).

Motivational challenges in online learning may have something to do with the cognitive load required to engage the course, particularly the *extraneous load* – that which pertains to the cognitive resources that must be dedicated to deciphering poorly-organized material, or navigating a poorly-designed or unfamiliar website. For instance, studies suggest hyperlinks, intended to be helpful with regard to navigation, may actually increase extraneous load (p. 130-131). Research appears to be inconclusive as to whether linear or nonlinear websites are more effective at reducing extraneous load, but do suggest linear sites are more effective when students are presented with factual information while nonlinear sites are more effective with regard to acquiring transferable knowledge. While such findings would seem to fit nicely into the modernist-postmodernist debate, inconsistencies still seem to characterize the overall state of research into online learning at present (pp. 132-133). More importantly, perhaps, little of the research appears oriented toward increasing the intrinsic motivation of learners. In other words, at present, there appears to be little in the way of inspiration and the articulation of individual advantage (not in the selfish sense; rather, the self-improvement sense) in online learning.

Even when the content remains the same, moving from the face-to-face classroom format to the online format poses problems with regard to clarity. From both the instructor and

academic advisor perspectives within UCF's Office of Interdisciplinary Studies, clarity is often

cited as a primary cause of frustration among UCF's Interdisciplinary Studies students taking the

Cornerstone and Capstone courses. In instructional environments, *clarity* refers to the

instructor's ability to communicate information and course content in a clear and concise manner

such that students are aware of what is required of them, and what they are to learn (Limperos et

al., 2015; Comadena et al., 2007). Citing prior research, Limperos states, "When instructor

clarity is achieved, it is linked to positive affective and cognitive learning outcomes as well as

student motivation and learner empowerment" (Limperos et al., 2015). In online courses, clarity

extends to overall course and individual module layout and organization, the presentation of

content, and the communication of expectations. Strategies for maximizing clarity in online

instructional environments might include planning and building the entire course before the

semester begins, communicating learning outcomes for the entire course at the beginning of the

semester, providing regular previews and reviews of material, frequently providing examples and

explanations relative to learning objectives and content, and using visuals to supplement text

(Limperos et al., 2015).

While research abounds with regard to clarity in face-to-face classroom learning

environments, research appears to be limited with regard to clarity in online environments.

Interestingly, several edited texts including a recently published 'handbook' for distance and

online education make no mention of clarity in their index. Of the two studies referencing clarity

in online instruction cited by Limperos and his team, one did not actually address online

learning, and the other *dated* study only addressed clarity with regard to student satisfaction and

perception of learning, not actual learning outcomes. Nevertheless, Limperos attempts to fill this

gap in his study. His team's findings, however, did not support the notion that clarity is one of

the most important aspects of online instruction. Yet, he does not deny that it is important, only that it may depend on the context. Limperos does suggest, however, that perceptions of closeness are equally important to or more important than clarity (Limperos et al., 2015).

Instructional *immediacy* refers to verbal and non-verbal strategies for building rapport and a sense of closeness between student and teacher. Studies suggest that strategies for enhancing teacher immediacy "are positively related to student affective and cognitive learning" (Comadena et al., 2007). These strategies as presented in research also appear to favor a lecture format in a face-to-face classroom rather than online instruction, and thus may represent a limitation of online instructional technology (Comadena et al., 2007; Hutchins, 2003). For instance, verbal strategies for immediacy include "the use of humor, frequent use of student name, encouragement of discussion and following up on student-initiated comments, encouraging future contact with students, and sharing of personal examples" (Hutchins, 2003). Humor might be incorporated into video-recorded lectures, but this would preclude the use of students' names or a back-and-forth discussion. Dividing students and facilitating small group chats or video-conferencing sessions with instructor participation might be ways to enhance verbal immediacy in the online environment, but at present do not appear to be widely implemented. The size of the course or student flexibility requirements may make such curricular components impractical. Asynchronous discussion forums too are problematic in that it may be difficult for instructors to respond to every post. However, on a textual level, most of the verbal immediacy strategies cited above can and are implemented at least to some degree in the discussion forum environment.

Nonverbal strategies would seem to be even more problematic. These include, "smiling, eye contact, vocal expressiveness, open gestures and body movement behaviors" (Hutchins,

2003). At the very least video-recorded lectures or video-conferencing would need to be

employed, practices that some online instructors would be hesitant to implement, if not entirely

averse to the idea. Recorded lectures are more common, but instructors employing this

instructional component may be tempted to read their lecture, which would likely be obvious to

the students, negatively affecting both immediacy and credibility. In addition to student

perception of learning and satisfaction with the learning experience, immediacy is important as it

relates to motivation. Hutchins states, "Immediate teachers often encourage students to

appreciate or value the learning task, which in turn, has been found to enhance cognitive

learning" (Hutchins, 2003). One way that instructors might overcome the impediments to

instructional immediacy in online learning environments might be through introducing new

material through carefully chosen attention getting visual or auditory stimuli (Gagné & Medsker,

1996, p. 140).

As suggested, effective incorporation of these variables, at least in terms of core

interdisciplinary studies courses becomes more than a technology question; it becomes a content

question. More specifically, it would seem the most salient variables to be addressed for short-

and long-term student success in the context of an interdisciplinary studies program relative to

the redesign of online core courses would be motivation and engagement. As will be supported

further in Chapter 6, it is my contention that such a question of content relative to the variables

of motivation and engagement in online instruction is best addressed through embracing a

cognitivist theory of learning. At present, the assumption put forth will be that currently

employed technology and modalities will be sufficient to achieve the curricular goals set forth

thus far.

<u>**Consideration of Best Practices in Online and Blended Education**</u>

Best practices in online education within the sphere of higher education are well documented (Keengwe & Kidd, 2010; Fish & Wickersham, 2009). While there may be distinctions in the literature between best practices for fully-online and blended education, there is clearly much overlap. For instance, in their "synthesis of best practices" for blended course design, researchers from the University of Texas at San Antonio, Patricia McGee and Abby Reis looked at the design process, pedagogical strategies, classroom and online technology utilization and assessment strategies. With regard to the design process, McGee and Reis state, "There is clear consensus that the best strategies for design begins (sic) by clearly defining course objectives before coming up with course activities, assignments and assessments" (McGee & Reis, 2012). While McGee and Reis are speaking of blended format, the same can (and has) been said about developing course objectives (and planning, more generally) with regard to fully-online instruction. Presenting content in a clear and organized manner is also going to be central toward keeping students engaged and on track relative to the pace of the course, as well as clear about expectations (Fish & Wickersham, 2009).

A recent ethnographic study of online teaching best practices asked online program coordinators within higher education across different programs to nominate exemplary online instructors without providing specific criteria for the nomination (Baran et al., 2013). Rather, the coordinators were asked to supply their own criteria with the nominations. While this study illuminates those practices that may have earned the online instructors the reputation of being exemplary online instructors, it says very little about the learning outcomes and future success of their students. The findings may, however, speak to the students' perception of learning, or at

least their satisfaction with the educational experience, the importance of which cannot be discounted.

Among the practices cited as earning these instructors the nominations were "frequent feedback…using several methods," "visually appealing short modules," "3-minute digital comments about the course materials...[shared via] Youtube," quick responses to students' questions and problems, communicating well with students, grading in a timely fashion, having an interest in getting to know students, recorded voice announcements, "online synchronous office hours," video-recording of lectures, and so forth (Baran et al., 2013). A common theme in these accounts of foregrounding instructor-student communication seemingly alludes more to student feelings than actual student learning outcomes. The study states at least one instructor "emphasized less student-student interaction, but more student-content interaction," while little else is said about student collaboration aside from the occasion discussion group. The authors of this study note that at least some of these instructors did not change the content of their courses in the transition from face-to-face to online modes but merely adapted the same content to the online mode. Generally speaking, however, there seems to be little new in these practices, and they are not far removed from current practice within the Cornerstone and Capstone courses.

In the University of Kentucky study mentioned earlier, researchers consider actual learning in addition to the perceived learning and feelings of instructor closeness. Their findings, which, based on the literature review, appear to be a replication of an earlier studies, suggest that online instruction in a multimodal format (specifically, audio narration of presented text) is more effective that online instruction delivered via a single format (Limperos et al., 2015). The authors cite earlier cognitive psychology research that suggests multimodal learning affords referential processing as opposed to the associative processing of a single mode. *Referential*

processing refers to connections made between visual and verbal mental models in addition to prior knowledge and is considered superior relative to achieving learning outcomes (Mayer & Moreno, 2002). Yet, multimodality would seem to be at least to some extent common practice, albeit inconsistently applied, among those who have taught online courses. Nevertheless, Limperos's team cites earlier research that suggests many of the same variables (e.g. immediacy, motivation, engagement and interaction) that lead to student success relative to learning outcomes and positive student perception of learning in the face-to-face classroom point to success in the online classroom (Limperos et al., 2015).

Those espousing best practices in online learning also emphasize a need for online students to feel a sense of connectivity (Keengwe & Kidd, 2010; Fish & Wickersham, 2009). In one sense they may be referring to fostering a collaborative environment, but an emphasis is also placed on technology that affords self-directed learning (McGee & Reis, 2012). Again speaking of best practices in the blended classroom, McGee & Reis state, "Learner independence and autonomy are core to successful blended courses" (McGee & Reis, 2012). With regard a sense of connectivity, a particular emphasis seems to be placed on instructor-student interaction (Fish & Wickersham, 2009). Citing numerous sources, Fish and Wickersham state, "Interaction between the instructor and student enhances the effectiveness of the online learning environment contributing to positive student performance, grades and course satisfaction" (Fish & Wickersham, 2009). Whether in a fully-online or mixed-mode format, communication and personalized feedback needs to be "prompt, relevant and continuous" (Fish & Wickersham, 2009; McGee & Reis, 2012). The mixed-mode format offers, perhaps, an even greater opportunity to build rapport with students, provide advice, pace the workload, brainstorm, and focus content (McGee & Reis, 2012). While open lines of communication between instructor

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and student would seem to be common sense, my own experience as both an online and mixed-mode instructor suggests to me that good instructor-student interaction is paramount to a positive student learning experience. While maintaining this line of communication may be difficult in large online courses, directing a little personalized attention to each student in the form of feedback goes a long way toward providing that sense of connectivity that keeps students engaged and worry free.

In summary, I have considered the affordances and limitations of current online learning platforms relative to both the technology and the content. I have further examined documented best practices as demonstrated among online educators. It will be important to keep these concerns and best practices in mind throughout the development of a transferable core interdisciplinary studies course curriculum. Before that, however, I investigate what other institutions of higher learning are already doing in terms of pedagogy and curriculum within the context of their interdisciplinary studies or related programs

CHAPTER 6: COMPARATIVE EXAMINATION OF INTERDISCIPLINARY STUDIES PROGRAMS AND CORE CURRICULUM

Because of the large number of undergraduate interdisciplinary studies programs (or, again, variously titled undergraduate degree programs that are interdisciplinary in nature) found in public and private academic institutions across the United States, the comparative analysis undertaken in this chapter is selective rather than exhaustive. Ten variously titled and oriented interdisciplinary undergraduate programs are discussed first relative to the overall structure and stated purpose of the program, and then with regard to the curricular content of required courses associated with the program. Where possible, syllabi from these courses are surveyed in order to extract relevant course information such as learning objectives, required texts, curricular requirements, assessment methods, best practices, etc. The goal of this investigation is to identify curricular trends evident across interdisciplinary studies undergraduate degree programs, particularly relative to required courses associated with these programs, and whether there is a publicly available means of determining the types of challenges faced within these programs and their required core courses.

The programs included in this survey were selected with the goal of representing both the diversity and the consistencies across undergraduate interdisciplinary programs within the United States. Institutions were selected based on variances in size, academic prominence, location, student population, stated goals, and curricular structure. Each undergraduate program will be discussed in turn, followed by a summary analysis and discussion. As UCF's IDS program and curricular practices have integral to earlier discussions, the analysis will relate programmatic and curricular insights drawn from this survey specifically to the UCF IDS experience.

Arizona State University (Tempe, Arizona)

The largest public university in the United States boasts a Bachelor of Arts degree in *Interdisciplinary Studies (BIS)* through its College of Letters and Sciences that "is among the top five of the more than 650 such programs in the nation" ("Pre-Advising Workshop," 2014). According to the Arizona State University (ASU) Interdisciplinary Studies website, ASU's Interdisciplinary Studies program allows students to "take an active role in designing their educational plans and defining their career goals" and that "The degree emphasizes written communication, versatility, self-assessment and critical thinking – essential skills for navigating today's dynamic world" ("ASU Interdisciplinary Studies," 2014).

In this program, students choose two concentration areas. Concentration area courses are pre-defined through "check sheets" listing core and restricted elective courses in much the same way minor requirements would be listed in an undergraduate catalog. There are more than 160 concentrations to choose from that appear to encompass most if not all of the disciplines and courses offered through Arizona State University ("BIS Concentrations," 2014). Each of the two concentration areas consist of 18 credit hours along with 12 credit hours of required core Interdisciplinary Studies courses for a total of 48 credit hours in the major. The four core Interdisciplinary Studies courses consist of *BIS 301 – Foundations of Interdisciplinary Studies*, *BIS 302 – Interdisciplinary Inquiry*, *BIS 401 – Applied Interdisciplinary Studies (internship or applied research)*, and *BIS 402 – Senior Seminar* ("Pre-Advising Workshop," 2014). The ASU Interdisciplinary Studies website states that "The core curriculum provides students the intellectual tools to integrate their concentration areas, engage in interdisciplinary problem-solving, and prepare for careers and graduate programs that increasingly cross disciplinary boundaries" ("ASU Interdisciplinary Studies," 2014).

The course description for *BIS 301 – Foundations of Interdisciplinary Studies* states that the course "introduces interdisciplinary studies core knowledge, skills and integration in academic and applied settings" ("BIS Core Courses," 2014). According to one publically-available and possibly dated syllabus for *BIS 301*, course enrollment is over 100 students per term. Students must have completed at least two courses in each Concentration Area prior to enrolling. The required text for this course is a course reader with a wide array of course-specific instructions and readings available through a local/campus copy shop (deLuse, n.d.). A more recent syllabus for BIS 301 requires a digital, downloadable reader (McCormack, 2015). The readings include an assortment of scholarly and non-scholarly articles related to both the practical application of interdisciplinary studies and broader philosophical, academic or professional topics.

The first of several BIS 301 syllabi reviewed states, students in the course "start with intradisciplinary thinking then move on to cross/multidisciplinary thinking and finally to multi/inter/transdisciplinary thinking using L. Richard Meeth's definitions ("Interdisciplinary studies: A matter of definition" from *Change: The Magazine of Higher Learning*, 1978) as the spine of the class…" Three foundational learning goals for the course are put forth in the syllabus:

Goal 1 – Understanding disciplines in general, and your concentration areas in particular, from an interdisciplinary perspective.
Goal 2 – Understanding interdisciplinary studies and how interdisciplinarity is practiced both in academia and in the "real world."
Goal 3 – Understanding individual strengths and opportunities for improvement with respect to future success in increasingly interdisciplinary workplace and societal settings (deLuse, n.d.).

These goals are accomplished through a series of low-stakes "Ticket In" assignments on various readings, development of a personal narrative and a portfolio (including a portfolio presentation),

a group presentation, at least one exam, and a "Multi – Interdisciplinary Paper and Presentation."

Students are assessed using a 1000-point scale with 200 points allocated to class participation

and 50 points toward an exam that must be passed with a "C" or better. The remaining points are

relatively evenly dispersed between low-stakes assignments, group work, an independent

writing, and the portfolio.

It is, however, important to note that ASU's BIS 301 Syllabus examined here is just one

of many publicly available syllabi for this particular course, which has been taught by various

instructors for a number of years. As such, course objectives appear to vary by instructor, as

does the clarity (a concern even within UCF's Interdisciplinary Studies program). Nevertheless,

common themes can be extracted from various syllabi, such as understanding of interdisciplinary

terminology, identify key characteristics of specific disciplines, making connections between

disciplines, and self-assessment related to strengths, weaknesses and goals (Eshleman, 2015). At

least one of the BIS 301 syllabi listed Tanya Augsburg's *Becoming Interdisciplinary: An*

Introduction to Interdisciplinary Studies as a required text. Incidentally, Tanya Augsburg taught

at Arizona State prior to moving to San Francisco State University. In another online syllabus

for BIS 301, the instructor uses a seemingly apropos metaphor in his overview for

interdisciplinary studies:

> Disciplines are like cultures…. Each has its own distinct language.
> Very often, we understand the limits of cultures and attempt to
> bridge the gap we perceive between them by learning them as
> foreign languages. Interdisciplinary Studies is similar because
> your task is to make disciplines speak with each other as you
> attempt to address the barriers to human understanding, progress,
> development, survival, justice, and so on that people have created
> in their mission to advance just these goals. Your task bears both
> obstacles and opportunities that are, ironically, the separate
> languages that you have assigned yourself to master in your
> university experience as a BIS major (McCormack, 2015).

<u>**Auburn University (Auburn, Alabama)**</u>

Auburn University's *Interdisciplinary University Studies* Bachelor of Science program, offered through the University College, allows students to combine two to three emphases or areas of study, drawn from at least two colleges or schools, "to create a unique program of study to meet their personal, academic and professional goals." Major Coursework totals 45 hours with at least 21 hours in one emphasis and no more than 24 hours in the second emphasis, or three emphases with 15 hours each ("IDSC Degree Requirements," 2015). Rather than having predefined emphases from which to choose, students appear to select courses within each respective college or school to make up their emphases and must obtain approval from departmental representatives. Existing minors may constitute students' emphases.

The program website language is vague, targeting "those with a desired career that requires a unique combination of academic disciplines and students unable to locate an academic major of interest to them" ("Auburn Interdisciplinary Studies," 2015). Student Learning Outcomes are equally vague and are as follows:

- Students will gain an understanding of interdisciplinary theory and application.
- Students will acquire a clear understanding of the potential careers for the individualized degree program that they propose.
- Students will articulate and achieve their personal educational goals ("Student Learning Outcomes," 2015).

There are two core components to the program (an introductory course, *IDSC 2190 – Foundations of Interdisciplinary University Studies*, and a Capstone Experience, *IDSC 4930* or *IDSC 4980*). The Capstone Experience consists of a faculty supervised research project/paper (*IDSC 4930*) or an internship or service learning project and final paper (*IDSC 4980*). Students are only required to complete one or the other, but have the option of completing the full 6 credit hours of the Capstone Experience component ("IDSC Degree Requirements," 2015).

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The emphasis of *IDSC 2190 – Foundations of Interdisciplinary University Studies* is on career exploration within an interdisciplinary context. To this end, students begin the course with a goal statement followed by a goal/career-centered research paper. Next, students complete a written prospectus in which they tie a plan of study to their educational and career goals. Students tentatively plan out the courses that will make up their areas of study with a Career Development Services counselor, and defend the feasibility of their plan of study. Basic concepts and theories associated with interdisciplinarity are also covered in IDS 2190. Two publicly-available although somewhat dated IDSC 2190 (also referred to as UNIV 2190) syllabus templates suggest that Tanya Augsburg's *Becoming Interdisciplinary: An Introduction to Interdisciplinary Studies* is a required text for the course ("UNIV 2190 Syllabus," 2008). One of these syllabi also lists Allen F. Repko's *Interdisciplinary Research: Process and Theory* as a required text, while the other employs a reading packet.

University of California, Berkeley (Berkeley, California)

The University of California, Berkeley (UC Berkeley) offers an *Interdisciplinary Studies Field (ISF)* Bachelor of Arts degree, described as "a research-driven program of liberal education." According to the program website, UC Berkeley's ISF major "offers students the unique opportunity to develop an individualized cross-disciplinary Research Program that includes a Course of Study and a Senior Thesis" ("Berkeley Academic Guide: Interdisciplinary Studies," 2015) Twelve interdisciplinary research fields are identified as a resource for students to aid in developing their research program; however, it is stated that students may pursue other research fields developed with advisors and faculty ("UC Berkeley Interdisciplinary Studies," n.d.). Of those interdisciplinary research fields provided, recent Senior Thesis titles, relevant UC Berkeley courses, bibliographical sources and other campus resources are provided. An

additional resource available to UC Berkeley students is a database that provides a list of faculty, their department, and their areas of expertise ("UC Berkeley Faculty Expertise," n.d.).

ISF students' Course of Study consists of "A minimum of 20 UNITS (at least SIX courses) drawn from at least THREE fields or disciplines." The Course of Study is developed with a faculty advisor. All courses must be upper division and can include courses outside of the College of Letters and Science with approval. Up to one technical or natural science course may be part of a Course of Study ("UC Berkeley Interdisciplinary Studies," n.d.). Core courses for UC Berkeley's ISF program include *ISF 189 – Introduction to Interdisciplinary Research Methods* (3 units), two theory and method courses (*ISF 100A – Introduction to Social Theory and Cultural Analysis* and one additional course from the *ISF100* series *B-H* or *ISF C145*, or another methodology course from an approved list), and *ISF 190 – Senior Thesis* (4 units). Additionally, a list of five courses is provided whereby students who have already taken one of these courses and earned at least a B- may place out of ISF 189. UC Berkeley's ISF Handbook states that *ISF 189 – Introduction to Interdisciplinary Research Methods* "is an introduction to research methods, leading students through different units built around specific learning goals and practical exercises" ("ISF Handbook," 2015). While the title of the course would suggest an interdisciplinary orientation, nothing in the ISF Handbook's course summary indicates the course is anything but a general research methods course. Indeed, a number of previously taken research methods courses from specific disciplines can be substituted for ISF 189 for applicants prior to June 1, 2014.

The Senior Thesis (*ISF 190*), however, is a "critical examination of a central interdisciplinary research question…." Students must choose a research question that relates to their disciplines as it is intended to be a demonstration of learning and synthesis within their

Course of Study. As such, the topic of the Senior Thesis must pertain to, and indeed "bridge," the disciplines that make up the students' coursework. The expected length of the Senior Thesis is between 30-40 pages, or 7500-10,000 words, not including front matter and bibliography. The guidelines for the Senior Thesis emphasize research that focuses on primary as opposed to secondary sources. A large portion of the guidelines are devoted to differentiating between primary and secondary sources, using examples of what does and does not constitute a primary source. The goal of the project is for students to demonstrate that they are capable of constructing an original synthesis from their academic experience that critically examines primary sources pertaining to both a complex problem and the relevant disciplinary approaches that address this problem ("ISF Thesis Guidelines," n.d.).

Covenant College (Lookout Mountain, Georgia)

Covenant College is a small private Christian liberal arts college associated with the Presbyterian Church in America (PCA). Covenant College offers a Bachelor of Arts degree in *Interdisciplinary Studies* "For the student wishing to explore more disciplines that would normally be provided by selecting a major and a minor field…." Similar to the commonly stated purpose of larger interdisciplinary studies programs and their notion of interdisciplinarity, Interdisciplinary Studies at Covenant College "employs a holistic approach that consciously applies a methodology from more than one discipline (integration) to examine a person's work, central theme, issue, problem, topic, or experience." The program website does, however, provide the disclaimer that "though the interdisciplinary major seeks to provide some depth in each of two academic disciplines, it will not give the same in depth grasp of a discipline that choice of a major in a single field would" ("Covenant College Interdisciplinary Studies," n.d.).

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The IDS major consists of 48 credit hours made up of 12 credit hours of core courses and at least 12 credit hours in each of three disciplines (36 credit hours). There are 30 disciplines from which to choose although only one Business department or Physical and Sport Education department discipline may be included in the three disciplines that make up a student's program of study. Moreover, for most of the 30 disciplines, specific required courses within the discipline are listed. Core courses for the program include *IDS 201 – Introduction to Interdisciplinary Studies*, *IDS 492 – Senior Integration Paper in Interdisciplinary Studies*, and 6 credit hours of IDS Prefix electives. Sixteen IDS prefix elective courses are listed in addition to IDS 201 and IDS 492.

