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Analyzing a college course that adheres to the Universal Design for Learning (UDL) framework

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Abstract: Universal design for learning (UDL) offers an educational framework for a college instructor that can maximize the design and delivery of course instruction by emphasizing multiple representations of materials, varied means for student expression, content and knowledge, and multiple ways to motivate and engage student learning. Through a UDL lens, learner variability is anticipated and considered as a strength in the instructional planning process. The present study examined the reflective practice of one faculty member as she applied the UDL framework to her graduate class. Study participants were engaged in action research that both explored the faculty's use of the UDL framework to design and deliver an introductory graduate research methods course and, student perspectives of the application of this approach. Both faculty and student responses were favorable towards the implementation of the UDL instructional practice. Results suggest that when faculty use the UDL framework to help design courses, goals are more clearly aligned with instructional practices; there is a positive relationship to student interest and engagement; and students are positively engaged in the course.

Keywords: Universal design for learning, teaching and learning, UDL, research methods, postsecondary education, universal design, higher education

I. Introduction.

Universal design for learning (UDL) offers a framework for a college instructor that can expand opportunities in the delivery of course instruction. Utilizing multiple formats, varied instructional methods, and flexible features of digital technologies, UDL can enhance learning experiences for all students. Research from the learning sciences supports the fact that learner variability is developmental, systematic, and context-dependent (Fischer & Bidell, 2006; Rose & Fischer, 2009; Rose & Gravel, 2010). This means that college instructors can expect to have a range of learners in classes that vary across multiple dimensions including their background preparation, their learning situated in context of the class; and their learning based on age and development (Rose & Fischer, 2009).

UDL applied to teaching and learning provides a lens that focuses targeted approaches on supporting student's affective, strategic and recognition learning networks (Rose & Meyer, 2002; Rose & Meyer, 2006; Rose & Gravel, 2010). The UDL framework places the burden to adapt on the curriculum rather than the learner (Rose & Meyer, 2006). Instructors can improve educational outcomes for a range of learners by considering the three central principles of UDL in the design of instructional goals, methods, classroom materials and assessments (Hitchcock & Stahl, 2003; Rose & Strangman, 2007).

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Research on how people learn (Bransford, Brown, & Cocking, 1999, 2000; Bransford, Vye, Stevens, Kuhl, Schwartz, Bell, Meltzoff et al. 2006) and the learning brain (Raz & Buhle, 2006; Rose, 2001, 2005; Rose & Meyer, 2002) verifies individual differences in approaches to learning. Three key findings have been determined to promote student learning (Bransford et al. 2000; 2006). First, students come to a classroom with preconceived ideas about how knowledge works and their initial understanding needs to be engaged. Learning transfer is heightened or hampered by the orientation of this prior knowledge. Likewise, students of differing cultural orientations may have difficulty with some school practices that conflict with those of their current community.

Second, to develop competence in an area, students need a deep understanding of the context and facts (Bransford et al. 2000). Distinctions are evident between expert and novice learners. Experts are able to notice, organize, and interpret information more successfully than novices. Experts have developed the skills to quickly recognize patterns in information and organize knowledge around key concepts. Scaffolding instruction through means that can highlight critical features, key questions and big ideas can be invaluable towards teaching expertise in novice learners (Rose & Gravel, 2010).

Finally, the third finding involves the need for students to develop a metacognitive approach to learning so that they can self-assess, understand, and appreciate their strengths and differences. Instruction and assessment situations that offer frequent feedback, assist students in self-discovery of their strengths, and encourage their ownership in their learning process encourage metacognition (Bransford et al. 2000; 2006). Providing multiple instructional approaches facilitates the acquisition of learning and the engagement of the learner. UDL offers a framework for educators' design of instruction and assessment that can heighten gaps in student's prior knowledge, scaffold and support their learning, and facilitate metacognition (Rose & Meyer, 2002; Rose & Gravel, 2010).

A. Federal Definition for UDL.

The inclusion of specific UDL language in the Higher Education Opportunity Act (2008) makes this an especially important conversation for faculty in teacher education. As defined, UDL is "a scientifically valid framework for guiding educational practice that provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged" (20 U.S.C. § 1003(24)). The HEOA emphasizes the need for teacher preparation programs to prepare future teachers with instructional practices that include the use of research-based instructional strategies and technologies consistent with the principles of UDL.

The focus of the UDL framework has revealed positive results in K-12 settings (Abell, Jung, & Taylor, 2011; Coyne, Pisha, Dalton, Zeph, & Cook-Smith, 2012; Dalton, Pisha, Eagleton, Coyne, & Deysher, 2002; Dolan, Hall, Banerjeee, Chun, & Strangman, 2005; Kortering, McClannon, & Braziel, 2008) particularly for students with disabilities. However, the research on the affective, strategic, and recognition networks maps to adult learners as well. Applying this framework to college courses can result in instruction that leads to positive student academic and affective outcomes (Schelly, Davies, & Spooner, 2011).

B. *Universal Design for Learning.*

The central tenets of UDL align with research-based practices that draw from the neurosciences, instructional design practices, and the learning sciences, which promote effective strategies and approaches for learner success (National Center on UDL, 2011a; Rose & Meyer, 2002; Rose & Gravel, 2010). Evolving research from the learning sciences has confirmed that faculty can expect students with learner variability in their classes (Fischer & Bidell, 2009). According to UDL researchers (Rose, 2001, 2005; Rose & Meyer, 2002; Rose & Strangman, 2007) individuals receive and interpret information through three primary neural networks: (a) recognition, (b) strategic, and (c) affective. Learning through these neural pathways is defined by the recognition network that involves the "what" of learning and allows individuals to identify, recognize and see patterns; the strategic network that emphasizes the "how" of learning and enable individuals to set goals, develop plans and act on these approaches; and the affective network that engages the why of learning. Three guiding principles are necessary to comprise a UDL approach (a) providing multiple, flexible methods of presentation that give students various ways to acquire information, (b) providing flexible methods of expression that offer students alternatives for acquiring and demonstrating their knowledge, and (c) offering options for engagement to help students get and stay interested as they are appropriately challenged (Rose & Gravel, 2010; Rose & Meyer, 2006).

The UDL framework is grounded in extensive research from the neurosciences, learning theories and teaching approaches (Rose & Gravel, 2010) that support the three UDL principles and nine categories offering additional guidelines for considering the customized design of instructional environments. Through the UDL guidelines, strategies can be considered to promote expertise in learning; learning that is intentional, purposeful and planned (National Center on UDL, 2012c). A table depicting the UDL guidelines is presented in Figure 1.

I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
Perception	Physical action	Recruiting interest
Language, expressions, and symbols	Expression and communication	Sustaining effort and persistence
Comprehension	Executive function	Self-regulation

Figure 1. The UDL Guidelines. Retrieved from The National Center on Universal Design for Learning. (2012c). Universal design for learning guidelines – Version 2.0. Wakefield, MA: Author. Copyright 2012 by CAST.

