Universal Design for Learning Implementation in Higher Education: Survey of Faculty and Instructional Designers

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Universal design for learning (UDL) is an inclusive design framework. Faculty and instructional designers were surveyed to investigate UDL implementation in higher education. This survey was based on one used by Westine et al. (2019). Results about how faculty and instructional designers learn about UDL, how instructional designers train and support faculty in UDL, and why and how participants choose to employ UDL are shared. The results from this study have provided new findings in relation to faculty and instructional designer UDL implementation efforts in higher education that have implications for training and supporting faculty with UDL application efforts.

Colleges and universities have diverse student populations, including ethnicity, gender, age, and students with disabilities (Hromalik et al., 2020), among other unique attributes that lead to learner variability. Inclusive pedagogy can help meet the needs of diverse learners. One model of inclusive pedagogy is the universal design for learning (UDL) framework, which can be implemented to diminish barriers to learning for diverse student populations (Black et al., 2014). UDL can be used to proactively design instruction for learner variability, improve pedagogy, and diminish barriers for all students in higher education (Bradshaw, 2020; Fovet & Mole, 2013; Schelly et al., 2011; Yang et al., 2024). Postsecondary stakeholders need a better understanding of UDL implementation in higher education from both faculty and instructional designer perspectives to encourage a shared vocabulary and discourse to craft policies and procedures that further UDL adoption and student success. The conceptual framework for this study is the UDL framework. The UDL framework includes guidelines for providing multiple means of action and expression, engagement, and representation and aims to produce expert learners who are purposeful and motivated, resourceful and knowledgeable, and strategic and goal-directed (CAST, 2018) and is based on research from over 800 peer-reviewed journal articles (Houston, 2018). The nine guidelines in the UDL framework, each with checkpoints that can be applied, are listed in Table 1 (CAST, 2018).

Table 1

*Universal Design for Learning Principles, Guidelines, and Descriptions**

Principle	Guideline	Description
Multiple Means of Representation	Options for Perception	Offering ways to customize displays and alternatives for auditory and visual information
	Options for Language and Symbols	Clarifying vocabulary and symbols, promote understanding across languages, and use multimedia
	Options for Comprehension	Activate prior knowledge, highlight relationships and important concepts, and maximize transfer
Multiple Means of Action & Expression	Options for Physical Action	Provide access to assistive technologies and vary response methods
	Options for Expression and Communication	Use a variety of media and tools for communication and scaffold content to provide practice opportunities
	Options for Executive Functions	Guide goal setting and strategy development
Multiple Means of Engagement	Options for Recruiting Interest	Allow for learner autonomy, optimize relevance and authenticity, and minimize distractions
	Options for Sustaining Effort and Persistence	Vary demands to increase challenge, provide mastery-oriented feedback, and foster collaboration
	Options for Self-Regulation	Facilitate personal coping strategies and develop learner self-reflection

** Adapted from the UDL Guidelines from CAST (2018).*

Literature Review

UDL is a framework that has been successfully implemented in K-12 classrooms and has the potential to reduce learning barriers, improve academic achievement, and meet the needs of all students (Ok et al., 2016). The implementation of UDL in higher education can help address learner variability and improve student success, retention, and graduation rates (Bastedo, 2013; Bradshaw, 2020; Eitzen et al., 2016; Westine et al., 2019). UDL implementation can empower faculty to support students

needing accommodations without the support of disabilities services, increase awareness among faculty of diverse learner needs, and improve equity and diversity of academic and non-academic services (Fovet & Mole, 2013; Toutain, 2019; van Kraayenoord et al., 2014). Although UDL research in higher education is still in its early stages, evidence suggests that UDL implementation has a positive impact on student perceptions of the course (Davies et al., 2013; Schelly et al., 2011).

Several literature reviews discuss UDL implementation methods and interventions. UDL implementations tend to be evaluated by learner perceptions, learner performance, or lesson design alignment to UDL (Al-Azawei et al., 2016; Roberts et al., 2011). UDL interventions have positively affected student perceptions of their learning experience and academic achievement (Al-Azawei et al., 2016; Ok et al., 2016; Seok et al., 2018). UDL application is an ongoing, iterative process of continual improvement of courses based on the changing needs of students and should be considered as a framework rather than an intervention completed after one attempt (Fornauf & Erickson, 2020; Smith et al., 2019; van Kraayenoord et al., 2014). UDL implementation can be difficult due to a lack of clarity for what guidelines mean in practice in higher education (Westine et al., 2019).

The UDL framework is complex and can be overwhelming for faculty to translate from guidelines to practice (e.g., Hromalik et al., 2020; Westine et al., 2019). The main barrier to UDL implementation in higher education, other than a lack of time, is a lack of knowledge, implying the need for professional development in UDL (Cunningham et al., 2017; Smith Canter et al., 2017). Faculty have described initial exposure to UDL and training as what persuaded them to implement UDL (Oyarzun et al., 2021). Kilpatrick et al. (2021) recommend training and instructional design support should be offered to faculty during UDL implementation to make efforts more effective.