In *IDS 201 – Introduction to Interdisciplinary Studies*, students are introduced to the concept of interdisciplinarity and interdisciplinary studies through a lecture format. Key to the objectives of the course is the integration of faith (in this case, the Reformed Christian faith) into the interdisciplinary process. While delving into the intricacies of what this means in terms of scholarship is not within the scope of this dissertation, the course syllabus simply states that students will "interact from a Christian holistic worldview with IDS." While the required texts for the course include Tanya Augsburg's *Becoming Interdisciplinary: An Introduction to Interdisciplinary Studies* and Allen F. Repko's *Interdisciplinary Research: Process and Theory*, a third text authored by the instructor of the course is also included: *A Christian Approach to Interdisciplinary Studies: In Search of a Method and Starting Point* by William D. Dennison.

Course Objectives listed on the IDS 201 Course Syllabus are:

1.   Introduce research materials and methods to IDS.
2.   To provide an understanding and definition of IDS.
3.   To be able to critically assess and describe IDS.
4.   To be able to propose the integration of three disciplines into one subject.
5.   To achieve a historical understanding of the IDS in the Liberal Arts context.

6.   To interact from a Christian holistic worldview with IDS and propose ways to make a positive contribution to the discipline (Dennison, 2014).

To accomplish these objectives, students complete a combination of brief library research assignments, textbook exercises and a Final Integration Project. In the Final Integration Project, students present their project and submit themselves to an oral examination somewhat that of a thesis or dissertation defense. Likewise, it seems that project topics will vary and require prior approval. In addition to class discussions, guest lecturers are also brought in from various disciplines to discuss methodology. Students are assessed through writing assignments (30%), group projects (10%), the Final Integration Project (20%), a mid-term (20%) and a final-exam (20%). An additional 10% for class participation and quizzes is also factored in to the student's final grade.

Emory University (Atlanta, Georgia)

Emory University is a private research university offering a Bachelor of Arts in *Interdisciplinary Studies in Society and Culture* through the College of Arts and Sciences. The program website states that "Interdisciplinary Studies in Culture and Society is the only major at Emory University that allows students to structure their own program of study around a field of interests that they themselves define." The website goes on to explain that the program is intended "for independently minded students who wish to study culture and society but whose interests are broader than those accommodated by a single discipline" ("Emory IDS Major," 2015). Learning Objectives for the program as listed in Emory's IDS Handbook state that an IDS major will be able:

a) to explain the cohesiveness of their (seven) concentration courses, stating methodological principles of the disciplines studied and identifying an important problem the understanding of which is enhanced by drawing on two or more disciplines represented
b) report orally in a public venue on conclusions of their senior year projects, stating explicit social, political, or cultural applications, or theoretical implications, of their research

c) describe how their learning experience as an undergraduate was enhanced or hindered by the student-designed program of study within the framework of the IDS major

The major requires 44 credit hours which consist of "5 Frame Courses + 7 Concentration Courses" ("Emory Catalog," 2015). While six pre-established concentrations and their associated consulting faculty are provided for students, specific concentration courses are determined in consultation with a faculty advisor or the Director of Undergraduate Studies, who approves the concentration at the time the student declares the major ("Emory IDS Major," 2015). The program's core component is referred to as the "Frame Courses." Frame Courses include two 200-level Interdisciplinary Studies continuing writing courses (from a list of five possible courses), one 300-level course focusing on cultural theory (usually *IDS 385 – Critical Cultural Theory*), and two senior year courses including *IDS 491 – Liberal Studies Senior Seminar* (Capstone) and Senior Research or Honors Research. Included in the list of 200-level continuing writing courses are *IDS 200 – Interdisciplinary Foundations*, *IDS 201 – Interdisciplinary Problems*, *IDS 205 – Interdisciplinary Science*, *IDS 213 – Politics of Identity* and *IDS 216 – Visual Culture*. There is an additional requirement of an IDS Senior Project described as "a synthesis of a student's course of study, and as a credential demonstrating a student's ability to organize complex ideas" ("IDS Requirements," 2015).

Emory University's Course Atlas describes *IDS 200 – Interdisciplinary Foundations* as a course that "examines the origins and development of distinct disciplines in contemporary universities through the lens of what counts as evidence in different fields of human knowledge. Guest speakers are regularly called upon to lead classroom discussions in the context of the required readings, and other class sessions are "devoted to critical analysis of visiting speakers' interventions." Required texts for IDS 200 include a rich array of classic and contemporary literature from Ancient Greece through present day. Texts include works by Plato, Sophocles,

Boethius, Chaucer, Charles Dickens, Arthur Conan Doyle, F. Scott Fitzgerald, Salman Rushdie

and Jared Diamond's *Guns, Germs, and Steel: The Fates of Human Societies* ("Emory Course

Atlas," 2015). The Augsburg and Repko texts are nowhere to be found, nor are other texts

specifically related to interdisciplinary theory or practice.

New York Institute of Technology (New York, New York)

The New York Institute of Technology (NYIT) is a private non-profit research university

that offers Bachelor of Arts, Bachelor of Science and Bachelor of Professional Studies degrees in

Interdisciplinary Studies ("NYIT Interdisciplinary Studies," 2015). The degree type is

determined by the courses the student takes. Those with at least 75 percent of liberal arts courses

will be awarded a Bachelor of Arts, those with at least 50 percent of liberal arts courses will be

awarded a Bachelor of Science and those with less than 50 percent of liberal arts courses will be

awarded a Bachelor of Professional Studies. The language used to describe the program is vague

and unremarkably similar to that of other such programs except that it is characterized as a

completion degree. NYIT's IDS program caters to those with prior learning experience

including "transfer students, veterans, and working adults." The program website states that

students are able to convert transfer credit and "life experience" to NYIT credit in order to

"complete their degrees in a compressed period of time" ("NYIT Catalogs," 2015).

NYIT's IDS majors select three subject areas of concentration from a list of 16

concentrations. While a minimum of 12 credit hours are completed in each concentration,

additional elective credits can be applied to the areas. Electives are chosen in consultation with

an advisor. Students take nine credit hours Interdisciplinary Studies coursework, including an

Internship/Service Learning (*IDSP 450*) or Senior Project (*IDSP 403*). The two courses required

of IDS majors includes *IDSP 310 – Foundations of IS Research* and *IDSP 410 – Capstone Seminar* ("NYIT Catalogs," 2015).

In *IDSP 310 – Foundations of IS Research*, NYIT IDS major are provided with a "Foundations of Interdisciplinary Research Companion Guide" website facilitated by the NYIT Library ("Companion Guide," 2015). While the website provides a wealth of information related to research in general, such as basic research and best practice information, library resource tutorials, database access, guides for all the major citation styles, and so forth, the website content does not seem specifically oriented toward interdisciplinary research. The required text for the course is *Social Research Methods* by H. Russell Bernard, which also does not appear specific to conducting interdisciplinary research. This is not to say that the text or Companion Guide website would not be valuable toward conducting interdisciplinary research. The course description, however, does suggest that students will be introduced "to the historical contexts of interdisciplinary studies and the development of academic disciplines" as well as "key concepts and methods of disciplinary and interdisciplinary research…" ("Undergraduate Course Descriptions," 2015). How this is accomplished is unclear without examining the course syllabus, which is presently unavailable.

Oakland University (Rochester, Michigan)

While the Association for Interdisciplinary Studies is housed at Oakland University's Macomb University Center, Oakland University's Bachelor of Arts in *Liberal Studies (LBS)* is a new and thus very small program. Nevertheless, it is included in this survey because of its distinctly interdisciplinary character. The program website states that the program targets "creative, motivated individuals interested in exploring the intersections between disciplines or in a combination of disciplines." Additionally, the program's stated purpose expresses "A

commitment to developing critical thinking, creative thinking and communication skills… [Such that students]…learn how to combine discipline-specific approaches to pursue cross-discipline connections and communicate that knowledge both within and between disciplines" ("Oakland Liberal Studies," 2014). While Oakland University's Liberal Studies majors have the option of choosing a single concentration from a single discipline offered through the College of Arts and Sciences, they also have the option of choosing two minors within the College of Arts and Sciences. A list of pre-approved minor-minor combinations is provided for students for "interdisciplinary careers and professions for which Oakland University does not currently have majors or minors."

Required courses for all Liberal Studies majors include *LBS 100 – Exploration of the Arts and Sciences*, *LBS 200 – Interdisciplinary Approaches to Liberal Studies*, as well as *LBS 495 – Senior Thesis I* and *LBS 496 – Senior Thesis II*. The first of these courses, LBS 100, is intended "to introduce students to the major discipline groups that traditionally comprise the College of Arts and Sciences (CAS), as well as the methods of inquiry employed within the humanities, social sciences and natural sciences" ("Oakland Liberal Studies," 2014). *LBS 200 – Interdisciplinary Approaches to Liberal Studies* is described as a "writing intensive" course satisfying this requirement for both general education and the major. Past this, the course description is vague, containing language common to such programs:

> Students develop knowledge, skills and methods in
> interdisciplinary research on focused topics. Draws on humanities,
> natural sciences, social sciences and fine arts to prepare students
> for advanced work in liberal studies ("Oakland Catalog," 2015).

According to one publicly-available course syllabus, a course theme is specified: *Globalization and Sustainability*. In the theme's elaboration, globalization and sustainability are described as interconnected, the inevitable reality of "politics, business, professional communication, science,

and the arts," and "perfectly suited for interdisciplinary study..." as understanding the larger issues of this reality requires the knowledge of multiple fields (Driscoll, 2012). In a current (Fall 2015) syllabus obtained directly from an instructor of record for the course, the course theme is *Feeding the World*, with a similar explanation (Hansen, 2015).

A required text for both LBS 200 sections is Allen F. Repko's *Interdisciplinary Research: Process and Theory*. For the *Globalization and Sustainability* themed section, an additional required text is *Global Sustainability: A Nobel Cause*, edited by H. J. Schellnhuber et al. For the *Feeding the World* themed section, readings are provided in PDF format through Moodle and Library Course Reserves. Learning outcomes specified in the latter section are divided between the overall learning outcomes for LBS 200, and theme-specific learning outcomes. Within the overall learning outcomes, the first is "An understanding of traditional disciplinary research methods." Next is "An understanding of interdisciplinary approaches, topics, and methods" (Hansen, 2015). While these outcomes are not constructed with action verbs commonly associated with Bloom's taxonomy, they do make an important distinction that seems to imply sequence. Other learning outcomes are framed in a similar way, using terms such as "An understanding of…" or "The ability to…" without any suggestion of sequence.

According to the first syllabus reviewed, students are assessed based on the Course Writing Journal (20%), the Research Project (30%), the Oral Presentation (15%), Class Participation (including homework and quizzes) (15%), Current Events Presentations (10%), and the Final Portfolio and Reflection (10%). The Course Writing Journal consists of class discussion notes, reading responses, research notes, and revision notes or "working process notes" for the three components of the research project, which may be hand-written. The current syllabus has a similar assessment structure, although there are two research projects, titled

respectively, "Act Locally" and "Think Globally," which are both tied to the course theme, but entirely separate from the Oral Presentation. Together these projects comprise 40% of the students' final grade. In the *Feeding the World* section, there is a 4-hour volunteer requirement which may be completed at the Campus Student Organic Farm (CSOF) which includes a written reflection requirement (Hansen, 2015; Driscoll, 2012).

San Francisco State University (San Francisco, CA)

At San Francisco State University (SF State), students can earn a Bachelor of Arts in *Liberal Studies (LS)* that is described as "an interdisciplinary major, which encompasses all areas of knowledge in the arts and sciences in a multidisciplinary curriculum" ("SF State Liberal Studies," n.d.). As mentioned earlier, among the Liberal Studies faculty can be found Tanya Augsburg, author of the previously mentioned *Becoming Interdisciplinary: An Introduction to Interdisciplinary Studies*. Although the program appears to be particularly marketed as preparation for teaching in an elementary classroom, the program website states that the program is excellent preparation for a number of other career paths. The reason for SF State's Liberal Studies program's focus on elementary school teacher education relates specifically to the education system in California. In California, undergraduate students cannot major in Education. Rather, they major in the subject area they wish to teach. As elementary school teachers are expected to be proficient in all subject areas that make up the elementary school curriculum, Liberal Studies serves as the vehicle best suited for developing this proficiency (Goldsmith, 2008, p. 138).

In the Liberal Studies major SF State students have a prescribed core curriculum of 31 upper division units and an Area of Emphasis of 12 units. Within the core course requirements are four separate areas: Area 1 – Communication, Language and Literature (7 units), Area 2 –

Life Sciences, Physical Science and Mathematics (6 units), Area III – Behavioral and Social Sciences (6 units), and Area IV – Creative Arts and Humanities (6 units). There are two additional required courses, *LS 300 GW – Perspectives in Liberal Studies – GWAR* (3 units) and *LS 690 – Liberal Studies Senior Seminar* (3 units) ("SF State Bulletin," 2015). The 12 units that make up the Liberal Studies students' Area of Emphasis fall within an approved "emphasis pattern" and must be approved in consultation with an advisor. A list of approved emphasis patterns is provided in which the emphasis patterns are grouped thematically under the aforementioned areas (I-IV) ("SF State Liberal Studies," n.d.). Liberal Studies majors may also complete an approved minor as their Area of Emphasis.

LS 300 GW – Perspectives in Liberal Studies – GWAR is described as "Basic preparation for interdisciplinary study." The course description further states that the course "Draws on language arts, mathematics, science, social sciences, humanities, and creative arts to prepare students for advanced work in Liberal Studies and for careers requiring breadth and depth of knowledge" ("SF State Bulletin," 2015). According to a publicly-available PowerPoint Presentation by Tanya Augsburg, LS 300's learning objectives are as follows:

- Students will learn how to become familiar with the scholarship on which knowledge in a specific discipline is based.
- Students will earn how to integrate different disciplinary approaches to the study of complex issues.
- Students will develop skills required to read and evaluate a wide variety of academic, creative, professional, and popular sources.
- Students will be able to frame questions, make claims, and support assertions.
- Students will develop the ability to craft well-written, thesis-driven papers that can distinguish between different disciplinary methods and potentially integrate them.
- Students will gain a comprehensive overview of the Liberal Studies curriculum, including an understanding of the core areas of study, the process of course selection and advising, and exposure to the options of the major (Augsburg, 2009).

University of Texas at Arlington (Arlington, Texas)

The University of Texas at Arlington (UT Arlington) offers both a Bachelor of Arts and Bachelor of Science in *Interdisciplinary Studies* through its University College, as well as *Interdisciplinary Studies – Education* degrees through its College of Education. To avoid confusion, this discussion only addresses the University College Interdisciplinary Studies programs. While language describing the program in relation to the student is similar to that of other such programs, a noteworthy distinction might be that the program's website expressly states that the program "is based on the theme of Social Justice, which views all research and learning as happening within a context of social relations," further declaring that "Issues and problems that face the world today take place in the context of interactions between individuals, groups, nations and institutions where power, privileges and resources are unevenly distributed" ("UT Arlington Interdisciplinary Studies," 2015). While representatives of other Interdisciplinary Studies programs might suggest that such a concern should be assumed, the University of Texas at Arlington seems to take this idea much further, not only in its website proclamation, but by building the theme into the major's core requirements.

UT Arlington Interdisciplinary Studies major is 54 credit hours. The major consists of 18 credit hours of core INTS-prefix courses that tie together interdisciplinarity with the Social Justice theme, and two 18 credit hour tracks. The tracks can be made up of another department's minor, a certificate program, a pre-defined INTS track or a custom track ("UT Arlington University Catalog," 2015). The first of the required core INTS courses is *INTS 2301 – Foundations: Identity, Institutions and Ideology* (3 credit hours), followed by *INTS 3320 – Social Justice Theory* (3 credit hours). The remaining 12 hours includes 6-9 credit hours of *INTS 4388 – Special Topics Interdisciplinary Studies*, and 3-6 credit hours of *INTS 4391 – Interdisciplinary*

Studies Senior Seminar/Capstone (*or,* senior service learning, senior thesis or senior project).

INTS 4391 is described in the course description as consisting of "vigorous academic discussion

of extensive readings" pertaining to a specific topic central to social justice. Internships and

Independent Study courses can also be incorporated into students' plans of study with prior

approval by the Director. The Internship includes attendance at four class sessions and an

integrative term paper or project ("UT Arlington Interdisciplinary Studies," 2015; "UT Arlington

Catalog," 2015).

According to one publicly-available syllabus for *INTS 2301 – Foundations: Identity,*

Institutions and Ideology, students are introduced "to core concepts in social inquiry, difference,

and justice, focusing on the interactions of identity, institutions, and ideologies in society"

(Connor, 2015). The theme of this particular section is *an interdisciplinary investigation of the*

American middle class. Student Learning Outcomes are as follows:

- Move from personal or common-sense understanding to apply academic concepts and analysis
- Understand the American middle class as a complex phenomenon with historical, social, political, and cultural dimensions
- Understand the rise, change, and prospects of the middle class in terms of identity, ideology, and institutions
- Understand how racial/ethnic and gender differences affect class mobility and status
- Compare, contrast, and synthesize research insights and concepts relating to the middle class from multiple disciplines
- Critically evaluate media messages about the middle class using academic concepts
- Participate in Team-Based Learning (TBL)

There is no required text for the section; rather reading material is posted on the electronic course

reserves or available through the Central Library Reserves Desk. Students are assessed based on

a Midterm Exam (30%), a Final Exam (40%), and in-class TBL Participation (30%). It is

unclear if all sections of this course follow a similar format.

University of Virginia (Charlottesville, Virginia)

The University of Virginia (UVa) offers a *Bachelor of Interdisciplinary Studies (BIS)* through its School of Continuing and Professional Studies specifically targeting working adults. While instruction is primarily face-to-face, courses meet during evening hours on multiple campuses and assume part-time enrollment. Some online synchronous and asynchronous courses are also available. The program offers concentrations in business, liberal arts and individualized. While students in this program choose a single concentration in which they complete 18-24 credits hours, students will take an additional 21-27 credit hours of electives outside of the concentration. Students will complete 6-9 credit hours of core BIS courses during the first four consecutive terms following matriculation, and will also complete a Capstone Project. All courses that students would normally take in the program appear to be proprietary, with all prefixes beginning with "IS" (ISBU, ISGE, ISHU, ISIN, ISLS, ISSS) ("UVa Interdisciplinary Studies," n.d.). While these course titles and descriptions are varied and arguably, intriguing, none of these courses appear to focus on interdisciplinarity or interdisciplinary studies as a primary curricular focus. Indeed, past the title of the program and the large amount of electives to be taken outside of the concentration, there appears to be little emphasis on or discussion of interdisciplinarity or integration.

The Capstone Project takes place over two semesters in which students "work primarily on [their] own" ("UVa Interdisciplinary Studies," n.d.). The project, while substantial, appears relatively devoid of the language related to integration common to interdisciplinary research projects. The project consists of "independent research on a question or problem of [the student's] choice…[in which students] engage with the scholarly debates in the relevant disciplines, and – with the guidance of a faculty mentor – produce a substantial paper that

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reflects a deep understanding of the topic" ("UVa Interdisciplinary Studies," n.d.). Such a

project could be interdisciplinary, but it would seem could just as easily take the form of a

standard research project. Rather than developing an argument or conceptual framework for an

interdisciplinary approach to addressing a complex problem, the purpose of the project appears

to be a demonstration of understanding.

In the Capstone project guidelines, required characteristics are originality, independence,

appropriate scope, orderly & objective process of inquiry and intellectual stretch.   While the

guidelines state, "Each characteristic can be satisfied in different ways depending on the topic,

discipline, and the approach taken," each of these characteristics is briefly expounded upon in a

few sentences. For instance for "Intellectual Stretch," the Capstone guidelines state "The

Capstone Project should take you to a place where you have not been before, and perhaps, did

not even think you could reach." The method of inquiry is equally vague, specifying that

students should demonstrate "the ability to ask the right questions, to synthesize ideas, to identify

and use evidence, to draw and support conclusions, to recognize compelling research, to

communication [sic] your ideas, or to solve a problem using a specific set of tools" ("UVa

Interdisciplinary Studies," n.d.). Nevertheless, a list of previous Capstone Project topics

suggests a wide array of complex problems have been addressed; the degree of interdisciplinarity

inherent within these projects would require further investigation. Some topics, however, seem

to leave little room for interdisciplinarity; for example, "Doowop & Its Influence on the Rock &

Roll Revolution" or "Stonewall Jackson: In the Shadow of Death."

Table 1: Interdisciplinary Studies Programs Overview Summary

Institution	College	Program Title	Degree	Theme/Purpose
Arizona State University	Letters and Sciences	Interdisciplinary Studies (BIS)	Bachelor of Arts	Students take active role in designing educational plans and defining career goals
Auburn University	University College	Interdisciplinary University Studies	Bachelor of Science	To create a unique program of study to meet their personal, academic and professional goals
University of California, Berkeley	Letters and Sciences	Interdisciplinary Studies Field (ISF)	Bachelor of Arts	Opportunity to develop an individualized cross-disciplinary Research Program
Covenant College	N/A	Interdisciplinary Studies	Bachelor of Arts	Holistic approach that consciously applies a methodology from more than one discipline (integration) to examine a person's work, central theme, issue, problem, topic, or experience
Emory University	Arts and Sciences	Interdisciplinary Studies in Society and Culture	Bachelor of Arts	For independently minded students who wish to study culture and society but whose interests are broader than those accommodated by a single discipline
New York Institute of Technology	Arts and Sciences	Interdisciplinary Studies	Bachelor of Arts; Bachelor of Science; Bachelor of Professional Studies	Educates students for a wide variety of careers and graduate study. For students with prior learning experience who need to complete their degrees in a compressed period of time

Oakland University	Macomb University Center	Liberal Studies (LBS)	Bachelor of Arts	Committed to developing critical thinking, creative thinking and communication skills... Students combine discipline-specific approaches to pursue cross-discipline connections and communicate that knowledge across disciplines
San Francisco State University	Liberal and Creative Arts	Liberal Studies (LS)	Bachelor of Arts	Preparation for teaching in an elementary classroom, but also as preparation for a number of other career paths. Encompasses all areas of knowledge in the arts and sciences in a multidisciplinary curriculum
University of Texas at Arlington	University College	Interdisciplinary Studies	Bachelor of Arts; Bachelor of Science	Based on the theme of Social Justice, which views all research and learning as happening within a context of social relations
University of Virginia	School of Continuing and Professional Studies	Interdisciplinary Studies	Bachelor of Interdisciplinary Studies (BIS)	Targets Working Adults. Offers concentrations in business, liberal arts or an individualized plan of study.