Developing Clear Goals. A core first step in UDL underscores the importance of developing clear goals that align with meaningful and attainable objectives. Goals need to be analyzed with the true intent in mind. (Coyne, Ganley, Hall, Meo, Murray, & Gordon, 2006). As Csikszentmihalyi (1990) notes, clear goals are essential for assuring optimal learning experiences. Through a UDL lens, writing clear goals also clarifies the importance of separating the intent of the goal and its outcome from the means to acquire the goal offering opportunities for providing multiple options. For example, if a stated goal emphasizes the importance of reading and writing text to achieve understanding, various learners may be at a disadvantage. Without more

specificity, students who write with their voice or read text by listening will have difficulty achieving this goal.

Multiple Means of Representation. Once clear goals are established, the development of a learning environment that is rich with varied learning opportunities is necessary. The first UDL principle encourages the use of multiple methods to present information. For example, an instructor might provide a lecture and use a PowerPoint presentation with examples that expand upon their discussion. Instructional environments that capitalize on the flexibility of digital mediums offer opportunities to strengthen specific guidelines addressed within the first UDL principle and provide ways to represent vocabulary terms or mathematical notation and symbols for example. Embedded hyperlinks to unfamiliar terminology can be represented by a definition, video presentation or concept map (National Center on UDL, 2011b).

Learners also vary widely in their learning experiences. Past experiences may include gaps in prior knowledge, different cultural or regional learning experiences or, difficulties challenged by a disability. Providing options that strengthen comprehension are key to the UDL approach and assure that opportunities to activate background knowledge are weaved throughout. Instructional approaches should include multiple opportunities to highlight patterns, critical features and relationships (National Center on UDL, 2012c). Many of today's learning management systems (LMS) offer an array of digital means to embed hyperlinks that can support these important functions. These are important examples of UDL in action and that maximize opportunities for understanding (Rose & Meyer, 2006)

Multiple Means for Action and Expression. Students enter a classroom with a range of capabilities, preferences and approaches. Diversity in the college classroom is more pronounced today than ever before (National Center for Education Statistics, 2010a). Research from the learning sciences confirms that learners, in general, vary widely in how they capitalize upon instructional information in a learning situation (Rose & Fischer, 2009). There is a noticeable distinction in the strategic neural networks of a novice versus an expert learner. Depending on the task, expert learners have developed a strategic approach that facilitates their success in learning. They know how to set clear goals, outline effective steps to obtain their goals, employ effective strategies and monitor their ongoing progress until they reach that goal. In contrast, novice learners have not yet developed these facilities in learning (Bransford et al. 2000; Rose & Gravel, 2010). Many may also be "several steps behind" in their learning development due to variation in background experiences or current capabilities. The second UDL principle encourages educators to be mindful of these differences and offer multiple opportunities for students to gain, express and demonstrate their understanding (National UDL Center, 2011b).

Multiple Means for Engagement. Learners also bring varied ways and preferences for how they engage their learning. They, like many novice learners, have not yet mastered the skills needed to monitor their learning progress, adjust their plans, or determine how to maximize the classroom experience for their benefit. These students will benefit from strategies and supports that build and enrich these skills. The third UDL principle encourages educators to consider this learning area and offer multiple opportunities for students to see relevance and value. Options that further heighten the importance of goals, personalize information and encourage self-assessment for the learner are important (Rose & Gravel, 2010).

The aim of this study was to (1) investigate the practice of one instructor as she redesigned her course using the UDL framework as an overarching lens; (2) explore the ongoing development of a new UDL survey measure that explored student perspectives of UDL in college classrooms; and (3) consider the perspectives of students when UDL is part of a

postsecondary course. The research participants included both the faculty and students in an introductory research methods course.

II. Literature Review.

A. Research in Universal Design for Learning.

Research exploring the application of UDL has been limited and especially in the context of college classrooms. While this research base is growing, the evidence of impact on learning is small. Studies on UDL in higher education have often been of a descriptive nature or focused on the application of universal design principles (Center for Universal Design, 2005) and how these universal design approaches can be infused into instruction or teacher training (McGuire, Scott, & Shaw, 2006) rather than on actual implementation of UDL principles for instruction.

As a framework, UDL encourages educators to consider instructional strategies and technologies that can enhance student learning and engagement. Instruction that is delivered under a UDL lens offers expanded opportunities to personalize and deepen the learning process (Rose & Meyer, 2006; Russell, 2010). The importance of personalization has been underscored by the U.S. Department of Education's *National Education Technology Plan* which defines the term "personalization" as referring "to instruction that is paced to learning needs, tailored to learning preferences, and tailored to the specific interests of different learners" (U.S. Department of Education, 2010, p. 12). Spooner, Baker, Ahlgrim, Delzell, Browder, and Harris (2007) found that the inclusion of UDL principles in general and special education teacher training resulted in improved lesson plan designs and the possibility of reaching a broader range of students. When UDL was included in training for college instructors, their course designs were more effective and student's perceptions were more positive (Schelly, Davies, & Spooner, 2011). Recently, Abell, Jung and Taylor (2011) confirmed that students in middle and high school settings showed higher perception scores for both their classroom personalization and participation when UDL approaches were included in the classroom setting. In this particular study, personalization was encouraged by student opportunities to interact with the teacher; and participation was encouraged through engagement. As these authors note, personalization and participation are central to the components of UDL that encourage targeted instructional approaches to scaffold learner performance and provide opportunities for choice and engagement (p. 178).

B. Technology and Learning in Higher Education.

The use of technology in higher education is increasing as members of the millennial generations enter college (Dahlstrom, deBoor, Grunwald, & Vockley, 2011; Howe & Strauss, 2003; Oblinger & Oblinger, 2005)—bringing new digital approaches and expectations for the classroom instructor (Levin & Arafeh, 2002; Prensky, 2010). Oblinger and Oblinger (2005) note that among these "net generation" students, 20% began using computers between the ages of five and eight. The millennial generation are defined as those born from 1982 to the (Howe & Strauss, 2003). These students are developing greater digital literacy and are more comfortable in Web-based environments that focus on expression through audio, video and graphics. The affordances provided through today's digitally rich Web 2.0 environments offer students

multiple ways (and often preferences) to communicate with others (Prensky, 2010). Many are skilled (and often schooled) in using the web as a medium of expression through websites, blogs and web spaces that showcase their work.

The use of instructional approaches that infuse digital tools and resources, such as those embraced by UDL, are essential to engage today's college students. The flexible features of digital media offer many opportunities for allowing students to interact with the content, connect in conversation with others, and demonstrate their understanding. Researchers have found that "effective use of dynamic media can lead to increased student engagement" (Bull & Garofalo, 2009, p. 41). According to the *2011 National Study of Undergraduate Students and Information Technology,* students identify technology as key to "making learning a more immersive, engaging, and relevant experience" (Dahlstrom et al. 2011, p. 4). Over thirty-three percent of students in this study highlighted technology as important to their learning in college. Comments such as "makes learning more creative, makes learning more relevant to real life, makes learning more engaging, and extends learning beyond the classroom" were specifically noted (p. 11). Technology offers college students a medium for convenience, increased productivity and a way to stay connected with others. Infusing digital media into classroom instruction, supported through a UDL lens, capitalizes upon ways to customize students' learning experiences and preferences.