Several studies recommended small UDL changes over time (Evmenova, 2018; Fovet & Mole, 2013; Westine et al., 2019), rather than completely redesigning entire courses or programs during professional development workshops. Follow-up recommendations after UDL training include class observations of UDL implementation (Basham et al., 2020; Rodesiler & McGuire, 2015) and having participants give UDL presentations to colleagues (Hromalik et al., 2020). It is important to implement a recurring UDL training program for new faculty to sustain momentum of a UDL campus wide initiative (Rodesiler & McGuire, 2015). Instructional designers (IDs) can provide UDL training needed in higher education and support in faculty implementation of UDL in courses. Singleton et al. (2019) investigated perspectives of IDs for online courses about defining and implementing UDL strategies and factors impacting adoption of UDL by faculty. Barriers to UDL adoption included external demands on faculty's time, lack of administrator mandates, and lack of incentives. IDs discussed the difference in faculty perspectives related to the need to provide accommodations versus UDL and proactively developing accessible content. Singleton et al. (2019) concluded with ways to improve faculty buy-in and implementation of UDL by integrating UDL in online courses consistently.

Gagné and Grimaldi (2021) described their experiences as IDs leading a reading group and training for a large-scale UDL implementation through a faculty summer camp for several campuses and disciplines. Rogers and Gronseth (2021) found that IDs viewed accessibility efforts as being at the center of UDL and fostering learning opportunities for all learners with varying abilities. Some of the themes that emerged for effective implementation of UDL and active learning included innovative instructors, funding incentives, technology and accessibility support, time, training, and administrative priority.

Purpose of Study

UDL research is in its infancy (Al-Azawei et al., 2016; Seok et al., 2018) and there is a shortage of studies on how the UDL framework is applied (Kilpatrick et al., 2021), UDL training in higher education (Hromalik et al., 2020), faculty and ID perspectives of UDL (Rogers & Gronseth, 2021), and the reasons for choosing to implement UDL in higher education (Oyarzun et al., 2021). This study is needed to provide postsecondary stakeholders with a better understanding of UDL implementation in higher education from faculty and instructional designer perspectives. This can lead to a common vocabulary and dialogue to create policies and procedures to expand UDL adoption in postsecondary education and lead to improved student success. The purpose of this study is to address this gap in the literature by surveying faculty and IDs to investigate UDL implementation in higher education. The following research questions will answer different aspects of this study:

- How do faculty and IDs learn about UDL?
- How do IDs train and support faculty in the UDL framework and implementation?
- Why do faculty and IDs choose to implement UDL?
- What are the benefits and challenges of implementing UDL?
- How do faculty and IDs implement UDL?

Methods

Two target groups working in institutions of higher education made up the research participants: faculty from a variety of academic disciplines and IDs or educational technologists. Participants who do not work in higher education as faculty or IDs/educational technologists, or who did not complete and submit the survey were excluded from the study. Participants were recruited via emails to individuals with LinkedIn profiles that mention UDL and work in higher education, social media channels including Twitter and Facebook and the Association for Educational Communications and Technology Facebook channels, and professional listservs. A raffle for five $25 Amazon gift cards was used as an incentive to recruit participants.

The demographic profile of the participant sample can be examined in Table 2. Demographic information is listed as both frequencies and percentages for the two groups of IDs and faculty separately, as well as both groups totaled together. A total of 58 IDs and 93 faculty completed the survey for 151 total participants. Female respondents made up just over 75% of participants and male respondents made up just under 24% of participants. Ethnicity of participants was 86% Caucasian, 5.3% Latino or Hispanic, 3.3% African-American or Black, and 1.3% Asian. The other respondents chose not to disclose ethnicity or listed other. Age was split among the following ranges: 4.6% were between 18-29, 27.2% were between 30-39, 26.5% were between 40-49, 31.1% were between 50-59, 9.93% were between 60-69, and 1 respondent was 70+. 94.7% of respondents were located in the United States, 4.6% were located in Canada, and 1 respondent was located in Ireland.

Most participants worked in public (43.7%) and private (34.4%) universities. Another 10.6% work in 4-year colleges and 9.9% work in community colleges. Finally, 2 respondents work in vocational, trade schools, or institutes of technology. 43% of respondents work in the applied sciences, including instructional design. 15.9% work in the social sciences; 12.6% work in the humanities; 12.6% work in the natural sciences; 9.27% work in library science; 5.3% work in health sciences; and 2 respondents work in other areas. In terms of position, participants work as staff or IDs (29.8%), adjuncts (5.3%), instructors/lecturers (4.6%), non-tenure track faculty (15.9%), tenure-track faculty (9.9%), tenured faculty (24.5%), had multiple roles (1.3%), or served as IDs and adjuncts or instructors (8.6%). In terms of familiarity with the UDL framework, 66.7% of faculty and 94.8% of IDs were familiar, 11.8% of faculty and 5.2% of IDs were possibly familiar with the framework, and 21.5% of faculty were not familiar with UDL.