Table 2: Front-End Core Course Comparison Summary (Extrapolated from available sources)

Institution	Course Title	Theme/Purpose	Required Texts	Major Components
Arizona State University	BIS 301 – *Foundations of Interdisciplinary Studies*	To introduce interdisciplinary studies core knowledge, skills and integration in academic and applied settings	Downloadable course reader; Augsburg's *Becoming Interdisciplinary*	"Ticket In" reading responses; portfolio with presentation; group presentation; exam(s); term paper
Auburn University	IDSC 2190 – *Foundations of Interdisciplinary University Studies*	Career exploration within an interdisciplinary context	Augsburg's *Becoming Interdisciplinary;* Repko's *Interdisciplinary Research*	Goal statement; goal/career-centered research paper; written prospectus tying plan of study to educational and career goals
University of California, Berkeley	ISF 189 – *Introduction to Interdisciplinary Research Methods*	Introduces a range of research skills, including but not limited to the ability to formulate research questions and to engage in scholarly conversations and arguments	Undetermined	Units built around specific learning goals and practical exercises associated with research methods and instruments of field research
Covenant College	IDS 201 – *Introduction to Interdisciplinary Studies*	To interact from a holistic Reformed Christian worldview with Interdisciplinary Studies	Augsburg's *Becoming Interdisciplinary;* Repko's *Interdisciplinary Research;* Dennison's *A Christian Approach to Interdisciplinary Studies*	Library research assignments; textbook exercises; group projects; quizzes; final integration project; a mid-term and a final-exam

Emory University	IDS 200 – *Interdisciplinary Foundations*	Evidence-based examination of the origins and development of distinct disciplines in contemporary universities	Works of Plato, Sophocles, Boethius, Chaucer, Charles Dickens, Arthur Conan Doyle, F. Scott Fitzgerald, Salman Rushdie and Jared Diamond's *Guns, Germs, and Steel: The Fates of Human Societies*	Undetermined
New York Institute of Technology	IDSP 310 – *Foundations of IS Research*	Introduces historical contexts of interdisciplinary studies and academic disciplines, key concepts and methods of disciplinary and interdisciplinary research	H. Russell Bernard's *Social Research Methods*	Undetermined
Oakland University	LBS 200 – *Interdisciplinary Approaches to Liberal Studies*	Globalization and sustainability as interconnected with politics, business, communication, science, and the arts; alternatively, feeding the world	Repko's *Interdisciplinary Research*; The edited text, *Global Sustainability: A Nobel Cause*	Course writing journal; research project; oral presentation; class participation (including homework and quizzes), current events presentations, and final portfolio and reflection

San Francisco State University	LS 300 GW – *Perspectives in Liberal Studies – GWAR*	Draws from various disciplines to prepare students for advanced work in Liberal Studies and for careers requiring breadth and depth of knowledge	Undetermined	Undetermined
University of Texas at Arlington	INTS 2301 – *Foundations: Identity, Institutions and Ideology*	An interdisciplinary investigation of the American middle class	Reading material posted on the electronic course reserves or available through the Central Library Reserves Desk	Midterm exam; final exam; in-class team-based learning participation
University of Virginia	6-9 credit hours from selection of proprietary BIS courses; none of these courses appear to focus on interdisciplinary studies as a primary curricular focus	Multidisciplinary approach to problems, academic writing, critical thinking, and research fundamentals	Undetermined; assumed to vary by course	Undetermined; assumed to vary by course

Discussion

This discussion first highlights some apparent similarities between the histories and pedagogies of UCF's and other interdisciplinary studies programs. The discussion then shifts to a more analytical framework addressing perceived challenges shared by at least some interdisciplinary studies programs and alternative curricular approaches that have been implemented in the face of these challenges. The discussion begins at the program-level administrative and pedagogical concerns and moves to course-level curricular concerns. Within this limited survey of interdisciplinary studies or interdisciplinary-oriented undergraduate

programs common approaches predicated on a common underlying pedagogical orientation are evident. It is also clear that there are many nuances to the stated purposes and structures of such programs as well as efforts at achieving integration and interdisciplinarity that set some programs apart. This would seem equally true with regard to the implementation of required core courses that serve to frame the programs and provide a sense of cohesion. Outside of the insights gleaned from the preceding survey of programs, published accounts and histories of these and other interdisciplinary programs serve to elucidate common trends and concerns throughout the discussion.

In one revealing chapter about San Francisco State's Liberal Studies program in *The Politics of Interdisciplinary Studies*, edited by Tanya Augsburg and Stuart Henry, similarities to UCF's experience with Liberal/Interdisciplinary Studies are evident. Liberal Studies at SF State is housed in the Division of Undergraduate Studies (corresponding to UCF's new College of Undergraduate Studies) "since the program [is] an all-university endeavor that [relies] on existing courses across campus" (Goldsmith, 2008, p. 133). Like UCF's Interdisciplinary Studies program, SF State's LS program is one of the largest majors by enrollment. Neither UCF's IDS program nor UCF's newly established *College* of Undergraduate Studies seem to carry the same weigh as other colleges around campus in terms of recognition, policy impact or funding. It is unclear how the Division of Undergraduate Studies fairs in this regard at SF State.

The published histories of SF State's LS and UT Arlington's IDS undergraduate programs suggest that efforts at injecting an interdisciplinary quality into the program objectives separating them from what might be otherwise conceived as at best multidisciplinary took a turn similar to that of UCF's Liberal Studies program. As previously noted, Liberal Studies at UCF became Interdisciplinary Studies when the two dedicated core courses were implemented in an

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effort to encourage the integration of the students' often disparate coursework. As we will see later, these courses were also an effort to address a feeling of disconnectedness among LS/IDS students. From the perspective of a program insider, it is apparent that these courses have not solved this problem. This may be in-part due to the nature of web-based learning environments. While the implementation of 6-12 credit hours of required core courses appears to be common in interdisciplinary studies programs, students can still expect to take few courses together within their areas of study unless they coordinate their plans of study on their own. SF State and UT Arlington have hired tenure-track faculty members to facilitate these courses, which until now has remained an unrealized hope for UCF's Interdisciplinary Studies program. While only adjuncts and "borrowed" faculty have heretofore taught UCF'S IDS Cornerstone and Capstone courses, at the time of this writing a search is underway for two dedicated 'visiting lecturer' positions for UCF's Interdisciplinary Studies program.

In terms of pedagogy, a common strategy for making Liberal Studies programs more "interdisciplinary" as opposed to multidisciplinary has been the effort to develop curriculum that emphasizes integration as an intentional externally-facilitated learning outcome. Within the current curricular status quo, at the outset, students are introduced to interdisciplinarity through a assortment of distinctions and metaphors associated with textbook terminology that would seem to have limited relevance outside of the classroom. Interdisciplinarity is treated in the abstract as a conscious intentional approach to problem-solving. In other words, the hope of program administrators and instructors seems to be that upon graduation, through a process-oriented curriculum superficially applied over a couple of core courses and a plan of study characterized by breadth, students will have developed the necessary resourcefulness and conceptual familiarity to consciously apply appropriate disciplinary insights toward solving complex

problems. As suggested earlier, Augsburg's *Becoming Interdisciplinary* seems to be the epitome of this approach and has been adopted as the required text in prominent state university interdisciplinary studies programs (i.e., Auburn, Arizona State, UCF), mid-sized public universities (i.e., SF State) and small private liberal arts colleges (i.e., Covenant College) alike. Again, my argument is that interdisciplinarity can be alternatively treated as an individual-oriented intrinsic cognitive synthesis that takes place in large part naturally and subconsciously with the gradual but sustained accumulation of knowledge.

That is not to say that such a synthesis whether, internally situated or externally facilitated, might not be demonstrated and assessed through a senior-level thesis or research project. Indeed, to varying degrees UCF's and other programs have implemented some type of back-end interdisciplinary research project for this purpose. Experience has shown, however, that an interdisciplinary research project integrated into the Capstone course with various other curricular requirements seems to afford a superficial product. In the programs, courses and texts examined, there seems to be little to suggest an emphasis is being placed at the front-end of the program on knowledge acquisition in and of itself, or on learning strategies that students might take with them as they begin their limited disciplinary coursework and carry with them later as they move on to graduate programs or professional roles.

In other words, what seems to be lacking in existing interdisciplinary programs, even within the conceptual understanding of interdisciplinarity, is an effort to directly or indirectly encourage the deep proficiency and understanding of knowledge within the students' disciplines that would allow interdisciplinary synthesis to happen of its own accord. Past Repko's discussion of disciplinary *adequacy*, which may actually serve to devalue the quest for deep-seated knowledge, I did not uncover any discussions to this effect in the interdisciplinary studies

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textbooks surveyed (Repko, 2012, pp. 44, 145). Repko's discussions of disciplines focused more on a conceptual and theoretical understanding of what disciplines are. There were certainly no discussions in the vein of someone like E. D. Hirsch, Jr., a strong advocate of the idea of deeply ingrained content knowledge.

Continuing the discussion at the program level, administrative concerns recognized as early as 1985 as being common to "interdisciplinary programs nationwide" would seem to have persisted as relevant concerns today, despite efforts to alleviate them. Among others, these concerns include "Insufficient upper-division depth", "Failure of thematic planning" and "Requirements in some Areas…met entirely by lightweight and/or introductory courses" (Goldsmith, 2008, p. 135). UCF, in particular, has attempted to address these specific concerns through implementing *Approved Course Lists* with primarily upper-division courses within the various thematically aligned areas of study. Nevertheless, as suggested earlier, it seems the general practice is to attempt to 'teach' interdisciplinarity either in the abstract or through isolated exemplars with limited personal relevance often before students learn what matters most within their areas of study – the proverbial 'cart before the horse.'

As mentioned earlier, a challenge seemingly still inherent in UCF's IDS program is likewise expressed with regard to the SF State LS student experience in that "students felt disconnected from each other and felt no identity in the major because they rarely took the same courses" (Goldsmith, 2008, p. 135). It would seem, in speaking with UCF IDS students in an advisor and instructor capacity, the problem of IDS students feeling disconnected from their fellow IDS colleagues and the sense of identity it fosters is an ongoing one, despite efforts to address it. Again, the hiring of dedicated faculty and the possibility of having faculty advisors who students might develop a sense of rapport with over the course of their studies may be one

move toward alleviating this issue. Past this, I would contend that students do not necessarily have to interact more or in different ways with fellow students to feel a sense of connectedness. Rather, simply having a vested interest in the attainment of a goal and the motivation to make connections with those who might assist the student in reaching this goal could also increase the sense of connectedness the student feels. In the curricular model to be proposed, initial online discussions will be designed to help students identify and connect with others who have similar goals, and, later, students will be asked to reach out to academic and professional insiders within the fields most associated with their goal.

As noted, SF State's LS program differs in at least one respect from UCF's Interdisciplinary Studies program relevant to its stated purpose – SF State's program targets, although not exclusively, future elementary school teachers (p. 133, 138). As we have seen, other liberal or interdisciplinary programs have evolved to embrace their own themes or fulfill specific educational niches (i.e., University of Texas at Arlington's "Social Justice" theme or Emory's emphasis on "Society and Culture" or, alternatively, University of Virginia's IDS program tailored to accommodate the 'working adult'). A debate that appears to be common within interdisciplinary studies programs is whether or not to create separate tracks altogether for these different themes. SF State's program administrators have debated creating a separate track for elementary school teachers, but have hesitated because they appreciate the cross-pollination afforded through the intermingling of students with different educational and career goals.

UCF has also created separate thematically-oriented tracks within the IDS major in certain instances. Currently, there is a separate track for Environmental Studies (ES) and Women's Studies. Specialized tracks within Interdisciplinary Studies, at least at UCF, seem to be an ever evolving presence within a 'survival of the fittest' academic milieu. The ES track is

flourishing and, indeed, is actually in the process of becoming its own Environmental Studies degree. Here many top-performing students are engaged in rigorous coursework within the sciences. Moreover, it is relatively easy to identify extracurricular and professional opportunities appropriate for ES students and inform ES students about them. The Women's Studies program, on the other hand, which is currently under review, has but a handful of students with seemingly narrow career interests. These interests include law school and advocacy work. Low enrollment in the Women's Studies track is necessitating the consideration of curricular and structural changes. In an effort to expand interest, the track is presently being reformatted as the Women's *and Gender Studies* track. While very few *First-Time-in-Colleges* (FTIC) students declare Interdisciplinary Studies as their major upon matriculation at UCF, those who do tend to declare the ES track. Students in both the ES and Women's Studies tracks are not required to take the Cornerstone or Capstone courses. They can expect to have little or no contact with the majority of IDS students within the general program but are more likely to have contact with each other due to the increased curricular structure.

It is possible for tracks to be discontinued for various reasons, including lack of student interest or lack of course availability. One such track was the *Nanoscience and Nanotechnology* track which was discontinued due to issues with course availability. Yet, there is speculation of still new tracks being developed, such as an *Integrated Science* track to attract STEM students who may be seeking, for whatever reason, an alternative to the traditional STEM majors. An Interdisciplinary Studies STEM track would both cater to the current political emphasis placed on STEM majors, while also accommodating an anticipated influx of students dismissed from the College of Engineering as a result of newly adopted academic performance policy changes. While potentially attracting new students, separate tracks do not necessarily solve the problem of

achieving interdisciplinarity or attaining those strong foundations of disciplinary knowledge within multiple areas of study that have the potential of reflecting integrated knowledge in a practical environment.

Moving now to the curricular level, similarities within the curriculum across programs consistent with the Augsburg text include the implementation of the previously discussed e-portfolio requirement to help students showcase and communicate their interdisciplinary education to prospective audiences (Goldsmith, 2008, p. 139; Repko, 2008, p. 145). As might be expected, the e-portfolio requirement is an integral component of Augsburg's SF State's LS program. From her PowerPoint, it is evident that the LS 300 e-portfolio requirement looks very much like that required of UCF IDS majors, albeit on a different platform. Increasingly, however, students in UCF's IDS program are being allowed to select a platform of their choice for their e-portfolio (Augsburg, 2009).

Other relevant curricular parallels are evident between UCF's Cornerstone course and the corresponding core courses of the programs surveyed. For instance, Auburn's prospectus requirement appears similar to the 'Course Study' assignment in UCF's Cornerstone course, but seems to place more emphasis on tying the plan of study to the students' educational and career goals. Auburn's program stands out as having a particularly goal-centered curriculum with students creating a goal-centered research paper and meeting with a career counselor to discuss the feasibility of their plan. UCF's Course Study assignment usually asks students to discuss the "driving force" behind their plan of study which may lack clarity in terms of what we are asking for. Students generally interpret driving force in terms of past experiences or even in terms of abstract material desires rather than as it relates to the attainment of specific future goals. This point in particular will be addressed in the revised curricular approach to be proposed.

We have also seen course-specific themes incorporated into the curriculum of core courses, such as the "Globalization and Sustainability" or "Feeding the World" themes of Oakland University's *LBS 200 – Interdisciplinary Approaches to Liberal Studies* or the literary orientation of Emory's *IDS 200 – Interdisciplinary Foundations*. At the course level, themes may provide an interesting and culturally advantageous vehicle for helping students engage the curriculum. Themes may help facilitate debates or collaboration within classroom settings or asynchronous online discussions. They may even elicit an element of subjectivity and passion on the part of an otherwise objective or detached student. And, again, they may serve to help provide students with that feeling of connectedness that is sometimes lacking.

Yet, as previously mentioned, one of the curricular concerns for the Cornerstone and Capstone courses has been achieving the greatest practical relevance for a diverse student population. As with degree tracks, while specific course-level themes would likely be appealing to some students, they might serve to alienate or disengage others. Incorporating specific themes into core courses might also limit the transferability of those particular courses between programs, as well as the practical relevance of knowledge attained within a specific thematic context. This is not to suggest that themes should be avoided in a general IDS program's core courses. Students might actually prefer to have explicit thematic options from which to choose. Moreover, even if themes are not specified up front, course content and discussions may tend to develop thematic qualities of their own accord. Here I am merely suggesting that in incorporating course-level themes attention be paid to the broadest possible application for the student such that the course is still in accordance with the program (or track) objectives, as well as the practical outcome of interdisciplinary synthesis as a natural byproduct of a mind infused with disciplinary knowledge and insights from varied areas of study. The theme of the core

course I will be proposing might be something like "Goal-Centered Knowledge Acquisition." Core courses that do focus on goal-centered knowledge acquisition could be transferable even to themed programs. Keeping this theme in mind, in the following chapter, I defend and support a pedagogical approach to interdisciplinary studies that will seek to integrate the old with the new resulting in a practically relevant and broadly applicable core curriculum.

CHAPTER 7: THEORETICAL SUPPORT FOR PROPOSED CURRICULAR MODEL

Over the preceding chapters, I have attempted to prepare the ground for setting in place three legs of theoretical and practical support upon which I will stand in the development of the curricular model I am proposing for the [re]design of a transferable front-end interdisciplinary studies core course. These three legs are classical education, Ramism and cognitivist theory. I have already expounded upon current trends in higher education pedagogy, interdisciplinary studies undergraduate programs, and online learning. In doing so, I have addressed what I perceive to be the limitations of current paradigm of 'teaching' interdisciplinarity as a consciously and intentionally performed outwardly-focused process. The Merriam-Webster dictionary offers two equally valid definitions for *process*. The first definition states that a process is "a series of actions that produce something or that lead to a particular result." This seems to be the prevailing definition as relates to the common notion of interdisciplinarity. I am embracing the second definition of *process*: "a series of changes that happen naturally."

The alternative that I am proposing is to cultivate optimal conditions within the individual learner (specifically catering to the often isolated and self-directed realities of the distributed learner) that will allow interdisciplinarity to happen intrinsically of its own accord. Due to the limited nature of the typical undergraduate interdisciplinary studies student's discipline-specific coursework, I have argued that establishing these conditions is predicated upon the efficient acquisition of deep-seated foundations of disciplinary knowledge relevant to achieving a specific academic or professional goal and upon which these students will be able to later build upon. Moreover, rather than dismissing the strategies of the past employed to this

end, I contend that they are particularly appropriate to the visual learner of today and the web-based resources at his or her fingertips.

Classical Education

Within UCF's Interdisciplinary Studies program, practically every academic interest and purpose is represented in the diversity of its students. There are students who have specific socially or environmentally conscious life aspirations. Others are seeking the practical knowledge to gain entry into professional fields such as medicine or law, to become commissioned military officers, or entrepreneurs and businessmen and women. Still others are seeking abstract or practical knowledge in the arts and humanities whether for personal edification, creative aspirations, or specific careers in these fields. In this context I contend that even abstract knowledge is practically valuable if only in that it serves as a transferable battery of learning strategies available to the learner for practical application later on. While the same might be said of the more mainstream outwardly-directed process-oriented interdisciplinary studies curriculum, what differs here is how I am framing the process of interdisciplinarity in itself – as an internal cognitive process, perhaps analogous to intertextuality. Catering to one type of interdisciplinary studies student, such as those seeking abstract knowledge for its own sake, while neglecting those presently seeking the foundations of practical expertise, would not seem to be a recipe for broad-based student satisfaction and success.

As suggested earlier, early domains of knowledge within classical education which might be more accurately grouped under basic rules of reasoning applicable across domains, began with the classical *trivium* (grammar, logic, rhetoric) and *quadrivium* (astronomy, arithmetic, music and geometry), and expanded to other distinct areas of study due to external pressures that "were expected to yield a direct benefit to society" (Swoboda, 1979, pp. 54-55). Often these

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external pressures originated with the students themselves and were "originally organized to serve the special interests of the students…" (Swoboda, 1979, pp. 54-55). After four years of this integrated education, students usually went on to study medicine, law or theology.

The university of the Middle Ages came to embody a polar extreme of doctrine as "final and given," which "was not conducive to the qualitative growth of learning" (Swoboda, 1979, p. 56-57). As we will see, this vision of firmly established content knowledge would later manifest in the textbooks of the Ramist paradigm (Ong, 2004, p. 132). Yet, there appears to have still been a degree of scholarly discourse relative to this final and given knowledge, perhaps, somewhat like the peer-reviewed journals we have today (albeit interpretive as opposed to additive). It appears scholars in the Middle Ages used the term *arts* somewhat differently that we do today, but in a way that might conjure up our notions of disciplines. Writing in the 12th century about what he considered the two kinds of writing, in his essay "On Study and Teaching," Hugh of St. Victor states:

> The first kind consists of those which are properly called the arts.
>
> The second comprises those which are appendages of the arts. The
>
> arts are those which are placed under philosophy, that is, which
>
> contain definite and established material of philosophy….
>
> Appendages of the arts are those which only look at philosophy
>
> [from the outside]…(Hugh of St. Victor, 1977, p. 576).

While we are far removed from the context in which Hugh of St. Victor was writing, I propose that this passage illustrates a parallel distinction between primary and secondary texts – primary works being the subject of study for gaining foundational knowledge, as well as object of study for interpretation and explanation. Hugh of St. Victor adds, "the arts without their appendages

are able to make a perfect scholar, but the appendages without the arts can confer no perfection, especially, moreover, since they possess nothing desirable in themselves which may attract the reader…(Hugh of St. Victor, 1977, p. 577). I cannot say I have not had this very thought when trudging through a particularly dense peer-reviewed article. On an aside note, I do not pretend to know what Hugh of St. Victor had in mind when he alludes to the "perfect scholar" past an eminent authority within either universals, or a particular domain of knowledge.

When we discuss classical education today, it refers to liberal arts and humanities curricula in general, suggesting the inherent breadth of interdisciplinary studies. What do not appear to be emphasized are the age old strategies for internalizing these curricula that transcended the bodies of knowledge themselves, or the direct benefit to society of deeply learning such curricula. It is with this aspect of classical education that I seek to rekindle pedagogical interest. While interdisciplinarity as a broadly applicable problem-solving process goes beyond the arts and humanities, in reality, so does the breadth of classical education – at least in its original sense.

Classical education included elements of computational sciences (arithmetic and geometry), behavioral and social sciences (politics), letters and modern languages (Greek, Latin, rhetoric and logic), and the physical sciences (physics and astronomy) all interconnected – if not in content, in terms of pedagogy. As indicated earlier, much of what we refer to today as the hard sciences (i.e., biological and physical sciences) came later. While we might not be able to map these distinctions from classical education exactly onto disciplines in the modern sense as the former emanated from universally applicable first principles in a way that is not applicable to the latter, some parallels appear to be self-evident. Within each of these disciplines there was a canon of knowledge usually embodied in the works of a specific Greek or Latin polymath (i.e.,

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Aristotle, Boethius, Cicero, Euclid, Ptolemy) (Unger, 2001, p. 228; Hugh of St. Victor, 1977, p. 574).

Canonical knowledge was the object of study and, indeed, mastery. As suggested earlier, this established and commonly accepted knowledge was meant to be received and internalized, not constructed. Hugh of St. Victor, albeit in the context of monastic life, spoke of the need to commit received knowledge to memory as follows:

> We ought, then, in all learning to collect something brief and
>
> certain, which may be hidden in the secret places of the memory,
>
> whence afterward, when it is necessary, the rest may be derived. It
>
> is necessary to repeat this often, and to recall the taste from the
>
> belly of the memory to the palate, lest, by long interruption, it
>
> should fall into disuse (Hugh of St. Victor, 1977, p. 582).

Lectures were internalized through repetition as illustrated in this official procedure for Repetitions:

> We ordain that…after the lecture they shall return home and meet
>
> in one place to repeat the lecture. One after another shall repeat
>
> the whole lecture, so that each of them may know it well, and the
>
> less advanced shall be bound daily to repeat the lectures to the
>
> more proficient (Rait, 1912, p. 144).

The notion of discipline in the Middle Ages embodied as much of the military sense of the word as it did a specialization of knowledge; the master/disciple, teacher/student hierarchical dichotomy was fully embraced and actually preserved through the Renaissance (Augsburg, 2006, p. 7; Hugh of St. Victor, 1977, pp. 579-580). Yet, the Renaissance saw a shift toward the

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expansion and advancement of knowledge (as opposed to merely imparting it) through the Renaissance academy and scientific research. It was this expansion of knowledge that eventually brought about the multiplicity of disciplines we have today.

My argument is thus: *much like you cannot have interdisciplinarity without first having disciplinarity, you cannot have the academy without first having the university.* Here again, ontogeny would seem to recapitulate phylogeny. While it would be easy to digress into a 'which came first, the chicken or the egg' argument, here I am merely framing this statement in the context of the medieval university relative to the Renaissance academy (rather than, say, Plato's academy), and likewise modern disciplines relative to interdisciplinarity as the practice of drawing insights from those disciplines. The individual's undergraduate [inter]disciplinary education should have more of the foundational spirit of the university of the Middle Ages (obviously re-envisioned for the 21st century) focused on educating and training, rather than attempting to move someone straight into the questioning and hypothesizing character of the Renaissance academy – which I submit is more the province of graduate school and beyond. This is not to say that research does not or should not happen at the undergraduate level, and, indeed, in the medieval university, "Insofar as members of the medieval university pursued research activities, they did so as a supplement to and not as an integral part of their [education]" (Swoboda, 1979, p. 57). That being said, it was Peter Ramus, "patriarch of print-centric scholarly method," that emerged to confront the educational status quo that followed the medieval period, and whose legacy ushered in the modern era. Like his medieval predecessors, Ramus believed that there was essential knowledge underlying the evolving frontiers of the known and that the deep-seated attainment of this knowledge was object of study.