C. Practitioner Inquiry and Reflective Practice.

Educators that engage in reflective practice expand opportunities to enrich their teaching (Cochran-Smith & Lytle, 2010). Teaching is both a craft and an art. According to Eble (1986) the acts of teaching are multifaceted and often include a measure of sharing expertise, orchestrating a successful performance, and seeking multiple means to incite and encourage learning. In some ways, teaching viewed as an art might be compared to many of the creative professions. Take the example of a gourmet chef. Their ability to develop a signature dish depends upon their capability to become experts of various skills, consider and combine ingredients into a complete finale, and deliver this dish in a manner that tempts all the senses. Similarly, skillful teachers proceed in much the same manner as they plan their instruction and consider the different styles of learning in their classrooms and individual student needs. For skillful educators, this art is one that requires constant inquiry and reflection to provide optimal learning experience for students. Effective teachers are mindful of the importance a practice of inquiry and reflection that play integral parts in their teaching and learning.

Cochran-Smith and Lytle (2010) confirm that practitioner researchers that engage in inquiry opportunities about their teaching practice are inviting opportunities for creative ways to alter and adjust their instruction, consider the impact on their students, and continuously monitor their effectiveness. Reflective educators constantly seek opportunities to adjust and improve their practice, reconsider their inquiry stance and redevelop their classrooms into rich and meaningful learning spaces (Cochran-Smith & Lytle, 2010). The success of this practice is predicated on the notion that "teacher is inquirer rather than teacher as expert" (G. Maimon, personal communication, February 21, 2012). Often their classrooms become "research laboratories," where new approaches are implemented and students become active co-researchers in the practice. "Educational research will not have any practical value if it does not affect teaching and learning in classrooms, no matter how brilliant the design or how magnificent the result" (Wang, Kretschmer, & Hartman, 2010, p. 105).

The UDL framework underscores the importance of reflective educational practice; re-evaluating how instructional practices are addressing learner preferences is central to this brain-based approach (Rose & Gravel, 2010; Rose & Meyer, 2002). Monitoring student progress, evaluating the curriculum with learner variability in mind, and maximizing effective uses of technology are important tenets of the UDL approach.

III. Methodology.

This was an action research study of one instructor's reflective practice to explore the effectiveness of using a UDL framework with a research methods in education course at a large, urban, research-oriented university in the southeastern United States. The author of this article partnered with the instructor to explore her educational classroom practice through a framework of UDL.

Action research studies are characterized by the ability for researchers to work with practitioners in the creation of knowledge through multiple sources (Huang, 2010). As a form of inquiry, action research allows for a constant and iterative process of reflection and action that informs the practice of the educator. Through the action research process educators can "reflect on their practice to improve it" and "develop a more energetic and dynamic environment for teaching and learning" (Bruce & Pine, 2010, p. 4).

A. Participants.

Participants were eighty graduate students enrolled in two sections of an introductory research methods course. The ages of these participants were not obtained as a part of this study. Reportedly, students enrolled in graduate classes fall within the 20-34 year old age group (National Center for Education Statistics, 2012b). Students in this study included those who were degree-seeking candidates, university staff seeking credits and those not officially enrolled. Degree seeking candidates represented the majors of special education, school counseling, education leadership, business and adult learning.

The research was conducted over four semesters: Spring, 2010; Fall, 2010; Spring, 2011; and Fall, 2011. This course is required of all education majors at this university and typically taken at the beginning of a core graduate program. The purpose of the course is to introduce students to the fundamental concepts and designs of quantitative and qualitative research. Students are introduced to research designs, statistical techniques, critical scholarly research reviews and the development of research questions. The course culminates in the development of a research proposal.

During the Spring 2011 semester, an additional instructor's class for the same course was included in the total sample. This instructor taught an additional section of the research methods course and applied the UDL approach in his class. The primary faculty of this study shared an orientation to the principles of UDL, her redesigned syllabus and access to her online course structure as a model to follow. The additional instructor's class was only involved in the survey data collection and no other parts of this action research. The total number of participants across each semester is provided in Table 1.

Table 1. Total study participants across 2010 and 2011 semesters.

Semester	Number of Students Enrolled (n=80)	Percentage of Total Sample
Spring 2010	18	22.5 %
Fall 2010	14	17.5 %
Spring 2011	**33**	**41.3 %**
Fall 2011	15	18.8 %

Note: Total number of participants in boldface includes 17 from the second instructor's research methods class.

B. Aims of the Research Study.

To guide this study, the research aims focused on (A) student perceptions of faculty use of UDL in their courses, (B) student engagement related to the infusion of these practices, and (C) the relationship between the use of UDL approaches and student engagement. The questions included the following: Which strategies are both implemented by the instructor and used by the students? What patterns, if any, exist? To what extent is instruction consistent with the principles of UDL? To what extent do students take advantage of options or participate in methods consistent with the principles of UDL? How engaged do students perceive themselves to be in class? What is the relationship between students reported use of UDL strategies and their level of interest and engagement?

B. Data Sources.

In this study, multiple sources of data were collected that were both quantitative and qualitative. As part of this study, students completed a survey of questions representing practices in the UDL approach. Multiple conversations were held between the researcher and instructor to discuss how instructional approaches were being considered, implemented and changed throughout the study. Reviews of the survey participant's responses were considered at the end of each semester to inform decisions of how the next semester's class would be adjusted or designed. The researcher was able to observe and participate in some of the class sessions. Informal conversations were held with students regarding their perceptions of the class and the researcher was able to read all student online blogs.

This course was taught using UDL as the overarching framework to guide teaching and learning. The author and faculty have extensive expertise in teaching and applying the UDL framework to college instruction and as UDL instructors; they have applied a UDL perspective to other courses that focus on the three principles of this framework. As educators, they understand the importance of how applying the UDL framework to a required graduate research course can result in instruction that both leads to positive student academic and affective outcomes. The UDL lens provides a coherent instructional model that addresses four key components for curriculum planning including (1) developing clear goals, (2) considering appropriate methods, (3) selecting a range of means to deliver the material and, (4) designing

assessment approaches that are formative in nature and provide ongoing opportunities to monitor progress.

IV. Research Measures and Approaches of the Study.

A. Course Instructional Planning.

This action research study involved the standard elements of reflective and responsive instructional practice, and was focused [in particular] on one instructor's actions in response to participant feedback. The instructor used a variety of curriculum approaches to design and develop her course. Detailed course lesson plans were designed prior to each course week and followed a planned schedule of activities, discussions, presentations, media, and assigned readings. The course was taught face-to-face and met on a standard day and time of the week. Course materials, lesson plans, course notes, digital presentations, assigned readings, audio and video were also posted to a companion online course website using the university course management system (CMS). Thus, students had digital access to all of the materials and resources used in each class.