Table 2

Demographic Profile

Gender	IDs	IDs %	Faculty	Faculty %	Total	Total %
Male	14	24.14	22	23.66	36	23.84
Female	43	74.14	71	76.34	114	75.50
Prefer Not to Say	1	1.72	0	0.00	1	0.66
Total	58	100.00	93	100.00	151	100.00
Ethnicity	**IDs**	**IDs %**	**Faculty**	**Faculty %**	**Total**	Total %
African American or Black	1	1.72	4	4.30	5	3.31
Asian	0	0.00	2	2.15	2	1.32
Caucasian	47	81.03	83	89.25	130	86.09
Latino/Hispanic	5	8.62	3	3.23	8	5.30
Other/Unknown	2	3.45	0	0.00	2	1.32
Prefer not to say	3	5.17	1	1.08	4	2.65
Total	58	100.00	93	100.00	151	100.00
Age	**IDs**	**IDs %**	**Faculty**	**Faculty %**	**Total**	Total %
18-29	4	6.90	3	3.23	7	4.64
30-39	19	32.76	22	23.66	41	27.15
40-49	16	27.59	24	25.81	40	26.49
50-59	15	25.86	32	34.41	47	31.13
60-69	4	6.90	11	11.83	15	9.93
70+	0	0.00	1	1.08	1	0.66
Total	58	100.00	93	100.00	151	100.00
Location	**IDs**	**IDs %**	**Faculty**	**Faculty %**	**Total**	Total %
United States	56	96.55	87	93.55	143	94.70
Canada	1	1.72	6	6.45	7	4.64
Ireland	1	1.72	0	0.00	1	0.66
Total	58	100.00	93	100.00	151	100.00
Institution	**IDs**	**IDs %**	**Faculty**	**Faculty %**	**Total**	Total %
Vocational/Trade School/Institute of Technology	0	0.00	2	2.15	2	1.32
Community College	4	6.90	11	11.83	15	9.93
Public 4-year College	1	1.72	3	3.23	4	2.65
Private 4-year College	5	8.62	7	7.53	12	7.95
Public University	33	56.90	33	35.48	66	43.71
Private University	15	25.86	37	39.78	52	34.44
Total	58	100.00	93	100.00	151	100.00
Discipline	**IDs**	**IDs %**	**Faculty**	**Faculty %**	**Total**	Total %
Applied Sciences (includes instructional design)	39	67.24	26	27.96	65	43.05
Humanities	5	8.62	14	15.05	19	12.58
Library Science	0	0.00	14	15.05	14	9.27
Natural Sciences or STEM	6	10.34	13	13.98	19	12.58
Social Sciences	5	8.62	19	20.43	24	15.89

Gender	IDs	IDs %	Faculty	Faculty %	Total	Total %
Health Sciences	2	3.45	6	6.45	8	5.30
Other	1	1.72	1	1.08	2	1.32
Total	58	100.00	93	100.00	151	100.00
Position	**IDs**	**IDs %**	**Faculty**	**Faculty %**	**Total**	Total %
Staff, instructional designer	45	77.59	0	0.00	45	29.80
Adjunct	1	1.72	7	7.53	8	5.30
Instructor or Lecturer	3	5.17	4	4.30	7	4.64
Multiple Roles	0	0.00	2	2.15	2	1.32
ID and Adjunct or Instructor	9	15.52	4	4.30	13	8.61
Faculty, non-tenure track	0	0.00	24	25.81	24	15.89
Faculty, tenure-track	0	0.00	15	16.13	15	9.93
Faculty, tenured	0	0.00	37	39.78	37	24.50
Total	58	100.00	93	100.00	151	100.00

Participants were asked to complete the survey instrument within the LibWizard survey tool (https://briarcliff.libwizard.com/f/surveyresearch), adapted with permission from a study by Westine et al. (2019). The survey instrument was piloted by three faculty members from different disciplines (English, education, and history) and three IDs who provided feedback on improving the survey. The pilot participants had varying levels of UDL knowledge. By piloting the survey with individuals representing both study groups, several weaknesses were found and modified, which helped improve the likelihood of validity. The survey instrument can be reviewed in the Appendix. This study has been approved by the institutional review board at the research institution. A consent form and the online survey were shared through social media sites (Facebook and Twitter), listservs for faculty and IDs, and via email based on LinkedIn profiles that mentioned UDL through the end of September 2022.

The closed-ended questions were analyzed using frequencies and percentages of responses. The question about how valuable each of the UDL guidelines were for participants was analyzed using the rank function in Excel to determine how faculty, IDs, and the total group of participants ranked the different UDL guidelines. In vivo and pattern coding methods recommended by Saldaña (2021) were utilized to code the open-ended survey questions. Two raters coded the open-ended questions; they coded ten (five IDs and five faculty) surveys independently and reached a consensus on how to apply the same coding methods for the rest of the survey responses. There was an interrater agreement rate of 95% and differences were discussed until a consensus was reached. Results included an initial list of 92 codes for the first question, 242 codes for the second question, 353 codes for the third question, and 314 codes for the final question. This initial list of codes was organized through pattern coding into categories or themes, which are shared in Tables 3 and 4.