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Ramism

In his book *E-Crit*, when Marcel O'Gorman states, "The nurse and Peter Ramus shared the same pedagogic agenda," he is referring to a text-image by the Romantic poet William Blake called 'Nurse's Song.' In this text-image, the nurse is depicted as lovingly attending to a young boy, perhaps 10 years old, while in the accompanying text she is chastising the boy for wasting his days away in frivolous play, presumably rather than engaging in rigorous study as he should be doing (O'Gorman, 2007, pp. 51-53). O'Gorman makes the case throughout this proposal for a digital age alternative to Ramus's print-centric pedagogical emphasis on objectivity, logical method, and "infinite binarization of the world," emphasizing rather invention (creativity), subjectivity and context – perhaps inadvertently reinforcing his own binary view of education. O'Gorman uses 'Nurse's Song' to illustrate Blake's (while symbolizing his own) rejection of an educational system predicated on logic and reason in favor of an educational system he considers more appropriate for the digital age characterized by open-ended creativity – seemingly failing to recognize that below the surface, the creativity and invention made possible by logic and reason (Ramus divided the study of Logic/Dialectic into Invention and Judgment) is what has made, first, the Enlightenment and, much later, the digital age, possible (Mack, 2011, pp.10-11).

While Peter Ramus was a child of his time, he seems to have leveled complaints similar to my concerns of today within higher education and the field of interdisciplinary studies in particular. Ramus's goal was to show students "the way to an education of broader scope and greater efficiency" (Graves, 1912, p. 108). Ramus states:

> It was my constant study to remove from the path of the liberal arts
>
> the briers and rocks, and all intellectual obstacles and retardations,
>
> and to make even and straight the way, in order to arrive more

easily not only at intelligence, but the practice and use of the

liberal arts (Graves, 1912, pp. 108-109).

Graves states that the principles of Ramus's educational reforms can be summed up in three words: *nature, system,* and *practice*. The first of these principles applies to content, the third to method, and the second to both. In terms of nature, Ramus believed that scholarly content should be based on the product of actual observations and investigations – consistent with later Enlightenment thinking. Once obtained, curricular content should then be "thoroughly sifted and arranged" according to "laws for defining and organizing the various subjects of study" (pp. 109-110). These laws are summarized as follows:

1. The law of truth (universality) – "every precept must be in keeping with truth, not only in some instances, but always…its validity must be incontrovertible" (p. 111). In other words, something that is true in particular instances would not be taught as a precept, this being a criticism Ramus levied against the scholasticism of his time.

2. The law of justice (homogeneity) – "all precepts must be germane to the subject and to each other" (Graves, 1912, p. 112). In other words, "the boundaries between the arts should be carefully marked so that clarity may be maintained.

3. The law of wisdom (primacy of the general) – "the general should precede and the particular should follow…whatever applies universally throughout a subject should be stated at the outset of the exposition, and only then." In relation to this law, Graves states, "This principle helps to produce a clearer arrangement of the material, and, through a natural and appropriate development of each subject, greatly facilitates the memory of the pupil" (p. 112-113).

As Graves suggests, Ramus was not so much adding to the curriculum as he was attempting to separate "the wheat from the chaff." Furthermore, he sought to make the curricular content "more logical and easily remembered" while eliminating confusion (Graves, 1912, p. 113).

Similarly to Ramus's curricular content reforms, his method (practice) sought to both streamline and maximize learning. University instruction in the mid-16th century primarily consisted of lectures, repetitions and disputations. Ramus did not appear to have a problem with these methods in themselves (as he did with artificial memory associations using images and places, or the 'method of loci'); rather, he took issue with what they had degenerated into – "a plethora of quibbles and hair-splitting distinctions," or otherwise fruitless debates. According to Graves, he "constantly attempted to simplify and render subjects intelligible," not in the sense of 'dumbing down' the educational experience but so as to amplifying it (Yates, 1992, pp. 229-230; Graves, 1912, pp. 114-115). Principles put forth in lecture needed to be accompanied by illustrations taken directly from classical works, and imitated by the students in written and oral exercises. In the classroom, the day progresses from an hour of lecture, to two hours of students independently "working up" what has been taught. This self-study is followed by an hour of recitation such that "the meaning of rules are understood and memorized." The remaining two hours are devoted to discussion and debate, intended "to discover whether the pupil can develop for himself what has been learned and can explain and apply it independently" (pp. 115-116). This basic progression would take place both in the morning and afternoon. Such a pedagogical approach would appear anything but passive and transactional.

In the spirit of Peter Ramus and the curricular goals he espoused, my argument is thus: *methodizing the curriculum of interdisciplinary studies core courses to maximize practical relevance as relates to learning itself while maintaining the integrity of disciplinary boundaries*

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neither inhibits creativity nor leads to the tunnel vision of disciplinary silos; rather it empowers

and broadens the potential for later critical thinking and creativity through the proven attributes

of structure and reason. Nevertheless, we do live in a digital age which does demand an

appropriate metaphor for understanding how we relate to and learn through computer

technology, as well as a curriculum that accommodates both the imagetext oriented

predispositions of a digitally immersed student population and the diversity of interdisciplinary

studies students' academic pursuits.

Cognitivist Learning Theory

As indicated earlier, cognitivist learning theory (or, information-processing theory)

emerged from the behaviorist tradition recognizing that in order to understand variance in human

behavior from one person to another, or within the same person over time, it is necessary to look

inside that 'black box' of the mind which behaviorists had ignored as irrelevant (Gagné &

Medsker, 1996, p. 44; Harasim, 2012, p. 47). Adopting a computer metaphor, in cognitivist

learning theory 'stimulus' becomes 'input' and 'response' becomes 'output,' output, of course

equating to behavior. In the computer (or, information-processing) metaphor, a given stimulus

does not simply lead to a given response. The external stimuli that form the input are

continuously stored, retrieved and manipulated within the CPU of the mind. Cognitivist theory

seeks to investigate and understand the hidden motivations for behavior and decision-making

that are not directly attributable to the external stimuli. Rather, these hidden motivations are

considered in terms of how information is stored, processed (integrated, transformed, etc.) and

retrieved from long-term memory.

Moreover, cognitivists seek to "understand how cognitive processes could promote

effective learning" (Harasim, 2012, p. 47). Similar to the assumptions of behaviorism,

cognitivist learning theorists hold that learning outcomes can be predictable given a certain stimulus. Yet, in order to achieve the predictable outcome, individual variance must be taken into account in the learning process. In other words, instruction is inherently prescriptive in that "By identifying and prescribing the appropriate stimulus and related pedagogical strategies, the instructional designer could ensure that students would learn the intended skills or set of subskills that would result in overall mastery of the skill" (Harasim, 2012, p. 52).

As suggested earlier, military training strategies and instructional design are prescriptive and efficient by necessity. My argument is thus: *Interdisciplinary Studies curricula for core courses offered online, particularly the Cornerstone course taken early in the program prior to courses that constitute the students' areas of study, should be prescriptive and efficient by necessity.* While some might object that such a prescriptive approach could amount to indoctrination, I would submit that the risk of indoctrination is equally inherent in any educational milieu, including those touting themselves as liberal. The risk here is mitigated in that the prescriptive approach refers not to instilling a particular ideological worldview, but to teaching broadly applicable strategies for acquiring knowledge. Military instructional and training protocols have often been developed from a cognitivist theoretical perspective, such as the work of previously mentioned instructional psychologist Robert M. Gagné. Gagné spent over 50 years engaged in military training research (p. 50). His work began with a behaviorist orientation, but shifted to a cognitivist orientation. Gagné developed his own taxonomy of instruction that learning outcomes, specific conditions for learning each outcome, and methods and procedures for facilitating this learning (p. 52). I propose that of particular relevance to undertaking the development of an efficient and effective curricular model for interdisciplinary studies core courses is understanding, from the cognitivist (information-processing) and

computer-mediated perspective, how information is processed. In particular, the work of Robert

Gagné will be explored and applied.

While Bloom's taxonomy of learning, which categorizes 'types of learning,' has been

widely embraced in higher education, especially relative to formulating observable/assessable

learning objectives, Gagné presents an alternative hierarchical classification scheme that

classifies the structure of knowledge as a sort of thing-in-itself (or things-in-themselves as it

were, each with its own conditions for learning) (Gagné & Medsker, 1996, p. 30). Gagné first

categorizes *learned capabilities* in terms of their characteristics (verbal information, intellectual

skills, cognitive strategies, attitudes, motor skills) (Gagné et al., 2005, p. 49; Harasim, 2012, pp.

50-51). For Gagné, Bloom's domains of learning (knowledge, comprehension, application,

analysis, synthesis, and evaluation) might be more accurately characterized as ways to

demonstrate learning, illustrated more clearly through the verbs used to frame learning

objectives, as opposed to the actual type of learning that is taking place (Gagné et al., 2005, pp.

60-61). Gagné believed human performance relative to the aforementioned learned capabilities

was determined by internal and external conditions of learning acting in conjunction with each

other (Gagné & Medsker, 1996, p. 30).

Gagné appears to be looking deeper in his conceptualization of learning, in a sense

evoking a surface/depth dichotomy between the two theorists. For instance, with regard to the

types of intellectual skills, consistent with my argument, Gagné believed that lower-level skills

in terms of complexity, such as the ability to *discriminate* (i.e., between various symptoms or

medicines) are prerequisite to higher-level skills such as understanding the biological and

homoeopathic rules (and problem solving rules, more generally) necessary to administer proper

medical care. The ability to perform these lower-level skills as a prerequisite to performing

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higher-level skills on a cognitive level represent the internal conditions of learning intellectual skills. In a curricular design, external conditions of learning will be employed to support the progressive development of these internal conditions of learning.

Creative problem-solving in a situation that the problem-solver has never personally encountered before, or relative to a complex problem that has not been solved more generally (an oft-stated goal of the interdisciplinarian) would not only require the ability to discriminate, but also to engage in abstract thinking about the problem, retrieving conceptual understandings from long-term (declarative and procedural) memory and implicitly applying rules (Gagné et al., 2005, pp. 62-63). While the abstract thinking that is taking place would not be directly observable or measurable, it would be evinced through attainment of desired outcomes. In other words, the ability to discriminate and apply previously internalized rules governing general or particular concepts would be demonstrated by virtue of the results attained during problem-solving process. But unless the problem-solver happens to be House M.D., verbally communicating the rules to his audience as he goes, the rules employed on a cognitive level might never be revealed to the lay observer.

Summary

Across the preceding discussions, I have focused on three main arguments. First, I have argued that deep-seated foundations of disciplinary knowledge are essential for interdisciplinarity to unfold in practice. Classical education pedagogy offer a potential means for building these foundations. Second, I have suggested that interdisciplinary studies core curriculum focused specifically on imparting knowledge acquisition strategies will prepare students to build acquire the knowledge within their areas of study that will afford a natural propensity for interdisciplinary reasoning and problem-solving. Ramus's efforts toward

increasing the clarity, efficiency and utility of curriculum is consistent with the present objective

of placing an emphasis on the practical relevance of such learning relative to the singular focus

of self-motivated goal-attainment irrespective of one's areas of study. Lastly, given the limited

opportunity for structured disciplinary coursework in the context of an interdisciplinary studies

undergraduate program, web-based core curriculum should be prescriptive relative to this goal-

attainment. A cognitivist pedagogical approach such as that offered by Robert M Gagné offers

such a prescriptive framework through which the installation of a goal-centered knowledge

acquisition imperative might be realized. Gagné's work will be central to the development of the

curricular model in the following chapter.

CHAPTER 8: THE CORNERSTONE MODEL

Instructional Design Approach

There are a number of instructional design models that should be considered when designing, or in this case, redesigning an online undergraduate course. Some of the more prominent instructional design models that focus on the integration of technology include the ASSURE Model, the ADDIE Model, the Dick and Carey Model, and the Kemp Model (Summerville & Reid-Griffin, 2008). Today, instructional design might be a term broadly applied to any model or process of course development in higher education. Yet, "historically, instructional design was recognized for its use in the military…to make learning more efficient" (Summerville & Reid-Griffin, 2008). As previously suggested, because the very nature of undergraduate interdisciplinary education tends to sacrifice depth for breadth, limiting the extent of focused disciplinary knowledge acquisition, embracing this same purpose of "making learning more efficient" will be a primary concern in the developmental of the interdisciplinary studies curricular model as it relates to the redesigned Cornerstone course, and a guiding principle to be imparted to the learner as they progress independently through their undergraduate program of study.

While each of the aforementioned instructional design models vary in terms of the process employed to reach their end, consistent with the ADDIE/ASSURE Models, it makes sense to first consider both the characteristics of who is to be taught, and the goals and objectives of the course (Ko & Rossen, 2010, pp. 53-54; Gagné et al., 2005, pp. 21-26). Yet, rather than simply subscribing to and following one of these popular instructional design models, it would seem most prudent to first investigate the "pioneer" model of instructional design, the Five Step Approach developed by the U.S. Air Force, which is presumably oriented toward the original

efficiency premise of instructional design. (Summerville & Reid-Griffin, 2008). While some might argue that higher education and military education might serve very different purposes, the latter existing within a social and hierarchical structure predicated on obedience, submission to authority, the following of rules, and the defining and carrying out objectives, I again point to the discipline, in the military sense, of the medieval university. Moreover, I again emphasize that in this scenario, it is the student that is in the driver's seat, setting their own learning objectives as they relate to their self-determined educational and professional goals.

Following this brief investigation of the original U.S. Air Force model, I will move in the logical direction that appears most appropriate toward reaching to the goals of this project. Because the U.S. Air Force Five Step Approach was the precursor to the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model, which was developed for the U.S. Army and eventually adopted by all the U.S. Armed Forces, not to mention directly influential in the development of later instructional design models, the ADDIE model, or at least the initial analysis and design stages of the model, will play prominently in design of the interdisciplinary studies core courses curricular model proposed here (Forest, 2014). Nevertheless, other models will be investigated with any relevant insights integrated as appropriate. Here it might be prudent to remind the reader that the stated purpose of this dissertation is to propose and support a new curricular direction relative to design, rather than the (technical) development, implementation and evaluation of this proposed curricular model. As such, these stages of the ADDIE instructional design model will not be embarked upon within the pages of this dissertation. Rather, the door will be left open, with adequate departmental or institutional support, for further development and implementation at some point in the future.

The original U.S. Air Force Five Step Approach developed and implemented between 1965-1970 consisted of the following steps:

1. Analyze System Requirements

2. Define Education and Training Requirements

3. Develop Objectives and Tests

4. Plan, Develop, and Validate Instruction

5. Conduct and Evaluate Instruction

System in this context refers to "an arrangement of resources and procedures used to facilitate learning" (Gagné et al., 2005, p. 18). Seemingly consistent with the information-processing metaphor that illustrates how new information is continuously processed (coding, elaboration, retrieval) within the human mind so as to potentially modify human behavioral output, but projected outwardly onto this conception of instructional design, feedback and interaction is continuously taking place throughout the progression across these steps with the goal of improving or updating the instruction as appropriate. Likewise, once the course is fielded, "Evaluation of instructional effectiveness continues for the life of the course and identifies needs that may develop for improving or updating the instruction" (AFMAN 36-2234, 1993, p. 9). This notion of a continuous cycle of evaluation, revision and implementation appears common among the various instructional design models.

In this model, the first step consists of "occupational, job, and task analyses which result in statements of behavior, conditions, and standards for task performances" (p. 9). In other words, the knowledge and behavioral requirements of the job are analyzed to develop appropriate learning outcomes. These concerns are also addressed in the form of a "needs assessment" in the first step (Analysis) of the ADDIE model (Gagné et al. 2005, p. 23). In the

ADDIE analysis, questions are asked such as, "What purpose does this course serve in the students' education?"…"What other courses depend upon skills learned in this course?"…"What knowledge, skills, and attitudes should a student leave this course with?"…and perhaps, most importantly, "What motivates these students?" are considered. These are just a small selection of the types of questions that would be asked in the ADDIE analysis phase. The ADDIE analysis also takes into account the characteristics of the learner, such as the learner's age, demographic characteristics, previous experiences, educational background, (in the case of online learning) technological proficiency, and educational goals (Gagné et al. 2005, pp. 24-25).   Lastly, the resources and constraints (i.e., time-constraints) of the course are also considered (Gagné et al. 2005, p. 26). Incidentally, in the ASSURE Instructional Design Model, a model which seems more oriented toward primary and secondary education, the entire emphasis of the initial analysis phase is placed on analyzing the learners (Smaldino et al., 2008, p. 87-91). In both the Kemp Design Model and the Dick and Carey Systems Approach Model, the first step focuses on identifying the instructional goals for the course (Morrison et al., 2007, pp. 28-29; Dick et al., 2005, pp. 15-16).

Reflecting on Ramus's 'law of the primacy of the general,' when asking what interdisciplinary studies students need to know at the end of the Cornerstone course, it would seem we might consider only the kind of knowledge which would apply, as much as possible, to all students beginning an interdisciplinary studies undergraduate program, regardless of their background or projected educational paths, while leaving the more 'particular' (i.e., disciplinary knowledge) for the courses to be taken later within each student's areas of study. The generally applicable knowledge I am speaking of in this context would be that as relates to teaching students how to learn efficiently yet deeply. In other words, because of the diversity of learners

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within a typical undergraduate interdisciplinary studies program the general 'truths' to be taught would seem to most appropriately deal with attitudes and broadly applicable strategies for maximizing learning. Already, within UCF's Interdisciplinary Studies program, topics related to defining, distinguishing between and applying interdisciplinary terminology are covered in Cornerstone and reviewed in Capstone. The degree to which students will actually use this terminology, or need to articulate these distinctions in their later academic or professional lives appears questionable. Academic planning exercises, on the other hand, can be useful for one seeking to choose the courses of most value toward reaching predetermined post-graduate goals as they progress through the program, but this experience might also be transferable to other scenarios where students would need to employ planning strategies. Nevertheless, the goal set forth in this project requires that all of the curricula be developed and evaluated based on the types of questions discussed above as well as the technology to be employed.

Analysis

In general terms, this analysis will consider the purpose, relevance, social needs and academic context of the Cornerstone curricular model to be developed. Each of these aspects of the analysis will be scrutinized through a series of questions, consistent with the analysis phase prescribed in the ADDIE model of instructional design (Gagné et al., 2005, pp. 24-26). While we could merely reflect on the stated purpose of existing core courses within various interdisciplinary studies programs, as undertaken in Chapter 6, in an attempt to better serve a pre-established purpose, the premise of my argument is that it may very well be the purpose itself of such courses that needs revision. As I have previously argued, one primary purpose of the Cornerstone course within an interdisciplinary studies undergraduate program should be to prepare students to gain and retain foundational knowledge within their chosen disciplines from

what will likely be a very limited number of courses within those disciplines. Students will certainly have some experience within disciplines in the broadest sense through their secondary school education and the GEP that makes up the first two years of their college experience. Experience shows that the degree to which this knowledge has been retained will vary greatly. Students, of course, will also have their own ideas and experiences relative to effective learning strategies, or, in other words, will have preferred learning styles. It goes without saying that given the diversity of students within an interdisciplinary studies undergraduate program, curriculum must be designed from a multiple intelligences theoretical perspective, as previously suggested, whether we are speaking of the curriculum itself, or the pedagogical outcomes. In short, it can be assumed that students entering an interdisciplinary studies program will not be blank slates. Students will neither learn in the same way nor will they be seeking to acquire knowledge and practical proficiency in the same things.

As previously alluded to when considering the different instructional design models, there are a number of questions one might ask to ascertain the purpose of instruction. How these questions might be answered appears ambiguous at best. Of the multitude of online resources available that discuss the ADDIE process, one might say something daunting but vague, such as the analysis "involves many hours of research and interviewing…." The more common approach appears to be simply to, "Ask *yourself* the following questions…." In this case, we might first reflect on the original impetus behind the development of UCF's Interdisciplinary Studies program and the associated Cornerstone and Capstone courses. The courses were developed to differentiate the Interdisciplinary Studies program from the previous Liberal Studies major that made little or no overt effort to emphasize integration as a necessary objective of a multi-disciplinary or interdisciplinary education. Cornerstone and Capstone were meant as

'bookends,' tying the individualized curriculum together and giving the program the semblance

of externally moderated purposeful learning. Along with this effort at increasing the academic

integrity of the program, it was determined that students needed assistance in communicating

what an Interdisciplinary Studies degree actually is for their respective post-graduation

audiences. The curriculum then evolved into a two-fold emphasis on integration of knowledge

(abstract and theoretical in Cornerstone, contextualized within a particular complex problem in

Capstone) and marketing one's self.

In envisioning the purpose of Cornerstone anew, I rationalize alternative responses to

variations of those questions commonly posed in an analysis or instructional goal identification.

These questions have been formulated to encompass a variety of concerns succinctly, omitting

the irrelevant or superfluous:

1) *Who will be taking this course?*

The majority of students who declare UCF's Interdisciplinary Studies major are either transfer

students graduating with an AA from a state college or UCF students who are seeking, for

whatever reason, to discontinue a different major. In the latter case, these students have often

already taken courses within their previous major and are hoping to count these courses toward

an area of study and/or minor as part of the IDS major. Comparatively few students within the

IDS major are 'First Time in College (FTIC)' students but there are some. Non-traditional

students, on the other hand, those who are often older, working, and/or returning to school after

being out of school for an extended period, also make up a large portion of UCF's IDS majors.

Because UCF's IDS program is marketed as an online degree (albeit within the constraints of

available online courses), there are a number of IDS majors who are distance learners. Finally,

as mentioned earlier, the students themselves are a diverse crowd likely representing all races,

ethnicities, ages, sexual orientations, points of origin, socioeconomic backgrounds, professional/academic contexts, levels of technological proficiency, interests, and indeed, 'intelligences.' We can only assume that, with exceptions particular to the institution (size, admission standards, constitution, etc.), comparable degree programs at other American institutions of higher education will have a similarly diverse student population.

2) *"What purpose does this course serve in the students' education?"*

The Cornerstone course will serve to prepare students to undertake their disciplinary coursework within their various areas of study such that students are mindful of the types of knowledge that will be most practically relevant to the attainment of their academic and professional goals, and how to acquire that knowledge deliberately and efficiently. The course will provide transferable self-development strategies for deeply internalizing knowledge relative to a diversity of 'intelligences' and disciplinary contexts, emphasizing the advantages (or disadvantages) such internalized knowledge would potentially afford with regard to innovation and creative-problem solving within contexts relevant to each individual student's interests. Students will be able to speak intelligently about their learning as a purposeful endeavor to their respective audiences. The course will also provide students a basic conceptual understanding of interdisciplinarity in practice within real-world contexts. That said, the Cornerstone course proposed here will differ from current Cornerstone course curriculum in that the purpose shifts away from imparting fluid terminology with questionable post-graduation relevance, abstract concepts and anecdotal examples that will likely not be retained without personal relevance or practical application, and the premature construction of an e-portfolio. While examining and dissecting published peer-reviewed research of an interdisciplinary character relative to the researcher's approach will hold relevance for students provided the research examined pertains to each student's academic or

professional interests, no energy will be expended in prematurely and having students attempt to

engage in their own scholarly research superficially adhering a complicated interdisciplinary

research process such as that expounded in the Repko *Interdisciplinary Research* text.