Instructor Planning Checklists. This course is often perceived by students as one that is dry in content, disassociated from their academic program and, having little meaningful application to their work. Prior to this study, the course had typically been taught with a standard course syllabus and text. Course materials and activities had been structured around previous professor's interests and instructional preferences. From a UDL standpoint, this design offered few opportunities to engage and expand the neural learning networks that connect recognition (the what of learning), strategic (the how of learning), and affective (the why of learning).

From the start, there were opportunities in applying a UDL framework to this course. The course had established clear goals; the course required the use of common grading rubrics, and the course text included a number of graphic organizers. As part of the initial course planning for this course, the instructor organized a *Checklist for UDL Implementation* for each of the identified UDL principles across recognition, strategic and affective learning networks. These checklists provided a structure for her to align course goals with intended objectives and target specific UDL approaches that supported each. Checklists for each UDL strategy implementation are illustrated in Table 2.

B. Survey Measures.

During each semester of the course, an introductory overview to the UDL principles was provided to the class. At the end of the course, students were invited to complete the *Student Survey on Learning and Instruction* (Smith, 2008). An example of this survey is provided in the appendix (see Appendix 1: Student Survey on Learning and Instruction). This paper-based survey was presented to students during class time and took no more than twenty minutes to complete. Eighty graduate students completed this survey.

The survey used in this study was designed as part of the author's original dissertation research, "Perceptions of UDL in College Classrooms" (Smith, 2008). Survey items representing the features of UDL were adapted from the *Teaching Every Student in the Digital Age: Deriving UDL Solutions Template* (Rose & Meyer, 2002). Items specifically addressed UDL and were primarily representative of the three guiding principles of UDL across the three brain areas: (a)

Table 2. Checklists for Instructor's UDL Strategy Implementation.

Recognition Learning Network	
Specific Course Goal: Standards that ask students to learn specific content	
Intended Course Objectives	*Instructor Targeted UDL Approaches*
Objective 1: Compare and contrast quantitative, qualitative and mixed-methods approaches to research Objective 2: Explain what experimental, quasi-experimental and non-experimental research designs entail and describe their application to different research questions Objective 3: Explain descriptive statistical techniques such as measures of central tendency, standard deviation and correlation	Provide multiple formats: • Provided in-class lecture on a course topic. • Provided a recorded lecture on a course topic. • Provided any other type of audio recording related to a course topic. • Provided a video that provided additional information on a course topic. Highlighted critical features: • Provided lecture notes that summarized a topic. • Provided notes with color-coding or highlighting of key points. • Provided a graphic organizer that summarized a topic. • Provided other handouts that summarized a topic. Provide multiple media and formats: • Provided digital course materials online (e.g., Blackboard). • Suggested/allowed for use of a magnifier on a computer screen to improve viewing. • Suggested/allowed for changing the background color of the computer screen to improve viewing. • Suggested/allowed for using a text-to-speech application to listen to course materials

Strategic Learning Network

Specific Course Goal: Standard that ask students to learn "how" to do something

Intended Course Objectives:

Objective 1: Select a research problem and formulate appropriate research hypothesis and/or questions.

Objective 2: Conduct a review of educational literature from texts, journals and computer databases.

Objective 3: Write a coherent synthesis of such literature as it relates to the research problem.

Objective 4: Prepare a viable research proposal.

Instructor Targeted UDL Approaches

Provide flexible models of skilled performance:
- Provided an example or model of an assignment.
- Provided an assignment rubric or template.

Provide opportunities to practice with supports:
- Facilitated a "hands-on" activity.
- Provided materials to read text alongside guiding questions.

Provide ongoing, relevant feedback:
- Was available to students for feedback on an assignment or task.
- Suggested/allowed for students contacting other individuals to ask for feedback on an assignment or task.
- Provided constructive feedback on an assignment.

Offer flexible opportunities for demonstrating skill:
- Suggested/allowed for an assignment that included images or video.
- Suggested/allowed for a spell checker to check written work.
- Suggested/allowed for a word processor or other digital writing tool to create an assignment.
- Suggested/allowed for a graphic organizer to plan an assignment.
- Suggested/allowed for creation of a web-based or other digital product for an assignment.
- Suggested/allowed for inclusion of Internet hyperlinks in an assignment.
- Suggested/allowed for maintaining a digital collection or portfolio of products created for the course.
- Suggested/allowed for use of a speech-to-text application to create a written assignment.

Affective Network Learning	
Specific Course Goal: Standard that ask students to enjoy, appreciate and use a content or skill area	
Intended Course Objectives	*Instructor Targeted UDL Approaches*
Objective 1*:* Demonstrate interest in educational research and its methods Objective 2: Demonstrate desire to participate in appropriate methods of research	Offer choices of content and tools: • Posted a website to learn more about a topic in the course. • Allowed students to select their own topic when completing an assignment. • Allowed students to select their own materials when completing an assignment. Offer adjustable levels of challenge • Allowed students to select their own topic when completing an assignment. • Allowed students to select their own materials when completing an assignment. Offer choices of learning content: • Allowed students to decide between working alone or with partner(s) to discuss a topic or complete an assignment. Office choices of rewards: • Provided feedback on an assignment.

recognition, (b) strategic, and (c) affective networks. During the development of the 2008 UDL study, the current UDL guidelines (National Center on UDL, 2011c) had not yet been developed and consequently were not a part of the survey design.

The survey developed for the present study included 33 items refined from the 2008 study. The thirteen interest and engagement survey items were adapted from the *Utrecht Work Engagement Scale for Students* (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). The Utrecht scale included specific dimensions related to engagement defined across vigor, absorption and dedication. The absorption and dedication items were adopted into the survey for this research. The survey used a Likert-type numerical rating scale, allowing participants to select from: 0-never, 1-sometimes, 2-often (a few times a month), and 3-very often (once a week).

V. Findings and Results.

A. Which Strategies were Implemented by the Instructor and used by the Students?

The central focus of this study followed the instructional practice of one faculty member over four semesters. From the beginning semester, a focus on designing the course through a UDL lens shaped her preparation. She developed course plans that aligned clear goals with attainable objectives.