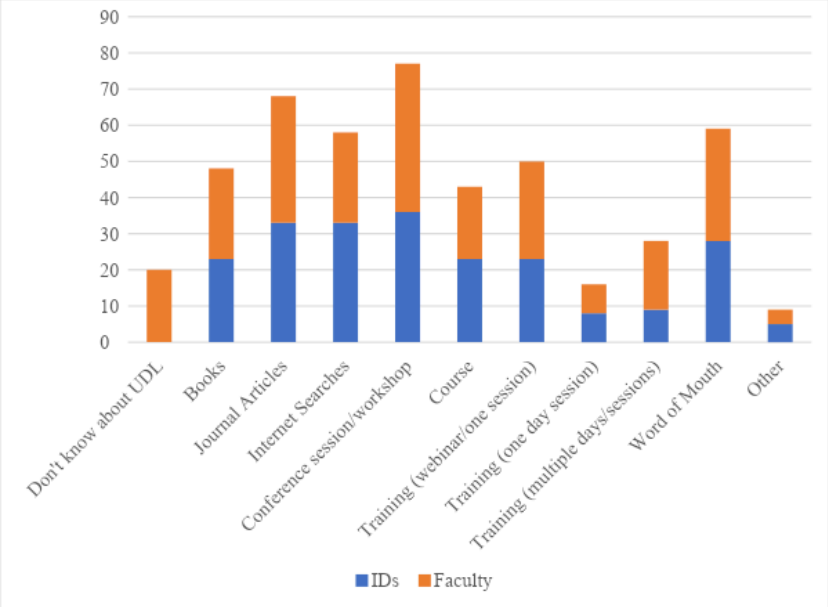
Results

RQ1. How Participants Learned About the UDL Framework

Participants learned about UDL in a variety of ways, and some learned about UDL in multiple ways (see Figure 1). The most prevalent ways of learning about UDL for both faculty and IDs was through conference session or workshop (36 IDs; 41 faculty), followed by journal articles and internet searches for faculty (33 for both methods) and journal articles (35) and word of mouth (31) for IDs.

Figure 1

How Participants Learned About the UDL Framework

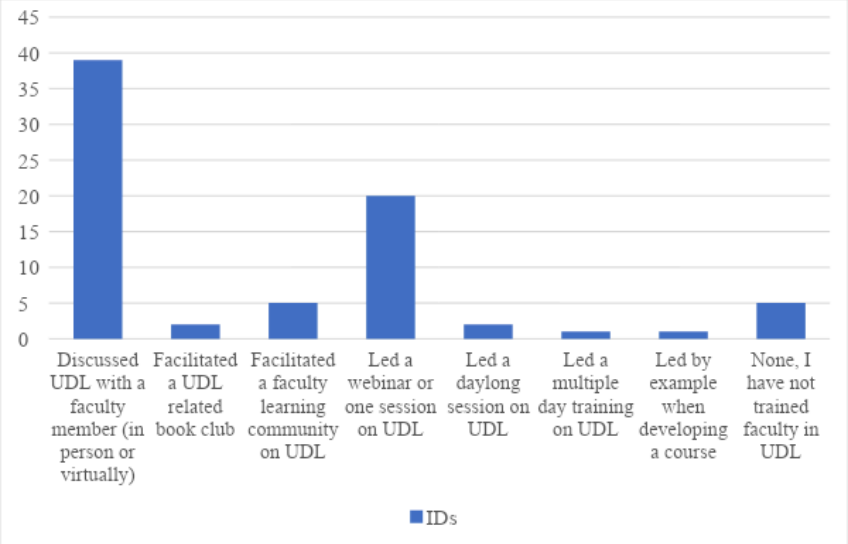


RQ2. How IDs train and support faculty in UDL

The majority of IDs (82.2%) have helped faculty learn about or apply the UDL framework. Training methods utilized by IDs varied with most leading discussions (39) or providing a webinar (20) (see Figure 2).

Figure 2

Instructional Designer Training Methods for Faculty



IDs supported faculty in applying the UDL framework through a variety of ways, displayed in Table 3. Training, discussions, accessibility support, coaching, and guidance for specific UDL techniques were the most prevalent support methods. Some IDs did not support UDL application since they did not discuss UDL explicitly, lacked UDL training or knowledge, time, or were dealing with faculty resistance.

Table 3

Methods of IDs Supporting Faculty in Applying the UDL Framework

Themes and examples	Number of mentions
Training	20
Discussions	14

Themes and examples	Number of mentions
Specific UDL techniques	11
Accessibility support	10
Coaching	10
Course design	9
Modelling	5
Other	5
Not supporting UDL application:	8

RQ3. Why faculty and IDs choose to implement UDL

The reasons for applying UDL were shared within nine themes in Table 4. Most frequent reasons involved equity and inclusion (i.e., supporting values of inclusion or creating equitable access) and specific UDL techniques or benefits (i.e., encouraging a growth mindset or creating relevance for each learner). Reasons given for not applying UDL included librarian faculty only taught one-shot instructions, lacking time or knowledge, and applying another pedagogy.