3) *How is this course relevant to students' undergraduate education and the attainment of their post-graduation goals?*

Ideally, the Cornerstone course will be taken the first semester after the student declares the

Interdisciplinary Studies major. In Cornerstone, students will be introduced to fellow students

beginning the Interdisciplinary Studies major and their diverse backgrounds, purposes, and

academic plans of study. Interactions with fellow students should afford a cross-pollination of

ideas relative to making the most of one's undergraduate interdisciplinary education relative to

one's post-graduation goals. With an emphasis on helping students think about and establish

individual post-graduation goals that are inspiring to each student, and developing an appropriate

academic plan for reaching these goals students will be instrumental in fostering the personal

relevance of the course for themselves. While it is unavoidable that some students will declare

the major late in their undergradute academic career, or for whatever reason enroll in

Cornerstone as late as the semester prior to graduating, even these students can be actively

thinking about their ultimate academic or career goals, developing plans, and reflecting upon

how the courses they have already taken may have prepared them (or not) for reaching this goal.

4) *"What other courses depend upon skills learned in this course?"*

As part of the Interdisciplinary Studies major, students will complete a number of upper-division

courses within various areas of study. As previously mentioned, currently within UCF's

Interdisciplinary Studies major students choose two areas of study and a minor totaling at least

48 credit hours. This structure is always subject to change, and we have further seen that this

structure will vary significantly between programs and institutions. Nevertheless, it can be

expected that in an interdisciplinary studies or liberal studies program, students will take far

fewer courses in any one discipline that would be taken if the student were in the dedicated

major. While it might be expected that students will pass these courses, experience shows that

the knowledge they retain from these often disparate courses will vary greatly and the practical

value these individual courses will offer for the student post-graduation will be questionable at

best. The skills imparted in Cornerstone will help students maximize the internalization and

retention of the knowledge gained in these courses, while also demonstrating the value of

incorporating these skills into their habitual practice as best fit their individual learning

proclivities. Within all of the courses that make up their undergraduate education within their

various areas of study, the goal will be for students to be able to separate the wheat from the

chaff, such that to the extent possible they ingest and deeply encode only the wheat.

   5)   *What practical knowledge will the student gain through taking this course?*

As previously suggested, the emphasis in this revised Cornerstone course will be placed on

knowledge acquisition strategies framed within a discussion of the value and benefits of

habituating these strategies. Through step-by-step exercises, Cornerstone students will learn

strategies for *rehearsing*, *elaborating*, *organizing* and *retrieving* content that can be employed

within their respective areas of study and other future learning endeavors (Gagné et al., 1996, p.

75). While it can be expected that many, if not most, students will have some previous exposure

to common encoding and retrieval strategies, learning aids, etc., students will be introduced to

such strategies anew in the context of their goal and undergraduate plans of study. Through

discussion and content-based illustration, students will understand why such encoding of

foundational disciplinary knowledge is important. Students will better know themselves in terms

of their preferred learning styles and the types of study habits that best suit their particular 'intelligences.' Rather than merely creating a 'Course Study' that tentatively lists the courses a student plans to take in order to complete their graduation requirements along with a brief explanation of the driving force behind their plan of study, students will employ inductive/deductive reasoning and utilize external resources to ascertain what types of disciplinary knowledge they will need to gain to achieve their intended goal. Through the use of cognitive organizers, students will work backward from their intended goal to investigate, catalogue and order the knowledge they will need to firmly grasp within their various areas of study, and only then seek to match the appropriate courses within a plan of study.

Separately, through assorted exercises over the course of the semester, students will apply different strategies for encoding content that would be transferable and could be brought to bear in later learning endeavors. These learning 'experiments' would correspond generally to the various 'intelligences' described by Gardner and other multiple intelligence theorists. Rather than focusing on the content itself (which students will assumedly be exposed to later in the coursework associated with their various areas of study), emphasis will be placed on the encoding strategies as self-contained transferable skills in themselves. Students will keep a detailed journal of their experiences and perceptions relative to these different ways of internalizing knowledge. Finally, students will be able to identify the characteristic components of a peer-reviewed article, and in their own writing, be able to transition between formal author-evacuated academic modes of writing and expressive/reflective writing as appropriate.

6) *"What can [we] reasonably expect the student to learn [and retain] in 15 weeks?"* Establishing specific goals for the course and framing these goals within a context of value and personal relevance, it is expected students will engage with the weekly assignments over the 15

week semester, mindful of the self-development benefits and academic advantages they afford. Each week, students will be expected to submit component assignments relative to their goal-centered disciplinary knowledge research, as well as journal entries associated with knowledge acquisition exercises. Over the course of the semester, students will apply various techniques for internalizing content and discuss their findings both within their journals, and with fellow students through online and/or in-class discussions. Students will further find a peer-reviewed article relative to their interests and areas of study that they believe is interdisciplinary in nature, and will analyze this article relative to the author's approach. It is expected that over 15 weeks, students will be able to learn what kinds of knowledge and skillsets they will need to internalize within their various areas of study relative to reaching their post-graduation goals, and practical strategies for accomplishing this knowledge acquisition efficiently. Students will be able to learn what encoding strategies best fit their individual intellectual dispositions. Students will also be able to identify what interdisciplinarity looks like in practice without becoming bogged down with unnecessary terminology. Finally, we can expect that students to be able to differentiate modes of writing such that they can employ these modes in their own writing as appropriate.

At this stage of the student's undergraduate education, it would be unreasonable to expect that students will have significant knowledge within their respective areas of study, or be prepared to undertake substantive interdisciplinary research. It would be unreasonable to expect that students will retain hypothetical or anecdotal content that is not personally relevant and transferable, or that is introduced in the abstract without immediate practical application.

7) *How will curricular content and tasks be classified relative to learning outcomes?*
Curricular content and associated tasks will be classified relative to types of learning outcomes following Robert Gagné's theory of instruction. Intended learning outcomes and corresponding

conditions for learning will be considered within the context of each event of instruction as appropriate. It is important to note that the learning outcomes in themselves, as practical strategies to be capitalized on by the student later on, may fall outside of Gagné's theory of instruction. For instance, Gagné's model might be employed to teach students encoding strategies that correspond more to Gardner's theory of multiple intelligences than Gagné's theory of instruction. After all, the goal will be to teach students the skill of learning deeply and efficiently as a proactive and often self-directed goal-oriented endeavor.

Weekly modules, or more precisely, the curricular content within these modules will be designed and organized in accordance with Gagné's nine prescribed events of instruction. Modules will begin with a brief narrative or multi-media component that illustrates the general value of the intended learning outcome (*1. Gaining attention*). Students will be informed of the objective of the module or task, with emphasis placed on how this exercise, with proper engagement, can be relevant to the learner's future success (*2. Informing learner of objective*). The manner in which the student is informed of the objective will depend on the particular type of learning outcome (*intellectual skill*, *cognitive strategy*, *verbal information*, *attitude,* and possibly for some students, *motor skills*). For example, the objective might be communicated through an example, a demonstration, verbal communication, or even through a self-evident realization after the task is complete. As students begin each new module, they will be reminded of previously covered learning strategies, or asked to reflect on the fruits of their earlier disciplinary knowledge research (*3. Stimulating recall of prior learning*) (Gagné & Medsker, 1996, pp. 140-145).

At this point, a stimulus (i.e., provisional content to be encoded, which may be supplied by the students themselves to ensure personal relevance) will be presented to the students (*4.*

Presenting the content) along with guidelines for encoding this content (*5. Providing learning guidance*). Continuing to follow Gagné's events of instruction, students would submit their findings each week relative to their essential disciplinary knowledge research and knowledge acquisition exercises, as well as participate in weekly discussions, and receive formative feedback from both instructors and peers. While most-often weekly submissions will be in a written format, it might also be expected that students will create video-submissions (*6. Eliciting performance* and *7. Providing feedback*). While, in many cases, assessment may take the form of conventional grading and instructor feedback schemes, self-assessment will also be an integral component of the process of helping students better know their own learning proclivities (*8. Assessing performance*). While it will be unreasonable to expect that within the 15-week Cornerstone course, students will be able to repeat and transfer learned encoding strategies in a meaningful way, the primary goal of the investigations into essential disciplinary knowledge and the encoding exercises is that students will be familiar with, and see the value in, applying these encoding strategies to essential disciplinary content later on as they undertake the courses that will constitute their areas of study (*9. Enhancing retention and transfer*) (Gagné & Medsker, 1996, pp. 145-150).

Design

When discussing the design process of the ADDIE instructional design model, Gagné and his co-authors state:

> A common mistake is to put too much breadth and not enough
>
> depth into a course. Generally too much breadth means the course
>
> focuses on "covering" information rather than developing skills
>
> (Gagné et al., 2005, p. 28).

Whether this is a valid concern with current core Interdisciplinary Studies courses at UCF or elsewhere is debatable, however, as earlier pointed out, too much breadth and not enough depth has been a criticism leveled against interdisciplinary studies programs in general. I argue that focusing the curriculum around a specific theme, *essential knowledge acquisition*, will allow the curriculum to unfold with sufficient depth so as to afford the development, within the Cornerstone student, of those skills necessary to that end.

In the design phase of the ADDIE model employed for developing the Cornerstone course proposed here, overall goals and course objectives will become learning outcomes for specific units, or, more accurately, the major course components and modules. As suggested by Gagné and his colleagues, weekly modules will be broken down into specific learning activities relative to the major course components, and these learning activities will be detailed relative to Gagné's conditions of learning (p. 26-29). Specifications for assessment will be detailed as well. Generally speaking, assessment will take the form of evaluating assignments in writing and/or multi-media formats (research summaries, online journal (wiki) entries, discussion posts, etc.) submitted each week.

What are the highest-level course objectives for the proposed Cornerstone course?

1. Students will identify a plausible post-graduation academic or professional goal that gratifies their deepest notion of fulfillment.

2. Students will defend why they believe this goal will be an inspiring, achievable and fulfilling goal for themselves relative to what they know about this goal and their own past experiences (academic or otherwise), passions, motivations, proclivities, and aspirations.

3. Students will recognize why it will be important to have a repertoire of internalized foundational knowledge from which to draw upon and build upon within their chosen disciplines/areas of study.

4. Students will identify, classify, and defend what essential knowledge they will need to acquire within their various disciplines/areas of study in order to reach their chosen goal.

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5. Students will apply a variety of encoding strategies relative to provisional content knowledge in an effort to determine what types of encoding/retrieval strategies are most suited to their own learning proclivities.

6. Students will distinguish between formal objective academic writing and subjective expressive/reflective writing.

7. Students will recognize a peer-reviewed journal article and identify the constituent parts.

8. Students will analyze a peer-reviewed article that they reasonably believe to be interdisciplinary in nature to determine how the author(s) integrated separate disciplinary insights into a coherent interdisciplinary approach or response to a complex problem related to the students' interest and plan of study.

What are the major course components and their learning outcomes?

1. Goal-centered Disciplinary Knowledge Research Assignments (25% – approximately 6

    weeks)

    - Chooses a post-graduation academic or professional goal
    - Identifies essential disciplinary knowledge to be acquired in pursuit of this goal
    - Classifies this knowledge according to discipline, student's plan of study, course descriptions and availability, and other learning resources
    - Adopts a rationalized strategy for reaching the chosen goal

2. Knowledge Acquisition Strategies Journal (wiki-format) (25% – approximately 12

    weeks)

    - Executes prescribed knowledge acquisition strategies relative to provisional bodies of knowledge
    - States the outcome of encoding strategy application through reflective writing
    - Demonstrates the outcome of encoding strategy application through multi-media documentation
    - Generates a comprehensive record of knowledge acquisition strategy experiments and findings
    - Chooses to adopt preferred encoding strategies in future coursework, on-the-job training and self-directed learning endeavors

3. Discussion Posts/Course Participation (25% – approximately 10 weeks)

    - Identifies the personal relevance and value of past learning experiences relative to goals and interests

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- Generates meaningful dialogue around the theme of goal-oriented knowledge acquisition and goal-attainment
- Demonstrates critical thinking relative to adopting certain behaviors and practices as a means of achievement

4. Peer-Reviewed Article Analysis Project (25% – approximately 5 weeks)

- States the purpose, complex problem, and major findings of an approved peer-reviewed article
- Discriminates between disciplinary theories, concepts and assumptions relative to the subject matter of the article
- Identifies the primary disciplinary perspectives of bibliographic material used to support the author's approach, arguments and findings
- Classifies, using quotations, disciplinary perspectives and insights represented within the various components of a peer-reviewed article to support the author's argument

How will the learning activities associated with the major course components and their corresponding learning outcomes be arranged into weekly modules?

In Gagné's discussion of the ADDIE design process, once the major units or topics of instruction (what I am calling the major course components) have been determined, the next step would be to "Flesh out the unit objectives by specifying the learning outcomes for each unit," after which the designer would "Break the units down into lessons and learning activities." In the Cornerstone course being proposed here each of the major course components operate in a more or less parallel and complementary (albeit independent) relationship, and as previously detailed, embody their own learning objectives. This structure is intentional as a previously suggested goal for this curricular model is that the curriculum and purpose be clear to students, straightforwardly pairing course requirements with practical benefits.

Gagné states that it may not be necessary to include all nine events in each learning sequence, suggesting a degree of flexibility in both application and presentation (Gagné, 2005, p. 29). Therefore, loosely within the prescribed events of instruction framework, provisional content is provided for each weekly module, will include information such as the module title,

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module theme or focus, module objectives, detailed learning activities as relates to the major course components and their associated learning outcomes, and, in some cases, assessment criteria (See Appendix). As sequence, particularly with regard to online/in-class discussion, is intended to be somewhat flexible, as will be the topics, discussions topics for week's 8-11 will be left open. A short discussion of possibilities will be included in the Week 8 module summary. As previously suggested, the curricular content itself is provided for demonstration or illustration purposes, and as such, should be treated as provisional. The emphasis should be placed on the logic behind the form and structure of the model relative to the philosophical underpinnings laid out in earlier discussions and the stated purpose of the course relative to an overall interdisciplinary/liberal studies undergraduate program, rather than the details of student-facing content, which will surely evolve or be adapted to suit each instructor and/or the needs of the specific program in which it is to be incorporated.

Summary

In this chapter, I have presented my vision of a revised curricular model for a front-end Cornerstone course for interdisciplinary studies programs that would place the emphasis on incorporating deliberate goal-centered knowledge acquisition strategies into one's studies. I have also explored instructional design theory, particularly that of Robert M. Gagné, and framed the curricular model's development within the context of the initial phases of the ADDIE instructional design model. I have further expounded on each weekly module providing provisional content that corresponds to specific learning objectives, as well as a justification. This course, however, is only one (albeit fundamental) aspect of an overall interdisciplinary studies undergraduate program. While most of the revisions I propose to current practice relative to core interdisciplinary studies courses are on the front-end of these programs, I will next

discuss other core course requirements to provide both provide additional context and offer

opportunities for future innovation.

CHAPTER 9: E-PORTFOLIOS, SENIOR PROJECTS AND OTHER CURRICULAR CONSIDERATIONS

As previously mentioned, within UCF's Capstone course, taken during the student's graduating semester, students can expect to be refreshed with regard to interdisciplinary concepts and terminology, revise and finalize their e-portfolios, and complete a research project. Having now taken the majority of courses with the areas of study that will constitute their IDS plan of study, this curriculum would seem entirely appropriate. Students will need tools to effectively articulate what their degree is to prospective audiences who may be unfamiliar with interdisciplinary studies; they will need a vehicle to tell their story and showcase what they bring to the table relative to their education and experiences. Additionally, students will need to demonstrate that they have the ability to draw insights from their disciplinary knowledge, and, yes, the disciplinary adequacy to consult appropriate resources and communicate intelligently in the languages of their respective disciplines. Moreover, they will need to demonstrate that they can integrate these insights toward a well thought out conceptual proposal for addressing a real-world complex problem of which they have a genuine interest in solving. Whether a 10-hour service learning requirement, which often takes place in an environment of questionable relevance or research value (i.e., a food pantry), or worse, can be easily falsified with a faxed completion form, is of real academic value to the future interdisciplinarian is a matter for debate.

On the whole, however, in terms of pedagogical approach and learning objectives, it might not be necessary to undertake serious revision to current back-end practice. At worst, in the context of the Cornerstone revisions proposed here, students might just be creating their e-portfolios from scratch or learning and applying the academic definitions and distinctions for various interdisciplinary concepts and terminology for the first time. With regard to e-portfolios,

experience shows that often students are unable to locate their previously created e-portfolios or have so many revisions given their wealth of new experiences that this is the reality anyway. Moreover, in Capstone, it is often *as if* students actually are being exposed to the concepts and terminology for the first time. That said, the preceding survey of other interdisciplinary studies and related programs offered insights into variations of the Capstone curricular model that might be useful to consider if revisions are to take place. In this chapter, I briefly discuss potential alternatives to the current model drawing ideas from current practice at other institutions.

Again placing an emphasis on clarity and depth, one possible alternative might be to have graduating seniors focus their efforts on two particular components of the Capstone course, but as an expanded and more comprehensive undertaking: *the e-portfolio* and *the research project*. With regard to the e-portfolio, the current objective in Capstone is to encourage students to tailor the content of their e-portfolio to a specific audience. This audience might be a prospective graduate school, professional audience, business partner, a non-profit organization, or in the case of at least one of my aspiring missionaries, future converts. Regardless of the target audience, the attention to detail and technical savvy demonstrated in the final product varies as much as the students themselves. For instance, a few submissions have still had the stock photo of an attractive face sporting a winning smile which had been preloaded into these students' selected template displayed in their final submission. Expanding the weight and detail of the e-portfolio project might afford a greater familiarity with and proficiency relative to the capabilities and limitations of various e-portfolio platforms, a better development of the narrative and presentation through feedback and revision (along with a potentially more detailed peer review), and the more effective integration of meaningful images (objects from one's experience) into the text to draw in the attention of and create a lasting impression upon the intended audience.

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Aside from the e-portfolio, the greatest opportunity for qualitatively enhancing the rigor and substantive value on the back-end of an interdisciplinary studies program would seem to be with regard to the interdisciplinary research project. As we have seen, UC Berkeley and Oakland University expand the requirement to the level of an undergraduate thesis. Several other programs examined in the survey, such as UT Arlington and Covenant College, also place an added emphasis on this requirement relative to UCF as a summative demonstration of learning – although perhaps to a lesser degree than UC Berkeley or Oakland. It is apparent, through interactions with UCF's Office of Undergraduate Research (OUR) that few Interdisciplinary Studies majors take advantage of the various programs available to completing formal undergraduate research. There are a number of potential benefits for the student who does engage in undergraduate research. As indicated in recent presentations delivered by OUR Director Dr. Kim Schneider and Associate Dean of Graduate Studies at UCF Dr. John Weishampel, respectively, these potential benefits would include documented research experience, specialized knowledge, increased rapport with faculty members (i.e., for recommendation letters), and the potential for recognition and funding at both the undergraduate and/or graduate level. Personal experience as one who completed an undergraduate honors thesis would attest to all of these benefits. It can be expected that most if not all institutions of higher learning will house some mechanism or resource for engaging in formal undergraduate research.

One way to make the senior thesis central to assessing program learning outcomes would be to follow the example of UC Berkeley and make the senior thesis and, perhaps, an associated directed reading its own autonomous credit hour requirement over the two consecutive semesters leading up to graduation. A directed reading requirement might be administered as it would in

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an undergraduate honors program. Alternatively, as the reader may recall, UC Berkeley

incorporates a research methods course requirement – *ISF 189 – Introduction to Interdisciplinary*

Research Methods. The two additional theory and method courses required as part of UC

Berkeley ISF core requirements or the additional array of proprietary courses from which

students might choose would likely be more than is feasible for most undergraduate

interdisciplinary studies programs. Integrating a senior thesis into an interdisciplinary studies

program might be more realistic, but I concede would necessitate some form of formal

preparation for students to engage in interdisciplinary research. Meeting this need might take the

form of an intermediate 'Keystone' methodology course as will be discussed later.

A second way to add greater emphasis to the interdisciplinary research project short of

creating an entirely new program requirement would be to look for ways to improve the research

process as prescribed to students within the context of the current Capstone course. In this

scenario it might be possible to simply place more weight on and devote more time to the

research project as well as the e-portfolio requirement. Correspondingly, less emphasis could be

placed on low-stakes assignments such as discussion posts and those related to disparate and

inconsequential content, or such assignments could be eliminated altogether. I submit that this

move might also add clarity relative to learning objectives and intended outcomes while

placating the charge of 'busy work.'

From what I know of Capstone, either through sections I have personally taught or my

familiarity with those as taught by other instructors, the interdisciplinary research project takes

the form of additive component assignments completed over the course of the semester. These

component pieces are then tied together at the end of the semester into a coherent final product.

This final submission would include either a literature review or annotated bibliography which,

ideally, will illustrate a degree of interdisciplinarity with regard to the sources from which insights have been drawn. Past this ability to consult sources in such a manner that a superficial treatment tends to be evinced in the final product, there appears to be little to demonstrate by way of inference the integration of previously attained disciplinary knowledge. To some degree, this may be due to the nature of citation requirements in academic writing. Nevertheless, there are exceptions, and I have often annotated exemplary work with the permission of the student to serve as illustrations for how one might integrate insights inferred from previously acquired knowledge. That being said, as suggested earlier, the ability to consult sources and demonstrate elementary critical thinking relative to these sources seems to be sufficient as a demonstration of learning, at least within undergraduate interdisciplinary contexts.

In his *Interdisciplinary Research: Process and Theory text*, Repko offers a somewhat densely expounded research process progressing through nine distinct phases: 1) Identifying Relevant Disciplines, 2) Conducting a Literature Search, 3) Developing Adequacy in Relevant Disciplines, 4) Analyzing the Problem and Evaluating Insights, 5) Identifying Conflicts Between Insights, 6) Creating Common Ground Between Concepts, 7) Creating Common Ground Between Theories, 8) Constructing a More Comprehensive Understanding or Theory, and, finally, 9) Reflecting on, Testing, and Communicating the Understanding (Repko, 2012, pp. 143). While I would flatly disagree with the notion that this textbook would be appropriate for students beginning an interdisciplinary studies program, it has been the basis for mine and other UCF instructors' research projects in Capstone, albeit, speaking for myself only, in a somewhat abridged form. For instance, weekly component assignments would look something like: 1) Proposal & Focus, 2) Disciplinary Perspectives, 3) Conflicts, 4) Common Ground, 5) Response/Solution, 6) In-Class Presentation (for mixed-mode sections), and, lastly, 7) Final

Submission & Annotated Bibliography. The Conflicts and Common Ground components are where the analysis would be expected to take place (approximately 2-4 pages). The final product is generally a 7-10 page paper plus annotated bibliography (or, in the case of one student, an 'annotated biography') along with an in-class presentation. While the research project was already a course requirement before I began teaching Capstone, I merely took what other instructors were already doing, coupled it with my own review of the Repko text, and attempted to streamline it for clarity and practicality given the medium and time constraints.

By way of comparison, we may recall that UC Berkeley's senior thesis is expected to consist of approximately 30-40 pages not including front- and end-matter. While an interdisciplinary array of secondary sources are still expected to be critically evaluated relative to a specific research question, emphasis in UC Berkeley's ISF Senior Thesis Guidelines is initially placed on consulting primary sources (those to which the 'conversation' of secondary sources tend to refer back and are built upon). This emphasis on primary sources seems to be an effort to move students away from what might arguably be called the superficial scholarship described above relative to the UCF IDS Capstone interdisciplinary research project. UC Berkeley's guidelines characterize sources as primary "in that they are produced by or refract specifically the historical actors and institutions and the social processes that are the object of study." The guidelines further state that "the Senior Thesis should strive to be more than an analytical and critical summary of secondary literature, comparing and contrasting contemporary academic scholarship on a question" ("ISF Thesis Guidelines," n.d.). In short, an argument must be presented.

