

Universal Design for Learning on the Higher Education Campus: Retention Strategies Through Instruction

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Abstract

The present study explored the alignment of instructors' current practices with principles of Universal Design for Learning through a survey including 11 Likert-type questions. The ensuing literature review explores the efficacy of UDL as a pedagogical framework in higher education for optimal student outcomes. First, we examine how student success and retention is possible regardless of the diversity of students enrolled in a college course. Next, the principles of UDL are described and introduced as a framework to ensure student success and retention. An inquiry into previous studies provides possible solutions to support instructors in effective implementation of the UDL into their face to face, blended, and online courses.

Keywords: Universal Design for Learning, Higher Education; Retention

1.1 Introduction

Despite vast research on student retention and timely graduation in higher education settings, student success remains an area of concern. Currently, only sixty percent of enrolled students complete a bachelor's degree within six (National Center for Education Statistics, 2022). Many factors can be attributed to this lower graduation rate (Dunn and Herron, 2023). However, a promising idea has entered the higher education classroom that could mitigate the lower graduation trend. Universal Design for Learning (UDL) is a comprehensive and strategic method for presenting and assessing content that can be linked with the student's learning strengths, thereby, increasing student retention and improving graduation rates.

Universal Design for Learning (UDL) is a proactive teaching approach that emerged from the Americans with Disabilities Act (ADA). The ADA is a federal law passed in 1981 that targets community integration of people with disabilities. Specifically, ADA requires that architectural barriers be eliminated in all federal buildings that would hinder a person with a disability from fully accessing the building and its resources. The universal design of the building makes it accessible for everyone; this includes persons with disabilities.

UDL extends this idea to the learning context by making the classroom instruction accessible to all students, regardless of learning style, from the first moment of planning course instruction rather than as an addition that occurs when the need arises (Center for Applied Special Technology, 2023).

However, his seamless system is not always practiced at the higher education level. Many times, discrepancies exist between how instruction is delivered in college courses and how students learn. For example, implementing single strategies to deliver course content does not establish success for all students. To better serve students and increase completion rates, effective course instruction should reflect a student-centered approach that builds an in-depth understanding of course content through a scaffolding process (Bransford, et al., 2005).

1.2 Student Success and Retention

Learning is socially and culturally situated through scaffolding by a more knowledgeable person who guides and supports students into an in-depth understanding of new knowledge and skills (Vygotsky and Cole, 1978). Levine, Resnick and Higgins (1993) stated learning did not occur by merely receiving information and that new knowledge was not merely placed into memory. Instead, students assimilate and accommodate new understandings with previous knowledge and experiences through interactions with others. These interactions help students organize, reflect, and internalize new knowledge. Academic success becomes a reality when students internalize the new understandings and take ownership of their learning through opportunities to reflect and self-assess (Bransford, et al., 2005; Lavender, Nguyen-Rodrigues, & Spruitt, 2010). Reflection and self-assessment occurs through formative feedback from instructors that help students learn to self-monitor (Hong and O'Neil, 2001). When students have a high internal locus of control, an increase in motivation and achievement leads to academic success and persistence (Morris and Finnegan 2008). To demonstrate, Cacciamani et al (2012) reported a connection between high levels of participation, reflection, interactions to academic success in both face to face, blended, and online discussions and activities.

1.3 Universal Design for Learning

Universal Design for Learning (UDL) promotes a learning environment conducive to the diverse strengths and needs of all students through a student-centered approach (Bransford et al., 2005). The implementation of UDL principles enable learners to make connections between background and new knowledge through a scaffolding process encompassing multiple means of instructional delivery and student expression. UDL enhances student interest, engagement, and success when faculty implement UDL principles into course planning and delivery (Crosling et al., 2009; Smith, 2012; Tobin, 2014). Resembling a blueprint, UDL is a guide for creating instructional goals, planning learning activities, and assessments as ongoing assessment and student self-assessment oftentimes leads to modification of plans to meet student needs (Center for Applied Special Technology, 2023).

Universal Design Principles. Universal design for learning is best characterized by three foundational principles that form the foundation for understanding the UDL philosophy. These three principles are described below. Table One explains these principles in greater detail.

Engagement. Engagement with the learning task occurs when learners are interested in a subject, they have sustained effort and persistence to learn the objective, and they can regulate their own actions to achieve the learning goal. Engagement is characterized by individual variation. Neurology, culture, personal relevance, background knowledge and other factors may create great differences in preferential learning styles (CAST, 2018).