Table 4

Reasons Contributing to the UDL Implementation

Themes	Number of mentions
Equity and inclusion	IDs: 18; Faculty: 46
Specific UDL techniques/benefits	IDs: 11; Faculty: 33
Best practice	IDs: 20; Faculty: 18
Accessibility	IDs: 19; Faculty: 18
Student variability or barriers	IDs: 8; Faculty: 17
Course design	IDs: 6; Faculty: 7
Course or overall environment	IDs: 2; Faculty: 8
Other	IDs: 2; Faculty: 4
Top-down or university-wide	IDs: 3; Faculty: 3
Not applying UDL	IDs: 5; Faculty: 14

RQ4. Benefits and challenges of implementing UDL

Challenges and benefits of implementing UDL help describe reasons faculty and IDs choose whether or not to implement UDL and can be viewed in Table 5. For example, the most predominant benefits of implementing UDL were diversity, equity, and inclusion, accessibility, and student success or achievement. This suggests that faculty and IDs chose to implement UDL based on these benefits. On the other hand, the top challenges of lack of time, complexity of the framework, and faculty attitudes could prevent some faculty and IDs from choosing to implement UDL.

Table 5

Benefits and Challenges of UDL Implementation

Benefits	Number of mentions
Diversity, equity, and inclusion	IDs: 21; Faculty: 33
Accessibility	IDs: 17; Faculty: 33
Student success/achievement	IDs: 15; Faculty: 27
Other specific student benefits	IDs: 8; Faculty: 30
Student engagement	IDs: 10; Faculty: 25
Student Agency	IDs: 10; Faculty: 9
UDL traits	IDs: 7; Faculty: 12
General faculty benefits	IDs: 4; Faculty: 14
Course/university level benefits	IDs: 5; Faculty: 5
Attitudes	IDs: 3; Faculty: 5

Benefits	Number of mentions
Student mental health	IDs: 3; Faculty: 3
Assessment	IDs: 1; Faculty: 4
Community	IDs: 2; Faculty: 3
Don't know any benefits	IDs: 0; Faculty: 5
Challenges	**Number of mentions**
Lacking time	IDs: 36; Faculty: 67
Complexity of the framework	IDs: 22; Faculty: 34
Faculty attitudes	IDs: 29; Faculty: 18
Needing training	IDs: 16; Faculty: 20
Lacking technology	IDs: 11; Faculty: 12
Lacking supports in place	IDs: 14; Faculty: 7
Campus	IDs: 7; Faculty: 13
Lacking resources/money	IDs: 5; Faculty: 11
Students	IDs: 4; Faculty: 8
Other	IDs: 4; Faculty: 4
UDL not eliminating the need for accommodations	IDs: 2; Faculty: 5
Sustaining implementation	IDs: 1; Faculty: 3
Challenge-free environment supports in place	IDs: 14; Faculty: 7

RQ5. How faculty and IDs implement UDL

IDs and faculty also shared which UDL guidelines they used (see Figure 3). Most used one or more guidelines, and several used all nine guidelines. Similarly, participants shared how comfortable they felt in applying the UDL framework (see Figure 4). Many participants felt comfortable applying UDL without assistance (24.1% of IDs; 40.9% of faculty). IDs tended to feel more comfortable training (34.5%) or mentoring others (31.0%) than faculty (10.8% for each).

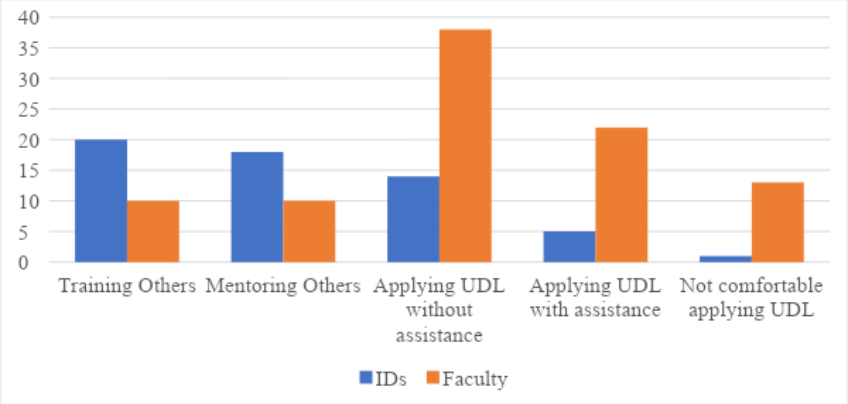
Figure 3

UDL Guidelines Used in Teaching or Work

Note. Participants could select multiple guidelines. Bar charts portray participant counts for each guideline.

Figure 4

Comfort Level in Applying the UDL Framework



Extent of UDL Principles Used

Three questions described the ways participants presented information in courses, engaged students, and assessed learning, which corresponded to the three overarching UDL principles. Response choices ranged from more than one way in all units (i.e., modules or weeks), more than one way in most units, more than one way in some units (i.e., different ways used within the same unit sometimes), more than one way in different units (i.e., different ways used in different units), or use one way in all units. Results can be viewed in Table 6.