Strategies to Support Recognition Learning. To address recognition learning, she incorporated a range of ways to represent course information by developing a companion course space in the online learning management system (LMS); this provided a digital location to post class notes, PowerPoint presentations, links to audio, video and text files, and course readings. The LMS also provided an organizing structure for each week of the course to list guiding questions, individual weekly goals, and graphics or pictures that represented the weekly course theme. She offered a number of multiple means to represent content and strengthen student understanding. Delineating research traditions was established early in the class by categorizing research traditions with specific names and pictures to help students recall the approaches; "ninja" for quantitative approaches and "pirates" for qualitative methods. Assigning this type of description provided a comedic comparison similarly used in Web memes to convey information in a humorous context (Shifman & Thelwall, 2009). To maximize student's comprehension for how to conduct a research study, she developed a "lunch tray model" to illustrate and review the essential steps and components of the research process 1) menu informs the question, 2) drink represents the research questions, 3) mixed fruit cocktail is the literature review, 4) utensils are the methods and design, 5) entree includes the results and discussion, 6) the vegetables represent the research citations to backup your discussion, and 6) the dessert includes the conclusion. An illustration of the lunch tray model is provided in Figure 1.

Strategies to Support Strategic Learning. To support strategic learning, she provided timely feedback on course assignments; sometimes this was a comment on the student's reflection blog, a written comment using track changes within a word-processed paper or, a weekly meeting with a student after class. Students were also provided a range of ways to represent and demonstrate their understanding of research through class activities. For example, at the beginning of each class, students engaged in hands-on sentence completion activities to recall research methodology steps. As a class, students were introduced to noted researchers through instructor made "trading cards" that included a picture of the researcher on the front and noted facts on the back of each card. To strengthen their grasp of reading, understanding and sharing research, students participated in mock "cocktail party reviews" by assuming the role of a favorite researcher and sharing research with others. As part of the final assignment, students participated in a research poster session by preparing posters that depicted the essential components of their "research study" and discussed these with class "conference participants".

Strategies to Support Affective Learning. Finally to support affective learning, the instructor began the course by crafting readings and materials with the student's interests in mind. She provided a brief multiple intelligences inventory (McKenzie, 2002) to better understand her student's individual interests and preferences. She considered this information in her selection of instructional approaches and readings; making sure she connected to their backgrounds and interests. She provided frequent opportunities during the class for think-pair-share and small

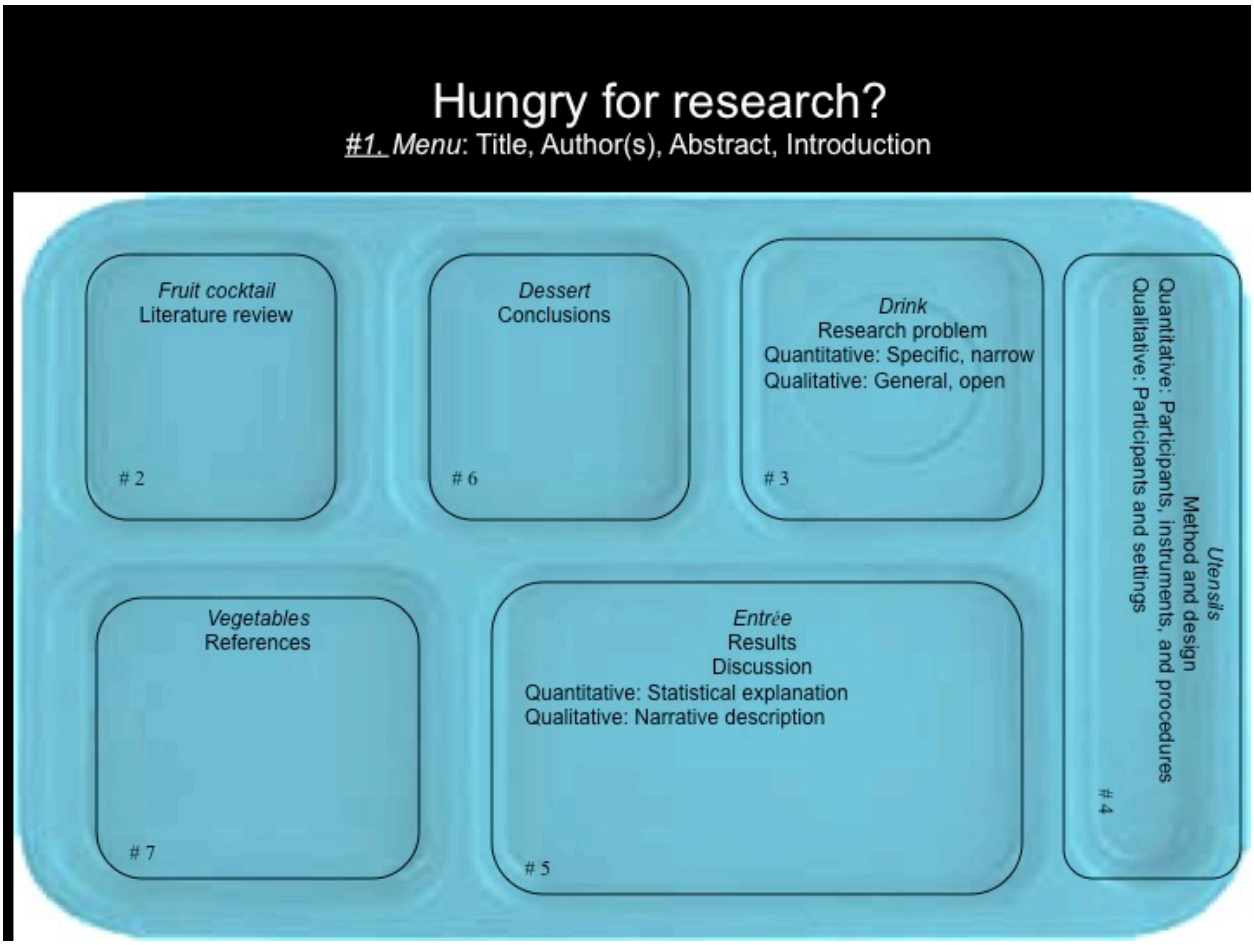

Figure 1. A Lunch Tray Model Representing the Research Process.

group discussions. An array of choices were offered in how students could consider the research topic that matched their interests, the researcher that they most wanted to explore, and the medium they chose to share this information. Students created personalized Wordpress® blogs to post their reflections to questions and prompts regarding course materials and readings. Throughout, the instructor included multiple sources of contemporary media to illustrate concepts from You Tube® videos.

B. How is Instruction Consistent with the Principles of UDL?

The student survey allowed the author and faculty to assess how consistent the instruction was with the principles of UDL from the students' perspectives. To contextualize student responses to survey questions, item descriptive statistics are provided in Table 3. A total of 33 items represented the principles of UDL for this survey. These are presented across each of the UDL learning networks and show both the instructor's planned strategies and those that were more preferred by students.

Recognition Network Learning. The UDL framework first addresses that educators need to consider providing multiple ways to present information that assist a learner in understanding the what of a learning situation. Providing instruction that addresses the recognition network of

learning includes offering multiple examples of the content, highlighting the critical features of the content, and providing a variety of media and formats. There were ten survey items addressing this area. These are illustrated in Table 3.

Table 3. Recognition Learning Network Results.