While UC Berkeley's ISF Thesis Guidelines initially seem to be positioning their ISF students to present an original argument utilizing primary sources, the guidelines soon fall back

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into the standard language of academic discourse. With regard to originality, the guidelines state that rather than students striving to be completely original, which is an impossibility, they should "select a subject in such as a way as to contribute to the conversation, drawing on the research and ideas of many other scholars and thinkers…" ("ISF Thesis Guidelines," n.d.). From this perspective, originality would seem to lie in the additive rather than the revolutionary quality of the argument. This may, in fact, be a more realistic proposition for undergraduate students. Yet, what this guidance would also suggest is that the goal of UC Berkeley's senior thesis would actually be more or less consistent with UCF's interdisciplinary research project albeit in an expanded form – a proposed response to a complex problem supported by insights drawn from both primary and secondary sources from within the academic discourse of different disciplines.

Therefore, taking current practice with regard to the interdisciplinary research project and expanding it, placing added emphasis on utilizing primary sources to develop an argument, could be an effective way to enhance the rigor and substance of the interdisciplinary research project even within the context of a single Capstone course. Given programmatic bookends such as the front-end Cornerstone course previously proposed and a revised back-end Capstone course as described here, however, as alluded to earlier it seems clear that there would indeed be an additional need relative to theory and process. Meeting this need might take the form of an entirely new mid-program 'Keystone' course. Such a course could also offer the added benefit of increasing student connectivity with both the interdisciplinary studies major itself and with one's fellow students within the major. In the remainder of this chapter I will discuss the potential implementation of such a course.

The need for a mid-program 'Keystone' course

One curricular approach to a mid-program 'Keystone' course focusing specifically on prevailing interdisciplinary studies theory and process might be to simply carry over and expound upon the Augsburg *Becoming Interdisciplinary* or the Repko *Introduction to Interdisciplinary Studies* textbooks' content currently being emphasized in UCF's Cornerstone course and as we have seen other interdisciplinary studies programs around the country. An effort might be made to standardize (an ugly word in liberal education) curriculum such that students can expect to be indoctrinated (another ugly word in liberal education) into the same interdisciplinary studies community of discourse. Students might then be able to employ learning strategies and memorization techniques introduced in Cornerstone to internalize and contextualize elements of interdisciplinary studies-specific content knowledge, such as field-specific terminology (i.e., multidisciplinary, cross-disciplinary, transdisciplinary), broadly applicable academic definitions (i.e., concept, theory, assumption), elaborated distinctions (i.e., critical versus instrumental interdisciplinarity), illustrative metaphors (i.e., a smoothies versus a bowl of fruit), and applied contexts (i.e., environment, poverty, childhood obesity).

Both objective and subjective aspects of this content knowledge could be easily assessed using current LMS functionality. Many UCF IDS instructors already utilize the LMS platform to administer timed quizzes and exams albeit in a web-based format it can be expected that they will always be 'open-book.' Nevertheless, such a curriculum would be relatively transferrable between undergraduate interdisciplinary studies programs. And as suggested earlier there will likely be opportunities to increase student interest as new platforms, applications and software become available. Through adequate funding and partnerships with software developers, interdisciplinary studies content knowledge could be loaded into applications that could

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contextualize and vary the application of relevant concepts and terminology, rewarding students as proficiency increases while reinforcing weakly grasped content.

In short, a Keystone course could be designed and implemented in such a way that it might be characterized as 'turnkey' web-based curriculum easily facilitated by novice interdisciplinary studies instructors or graduate teaching assistants. While mainstream academics might balk the characterization of university curriculum as standardized and turnkey, I have seen firsthand how this style of step-by-step process-oriented curriculum has been implemented in technical colleges such that students are taught and indeed thoroughly imparted with practical knowledge (in this case relative to technological proficiency) that mainstream university students might be expected to already know – yet apparently often do not. I contend that university undergraduates are not above such modes of learning and indeed can benefit immensely from them. Presented in the context of a fully online mid-program course, interdisciplinary studies students would be introduced to relevant interdisciplinary studies core knowledge as represented in current textbooks in the midst of their disciplinary coursework rather than before or after. Additionally, we might expect that most interdisciplinary studies students will be exposed to these concepts in closer proximity to Capstone in which they will be expected to apply them. The prospect that interdisciplinary studies content knowledge might be more deeply ingrained and therefore automatic and intuitive in its application would be complementary to an interdisciplinarity conceived as interiorized within the individual learner and indeed serve as the keystone to a more integrative and practically applicable core curriculum. Taken together this tripartite vision of a revised curricular approach to 'teaching' core interdisciplinary studies courses offers an adaptable and transferable alternative to current practice. In the final chapter of this dissertation, I shall summarize my main arguments with

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regard to the revision of core interdisciplinary studies curriculum primarily as it relates to the

Cornerstone course but contextualized within the overall curricular requirements of an

interdisciplinary studies or like program, and the IDS student's individual plan of study. I will

also recap my discussion of current thinking relative to liberal education in general,

interdisciplinary studies and online learning in particular, and the historical and theoretical

supports underlying my proposed

CHAPTER 10: CONCLUSION

At the outset of this journey of pedagogical and curricular exploration, I audaciously suggested that having both taught and advised for UCF's undergraduate Interdisciplinary Studies program, I had a few ideas about how we might revise core curriculum to better serve our students. I couched this suggestion within perceived shortcomings and criticisms levied against the American educational system in general and interdisciplinary studies degree programs in particular, coupled with my own experience with IDS undergraduates in the aforementioned roles and the documented decline in enrollment in UCF's IDS program. I specifically considered the academic and motivational challenges I have witnessed many of my students and advisees face and the concerns they have voiced. Regardless of where students are going, they seem to crave structure and direction, even within the context of an interdisciplinary studies program. In my mind, better serving students meant providing specific practical strategies for helping them acquire essential disciplinary knowledge within what is inevitably a limited multidisciplinary framework that will carry them forward toward the achievement of a pre-established post-graduation goal. On top of this, given the diversity of students in interdisciplinary studies programs, a revised curriculum would need to be applicable to the entire spectrum of students striving toward an equally diverse and often shifting array of goals. Lastly, I suggested that for a curricular model to have value beyond a specific program, it would need to be transferable and easily adapted to other interdisciplinary or liberal studies programs with varied LMS platforms and curricular structures.

Prior to developing this revised curricular model I considered a number of factors. These factors included current approaches to teaching and learning in higher education to include their theoretical underpinnings, current approaches to online learning in particular given the current

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format of core interdisciplinary studies courses (at least at UCF), and current pedagogy and curriculum within the field of interdisciplinary studies. With regard to current practices relative to undergraduate education within the field of interdisciplinary studies, I considered not only what we were doing at UCF, but what other institutions of higher learning were doing within similar programs. While I found some similarities between the programs I surveyed, I also found some notable differences. Some of these differences included programs tailored toward specific demographics or educational needs (i.e., Covenant's program tailored for a Reformed Christian demographic, University of Virginia's program catering to working adults or San Francisco State's program aimed at preparing elementary school educators). Alternatively, themed programs were geared toward addressing specific social or environmental concerns (i.e., UT Arlington's "social justice" theme or the various social/environmental themes integrated into Oakland's core curriculum). Lastly, there were variations with regard to pedagogy and curriculum calculated to enhance student interest and engagement (i.e., Auburn's career focused approach or Emory's literary approach).

While these programs offered a number of interesting ideas relative to better serving the needs of interdisciplinary studies students, I also looked into the past to see what the wisdom of the ages had to say about effective learning strategies. My premise in looking back to the practices of our forebearers and beyond was that it was not through faulty educational practices that, in the blink of an eye cosmically speaking, we emerged from cave dwellings to put people on the moon nor was it from corrupt social foundations that America has become the politically stable, socially integrated, economic powerhouse that it is today. In saying this I recognize there have been growing pains and hiccups along the way. Even since the Enlightenment a sometimes misguided passion has occasionally gotten the best of sound reason in the short term.

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Nevertheless, we have gradually forsaken attitudes and social practices that would abhor our cultural sensibilities and common sense today while at the same time preserving those principles that have been instrumental to progress and stability.

Works that have come down to us from antiquity would suggest that our minds are not so different than they were thousands of years ago. The bards and painters of ancient Greece thought in visual images much as biologists and engineers do today – so too the creative problem-solvers. Our minds have always operated on the same principle as our bodies – that there will be a correspondence and indeed a transformational synthesis between what goes in and what comes out. I am not merely applying a computational metaphor here. Rather, we have built our computers on this understanding. I have merely sought to apply this same principle to interdisciplinary studies undergraduate programs in revising its core curriculum.

I have also contended that through a cumulative process of knowledge acquisition across multiple disciplines the interconnections characteristic of interdisciplinarity will come naturally and of their own accord. In approaching interdisciplinary studies in this way, at least on the front-end, we have the potential to provide students with tools to acquire the knowledge essential to becoming an authority in their chosen field or niche. Classical education offers an intriguing opportunity to reimagine knowledge acquisition in the present day when that knowledge is more accessible than ever before. I have argued that we need not sacrifice depth for breadth at all. Rather, through time-tested visualization and memory techniques that emerged in the classical period and experienced a revival during the Middle Ages, we can acquire and retain knowledge through visual associations (and other methods) that will allow us to begin to make this knowledge our own rather than predominately relying on external resources. That is not to say

that these external resources, i.e., our digital technology, won't be essential to the process –

indeed, I count on it.

While Ramist pedagogy, which emerged later, offers a more straightforward approach to

drilling a self-contained body of knowledge into our heads through practice and repetition, it too

may still have value in the limited discipline-specific framework of an interdisciplinary studies

undergraduate program. I have argued that all disciplines in one form or another have

foundational knowledge upon which everything else is built. This notion was central to Ramist

thinking. While this foundational knowledge may vary given the ultimate purpose of the learner

or otherwise evolve over time, it would seem that at least some elements of this knowledge will

be relatively established and fundamental for entry into the discourse community. I have argued

that determining what this knowledge is through determined investigation and applying classical

and/or Ramist strategies to acquire this knowledge we will better position our interdisciplinary

studies students to be motivated self-directed goal-centered learners with a sense of purpose as

they set out to complete their upper-division coursework. Strategies such as the ones I have

advocated, particularly the Ramist strategies, are still utilized in the military, the corporate world,

technical colleges, and likely even in some university majors. Applying these same strategies in

the context of an interdisciplinary studies undergraduate program is not a giant leap.

While behaviorist and constructivist theoretical frameworks offer opposing perspectives

relative to pedagogy, a cognitivist framework seems to occupy a middle ground particularly

well-suited to a predominately web-based curriculum. Indeed, instructional design pioneers such

as Robert M. Gagné have subscribed to the cognitivist school of thought. Gagné's motivation

was to provide the military with an efficient and effective way to educate their students. As I

had a similar motivation with regard to interdisciplinary studies students and having firsthand

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experience with the efficiency and effectiveness of military and corporate instruction, it occurred

to me that Gagné's instructional design work would be an appropriate starting point for

designing a revised core interdisciplinary studies Cornerstone course. To this end, I have sought

to follow the initial phases of Gagné's ADDIE instructional design model in the development of

the curricular model I have proposed.

As I progressed through the conceptualization and design of this curricular model, I kept

several factors in mind relative to the student experience. The purpose of the curriculum would

need to be clear, the practical relevance of the curriculum would need to evident, and the

students would need to be interested and engaged in what they were asked to do. I looked at

what we were currently doing (or, at least what I had done) in UCF's Cornerstone course and

attempted to eliminate or at least postpone requirements that seemed either superfluous or

premature while retaining and enhancing that which would seem to be of most benefit to the

student on the front-end of the program. Then I considered the revised course objectives within

Gagné's framework placing an emphasis on career exploration, goal-setting, and knowledge

acquisition. I was left with four equally weighted course components: 1) Goal-centered

Disciplinary Knowledge Research, 2) a Knowledge Acquisition Strategies Journal, 3) Discussion

Posts/Course Participation, and 4) Peer-Reviewed Article Analysis Project.

The Goal-centered Disciplinary Knowledge Research component ensures IDS students

are thinking seriously about how their multidisciplinary education will work together toward

their future success. In our advising capacity, we often tell students that in order for this degree

to have value, they have to where they are going. Through choosing a post-graduation academic

or professional goal, identifying essential disciplinary knowledge pursuant to this goal, and

pairing this knowledge to a fleshed out plan of study students foreground and begin to take

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action relative to this imperative on the front-end of their program. At the same time, through the Knowledge Acquisition Strategies Journal students begin keeping a record their learning as a deliberate systematic endeavor while they learn about and apply different techniques to efficiently acquire knowledge essential to reaching and perhaps even surpassing their goal.

Through the Discussion Post component students will get to know their fellow interdisciplinary studies majors and generate meaningful dialogue around the theme of goal-oriented knowledge acquisition and goal-attainment. Additionally, it is hoped that students will demonstrate critical thinking relative to adopting certain behaviors and practices for the purpose of optimizing their learning potential. Discussion posts also offer an opportunity for instructors to innovate the curriculum according to their own preferences, research interests and scholarly insights. As for the final component, the expanded Peer-Reviewed Article Analysis Project introduces students not only to the identifying characteristics and constituent parts of the peer-reviewed article, but also the characteristics of interdisciplinarity in practice. This project further serves to provide students with guidance and practice in formal academic writing. Through this mode of writing students will deconstruct and analyze the content of published research such that they are able to isolate specific disciplinary insights that have been integrated toward addressing a complex problem. In this way, students will begin to develop an intuitive understanding of the interdisciplinary process and gain familiarity with the product of interdisciplinary research.

Taken together, I have argued that these components will provide an appropriate starting point for preparing undergraduate interdisciplinary studies majors to engage in the kinds of goal-centered knowledge acquisition and retention that will enable them to build an internalized multidisciplinary bank of knowledge. From this multidisciplinary bank of knowledge our students will have their own internalized foundation from which they might intuitively and

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inferentially integrate disciplinary knowledge toward innovation and complex problem-solving. This model further offers an alternative to the current pedagogical status quo within the field of interdisciplinary studies that I have proposed may be better suited to both the constraints of the online format and the needs of what may be the most diverse assemblage of students found in a single degree program at the undergraduate level.

That this curricular model would seem to go against the grain of current thinking relative to liberal education and interdisciplinary studies pedagogy makes it an audacious proposition indeed. With this apprehension always at the forefront of my mind, I have advanced cautiously, striving to use both primary and secondary sources to preempt and defuse counter arguments and points of contention before they materialized. That being said, I still feel it prudent to reassure the reader that I am not attempting to turn back the clock on pedagogy in higher education nor apply an outmoded and unpopular print-centric curricular model to a field that is philosophically aligned with the postmodern cultural zeitgeist that seems to have emerged in tandem with the ubiquity of digital interconnectivity. Rather, I have merely suggested that there may be ways to incorporate the best practices of both worlds, old and new, toward a more comprehensive interdisciplinary studies education predicated on both breadth *and* depth. In rethinking everything we run the risk of throwing the baby out with the bathwater. What I have sought in the development of this curricular approach is not a reversal or a polar shift, merely an ideal balance.

APPENDIX: PROVISIONAL CONTENT

Week 1: Why are you here?

Consistent with usual instruction protocols, during the first week, students will be presented with an overview of the course, course objectives, major course components, course requirements and a point distribution table. Exclusively within the fully-online mode, and as a complement to in-class discussion within the mixed-mode format, these formalities will be accomplished through a visually-appealing homepage with a clear layout, as well as a more personal welcome announcement or recorded message from the instructor. Links to the course syllabus (which includes a course schedule with week-by-week due dates and itemized point distributions) the "Week 1 Module" will be prominently displayed on the homepage. As is usual in LMS platforms, a navigation menu will also allow for easy navigation within the course; only those menu tabs relevant to the student will be displayed in the student view. Experience also suggests that only releasing the current and previous week's module to the student view, prominently displayed on the homepage, alleviates the potential for confusion on the part of the student, while stimulating recall of prior learning (sometimes depicted as the third event of instruction in Gagné's theoretical framework).

Moviemakers often attempt to draw their audiences in with dramatic opening scenes in much the same way we might gain our students' attention at the beginning of a course, lecture or, indeed, within the weekly module of an online course. In a Sunday sermon, pastors might gain their congregations' attention with a popular culture reference with which the congregants can identify. Professors might gain their audience's attention by beginning their lecture with a clever narrative, ironic piece of trivia, and so forth; it is common practice to the point of being practically cliché. Yet, this practice in all its forms seems to persist because it works, and thus, despite the limitations of the online instructional venue, will be employed here. As previously

suggested, my experience as both an instructor and advisor within UCF's Interdisciplinary Studies program, and my investigation into other large interdisciplinary studies programs, suggests that a significant number of students entering a general interdisciplinary studies or liberal studies program will have either become disenchanted with or dismissed from a different college or major within the university. Others will be uncertain what they want for their future, and equally unable to definitively express their interests and inclinations. The Week 1 module would begin with a movie clip, such as this one from the movie *Gattaca* where the main protagonist narrates his despair of reaching his goal: http://www.wingclips.com/movie-clips/gattaca/so-close-to-dream. This clip is intended to break the ice by helping students identify with the uncertainty they may be facing, or the seemingly daunting road they will need to traverse to reach their goals. The movie itself is filled with inspirational content relative to the idea of exceeding one's potential and achieving the impossible, and has personally always been an inspiration for me.

The learning objectives for the first week are fairly standard, but will focus from the outset on establishing a goal that, ideally, will be the basis for the students' entire plan of study. Learning objectives for Week 1 would be as follows:

- Navigate web site and review policies, expectations, and procedures for the course
- Discuss academic and professional goals and interests with fellow students
- Identify and elaborate upon academic or professional goal
- Create a blog or wiki that will serve as the platform for hosting the Knowledge Acquisition Journal

During the first week, students will begin three of the four components of the Cornerstone course: the Online/In-Class Discussions, Goal-Center Disciplinary Knowledge Research, and their Knowledge Acquisition Journal. The week's activities associated with each component will be discussed in term.

Online / In-Class Discussion:

Text will be the most likely mode for providing guidance for the discussion posts. If they have not already done so, students will be asked to begin to think about what will give their life meaning or fulfillment. They will need to think in terms of their goals for their life, academically, professionally, and personally. It will be emphasized that in order for their Interdisciplinary Studies degree to have value for them, they must have a goal they are using their plan of study to work toward. Past the usual introductions, potential discussion prompts might include: *What will you do with your future? What do you want to become? What inspires you? Why? What do you want to learn as an undergraduate? How will this learning benefit you? What do you think you will need to know in order to reach your goal? What do you love to do or think about when you are not required to be doing or thinking about something else?*

As is already common practice with online discussions, students will respond to some presentation and combination the preceding prompt(s) in 2-3 well-written paragraphs. In this context, a paragraph consists of at least five (5) complete sentences. Students will respond to at least two of their fellow students' posts, offering insights and suggestions in thoughtful complete sentences. Response posts should be substantive and engaging. Instructor/GTA will determine if students have made the requisite posts substantively and by the specified deadlines. Initial post will generally be due a few days prior to response posts to allow students time to respond. Comprehensive rubrics that assess student posts with regard to "quantity, quality, timeliness, and writing proficiency" could be employed for online discussions; attendance/observation for in-class participation (Solan & Linardopoulos, 2011). At the beginning of the following week (or following week's class for mixed-mode sections), Detailed online announcement or in-class review during the following week recapping the prior week's discussion, highlighting important

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points or insights, soliciting follow-up comments and/or discussion. As this will be the general format for all online discussions, these details will not be repeated in each week's synopsis below.

Goal-Centered Disciplinary Knowledge Research:

Following the same theme as the discussion, students will be prompted through textual guidance to reflect on their ideal future and goals. Again, students will be asked to identify a specific post-graduation academic or professional goal/role in which they would like to move toward – or, rather, a goal that moves them. This goal or professional role will be the basis for the occupational and disciplinary research that they will conduct in this component of the course. In establishing this goal, students will focus on the "why" behind their goal, and be encouraged to think big, stretching the limits of what they believe possible. However, students will not be merely repeating what they say in their discussion post. They will be directed to begin their goal-centered disciplinary knowledge research with an institution-specific Career Services resource such as MyPlan (http://ucf.myplan.com) available to UCF students and alumni. This resource includes a number of assessment tools to assist students in establishing educational and career goals appropriate for their predispositions.

In 1-2 well-written pages, double-spaced, 12 point font, and using bibliographical references and in-text citations, students will use online/library resources to elaborate on this goal: what the role entails, general statistics related to this role, potential employers, etc. Instructor/GTA will make a subjective determination as to whether the content sufficiently addresses the prompts and an objective determination as to whether the form meets university standards. As previously discussed when considering best practices in online instruction, personalized feedback will be essential to student satisfaction. Students will be asked to refer

back to the goal they have set for themselves throughout this component of the course and in online discussions.

Knowledge Acquisition Journal:

One potential candidate for required reading relative to this component of the course might be *Moonwalking with Einstein* by Joshua Foer. While this book is intended to be accessible for a mainstream audience, its subject matter deals with making the most of one's memory efficiently. The book does contain an extensive bibliography of scholarly sources with reference notes related to making practical use of memory. Moreover, it is engaging and fun to read.

For this component of the course, guidance might be provided in text or multimedia formats which, in mixed-mode sections, could then be supplemented by verbal instructions. The discussion will begin with the overall structure of the interdisciplinary studies/liberal studies program emphasizing the opportunities but also the limitations they will face relative to disciplinary coursework. Additionally, the discussion will address the imperative of choosing appropriate courses relative to acquiring the essential knowledge they will need to have, as well as the need to be aware of graduate school prerequisites, etc. Value and efficiency will be two guiding principles stressed as students undertake this component of the course.

During the first week, Students will create a wiki or blog using an approved platform within which they will make their weekly journal entries. Potential platforms might include Blogger (https://www.blogger.com/home) or WordPress (https://wordpress.com/). Each week a prompt or exercise will be provided to students and their response entry will take the form of a text, video, or audio submission. During the first week, students will submit their wiki or blog URL for review in accordance with formatting guidelines. Instructor/GTA will determine if wiki

or blog is accessible and set up according to specified formatting guidelines. Written submissions will consist of reflective writing that does not need to adhere to formal academic writing standards. The journals will have an additive quality that will allow students to look back at early entries, comparing and contrasting impressions with regard to learning efficacy, value, personal preference, etc.

Week 2: How do I exceed my potential?

One video clip from the talk show *Ellen* that might gain students' attention as they begin Week 2 is an interview with Brielle, a 3-year prodigy who has memorized the periodic table among a host of other geographical and historical facts (https://www.youtube.com/watch?v=7nGz7xgGJzc). While some might be tempted to discount her talent as rote learning, this anticipated objection could open the door for a discussion of memorization and its value in practical applications.

During the second week, students begin to explore what it means to internalize aspects of their external world, and, in particularly, disciplinary knowledge, in effective ways. One potential resource for framing this discussion might be Jonathan Levi's TEDx Talk titled "What if Schools Taught Us How to Learn" (https://www.youtube.com/watch?v=vtQzuwnyW6E). In this talk Levi makes the argument that schools and universities don't teach us effective learning strategies for the 21st century while at the same time sharing his own experiences in overcoming a learning disability. Levi further introduces his audience to previously mentioned concepts such as visual learning and the memory palace, whose application will be explored later in more depth. Switching gears, students will consider what constitutes a complex problem, and investigate what kinds of complex problems concern those who are in the roles toward which they are moving. This will be the first step in determining what kinds of knowledge will be

valuable for students to acquire as they move toward their goal. In this process, students are also

making a determination as to what complex problems are most interesting to them. The learning

objectives for the week will include:

- Explain how past learning and experiences have informed your chosen goal
- Identify specific academic and professional qualifications necessary to goal attainment
- Describe personal experience and practical worth of memorizing the multiplication tables

During Week 2, students will continue to focus on the same three course components:

Online / In-Class Discussion:

The prompt for this week's discussion might be somewhat as follows: *By now we all*

have some familiarity with Abraham Lincoln's legacy. But before he became the 16th President

of the United States, before the Emancipation Proclamation, before the 13th and 14th

Amendments to the U.S. Constitution, Lincoln's personal experiences and observations began to

shape the convictions that would move him toward his destiny. William H. Herndon, a law

partner and biographer of Lincoln offers insights into those experiences and observations.