Representation. Variance of the representation of content is necessary to engage all learners. Many learners grasp information quickly and some need more time. Multi modal methods of representing content is necessary to reach all learners who may favor visual content over auditory or kinesthetic over visual. Multiple representation of content implies that there is not one means of representation that will be optimal for all learners (CAST, 2023).

Expression. Students with diverse abilities will be most successful when provided with multiple means of expressing what they know and understand. For example, students with movement disorders such as cerebral palsy may express their new knowledge better through using alternative text such as a computer or text to speech computer programs. Students with learning disabilities may also benefit from alternative means of expression that meets their skill strengths (CAST, 2023).

Table One Examples of UDL Principles

Provide Methods for Representing the Content of the Lesson	Provide Multiple Means of Engaging the Student	Provide Multiple Means of Action and Expression
<ul style="list-style-type: none"> • Offer varying way of customizing the display of information. • Offer alternatives for auditory or visual information. • Clarify vocabulary • Illustrate important concepts through multiple media. • Activate background knowledge 	<ul style="list-style-type: none"> • Optimize individual choice and autonomy. • Optimize relevance and value to the learner. • Foster collaboration. • Increase mastery-oriented feedback. • Encourage personal coping skills and strategies. • Develop self-assessment and reflection strategies. 	<ul style="list-style-type: none"> • Vary the methods of responses concerning a learning goal. • Use assistive technologies for expression of knowledge. • Allow students to gradually increase their proficiency toward a learning goal. • Use multiple tools for construction and composition.
(CAST, 2018)		

1.4 Barriers to UDL Implementation

Benefits to implementing UDL design principles within coursework are well noted. However, implementation is not uniform, nor always embraced. Barriers to use of the UDL framework are noted by both university professors and students with disabilities. Kranke et al., (2013) discovered that students with disabilities were fearful of losing the accommodations that had served them well in the past. For example, a redesigned classroom that includes accommodations such as unlimited timed tests might not give the student with disability the extra support they had always experienced for success. Likewise, university professors reported that a perceived lack of rigor and lack of time were barriers that might influence their adoption of UDL principles in their classroom. Limited resources, sparse professional development and a basic misunderstanding of UDL principles are further barriers described to full implementation of UDL.

2.1 Methodology

The present study seeks to assess the knowledge base of university professors at a four-year institution of higher education. Specifically, the study sought to answer the questions described below.

Research Questions

1. Is there a difference in the types of UDL principles that university professors use in their coursework?
2. To what degree do university professors perceive that they include the UDL principles of representation, expression, or engagement in college coursework?

2.2 Setting

This study took place at a regional university in Northeast Texas. The university enrolls more than 12,000 students and has over 130 degree programs. The university has six academic colleges and two schools. The university has more than ten 100% online degree programs and more than 50 hybrid/blended online degree programs.

There are six off site locations in varying geographic locations where students may receive instruction. The ethnicity make-up of the university is 43.9% White, Hispanic 20.25%, Black 20.1%, Multiracial 6.0%, International 5.2% , Asian 2.5%, Unknown 1.5%, Hawaiian .1% and Indian.5%. Male students represent 38% of the student body while females represent 62%. Only sixty nine percent of first year students return for a second year. However, only 40% of students who enter this university graduate within six years.

2.3 Instrument

The survey instrument used in this study utilized the defining categories of Universal Design for Learning as noted by the CAST website. The three defining categories include (a) representation of instruction material, (b) engagement of learners and (c) expression of material learned. The 11 question survey was based on a six point Likert scale ranging from agree to never.

Table 2 Survey Results

Question	N	Range	Minimum	Maximum	Mean	SD
Q1 To what extent do you provide multiple means of representation in your course?	78	2	1	3	2.35	.787
Q2 To what extent are you aware of assistive technology?	78	2	1	3	1.44	.695
Q2 To what extent do you use physical manipulatives (e.g. 3D models) to explain difficult concepts?	77	2	1	3	1.23	.535
Q4 To what extent do you use social media and interactive web tools to present information?	n77	10	0	10	5.91	3.167
Q5 To what extent do you allow students to use a variety of strategies to solve problems?	78	9	1	10	7.51	2.405
Q6 To what extent do you provide guides for breaking long-term goals into reachable sort-term objectives?	77	10	0	10	6.65	2.742
Q7 To what extent do you use formative feedback to assist learning with monitoring?	78	10	0	0	7.58	2.225
Q8 To what extent do you allow students to use multiple media formats?	78	10	0	10	5.37	2.990
Q9 To what extent do you provide multiple means of student engagement with course content?	78	10	0	10	6.68	2.704
Q10 Universal design for learning provides a blueprint for creating instructional goals, methods?	76	10	0	10	6.39	2.912
Q11 Universal design for learning is necessary because individuals bring a huge variety learning needs?	76	2	1	3	1.95	.831