UDL Recognition Learning Network			
Instructor Strategy	**Student Responses (n = 80)**	**M**	**SD**
Provided multiple examples			
• Provided in-class lecture on a course topic.	Listened to an in-class lecture on a course topic	2.84	.43
• Provided a recorded lecture on a course topic.	Listened to a recorded lecture on a course topic	.65	.87
• Provided any other type of audio recording related to a course topic.	Listened to any other type of audio recording related to a course topic	1.24	.83
• Provided a video that provided additional information on a course topic.	Watched a video recording related to a course topic	1.64	.84
Highlighted critical features			
• Provided lecture notes that summarized a topic	Read lecture notes that summarized a topic	2.37	.83
• Provided notes with color-coding or highlighting of key points.	Read notes with color-coding or highlighting of key points	1.38	1.17
• Provided a graphic organizer that summarized a topic.	Viewed a graphic organizer that summarized a topic	2.33	.84
• Provided other handouts that summarized a topic.	Viewed other handouts that summarized a topic	2.87	.43
Provide multiple media and formats			
• Provided digital course materials online (e.g., Blackboard).	Accessed digital course materials online (e.g., Blackboard)	.61	1.04
• Suggested/allowed for using a text-to-speech application to listen to course material.	Used a text-to-speech application to listen to course material	.05	.22

Strategic Network Learning. The second network addressed in the UDL framework addresses the importance of providing multiple ways to present information that assists a learner in understanding the how of a learning situation. Providing instruction that addresses the strategic network of learning includes offering flexible models of skilled performance, offering opportunities for students to practice what they are learning with supports and scaffolds offering

ongoing, relevant feedback and, offering flexible opportunities for students to demonstrate their skill. There were fifteen survey items addressing this area. These are illustrated in Table 4.

Table 4. Strategic Learning Network Results.

UDL Strategic Learning Network			
Instructor Strategy	**Student Responses**	**M**	**SD**
Provide flexible models of skilled performance			
• Provided an example or model of an assignment.	Referred to an example or model of an assignment	2.39	.70
• Provided an assignment rubric or template.	Referred to an assignment rubric or template	2.25	.67
Provide opportunities to practice with supports			
• Facilitated a "hands-on" activity.	Engaged in a "hands-on" activity	2.81	.42
• Provided materials to read text alongside guiding questions.	Read text alongside guiding questions	1.48	1.07
Provide ongoing, relevant feedback			
• Was available to students for feedback on an assignment or task	Contacted the instructor to ask for feedback on an assignment or task	1.81	.75
• Suggested/allowed for students contacting other individuals to ask for feedback on an assignment or task.	Contacted another individual to ask for feedback on an assignment or task	1.24	.99
• Provided constructive feedback on an assignment.	Received constructive feedback from the instructor on an assignment	2.51	.55
Offer flexible opportunities for demonstrating skill			
• Suggested/allowed for an assignment that included images or video.	Created an assignment that included images or video	1.3	1.1
• Suggested/allowed for a spell checker to check written work.	Used a spell checker to check written work	2.67	.70
• Suggested/allowed for a	Used a word processor or other	2.76	.68

word processor or other digital writing tool to create an assignment.	digital writing tool to create an assignment		
• Suggested/allowed for a graphic organizer to plan an assignment.	Used a graphic organizer to plan an assignment	1.15	1.13
• Suggested/allowed for creation of a web-based or other digital product for an assignment.	Created a web-based or other digital product for an assignment	1.99	1.23
• Suggested/allowed for inclusion of internet hyperlinks in an assignment.	Included internet hyperlinks in an assignment	1.1	1.13
• Suggested/allowed for maintaining a digital collection or portfolio of products created for the course.	Maintained a digital collection or portfolio of products created for the course	2.11	1.06
• Suggested/allowed for use of a speech-to-text application to create a written assignment.	Used a speech-to-text application to create a written assignment	.04	1.91

Affective network learning. The third network addressed in the UDL framework addresses the importance of providing multiple ways to engage a learner in the why of a learning situation. Providing instructional strategies that addresses the affective network of learning includes offering choices of content and tools, offering adjustable levels of challenge, offering adjustable choices of learning content, and offering choices of rewards. There were five survey items addressing this area. These are illustrated in Table 5.

As noted across Tables 3, 4 and 4, there were mean scores greater than two (indicating use of the technique at least "often" or more frequently) across all of the UDL network areas. In particular, students indicated multiple representations that included in class lectures, handouts that summarized a topic, hands-on activities, multiple examples and rubrics were of most benefit to them. Opportunities that allowed them to express and represent their work through the use of digital supports and writing tools (e.g., spell checkers, word processors, digital portfolios) were encouraged. Finally, strategies and approaches that were engaging for their classroom learning included the opportunity to create digital portfolios (blogs), have the options to select their assignment topics and receive frequent feedback on their work.

C. How Engaged do Students Perceive Themselves to be in this Class?

Means and standard deviations for each of the 14 common items adapted from the Utrecht Work Engagement Scale for Students are provided in Table 6. All of these items were rated above the average by students in all of the classes with particular emphasis on tasks and graded assignments.

Table 5. Affective Learning Network Results.

Instructor Strategy	Student Perspectives	M	SD
Offer choices of content and tools			
• Posted a website to learn more about a topic in the course.	Visited a website to learn more about a topic in the course	2.12	.88
• Allowed students to select their own topic when completing an assignment.	Selected my own topic when completing an assignment	2.35	.69
Offer adjustable levels of challenge			
• Allowed students to select their own topic when completing an assignment.	Selected my own materials when completing an assignment	2.28	.73
Offer choices of learning content			
• Allowed students to decide between working alone or with partner(s) to discuss a topic or complete an assignment.	Decided between working alone or with partner(s) to discuss a topic or complete an assignment	1.51	.99
Offered choices of rewards			
• Provided feedback on an assignment.	Received feedback on an assignment	2.65	.51

Table 6. Total Interest & Engagement Scale Results.

Survey Questions Addressing Interest and Engagement	M	SD
When I am in class, I forget about everything else	2.02	1.07
I feel happy when working intensely on graded class assignments	2.23	.97
I get carried away when I'm working on class tasks and assignments	2.43	1.06
I feel happy when working intensely on tasks during class	2.45	.96
This class inspires me	2.65	1.04
Time flies when I'm in class	2.74	1.11
I am immersed in tasks during class	2.87	.97
I am enthusiastic about this class	2.90	.96
To me, graded class assignments are challenging	2.93	.91
I am immersed in the graded assignments I complete for this class	3.11	.99
I am proud of the graded assignments I complete for this class	3.36	.79
I find that graded class assignments are full of meaning and purpose	3.56	.67
I find that tasks are full of meaning and purpose	3.58	.65

The relationship of student's perception of faculty [use of] UDL use was determined by calculating a Pearson product-moment correlation to determine if a relationship existed between total student UDL and total student interest and engagement. The total student UDL composite

score (average of items attempted) represented 33 common items on *The Student Survey on Learning and Instruction in College Classrooms* for each participating student. The 14 items adapted from the *Utrecht Work Engagement Scale for Students* were grouped to form a total composite score (average score of items attempted) representing interest and engagement for each student. The total student interest and engagement composite represents the variables of interest and engagement. The Cronbach's alpha reliability coefficient for the total student UDL scale was .81 and .92 for the total interest and engagement scale. Reliability levels of .70 or greater are considered above average reliability (Schmitt, 1996).