Providing an account of a trip Lincoln made to New Orleans on a river job earlier in his life,

Herndon states:

> In New Orleans, for the first time Lincoln beheld the true horrors
> of human slavery. He saw "*negroes in chains – whipped and*
> *scourged."* Against this inhumanity his sense of right and justice
> rebelled, and his mind and conscience were awakened to a
> realization of what he had often heard and read. No doubt, as one
> of his companions has said, "Slavery ran the iron into him then and
> there" (Carnegie, 1959, pp. 33-34).

Among the many other documented pre-presidency observations that would solidify Lincoln's

repugnance for slavery, one in particular records Lincoln's own words as he walks casually

along the Ohio River dividing the free-state of Ohio from the slave-state of Kentucky, and points

to Lincoln's theory of slavery's socio-economic consequences on both individuals and society.

Lincoln says:

> Here is this fine city of Cincinnati, and over there is the little town
> of Covington. Covington has just as good a location as Cincinnati,
> and a fine country back of it. It was settled before Cincinnati.
> Why is it not a bigger city? Just because of slavery, and nothing
> else…[in Covington] I went to the ticket office and found a lank
> fellow sprawling over the counter, who had to count up quite a
> while on his fingers how much two and one-half fares would come
> to. While over here in Cincinnati, when I shove my money
> through the window, the three tickets and the change would come
> flying back at me quick. And it is just the same way in all things
> through Kentucky. That is what slavery does for the white man"
> (Burlingame, 1994, p. 30).

While perhaps not as historically consequential (not yet anyway), we've all had personal experiences or have made objective observations that have served to stimulate our thought, ignite our passions, attract our curiosity, and mold our deepest convictions in such a way as to influence the direction of our lives and our conscious choices about our future. Using your own best judgment as to what constitutes TMI, and being sure to only discuss that with which you are comfortable sharing publicly, describe a past event or observation that has been paramount in influencing your life direction and goal for your future.

Goal-Centered Disciplinary Knowledge Research:

This week, students will begin delving deeper into the realities underlying their goal. They will begin to research what sorts of qualifications are essential for entry into the field or role. Students will start with the goal and work backward. Students will be asked to investigate, through a combination of Internet and library research, questions such as: *Are there specific licenses, certifications, credentials or even physical requirements that are necessary for entry into the field? How are these credentials attained (i.e., must one be sponsored)? Is there a specific academic degree required for this field or role? What institutions of higher learning*

offer degrees in this field? How competitive is admission into these programs? What are the admission requirements for these programs? Do some accredited schools have more or less stringent or competitive admission standards? What activities can make the student more competitive? What graduate-level admissions test is required for admission to graduate schools in this field? What are the specific undergraduate courses are prerequisites for admission to graduate programs in this field? How might these courses be incorporated into the student's plan of study? Responses should be 2-3 well-written pages, double-spaced, 12 point font, and using bibliographical references and in-text citations.

Knowledge Acquisition Journal:

For their first journal entry, students will be asked to reflect on their elementary school experience of memorizing the multiplication tables. *How did this accomplishment make you feel? How has internalizing this foundational knowledge benefited you later on as you learned higher level math? How have you made practical use of this knowledge in everyday life? Can you remember what strategies you used to commit the multiplication tables to memory? Does having this knowledge at your fingertips tax your mental faculties or in any way disadvantage you?*

Students will make a reflective written or recorded entry responding to the prompts above, or variations thereof. While not held to the standards of formal academic writing, responses will need to be thoughtful and substantive. Past this, students will be afforded the creative liberty to compose their responses as they are inclined. While assessing submissions of this nature is always subjective, students will be provided detailed explanations in the case of point deductions with specific guidance for avoiding such deductions in future submissions.

Week 3: Building your own interior castle.

By Week 3, students will have a good understanding of the premise behind the revised

Cornerstone course, and what they can expect over the remainder of the course. Students will

understand why they are being encouraged to better 'know themselves' and have a vision for

their future, and ideally, see the value in a largely self-directed goal-centered approach to

completing their undergraduate education. As discussed earlier, student motivation is a critical

element in student success in any learning endeavor. Toward this end, students might be asked

to begin the week watching Simon Sinek's TED Talk, "How great leaders inspire action"

(https://www.ted.com/talks/simon_sinek_how_great_leaders_inspire_action?language=en).

In his talk, Sinek uses culturally relevant illustrations to present a conceptual model for

explaining how inspiration works in the minds and actions of great innovators and leaders, as

well as those who follow. I have already used this video as an ice breaker and focal point of

discussion in Cornerstone and Capstone sections that I have taught with great success in terms of

the student response. On several occasions, students have approached me weeks later asking for

the link to this video so that they might watch it again. Learning objectives for Week 3 would

include:

- Summarize the life path and achievements of a notable figure within the field or role most closely related to your own goal.
- Discover specific knowledge essential to an undergraduate education relative to your goal.
- Practice the *method of loci* as a technique for memorizing essential knowledge and information efficiently.

Online / In-Class Discussion:

In the Week 3 discussion, having watched the Sinek talk, students would be asked to

identify some of the greatest achievers within fields or roles most closely related to their goal.

Prompts might include: *Who were they? When did they live? What did they achieve? What was*

the cultural context in which they became what they became, or established their legacy? What

was the 'why' behind their achievements? What obstacles did they face, and how did they

overcome them? What academic/professional path did they take to become what they became?

In response, students would be encouraged to share their own thoughts and insights relative to

both the initial post and the Sinek talk.

Goal-Centered Disciplinary Knowledge Research:

Some students will likely be taken out of their comfort zone for this week's disciplinary

knowledge research assignment. They will be asked to identify and reach out to (most likely via

email) three to five individuals already serving/working in a role/field that aligns with their goal.

These individuals might include university professors, practitioners in the field, friends and

family already working in the role, etc. Students will identify themselves, provide a bit of

context to their inquiry, and then ask a specific question: *As an undergraduate student, what*

specific foundational knowledge would you consider it most paramount that I firmly attain to be

successful in your field? A variation of this question might be…*to succeed in graduate school?*

As it might be expected that some of those individuals contacted will not respond, students will

be advised to reach out to more or less as necessary, and perhaps try different approaches within

the boundaries of professional courtesy. For instance, the more ambitious students might attempt

to schedule an interview in person or over the phone. It might be necessary to forewarn students

about this requirement ahead of time so that they can allot adequate time to make such

arrangements.

Knowledge Acquisition Journal:

During Week 3, students will begin to learn about and practice techniques that have the

potential of aiding their learning and retention of essential disciplinary knowledge. While

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students could be introduced to any number of techniques through reading and exercises,

following Joshua Foer's ethnographic journey into the world of competitive mnemonists,

students might be asked to read Chapter 5*: The Memory Palace* (pp. 89-105). Foer frames this

technique, also called the *journey method* or *method of loci*, within a discussion of classical

sources and an exercise prescribed by his mentor, Ed Cooke. In this technique, an individual

associates information, physical objects, or tasks to one's preexisting spatial memory through

imaginative visualization. Students might be asked simply to follow the list and guidance

provided for the exercise within the text of the chapter, or to apply the technique to their own list,

ideally, relative to something they might need to learn through their plan of study (say, the

constituent parts of a neuron). Students' academic institutions may offer their own memory

practice resources such as that found at UCF's Student Academic Resource Center (SARC)

Online website (http://sarconline.sdes.ucf.edu/?p=2357). For their journal entry, students will

describe in detail their experience using this method, what they memorized, how they did it –

i.e., visualizations (censored, of course, assuming one follows the guidance offered), locations,

etc. – and how successful they were. Students will be asked to log the time devoted to the

exercise. Students will further consider how they might employ the memory palace in their

future learning. In the chapter, Foer defends the premise behind such memorization techniques:

> Only through memorizing, the thinking went, could ideas truly be
> incorporated into one's psyche and their values absorbed. The
> techniques existed not just to memorize useless information like
> decks of playing cards, but also to etch into the brain foundational
> texts and ideas (Foer, 2011, pp. 10).

Supplemental reading for Week 3 could include a scanned PDF copy of the section of the Latin

textbook *Rhetorica ad Herennium* (translated, of course) pertaining to memory. This complete

discussion of memory, which includes the method of loci and, relatedly, techniques for

visualization and association, was composed during the Roman era (and apparently erroneously attributed to Cicero) and was apparently widely used in medieval Europe.

Week 4: Retrieval practice as deliberate learning.

In Week 4, students will switch gears relative to the notion of knowledge acquisition with the introduction of the concept of retrieval practice, and the related theory of *deliberate practice*, the "effortful activities designed to optimize improvement" (Ericsson, 1993). An introductory discussion of retrieval practice might begin as follows: *While our inclination might be to seek to get knowledge into our head through note taking, reading and rereading, highlighting, etc., studies suggest that just as important to the learning process as is deeply encoding knowledge into memory, if not more so, is retrieval, the act of reconstructing knowledge* (Agarwal, et al., 2013; Karpicke & Blunt, 2011). *When Benjamin Franklin, the statesman, writer, dabbler, and inventor, a decided polymath (which might be another saying, an interdisciplinarian), undertook to teach himself to write, he seems to have intuitively adopted a form of retrieval practice. In his autobiography, Franklin states:*

> About this time I met with an odd Volume of the Spectator…I thought the Writing excellent, and wish'd if possible to imitate it. With that View, I took some of the Papers, and making short Hints of the Sentiment in each Sentence, laid them by a few Days, and then without looking at the Book, try'd to compleat the Papers again, by expressing each hinted Sentiment at length and as fully as it had been express'd before, in any suitable Words, that should come to hand. Then I compar'd my Spectator with the Original, discover'd some of my Faults and corrected them (Labaree, et al., 2003, pp. 61-62).

While exams or other assessments within the context of online or classroom instruction may require retrieval, they do not constitute retrieval practice. In the military and brokerage industry, for instance, retrieval practice is often an integral component of the learning process. Informal assessments or performance tests (those not recorded for assessment purposes) are

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administered on a daily basis throughout the learning process. We may have used retrieval

practice ourselves in the past, attempting to talk through knowledge while preparing for a

speech or an exam, perhaps, with the aid of a study partner. It is probably more common,

however, to cram information into our short-term memory immediately prior to an exam, and

promptly purge it once the exam is over.

To introduce retrieval practice as a concept and a learning strategy that students might

make their own, students might watch social psychologist David Myers' YouTube video entitled

"Make Things Memorable" (https://www.youtube.com/watch?v=rFIK5gutHKM). While these

videos are offered as provisional content, in the implementation phase of the instructional design

process, instructors could begin producing their own multi-media content to introduce these

same concepts, strategies and discussion topics. Students could also read Chapter 8: *The OK*

Plateau of *Moonwalking with Einstein* (Foer, 2011, pp. 163-185). Learning objectives for Week

4 would include:

- Develop ideas about how one might keep track of his or her own learning progress and improvement.
- Categorize essential disciplinary knowledge pertaining to student's goal and plan of study into an organized visual representation.
- Reconstruct a passage or text daily from memory and evaluate your progress over the course of the week.

Online / In-Class Discussion:

The discussion this week will focus on the idea of keeping deliberate track of one's

learning, taking ownership and personally investing one's self in his or her learning progress and

outcomes. The prompt might go something as follows: *In* Moonwalking with Einstein*, two-time*

world memory champion Andi Bell is quoted as saying, "You have to analyze what you're

doing" (Foer, 2011, p. 175)*. Foer elaborates on this idea as follows:*

> This, more than anything, is what differentiates the top memorizers
> from the second tier: They approach memorization like a science.
> They develop hypotheses about their limitations; they conduct
> experiments and track data (Foer, 2011, p. 175).

More broadly, what Foer is alluding to is the practice of meticulously keeping track of your progress in any learning endeavor in which you wish to improve. Similar to how someone might track their fitness training progress, or calorie intake, mental athletes also keep track of their performance and analyze their shortcomings. What experience do you have in logging your progress in any learning or self-improvement endeavor? What data you record and why? How did this process help you improve or reach your intended outcomes? Aside from monitoring your posted grades, how might you keep track of your own learning within the context of an undergraduate interdisciplinary studies program? What information or types of learning might be important to track? In your response posts, build on the ideas presented by your fellow students to offer your own ideas and insights about a disciplined approach to knowledge acquisition and personal development within one's areas of study?

Goal-Centered Disciplinary Knowledge Research:

This week, students will conduct their own online/library research, asking themselves the same question they posed to their respondents last week. Often a student's academic institution will have resources that will help them identify essential disciplinary knowledge, such as UCF's previously mentioned Student Academic Resource Center. Students will corroborate and compare the responses of their respondents with the fruits of their own investigations. Students will further seek to categorize essential knowledge within their specific areas of study, into an organized, logical and coherent structure and progression. Students will create a chart or concept map to present their findings. Specific submission criteria for the chart or map could be specified according to the instructor preference.

Knowledge Acquisition Journal:

The knowledge acquisition exercise associated with retrieval practice would most likely entail having students read a short passage or text, or watch a short video, and then prompt students to write down everything they remember, or even to reconstruct the text in its entirety. Using the same text or video, this exercise could be repeated daily over the course of the week. Students could be encouraged to attempt to memorize the text verbatim or point for point (as recommended by the classical authorities). An alternative might be to have students attempt to type out everything they remember from the previous week's module or other courses without reviewing notes, albeit this would be a more limited exercise. While these exercises are done under the honor system, with the assumption that students will get out only what they put into them, it would admittedly be difficult to ensure engagement in these exercises. Weekly log entries could be fabricated, which goes to say that implementation of these exercises would be an area for further development. **Supplemental reading** for Week 4 might be J. D. Karpicke and Janell R. Blunt's 2011 peer-reviewed article entitled "Retrieval practice produces more learning than elaborative studying with concept mapping."

Week 5: What can a chunk do for me?

Students might be introduced to the concept of chunking as follows: *Although the concept of a chunk and chunking in relevant literature seems to vary with the context and application, chunking appears to be an essential concept in the realm of optimized learning. In the simplest sense, when we group letters into words, we have a chunk.* In one context the concept of chunking might be introduced as it relates to George A. Miller's seminal 1956 article, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information." *We might use the concept of a chunk to explain why phone numbers are grouped*

the way they are, or apply it something more complex, like performing a task or working through

specific types of problems. Psychologist George Miller states, "we are not very definite about

what constitutes a chunk of information." Yet, Miller's research indicates that the average

person can hold approximately seven items in immediate (or working) memory; that item could

be one digit, or one string of digits. Alternatively, a chunk can be a much larger meaningful unit

of information (Miller, 1956). For example, a professional chemist will most likely have

chunked all of the separate actions associated with laboratory safety protocols, or someone may

have chunked all the steps necessary to operate a piece of equipment. In short, chunking has

relevance for both short-term and long-term memory. Regardless of the context (with, perhaps,

the exception of the term's use in long division), the basic underlying premise of chunking seems

to remain the same: that by grouping information together (into chunks), and, indeed, by

increasing the amount of information in each chunk, we can increase the amount of information

we are able to remember and apply in various contexts.

To gain students' attention in Week 5 instructors might construct a visual representation of the concept of chunking both as it relates to working memory and long-term memory. A conceptual representation of chunking as it relates to working memory could be a simple as a stock image of numbers or letters first presented in an equally spaced and meaningless way versus the same numbers or letters grouped together in a meaningful way. The representation for long-term memory might list a sequence of individual steps in an activity with a high cognitive load initially, but once mastered, these steps intertwine to become subconscious and automatic. The learning objectives for Week 5 are as follows:

- Match essential disciplinary knowledge to courses that could fit within students' programs of study or identify alternative possibilities for acquiring this knowledge.
- Construct chunks by grouping information pertaining to essential disciplinary knowledge

As I have found that periodically giving students a break from making discussion posts seems to boost their morale, and perhaps even increase the quality of posts later on, Week 5 will not have a discussion post requirement.

Goal-Centered Disciplinary Knowledge Research:

Week 5 will conclude the Goal-Centered Disciplinary Knowledge Research component of the course. Students will dive into the undergraduate course catalog for their institution to attempt to match essential knowledge that they need to attain to specific courses that will fit their program of study. Not only will students need to evaluate course descriptions, they will need to consider course prerequisites, course access, course availability and so forth. If students are unable to find a specific course to correspond with essential knowledge for which they can expect to register, they will need to investigate other possibilities for acquiring this knowledge. Alternative possibilities might include taking courses as a transient student, self-directed learning through online or text-based resources, or even through enlisting the services of a tutor. Students would either extend their previously created charts or type out their findings in an organized manner. Again, specific criteria for submissions could be left to the discretion of the instructor. Students would be encouraged to keep their research material in a place, such as OneDrive or SkyDrive, in which it can be easily located and referred to throughout their undergraduate education.

Knowledge Acquisition Journal:

This week's exercise will require students to take disparate bits of information and create meaningful chunks. Students will be challenged to take elements of the essential disciplinary knowledge previously gathered and experiment with organizing it into meaningful chunks that will afford their instilling it into long-term memory. Ways that students might accomplish the

task of discovering or constructing meaning is to search for patterns, or associate the elements of the knowledge to aspects of their goal. In doing so, students will not be expected to learn the actual content and particulars of this knowledge, rather to begin creating an internalized schema of what types or categories of knowledge they will need to learn in the future. Students will be expected to graphically represent their chunks within their journal, and articulate the logic behind their chunks as a written supplement. **Supplemental reading** for Week 5 might include George Miller's 1956 article, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information" or Gobet, Croker, Jones, Oliver, and Pines 2001 peer-reviewed article published in *Trends in Cognitive Sciences*, "Chunking mechanisms in human learning." One last possibility might be Nelson Cowan's 2010 article, "The Magical Mystery Four: How Is Working Memory Capacity Limited, and Why?"

Week 6: More on associations.

In Week 6, the concept of association alluded to in the discussion of the memory palace is expanded with the intent of encouraging associations between essential knowledge and its hypothetical application in addressing real-world complex problems. Alternatively, exercises might merely focus on useful knowledge related to their areas of study that can be broadly applied. The introduction for the week's module might be as follows: *As it relates to learning,* association (or, elaborative encoding) *generally means relating something you are learning to something you already know (i.e., relating new information to physical spaces with which one is already familiar). It would seem there can be many creative variations of this idea. An example provided by Joshua Foer is that of Austrian Corinna Draschl, a competitor in the World Memory Championships who memorizes poetry not by associating images, but by associating an emotion she with each line. Foer states, "She breaks the poem into small chunks and then assigns a*

series of emotions to each short segment" (Foer, 2011, p. 133). Foer relates Draschl's strategy

to method acting. Foer discusses A short discussion of memory strategies associated with

method acting might follow. There are a number of directions an instructor might take in this

module. Other methods for creating associations Foer describes, particularly as relates to

memorizing numbers, are the *Major System* and the *PAO System* (Foer, 2011, pp. 164-166). If a

student is a writer, he or she might experiment with one of these methods to memorize

something as simple but potentially useful as ALT codes for accented characters. It is important

to note that the order of progression for the knowledge acquisition discussions and exercises laid

out here is also provisional, and instructors would have the liberty of reordering content in

however way it might enhance its effectiveness. The goal, however, is that students

progressively think about the knowledge acquisition exercises within the context of useful

disciplinary knowledge acquisition as opposed to encoding random and irrelevant information

(like the order of a deck of cards or a series of binary digits) in working or long-term memory.

The introduce Week 6's discussion on associations, students might watch a short clip of Joshua

Foer discussing the Baker/baker paradox filmed for CNN at the time of his 2012 TED Talk

(http://www.cnn.com/2012/06/10/opinion/foer-ted-memory/). The learning objectives for Week

6 are as follows:

- Discuss impressions of the utility of the type of learning that takes place when preparing for an event such as the Scripps National Spelling Bee
- Create associations between new knowledge gained through reading an article or text with prior knowledge and experience
- Reconstruct the content of an article or text relevant to one's goal and program of study from associations made with prior knowledge and experience

Online / In-Class Discussion:

This week, students might listen to the 2012 NPR story "Why Indian-Americans Reign as

Spelling Bee Champs" (http://www.npr.org/2012/05/29/153898668/why-indian-americans-reign-

as-spelling-bee-champs) and, perhaps, the WSJ interview with the 2013 Scripps National Spelling Bee champion Arvind Mahankali (http://www.wsj.com/video/scripps-spelling-bee-champion-13-reflects-on-win/4CE5E7A8-CE36-4B81-8361-119B53C29CC4.html). Students might then be given the following prompt: *Criticisms of the type of learning associated with spelling bees might be that it entails rote memorization with no context or practical application, nor does it offer transferability relative to the learning that is taking place (perhaps similar to empirical studies that suggest those really good at Tetris...are just really good at Tetris)* (Sims & Mayer, 2002). *Do you agree or disagree? Why? What types of associations might take place with this type of study? What practical value might this type of self-directed learning have in someone's undergraduate education or beyond? One common way that spelling bee competitors, and students in general, prepare for competitions or exams is with flashcards. But, this could prove to be a very passive method of study. How might one incorporate retrieval practice into study with flashcards? What types of associations might one make to aid their memory when studying with flashcards?* As usual, the hope would be that the initial discussion posts would stimulate thoughtful responses from fellow students.

Knowledge Acquisition Journal:

For this week's knowledge acquisition exercise, the emphasis will be on creating associations between new knowledge and knowledge already stored in long-term memory. Students would review additional association strategies such as those suggested by UCF's SARC Online Memory Skills resource (http://sarconline.sdes.ucf.edu/?p=238). Students will then begin the exercise by reviewing their essential disciplinary knowledge findings. Then, students will find an article on the Internet that relates to a complex problem, controversy or issue that is in

some way related to their chosen goal and areas of study. The article does not need to be peer-reviewed, but should be substantive and interesting to the student. Any time students are asked to find an article for their exercises, the title, author, source and link to the article should be present in their journal entry. As students read the article they will isolate pertinent bits of information (i.e., dates, locations, descriptions, facts, statistics, etc.). Students might create lists, tables or simply note them directly on the printed article; how they do it is left up to them, but creativity is encouraged. Once this is done, students will describe something that each bit of information reminds them of in detail. Associations might be made relative to important dates, people, events, or possibly even related to essential disciplinary knowledge previously collected. Over the course of the week, students will test themselves (retrieval practice) every other day by drawing on their associations as cues to write out all of the important points and details of the article they can remember. Students will then compare their reconstructions of the article content with the original and record their progress in their journal. **Supplemental reading** supporting Week 6's emphasis on associations might be Weinstein, Ridley, Dahl and Weber's 1989 article "Helping Students Develop Strategies for Effective Learning."

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Week 7: The efficacy of visual learning.

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Week 7's content might be framed within the context of Chapter 9 of *Moonwalking with Einstein* entitled "The Talented Tenth." The chapter discussed the pedagogical approach of Raemon Matthews, a former history teacher at the Samuel Gompers Vocational High School (students might be encouraged to avoid the more recent headlines about Raemon Matthews). Among other things, the chapter discusses Matthews teaching a group of forty three students, dubbed "The Talented Tenth," the same memory techniques employed in the USA Memory Championship to memorize "every important fact, date, and concept in their U.S. history

textbook." Foer states, "every single member of the Talented Tenth has passed the Regents

exam each of the last four years, and 85 percent of them have scored a 90 or better" (Foer, 2011,

p. 190). Week 7's module might be introduced somewhat as follows: *We have already alluded*

to the idea that associating information we would like to learn (usually received textually or

verbally) with images is a way to make it more memorable (Allan Paivio's dual-coding theory).