2.4 Data Collection

The survey instrument was disseminated to all university faculty through university wide email. Two different emailings of the survey were sent out over the course of one month and 68 surveys were completed within the one month time period.

Data Analysis

Data emerging from the survey were analyzed using SPSS software. Mean data points were calculated and ranked with $X = 1.23$ being the lowest mean value and $X = 7.58$ being the highest mean value. The lower end of the ranking scale revealed that there was low agreement among professors on Questions 3, 2, 11, and 1 ($X = 1.23, 1.44, 1.95, 2.35$). Moderate agreement among professors was achieved on Questions 8, 4, 10, 6, and 9 ($X = 5.37, 5.91, 6.39, 6.65, 6.68$). The highest agreement among means occurred on Questions 5 and 7 ($X = 7.51$ and 7.58). Questions were also analyzed according to the UDL principle, the related question and the X score.

Table 3 UDL Principal Sorted by Survey Question and Mean

UDL Principle	Q#	Question	μ
Representation	3	To what extent do you use physical manipulatives (e.g. 3D models) to explain difficult concepts?	1.23
Representation	1	To what extent do you provide multiple means of representation in your course?	2.35
Representation	4	To what extent do you use social media and interactive web tools to present information?	5.91
Engagement	8	To what extent do you allow students to use multiple media formats?	5.37
Engagement	10	Universal design for learning provides a blueprint for creating instructional goals, methods?	6.39
Engagement	6	To what extent do you provide guides for breaking long-term goals into reachable short-term objectives?	6.65
Engagement	9	To what extent do you provide multiple means of student engagement with course content?	6.68
Engagement	5	To what extent do you allow students to use a variety of strategies to solve problems?	7.51
Action Expression	& 7	To what extent do you use formative feedback to assist learners with monitoring?	7.58
Action Expression	& 2	To what extent are you aware of assistive technology?	1.44
Action Expression	& 11	Universal design for learning is necessary because individuals bring a huge variety of skills.	1.95

A one way ANOVA test of the three categories of agreement (low, middle, high) reveal a statistically significant difference between each category. ($P > .10$). However, when analyzed according to the UDL principles (representation, expression, and engagement) the data reveal that the differences between these groups is not statistically significant. ($P = .08$). (see Table 4)

Table 4 One ANOVA revealing no significant differences in question responses

Source		D	Sum	of Mean	F	P-value
		F	Square	Square	Statistic	
Groups (between groups)	2	29.4737	14.7369	3.3884	0.0859	1
Error (within groups)	8	34.7941	4.3493			

3.1 Summary

The results of this study indicate that professors do not embrace UDL principles in their classes on a large scale. While some professors do indicate a need for the practice, overall there was no widespread use of UDL across departments or across the various university satellite campuses.

3.2 Implications

Several implications emerge from this study. First, the study reveals that

1. The lack of motivation among university professors in this study to integrate the UDL components may contribute to the low recidivism rates among college freshmen and those who complete their degree.
2. A larger sample size with universities in various parts of the US may yield more participants and more generalizable findings.
3. Surveying a university that currently uses UDL strategies may provide more greater understanding of ways that UDL can be used as a retention strategy in higher education.

3.3 Limitations

This study was limited to one university in Northeast Texas. Therefore, findings cannot be generalized to other universities or geographic locations.

3.4 Discussion

Universal Design for Learning is an educational framework that aims to optimize learning experiences for all students. This is especially true for students in the higher education setting who encounter barriers to learning such as those with disabilities or those who may not be prepared for the rigor of the higher education academic setting. The overarching principles of UDL (multiple means of representation, multiple means of expression, multiple means of engagement) are pivot points that can be used by the university instructor to increase success rates among students who find the higher education academic setting difficult. By incorporating these principles UDL promotes a more inclusive education and will help meet the diverse needs of learning and increase their chance for success.

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