The results of the Pearson product-moment correlation show that there was a moderate positive, statistically significant relationship between total student UDL and total interest and engagement ($r = .402$, $p < .01$.) In other words, when students perceive that the instructor is using more UDL strategies and technologies in their classes, they also report a higher level of their own interest and engagement.

B. Instructor Reflections and Perceptions.

In an interview with the instructor, she shared her perspectives on changes in course design, features she had implemented over the four semesters, and patterns that began to evolve.

Varied Representations of Content. Initially she began with a focus on developing the course to offer multiple representations across all three UDL areas: recognition, strategic and affective learning networks. This assured that a range of options were provided in how she presented course information, how students demonstrated their understanding, and how students became engaged with the content. She developed the categories for research traditions to help students recall specifics (e.g., ninja, pirate). She included a printable version of her course notes prior to each session. Students were encouraged to develop personalized blogs for their class reflections and encouraged to share content with multiple forms of media. Content material posted online was paired with pictures, cartoons, audio or video to provide multiple presentations. PowerPoint presentations used to supplement the lecture were posted prior to class. As previously noted, at the conclusion of each semester, the instructor would confer with this author to discuss practices and approaches and reflect upon what was and was not working in her practice.

Student Choice and Engagement. During the second semester of the study, she increased the emphasis on opportunities for student choice and engagement by bolstering instructional strategies that connected to student interests and backgrounds. Selected readings were purposefully chosen to match with student-expressed interests. Video and audio files were selected from contemporary artists or programs (e.g., the Glee© television program, songs by the artist Beyoncé©) to both enhance student comprehension and connect to the students' interests in mainstream pop media. In-class discussion groups were formed based on student interests and their designated multiple intelligence profiles. Increased opportunities to share feedback were provided through blog posts, email, in-class attention and after-class discussions. In addition, students were paired with peers to gain peer-feedback on research reviews.

Instructional Support and Scaffolds. By the third semester, a need for more strategic network items was identified by student evaluation comments. To adjust, the instructor provided more targeted feedback on course projects and quicker turnarounds on submitted paper drafts. Electronic comments, style and tracked changes were included in papers to scaffold student learning. She provided weekly meetings and conferences and offered more meaningful formative

assessment comments on reflective blogs. Students were provided multiple opportunities to demonstrate their understanding through in-class discussions, reflective blog posts, poster presentation displays and discussions of research as well as formal written papers.

UDL Resources. Finally, by the fourth semester, she included additional video clips and created "three minute reviews" to support noted and observed gaps in student prior knowledge. Students were required to access outside library resources to maximize their development of research products. What makes this course a success? As this instructor noted, using a UDL framework as a lens to plan her course helped her to focus on what was working in the instructional process. By focusing on the process she was able to target student learning versus the tool or application of technology. In fact, this instructor found that by the fourth semester, she observed that fewer of her students actually used the multiple resources in the course LMS but rather favored selected readings and their blogs. This suggested that they appreciated the opportunity to work with information that reflected their individual choice, interests and customized products. Developing clear goals was key to student understanding and helped her to separate the methods from the outcome. Employing the UDL framework helped to "delete a lot of the silliness" in the course and "helped to reduce course features that did not have an impact". "If it wasn't linked to the goal I took it out" (Instructor, personal communication, December 21, 2011).

VI. Discussion.

The purpose of this action-research study was to explore the reflective practice of one faculty member as she applied the UDL framework to her graduate course. This study also provided an opportunity to further analyze this college course using a survey measure designed with items representing the three UDL learning networks: recognition, strategic and affective learning. In the college classroom, student engagement is an important focus for college faculty and administrators as they seek to make the most of students' experiences on campus and understand how college provides for these opportunities (National Survey on Student Engagement, 2011). "Educators must actively collaborate about the experience of their students, talk about what students know and can do, and design new approaches to engaging students at high levels" (p. 10). Strategies and technologies that are integral to the UDL framework, particularly those aligned with the affective neural network, can encourage student interest and engagement in a classroom setting.

While numerous articles and opinion papers have discussed the value of UDL in education, few studies have demonstrated if the applied use of UDL has a relationship to student interest and engagement. This study indicated that there was a statistically significant relationship in this area. Results of this study concurred with recent research about how people learn (Bransford, Brown, & Cocking, 2000, 2002; Bransford et al. 2006), how instructional approaches correspond with the learning brain (Rose, 2001, 2005; Rose & Meyer, 2002; Rose et al. 2005), and how multiple teaching strategies satisfy individual differences in learning. Furthermore, the study coincided with others' contentions and findings that UDL approaches that make use of flexible opportunities inherent in digital formats can have a positive impact on student perceptions (Abell, Jung, & Taylor, 2011; Schelly, Davies, & Spooner, 2011)

This study contributes to the literature in this area in several ways. First, the results of this study provide a survey that begins to discern which UDL variables are perceived to have a relationship with student interest and engagement in college classrooms. Second, the results offer

data that support the relationship of UDL strategies and technologies on students' interest and engagement in college classrooms. Finally, the results provide a detailed look at how a faculty member redesigned a traditional graduate course through a UDL lens and the successes that evolved from this process.

The foundation of UDL is guided by three main principles: (1) provide multiple representations of content, (2) allow multiple opportunities for students to demonstrate mastery of content, and (3) offer multiple options to support learner engagement. Aligning the UDL framework to a college course provides a structure that includes multiple strategies and technologies to enrich an instructional situation. The UDL approach shifts reliance upon a single, printed text medium to one that is digital—increasing its transformable and malleable qualities (Rose & Meyer, 2002; Rose & Gravel, 2010). From an instructional design standpoint, UDL offers faculty a scientifically valid research framework (National UDL Center, 2011c; HEOA, 2008) from which they can plan and design effective courses that include attainable goals for all students. Many of the instructional strategies used by this faculty were identified as important to these students. Applying a UDL lens to this course had a positive relationship to student interest and engagement. Students indicated that specific strategies were important to their success in this course.

VII. Limitations.

The following limitations were factors that may have affected the results of this study. The design of the survey used in this study offered the opportunity to continue the construction of a new instrument to assess UDL in college classrooms. As with any evolving instrument, there are changes and adjustments that can be made. The subscales representing recognition, strategic and affective learning were based on the Rose and Meyer (2002) text *Teaching Every Student in the Digital Age: Universal Design for Learning*. These scales do not include the more expansive list of the nine detailed UDL Guidelines that have since been developed (National Center on UDL, 2011c).