One might argue, however, that the practice of visual learning is so important in our digital age

and visual culture that it deserves special attention. In a broader sense, visual learning could

refer to employment of any number of visual representations of knowledge or processes that help

us to conceptualize and remember. Most of you will already have at least some experience with

flowcharts and concept maps. But how many of you consciously and habitually represent what

you are trying to learn visually? The learning objectives for Week 7 are as follows:

- Judge the validity of arguments for traditional memory-oriented pedagogy relative to arguments for experience-oriented pedagogy
- Create a *mind map* using guides publicly available via online resources
- Reconstruct the content of an article or text relevant to one's goal and program of study using a self-generated mind map

Online / In-Class Discussion:

As stated, students will read Chapter 9 of *Moonwalking with Einstein*. As they do so,

they will be asked to reflect on the previous week's discussion. After reading the chapter,

students will respond to the following prompt: *In Chapter 9, Foer discusses the gradual shift*

away from a more passive approach to education (memorization) to a more active approach

(experiential learning) (p. 192, 194). While there appears to be sound arguments to support this

shift, Foer states:

> Memorization drills weren't just about transferring information
> from teacher to student; they were actually thought to have a
> constructive effect on kids' brains that would benefit them
> throughout their lives. Rote drills, it was thought, built up the

faculty of memory. The what that was memorized mattered, but so too did the mere fact that the memory was being exercised. The same was thought to be true of Latin, which at the turn of the twentieth century was taught to nearly half of all American high school students. Educators were convinced that learning the extinct language, with its countless grammatical niceties and difficult conjugations, trained the brain in logical thinking and helped build "mental discipline" (Foer, 2011, pp. 192-193).

Foer initially quoting memory guru Tony Buzan further offers his thoughts on the matter, which

sound surprisingly interdisciplinary:

"The art and science of memory is about developing the capacity to quickly create images that link disparate ideas. Creativity is the ability to form similar connections between disparate images and to create something new…." If the essence of creativity is linking disparate facts and ideas, then the more facility you have making associations, and the more facts and ideas you have at your disposal, the better you'll be at coming up with new ideas.

He goes on to say:

Invention was a product of inventorying. Where do new ideas come from if not some alchemical blending of old ideas? In order to invent, one first needed a proper inventory, a bank of existing ideas to draw on (p. 203).

In 2-3 well formed paragraphs in your best writing, how would you respond to pedagogical

debate which Foer frames between the views of Jean-Jacques Rousseau and John Dewey, and

those of E.D. Hirsch Jr., Tony Buzan, and Raemon Matthews? Do you agree or disagree with

any of the points made relative to these figures presented in Chapter 9? Why?

Knowledge Acquisition Journal:

The supplemental reading below suggests that while mind maps might be an effective

visual learning study technique, one challenge is that students are not necessarily motivated to

employ them. This point will be made to students before they are asked to create a mind map as

this week's knowledge acquisition exercise. Using the Internet, students will find another

substantive article related to their goal and areas of study. Students will then be asked to create a mind map following the seven steps and tips, originated by Tony Buzan, which are publicly available on the Internet (for instance, as retrieved from http://lifehacker.com/how-to-use-mind-maps-to-unleash-your-brains-creativity-1348869811 or http://blog.iqmatrix.com/how-to-mind-map). Even institutions of higher learning are likely to have tutorials on creating mind maps, such as UCF's SARC online mind mapping resource (http://sarconline.sdes.ucf.edu/?p=270). Students may need to do some digging as these academic resources are not necessarily widely publicized or easy to find, but knowing they exist is half the battle. The goal of the mind map will be to connect the main idea of the article with concepts, facts, ideas, matters of disciplinary relevance, and, of course, previously gathered essential disciplinary knowledge. Two days after creating their mind map, students will be tasked with reconstructing the main points of the article in paragraph format without referring to the original article, and connecting these main points to their disciplinary knowledge research. Students will display both their mind map and their reconstruction within their Knowledge Acquisition Journal. Students will be free to use publicly available mind mapping software, but will be encouraged to use old fashioned paper and pencil…or, rather, colored pencils. **Supplemental reading** for Week 7 will be Farrand, Hussain, and Hennessy's 2002 article, "The efficacy of the 'mind map' study technique."

Week 8: Is speed-reading with comprehension really a thing?

While I recognize that speed reading with comprehension is a dubious subject, academically speaking, I defend the idea of at least considering it as follows: *The Internet is rife with e-books, online courses, software, and apps that boast of being able to double or even triple an individual's reading speed while at the same time increasing comprehension in as little as an hour. Apparently, there are "many universities that also claim to teach [speed reading]"*

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(Carver, 1990, p. 419). I submit that it is, perhaps, for this very reason that the subject should

not be neglected in a course in which a primary objective is to help students learn to acquire

knowledge more efficiently and deeply. Studies suggest that sustained immersive reading at any

rate of speed is a threatened skillset in the digital age (NEA, 2007). Advocates and peddlers of

speed-reading are quick to point out that John F. Kennedy and Jimmy Carter took courses in

speed reading. While reliable sources for this and similar claims are sometimes murky, the JFK

Presidential Library website does state that "John F. Kennedy could read 1200 words a minute.

In 1954-1955 he attended meetings at the Foundation for Better Reading in Baltimore" (JFK

Library, n.d.). Jimmy Carter confirms it himself in an interview with Brian Williams

(https://www.youtube.com/watch?v=wjnN4GcQxiU). Existing scholarly research, however,

suggests "Speed readers are best regarded as experienced or expert skimmers" (Carver, 1990,

p. 420). The research that does indicate that reading rates with comprehension (or, rauding)

can be significantly increased through such training often do not meet research standards for

validity (pp. 370-371). Inevitably, it would seem, with a few modest exceptions, so-called speed

readers sacrifice comprehension for speed (pp. 417-418).

Proposed learning objectives for Week 8 are:

- TBD *(Online/in-class discussion)*.
- Assess the utility of and personal preference for different strategies for skimming texts in academic reading.

Online / In-Class Discussion:

For Weeks 8-11, online/in-class discussions might focus on topics related to concepts

associated with interdisciplinarity itself, as some might argue that this topic has been heretofore

absent in the proposed curricular model. This will be important as students will need to have

some familiarity with these concepts when they complete their article analysis toward the end of

the course. In addition, past Cornerstone courses taught at UCF have commonly included

discussions related to the notion of 'play' in learning (http://www.nowplayingworldwide.com/),

metaphors used to characterize the nature of interdisciplinarity (and associated terms), and

various TED Talks, such as Malcolm Gladwell's "Choice, happiness and spaghetti sauce"

(https://www.ted.com/talks/malcolm_gladwell_on_spaghetti_sauce?language=en) or Jill Bolte

Taylor's "My stroke of insight"

(https://www.ted.com/talks/jill_bolte_taylor_s_powerful_stroke_of_insight?language=en).

Perhaps more relevant to the theme of the arguments supporting this curricular approach

presented here would be Nicholas Carr's 2011 NPR interview

(http://www.npr.org/templates/story/story.php?storyId=127370598).

More directly related to interdisciplinary studies, topics for discussion might include the

arguments put forth in Benson's "Five arguments against interdisciplinary studies" and Newell's

"The Case for interdisciplinary studies: Response to professor Benson's five arguments"

(Benson, 1982; Newell, 1983), or any number of more recent articles that subscribe to a more

conventional approach to 'teaching' interdisciplinarity and interdisciplinary studies courses. At

times, we have looked at emerging interdisciplinary fields, such as the NPR story on soundscape

ecology (http://www.npr.org/2011/04/22/135634388/listening-to-wild-soundscapes). A more

recent candidate for framing a discussion might be the NPR story about an effort in Saudi Arabia

to treat jihadists with art therapy

(http://www.npr.org/sections/parallels/2015/04/03/397322648/treating-saudi-arabian-jihadists-

with-art-therapy). Admittedly, it would be unlikely that a new curricular approach to teaching

core interdisciplinary studies courses could entirely divorce itself from the status quo of

terminology, concepts, metaphors and anecdotes found existing textbooks, and indeed, some of these are important.

One final possibility for the discussion component of the course is to substitute small-stakes assignments that will have specific academic value for students as they begin their disciplinary studies. Content for these small-stakes assignments could include prefab information literacy modules available through the academic institutions library or resources centers, online quizzes relevant to readings with particular relevance to interdisciplinary studies (history, terminology, distinctions, etc.). I have found from personal experience teaching UCF's Cornerstone and Capstone courses that instructors are indeed constantly seeking out new and interesting resources to serve as starting points for discussion. As such, it would seem reasonable to leave mid-semester discussion topics open to afford instructors the opportunity of exercising their own academic liberty to engage students and invigorate online/in-class discussions in new and innovative ways.

Knowledge Acquisition Journal:

Given the preceding introduction to speed reading, and the enormous amount of material that students are generally expected to 'read' during their university studies, this week's knowledge Acquisition Journal assignment will entail students investigating whether there might be a more effective technique for skimming that they could incorporate into their studies. "Using English for Academic Purposes" consultant Andy Gillett's website offers both techniques and publicly available exercises geared specifically toward higher education (http://www.uefap.com/reading/). Students would be tasked with reviewing the discussions on skimming technique presented through the website and completing at least two of the exercises for each strategy. Then they would repeat each technique with separate texts related to their goal

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and areas of study. For their journal entry, they would discuss each technique relative to their

perception of its utility in academic reading. As many students are initially confused about what

constitutes a peer-reviewed article (or scholarly journal article), **Supplemental reading** for

Week 8 might include the UCF Library web resource on peer-reviewed articles

(http://guides.ucf.edu/c.php?g=78514&p=517607). Many excellent videos about recognizing

and skimming peer-reviewed articles are also publicly available online and easy to find.

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Week 9: Memory palaces applied.

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This week, students will return to the concept of the memory palace, but this time the

emphasis will be more on application. Students will create a memory palace to remember a

speech or presentation. Again, the seriousness with which students approach this exercise will

be fundamental to what they get out of it. Images of memory palaces created for specific

purposes will help students conceptualize what is entailed in creating their own memory palace.

Learning objectives for Week 9's module are:

- TBD *(Online/in-class discussion)*.
- Create a physical representation of a memory palace to organize the main points of a
  speech

Online / In-Class Discussion:

See Week 8's Online/In-Class Discussion summary.

Knowledge Acquisition Journal:

Students will draw out a complete floor plan from memory of a building with which they

are intimately familiar. They will then take a new article or text of interest, related to their goal

and areas of study and use this map to organize the main points of a mock 5-minute speech.

Students will draw a route from room to room that will represent their progression through the

content of the speech, and in each room write short cues to trigger recall of the important points

they wish to address. Students will then use their physical representation of the memory palace to mentally organize the main points of the speech which they will present to a hypothetical audience entirely from memory. As they practice delivering their speech, students will use only their mind's eye to guide them through the main points. For best results, students will be encouraged to find a friend or family member to serve as their audience. For extra credit, students might even record their speech an upload it to their Knowledge Acquisition Journal. In any event, students need to upload an image of their memory place and describe how successful the technique was in helping them remember their speech. An alternative to this requirement might be to have students utilize online applications and resources to construct their memory palace. There are many ideas for creating or adapting memory palaces utilizing online resources found on the following wiki page: http://mt.artofmemory.com/wiki/Artificial_Memory_Palaces.

Week 10: What else is there?

This week, students will be tasked with exploring the resources available through their own academic institution or, if no satisfactory resources are available, those of another institution of higher learning. For instance, as suggested earlier, UCF's SARC and SARC Online websites have a wealth of information and strategies for optimizing the learning experience (http://sarconline.sdes.ucf.edu/ and http://sarc.sdes.ucf.edu/). Learning objectives for Week 10 are:

- TBD *(Online/in-class discussion)*.
- Summarize and evaluate three additional learning strategies as suggested through their own or another institution of higher learning

Online / In-Class Discussion:

See Week 8's Online/In-Class Discussion summary.

Knowledge Acquisition Journal:

Students will seek out additional learning strategies found within the learning skills resources available through their own academic institution. If no satisfactory resources are found, students might explore UCF's publicly available online learning resources (http://sarconline.sdes.ucf.edu/?page_id=344). Students would evaluate at least three learning strategies not previously discussed, summarizing the justification offered with regard to each topic or skill set, and, if feasible, experiment with the strategy over the course of the week in their own learning. Alternatively students will speak hypothetically about how they could employ the strategy in future learning. Often these resources will include more traditional strategies such as effective time management, effective note taking, effective use of notecards for self-testing (retrieval practice) and so forth. Students should include hyperlinks to the resources they are discussing both for the instructor's and their own reference.

Week 11: Academic writing versus reflective writing.

One of the biggest challenges that I have found when teaching UCF's IDS Cornerstone and Capstone courses, is that students are initially unable to distinguish between the casual subjective and narrative tone of reflective/expressive writing and what constitutes formal expository author-evacuated academic writing. In the past, prior to beginning their Interdisciplinary Analysis Project (the precursor to and somewhat more abbreviated version of the Peer-Reviewed Article Analysis Project), I have required my students to read and discuss the key points of Ann John's discussion on academic discourse (from the chapter entitled "Discourse communities and communities of practice" in *Text, role, and context: Developing academic literacies*) (Johns, 197, pp. 58-64). I should give credit to UCF's Rhetoric & Writing professor, Dr. Elizabeth Wardle for introducing me to this work in the context of one of her graduate

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courses. Including this discussion has helped students more effectively toggle between informal subjective writing and formal objectively framed writing. Rather than including this reading as a discussion, it would be incorporated as the Knowledge Acquisition Journal exercise to help students transition into the type of writing that will be required for their Peer-Reviewed Article Project. Learning objectives for Week 11 are:

- TBD *(Online/in-class discussion).*
- Distinguish between non-academic and academic writing

Online / In-Class Discussion:

See Week 8's Online/In-Class Discussion summary.

Knowledge Acquisition Journal:

Students will read Ann John's discussion on academic discourse (from the chapter entitled "Discourse communities and communities of practice" in *Text, role, and context: Developing academic literacies*) (Johns, 197, pp. 58-64). Students will then take any 1-2 page essay or substantive writing they have previously written (either for this course or a different one) in which they have used a first person narrative or subjective (i.e., impassioned) tone to make an argument or reflect on an experience and rewrite it in an author-evaluated objectively moderated tone as prescribed in Ann John's discussion on academic discourse. Students will display both the original and the revised writing within their Knowledge Acquisition Journal with a textual description of the types of changes that were required.

Week 12: Finding your article.

During Week 12, students will complete their Knowledge Acquisition Journal and begin the Peer-Reviewed Analysis Project which will finish out the semester. To assist students as they begin to search for their articles, students will be encouraged in the week's introduction to just start trolling the Internet for popular news articles or reports that pertain to their goal and

interests. Anything is fair game at this point. Students will initially be directed toward any

issues or problems that attract their interest and attention. Once they have found a non-scholarly

article or report that strikes there interest, they should begin looking for clues as to where the

information contained therein came from. Often a non-scholarly news article will point to a

scholarly source from which its content is derived, such as a study, or an expert in the concerned

field. One study may lead to another and so on. This process becomes a bit like detective work

and can actually be fun. Learning objectives for Week 12 are:

- Judge the efficacy of the various exercises that comprised the Knowledge Acquisition Journal component relative to each other and personal preference.
- Identify a scholarly journal article for the purpose of analyzing the author's approach
- Summarize the main points of the article, the author(s)'s background information, and evident context in which the article's content is situated

Knowledge Acquisition Journal:

This week's Knowledge Acquisition Journal will be a general reflection on the learning

strategies that have been covered, with the opportunity to make suggestions for improving the

student experience. Students should also discuss whether they feel that any of these techniques

will be useful for them during their academic career and which techniques in particular they plan

on incorporating into their studies and habitual practice.

Peer-Reviewed Article Analysis Project:

Step 1: During the first week of the Peer-Reviewed Article Analysis Project, students

will locate a 'scholarly journal article' that addresses a complex problem or issue that will likely

involve an interdisciplinary approach to solve or address.   This will be an opportunity for

students to practice skimming. Students should choose an article that addresses a problem that is

both relevant to their goal and their disciplines (areas of study). Moreover, the article's subject

matter should be something in which the student is truly interested; something that motivates

them in this particular academic direction. Students should consider that they will be conducting research on key concepts and academic discourse within these fields, which may help them further their own studies and develop a familiarity with the disciplines in which they will be studying. Students will use the UCF library databases and/or Google Scholar to locate their article. Importantly, the article should be dated within the last five years. If students have difficulty identifying what constitutes a peer-reviewed article, they should refer to the supplemental reading for Week 8.

Students will understand that they will be creating an analytical report in their best academic writing on the author's approach to addressing the problem, rather than merely creating a report on the subject matter of the article. Once students have chosen an article, they will first list the author, date, title, publisher, and URL for the article (in MLA or APA format). Students will then describe the main topic of the article (the object of study and central questions), and how this particular article relates to their goal and areas of study. Moreover, they will explain why they chose this particular article relative to their specific academic and professional interests (students should already be thinking about potential niches). It is not necessary that the article align exactly with the student's areas of study, but there should be some general connection. Students should be certain to note the disciplines that comprise their program of study.

Step 2: Next, students will investigate that author(s) academic/professional background and areas of expertise. Specifically, students will summarize the following details about the author(s): *the author(s) home institution, academic credentials, previous publications, special academic niches, involvement in academic organizations, and anything else that might be relevant to developing a firm understanding of where the author might be coming from, academically speaking.*

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Step 3: Students will then consider the context in which the article has been written. Students will ask themselves questions such as: *Is the subject matter of the article isolated or systemic? Is the problem or controversy local, regional, or global? Who would be professionally concerned with this problem; who (or what) does this issue affect? Has the subject matter become a concern only recently or has it persisted for some time unsolved or unaddressed? What disciplines might be of relevance in addressing this issue?* At this point students will be primarily looking for their answers directly in the text of the article, but they are free to consult online resources as well. Students will be directed to pay special attention to the introduction and literature review sections of their article. It will not merely be creating answers to the preceding questions, but developing their thoughts within the flow of expository writing.

Student submissions should be approximately 2-3 pages, in paragraph format, double-spaced, with in-text citations and bibliography as appropriate. Students are encouraged to go beyond the minimum requirements. Additional guidance relative to concepts associated with interdisciplinarity and interdisciplinary synthesis will be provided as necessary either earlier in the semester, as a separate resource, or within the introduction. Although rubrics have been employed in the past to grade Interdisciplinary Analysis Projects, my preference is for personalized feedback of a somewhat subjective nature with points deducted for objectively determinable deficiencies such as timeliness, grammatical errors and missing elements.

Week 13: What's in an analysis?

At this point, students will only be focusing on their analysis. As such, curricular distractions will be kept to a minimum. The remaining modules (Week's 13-15) would likely lead directly into the guidelines for that week's analysis submission. Learning objectives for the week would include:

- Distinguish between disciplinary theories, concepts and assumptions relative to the subject matter of the article.
- Identify the primary disciplinary perspectives of bibliographic material used to support the author's approach, arguments and findings.
- Discuss, using quotations, disciplinary perspectives and insights represented within the various components of a peer-reviewed article to support the author's argument.

Peer-Reviewed Article Analysis Project:

Students have already identified the object of study, central questions to be addressed, author's background, and context for their chosen article. Now students will be asked to dig deeper in their analysis. Students will begin to identify and elaborate on the following elements contained within their article:

- any disciplinary perspectives from which insights are drawn, explicit or implied
- the disciplinary relevance of relevant facts and statistical data contained within the article
- any concepts that support the arguments presented in the article
- any key theories cited in the article and their associated disciplines
- any assumptions underlying concepts or theories
- any key thinkers cited as experts and their field of expertise
- any evidence of bias, disciplinary or otherwise
- any evidence of essential disciplinary knowledge that has been applied toward addressing the central questions of the article

At this point, students will be encouraged to consult secondary academic sources to elaborate on the concepts and theories supporting the hypotheses and arguments of their primary article. First and foremost, students will evaluate the sources listed within the article's bibliography to determine the disciplinary perspectives represented, and to attempt to identify source material for the concepts and theories employed in the primary article. Students will also incorporate other scholarly sources as necessary to fill out their elaborations. Again, student submissions should be approximately 2-3 pages, in paragraph format, double-spaced, with quotations, in-text citations and bibliography as appropriate.

Week 14: Summing it up.

Learning objectives for Week 14 are:

- Evaluate the interdisciplinary character of the analysis article
- Justify the relevance of additional disciplinary perspectives in addressing the issues or problems raised in the primary analysis article

Peer-Reviewed Article Analysis Project:

This week, students will identify and address what each discipline (and/or sub-disciplines) added to the conclusions reached by the author(s) regarding the object of study. Students will them ask themselves questions such as: *Would additional disciplines provide more insight into the problem? Were key disciplines or sub-disciplines essential to solving the problem overlooked, and if so, why are they relevant? If additional disciplines are or are not necessary, justify your stance.* In short, students will evaluate and justify whether or not the solutions/conclusions presented in the article is truly interdisciplinary. If the article is an interdisciplinary work with evidence of integration and/or synthesis in its construction and support, students will need to defend why; if not, they will explain why not. Students will again be reminded that they are analyzing what was in the article and how it was supported, not giving their opinion about the topic itself. Submissions for this component of the project are expected to be anywhere from 1-3 pages.

Week 15: Final submission and reflection.

Learning objectives for Week 15 are:

- Combine component parts of the Article Analysis Project into a single document, incorporating recommended edits
- Create an annotated bibliography of supporting secondary academic sources

Online / In-Class Discussion (extra credit):

I have found that having a final discussion post for extra credit (previously as a private journal entry in the Blackboard LMS platform) that allows students to express their sentiments about the course, offer suggestions for improvement, and generally reflect on their learning gives

students the opportunity to vent, praise, and otherwise get things off their chest relative to the course content and its implementation. This seems to have a positive effect on the student experience. A final discussion prompt for a publicly viewable post might be as follows: *In the Epilogue of* Moonwalking with Einstein*, after Foer has won the 2006 USA Memory Championship, he states: My experience had validated the old saw that practice makes perfect. But only if it's the right kind of concentrated, self-conscious, deliberate practice. I'd learned firsthand that with focus, motivation, and, above all, time, the mind can be trained to do extraordinary things (Foer, 2011, p. 267).*

A few pages later, Foer adds, "Our ability to find humor in the world, to make connections between previously unconnected notions, to create new ideas, to share in a common culture: All these essentially human acts depend on memory" (p. 269). I have developed this course with this fundamental idea in mind, that memory (internalized memory) is integral to being an interdisciplinarian. The memory theorist that studied Foer during the year he prepared for the USA Memory Championship said this about his subject: "You're clearly not a random person, but on the other hand, I'm not sure there's anything in how you improved that is completely outside the range of what a motivated college student could do" (Foer, 2011, p. 268).

In 200-250 words, reflect on your Cornerstone experience this semester. Discuss how you, as an individual, will be able to acquire essential disciplinary knowledge efficiently as it relates to your goal. How might you apply what you have learned about memory and knowledge acquisition strategies to attaining this knowledge? How will the very act of having a goal determine the course of your studies and extracurricular preparation? Lastly, identify assumptions you had about interdisciplinary studies prior to this class. How have these assumptions changed as a result of this course?

Peer-Reviewed Article Analysis Project:

For their final submissions of the Peer-Reviewed Article Analysis, students will combine their three preceding project submissions into a single file incorporating any changes that may have been suggested through personalized feedback and ensuring textual continuity. Together, the complete analysis should consist of approximately 7-10 pages. The annotated bibliography will consist of at least six credible sources; the expected length of the annotated bibliography will be between 2-3 pages. Between Week's 14 and 15, students will get specific guidelines for creating their annotated bibliographies. Students will further be directed to their university's resource or, if none is available, another academic resource for creating annotated bibliographies. For illustration purposes, UCF's University Writing Center provides a tutorial for writing annotated bibliographies under the *Resources* section of their website (http://uwc.cah.ucf.edu/wp-content/uploads/sites/9/2015/04/Annotated-Bibliography-Handout-Fall2011.pdf).

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