Table 6

Ways Used to Present, Engage, and Assess in Courses

Ways Used to Present Information in Courses	IDs	Percentage	Faculty	Percentage	Total	Percentage
More than one way in all units	7	53.8	19	20.4	26	24.5
More than one way in most units	5	38.5	30	32.3	35	33.0
More than one way in some units	1	7.7	27	29.0	28	26.4
More than one way in different units	0	0.0	13	14.0	13	12.3
Use one way in all units	0	0.0	4	4.3	4	3.8
Total	13		93		106	
Ways Used to Engage Students in Courses	**IDs**	**Percentage**	**Faculty**	**Percentage**	**Total**	**Percentage**
More than one way in all units	7	53.8	19	20.4	26	24.5
More than one way in most units	5	38.5	30	32.3	35	33.0
More than one way in some units	1	7.7	27	29.0	28	26.4
More than one way in different units	0	0.0	13	14.0	13	12.3
Use one way in all units	0	0.0	4	4.3	4	3.8
Total	13		93		106	
Ways Used to Assess Learning in Courses	**IDs**	**Percentage**	**Faculty**	**Percentage**	**Total**	**Percentage**
More than one way in all units	5	38.5	14	15.1	19	17.9
More than one way in most units	5	38.5	28	30.1	33	31.1
More than one way in some units	2	15.4	21	22.6	23	21.7
More than one way in different units	1	7.7	17	18.3	18	17.0
Use one way in all units	0	0.0	13	14.0	13	12.3
Total	13		93		106	

Perceptions of UDL Guideline Importance

Faculty and instructional designers were asked to rank the UDL guidelines in order of importance. Ranks for IDs, faculty, and total participants were determined through the rank function in Excel with the formula of RANK(number,ref,[order]). These rankings are shared in Table 7 for IDs, faculty, and total participants.

Table 7

Participant Rankings of UDL Guidelines

	IDs Rank	Faculty Rank	Total Rank
Comprehension	2	1	1
Perception	1	2	2
Expression and Communication	3	3	3
Language and Symbols	4	4	4
Recruiting Interest	5	5	5
Executive Function	6	6	6
Physical Action	7	8	7
Sustaining Effort and Persistence	9	7	8

	IDs Rank	Faculty Rank	Total Rank
Self-Regulation	8	9	9

Discussion

This survey was based on one used by Westine et al. (2019) given to faculty teaching online courses at one institution. This study expanded the sample to include faculty at institutions across the United States, Canada, and one in Ireland as well as IDs from those institutions. This study also did not focus specifically on online teaching, but generally on implementing UDL in higher education. Results will be compared between the current study and the study by Westine et al. (2019) when applicable, along with other applicable studies.

How do faculty and IDs learn about UDL?

Westine et al. (2019) found that faculty respondents were interested in learning how to apply UDL guidelines in online courses. Results from this survey share the ways that faculty have previously learned about UDL and suggest training methods that IDs and faculty may want to utilize. The present survey found that faculty and IDs learned about UDL in a variety of ways including webinar, daylong, or multiple session trainings; conference sessions or workshops; and journal articles predominantly. They also learned about UDL through books, internet searches, a course, word of mouth, or other methods. Twenty faculty participants did not know about UDL.

One implication of these results is that it may be best to offer a variety of professional development opportunities to faculty to help them learn about the UDL framework and implementation. Hills et al. (2022) similarly described a need for UDL training to increase faculty knowledge of UDL, promote UDL on campus, and increase UDL implementation. IDs and faculty that want to help others learn about UDL may succeed by offering a variety of training opportunities, sharing articles or websites with faculty related to UDL, and discussing UDL in course design conversations. This relates to the second research question.

How do IDs train and support faculty in the UDL framework and implementation?

IDs tended to feel more comfortable with UDL and training or mentoring others than faculty, and the majority of IDs have helped faculty learn about or apply the UDL framework. A variety of training methods were utilized by IDs when training faculty in the UDL framework, the most prevalent being discussions and webinars or one-session trainings in UDL. Fewer instructional designers used other methods, including two who offered a book club similar to the reading group offered by Gagné and Grimaldi (2021), five who offered faculty learning groups, and one ID led a multiple day training similar to the one offered by Hromalik et al. (2020).

The open-ended question regarding IDs support of faculty in applying UDL brought up additional methods that IDs utilized in supporting or training faculty beyond discussions and webinars/one-session trainings, including supporting faculty in applying specific UDL checkpoints, coaching, accessibility support, course design, and modelling the UDL framework by applying UDL themselves. Several IDs described the reasons they did not support faculty UDL application since they did not explicitly discuss UDL, lacked training or knowledge of UDL, lacked time, or dealt with faculty resistance. Some IDs also brought up the difference between recommending that faculty apply UDL and enforcing that faculty apply UDL. Several IDs discussed not having the authority to require faculty to use specific instructional strategies, but they could recommend strategies like the UDL guidelines. Some chose to couch UDL guidelines as best practices rather than explicitly discussing the UDL framework or accessibility. This is an interesting finding that deserves further research about the fine line that IDs walk between recommending UDL versus best practices and which of these is the more effective method for increasing UDL implementation in higher education. The answer may vary by institution and context. This relates to the importance of the partnership between IDs and faculty discussed by Singleton et al. (2019).

Why do faculty and IDs choose to implement UDL?