In addition, there are only five items in the affective subscale of this survey and indicate the need for more representation in this area. Continued analysis and refinement of this survey is underway and an enhanced version of the measure is being tested with a more comprehensive representation of the nine UDL guidelines.

There was no sample technique used for this study, as this was an action-research design. The primary study focused on the reflective practice of one faculty member as she applied the UDL framework to her graduate class and results may not be appropriate to generalize to a larger population.

VIII. Conclusion and Implications.

Empirical studies demonstrating the value of UDL applied in college classrooms have been few. As faculties begin to see the benefits of UDL, there is a need to conduct research that can illustrate success of UDL and which aspects are most beneficial. Replication of this study is encouraged so that a broader sample of college classrooms might be considered as more faculties infuse UDL approaches and technologies in their teaching.

In view of the absence of a specific instrument for assessing effectiveness of UDL in postsecondary classrooms, the continued design, development and testing of such an instrument

is warranted. Since this survey addressed a relationship between the use of UDL technologies and strategies and student interest and engagement, it should continue to be refined and used. Ongoing efforts to update and enhance this survey are underway in hopes of providing a standard tool to guide postsecondary institutions and their faculties as they plan courses and consider specific UDL strategies that can be infused into instruction. This can ensure that UDL is being considered as a framework for the design of instruction, which can meet the needs of all students.

Continued efforts for enhancing faculty understanding of the benefits of instructional strategies and technologies, coordinated through a UDL lens, may encourage the broader understanding of why these approaches are beneficial to address learner variability in classrooms. Sharing research on best practices in the neurosciences, new learning theories, and the transformable qualities of emerging digital technologies may help expand the message on the value of UDL, for all learners, including those with disabilities. The changing knowledge base in the neurosciences will continue to inform how we consider and understand learning in the classroom. As a flexible educational model, UDL in turn can be an ever-changing model as we continue to learn and reflect more on the learning brain (Rose & Fischer, 2009; Rose & Strangman, 2007).

In addition, college students of the millennial generation often use the interactive features of digital media and mobile tools (Howe & Strauss, 2003; Dahlstrom et al. 2012). Expanding the instructional benefits of UDL approaches in college classrooms can capitalize upon contemporary tools such as electronic writing aids that automate organization, emerging Web 2.0 collaboration tools that facilitate discussion and sharing, and multiple formats that support and enhance their learning.

Because the UDL concept is relatively new, continued research is needed, particularly related to effectiveness of UDL for the myriad of diverse learners who are and will be attending college. Infusing UDL into campus environments underscores the focus of a campus community that provides effective teaching and learning for *all* students. The findings from this study suggest that when faculties consider the UDL framework to plan their course instruction and include UDL approaches and technologies in their classes, there is a positive relationship to student interest and engagement. Continuing to explore the effects of UDL approaches with students in college classrooms can provide additional perspectives on how these approaches can enhance their learning. The results from this study support the need for continued exploration in this area.

Appendix

Appendix 1. Student Survey on Learning and Instruction in College Classrooms.

Student Survey on Learning and Instruction in College Classrooms

College Name
Course Instructor Name and Email

You are being asked to complete this survey as part of an action research study being conducted by your instructor regarding student perceptions of how instructional strategies and technology are used in college courses. This study is a part of the reflective practice process and any information collected will be used in an effort to improve instructional practices. In addition, data collected as a part of this study will be shared with others who are interested in teaching and learning at the university level.

- You are not required to complete the survey, and there is no penalty for not completing it.
- If you do not wish to participate in the study, please do not complete the survey. Instead, return the blank survey to the envelope.
- By completing the survey, you are agreeing to participate in the study. Please return completed surveys to the envelope.
- The survey should take approximately 15 minutes to complete.
- If you have further questions about the survey, please ask your instructor at any time.
- This cover sheet includes contact information for the instructor; you may choose to tear off the cover page and keep it as a reminder of how to contact the instructor with questions about the study.

Thank you for your time.

To participate in the survey, please turn the page →

Directions: Respond to each item by placing a mark (X) in the box that indicates the frequency of your engagement in each activity.

How often have you done each of the following for this course?	**Very Often** (Once a week)	**Often** (A few times a month)	**Sometimes** (Once a month or less)	**Never**
Visited a website to learn more about a topic in the course				
Selected my own topic when completing an assignment				
Selected my own materials when completing an assignment				
Decided between working alone or with partner(s) to discuss a topic or complete an assignment				
Received feedback on an assignment				

Please turn the page →

How often have you done each of the following for this course?	**Very Often** (Once a week)	**Often** (A few times a month)	**Sometimes** (Once a month or less)	**Never**
Engaged in a "hands-on" activity				
Created an assignment that included images or video				
Used a spell checker to check written work				
Used a speech-to-text application to create a written assignment				
Used a word processor or other digital writing tool to create an assignment				
Referred to an example or model of an assignment				
Referred to an assignment rubric or template				
Used a graphic organizer to plan an assignment				
Created a web-based or other digital product for an assignment				
Included internet hyperlinks in an assignment				
Read text alongside guiding questions				
Contacted the instructor to ask for feedback on an assignment or task				
Contacted another individual to ask for feedback on an assignment or task				
Received constructive feedback from the instructor on an assignment				
Maintained a digital collection or portfolio of products created for the course				

Please turn the page →

How often have you done each of the following for this course?	**Very Often** (Once a week)	**Often** (A few times a month)	**Sometimes** (Once a month or less)	**Never**
Listened to an in-class lecture on a course topic				
Listened to a recorded lecture on a course topic				
Listened to any other type of audio recording related to a course topic				
Watched a video recording related to a course topic				
Watched a video that provided additional information related to a course topic				
Read lecture notes that summarized a topic				
Read notes with color-coding or highlighting of key points				
Viewed a graphic organizer that summarized a topic				
Viewed other handouts that summarized a topic				
Accessed digital course materials online (e.g., Blackboard)				
Used a magnifier on a computer screen to improve viewing				
Changed the background color of the computer screen to improve viewing				
Used a text-to-speech application to listen to course material				

Please turn the page →

*Directions: The following statements are about how you feel at work. Please read each statement carefully. Respond to each item by placing a mark (X) in the box that indicates how often you feel this way when thinking of **this class**.*

	Always (Every class)	**Often** (Once or twice each month)	**Sometimes** (Once a month or less)	**Rarely** (A few times or less)	**Never**
I find that tasks in class are full of meaning and purpose					
I find that graded class assignments are full of meaning and purpose					
Time flies when I'm in class					
I am enthusiastic about this class					
When I am in class, I forget about everything else					
This class inspires me					
I feel happy when working intensely on tasks during class					
I feel happy when working intensely on graded class assignments					
I am proud of the graded assignments I complete for this class					
I am immersed in the graded assignments I complete for this class					
I am immersed in tasks during class					
I get carried away when I'm working on class tasks and assignments					
To me, graded class assignments are challenging					

Please turn the page →Thank you for completing this survey. Please place it in the envelope with the other students' surveys.

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