Generally, this study agrees with much of the previous research about the benefits and challenges of UDL implementation in higher education, which influences why faculty and IDs may choose whether or not to implement UDL. Many of the reasons given for applying UDL included accessibility, it being a best practice, meeting the needs for student variability, diminishing learning barriers, and equity and inclusion, which could all be categorized under an overarching theme of diversity, equity, and inclusion. Many benefits described were previously listed in the literature, including improving accessibility (Al Azawei et al., 2016; Houston, 2018; Rogers & Gronseth, 2021; Yang et al., 2024), giving students more agency in their learning (Evmenova, 2018; Rogers & Gronseth, 2021; Yang et al., 2024), improving student success and achievement (Bradshaw, 2020; Eitzen et al., 2016; Fovet & Mole, 2013; Ok et al., 2016; Schelly et al., 2011), and improving retention (Bastedo et al., 2013; Bradshaw, 2020; Eitzen et al., 2016; Fovet & Mole, 2013; Houston, 2018; Westine et al., 2019).

Faculty and IDs listed a lack in time and knowledge as the main reasons for not applying UDL. The lack of time is the challenge described in most of the literature on UDL implementation (Hills et al., 2022; Kilpatrick et al., 2021; Rogers & Gronseth, 2021), but the lack of knowledge is also discussed (Cunningham et al., 2017; Smith Canter et al., 2017). The lack in knowledge could be remedied by further training and support from IDs. This finding has the implication that although IDs may not have the authority to enforce UDL implementation, sharing information about UDL and training faculty in UDL in a variety of ways would help faculty overcome the lack of knowledge barrier and improve the level of UDL implementation on college campuses. Another key challenge to implement UDL included being overwhelmed with choice, which could be partially overcome by IDs offering training and support in UDL application.

There were unexpected responses to challenges to UDL implementation, including the need for additional accommodations after UDL implementation. This is directly related to the benefit of improving accessibility of course materials. Some faculty or IDs may wrongly assume that implementing UDL will remove the need for additional accommodations. Implementing UDL will likely decrease the need for accommodations, but it will not completely eliminate this need, possibly due to the varied implementation techniques utilized and level of implementation. Some students were overwhelmed with choices in UDL implemented courses. While choice can improve student agency and autonomy, too much choice can have the adverse effect of overwhelming students. Finally, a few respondents noted that sustaining UDL implementation over time was a challenge. Further research on UDL implementation efforts over a longer timeframe is recommended.

How do faculty and IDs implement UDL?

Faculty and IDs shared which UDL guidelines they implemented in their teaching or work with most using one or more guidelines and several using all nine of the UDL guidelines. There were only four faculty respondents that did not use any of the guidelines. Comfort levels applying UDL differed between faculty and IDs with most faculty being comfortable applying UDL with or without assistance and one third of IDs being comfortable applying UDL with or without assistance. IDs felt more comfortable training or mentoring others in UDL than faculty were. Though results differed slightly with the use of UDL principles within courses or work for the current research and the study by Westine et al. (2019), comparing the results from Westine et al. (2019) to the current study suggests they may be replicable across a wider sample of faculty and IDs in higher education.

Similarly, results for the faculty ranking of the UDL guidelines can be compared between the two studies. Westine et al. (2019) found that faculty ranked comprehension, expression and communication, and perception as the most valued. In this study, faculty ranked comprehension as the most important, followed by perception and expression and communication as the most highly valued principles. The other guidelines rankings varied, but it is interesting to note the similarities between the two studies. These were also the top three ranked guidelines for IDs. These findings suggest that IDs may want to begin training in UDL by focusing on the guidelines most valued by faculty including comprehension, expression and communication, and perception.

Limitations

One of the main limitations of this study is that most participants are located in the United States with 35 states represented. There were seven participants from Canada and one from Ireland. The sample size of 151 is reasonable for a voluntary survey, though a larger sample size of IDs would be preferable. Additional research is recommended, particularly from an international perspective to explore if these results would be similar in other locations. It would also be beneficial to obtain more in-depth, qualitative responses related to these research questions to further explore UDL implementation in higher education, particularly exploring more deeply the potential similarities or differences in use and ranking of guidelines by novice and experienced faculty and IDs with differing comfort levels with UDL. Additional research on IDs' role in supporting and recommending UDL implementation, more longitudinal research over time, and investigating the value faculty and IDs place on different UDL guidelines is recommended.

Conclusion

The results from this study have provided new findings in relation to faculty and IDs UDL implementation efforts in higher education. The variety of ways that faculty learned about the UDL framework were examined. Similarly, the open-ended questions attempted to answer why and how faculty choose to implement UDL. Faculty shared how they implemented each of the overarching UDL principles when responding to the questions about the ways they present information, engage students, and assess learning. IDs shared how they support faculty implementation efforts and how they train faculty in UDL. While this study met its purpose in examining UDL implementation in higher education, more research is needed on the topic.

IDs can take the results of this study into consideration when supporting faculty or designing training for faculty in UDL by focusing on the guidelines most frequently used by participants. Similarly, IDs and others supporting faculty in UDL implementation can focus on the guidelines ranked as most valuable by participants. In practice, IDs can recommend that faculty implement UDL because of the benefits described by participants in the current study and support faculty in implementing UDL techniques and overcoming challenges. Faculty and IDs can utilize inclusive instructional practices by implementing the UDL framework in postsecondary education.

References

Al-Azawei, A., Serenelli, F., & Lundqvist, K. (2016). Universal design for learning (UDL): A content analysis of peer-reviewed journal papers from 2012 to 2015. *Journal of the Scholarship of Teaching and Learning, 16*(3), 39-56. https://doi.org/10.14434/josotl.v16i3.19295

Basham, J. D., Gardner, J. E., & Smith, S. J. (2020). Measuring the implementation of UDL in classrooms and schools: Initial field test results. *Remedial and Special Education, 41*(4), 231-243. https://doi.org/10.1177/0741932520908015

Bastedo, K., Sugar, A., Swenson, N., & Vargas, J. (2013). Programmatic, systematic, automatic: An online course accessibility support model. *Journal of Asynchronous Learning Networks, 17*(3), 87-102. Retrieved June 18, 2022, from https://eric.ed.gov/?id=EJ1018300

Black, R. D., Weinberg, L. A., & Brodwin, M. G. (2014). Universal design for instruction and learning: A pilot study of faculty instructional methods and attitudes related to students with disabilities in higher education. *Exceptionality Education International, 24*(1), 48-64. https://doi.org/10.5206/eei.v24i1.7710

Bradshaw, D. G. (2020). Examining beliefs and practices of students with hidden disabilities and universal design for learning in institutions of higher education. *Journal of Higher Education Theory and Practice, 20*(15), 12-20. https://doi.org/10.33423/jhetp.v20i15.3933

CAST. (2018). *Universal design for learning guidelines version 2.2.* Retrieved from http://udlguidelines.cast.org

Cunningham, M. P., Huchting, K. K., Fogarty, D., & Graf, V. (2017). Providing access for students with moderate disabilities: An evaluation of a professional development program at a Catholic elementary school. *Journal of Catholic Education, 21*(1), 138-170. https://doi.org/10.15365/joce.2101072017

Davies, P. L., Schelly, C. L., & Spooner, C. L. (2013). Measuring the effectiveness of universal design for learning intervention in postsecondary education. *Journal of Postsecondary Education & Disability*, *26*(3), 195–220.

Eitzen, A. M., Kinney, M. A., & Grillo, K. J. (2016). Changing the praxis of retention in higher education: A plan to teach all learners. *Change, 48*(6), 58-66. https://doi.org/10.1080/00091383.2016.1247584

Evmenova, A. (2018). Preparing teachers to use universal design for learning to support diverse learners. *Journal of Online Learning Research, 4*(2), 147-171. Retrieved June 18, 2022, from https://eric.ed.gov/?id=EJ1184985

Fornauf, B. S., & Erickson, J. D. (2020). Toward an inclusive pedagogy through universal design for learning in higher education: A review of the literature. *Journal of Postsecondary Education and Disability*, *33*(2), 183–199.

Fovet, F., & Mole, H. (2013). UDL- from disabilities office to mainstream class: How the tools of a minority address the aspirations of the student body at large. *Collected Essays on Learning and Teaching, 6*, 121-126. https://doi.org/10.22329/celt.v6i0.3762

Gagné, A., & Grimaldi, A. (2021). Designing together from moment to movement: A faculty framework for access online. *The Journal of Applied Instructional Design, 10*(1). Retrieved June 18, 2022, from https://edtechbooks.org/jaid_10_1/designing_together

Hills, M., Overend, Al., & Hildebrandt, S. (2022). Faculty perspectives on UDL: Exploring bridges and barriers for broader adoption in higher education. *The Canadian Journal for Scholarship of Teaching and Learning, 13*(1). https://doi.org/10.5206/cjsotlrcacea.2022.1.13588

Houston, L. (2018). Efficient strategies for integrating universal design for learning in the online classroom. *Journal of Educators Online, 15*(3), 1-16. Retrieved June 18, 2022, from https://www.thejeo.com/archive/archive/2018_153/houstonpdf

Hromalik, C. D., Myhill, W. N., & Carr, N. R. (2020). "All faculty should take this:" A universal design for learning training for community college faculty. *TechTrends, 64*, 91-104. https://doi.org/10.1007/s11528-019-00439-6

Kilpatrick, J. R., Ehrlich, S., & Bartlett, M. (2021). Learning from COVID-19: Universal design for learning implementation prior to and during a pandemic. *The Journal of Applied Instructional Design, 10*(1). https://dx.doi.org/10.51869/101jkmbse

Moore, E., Smith, F., Hollingshead, A., & Wojcik, B. (2018). Voices from the field. *Journal of Special Education Technology, 33*(1), 40-53. https://doi.org/10.1177/0162643417732293

Ok, M. W., Rao, K., Bryant, B. R., & McDougall, D. (2016). Universal design for learning in pre-k to grade 12 classrooms: A systematic review of research. *Exceptionality: A Special Education Journal, 25*(2), 116-138. https://doi.org/10.1080/09362835.2016.1196450

Oyarzun, B., Bottoms, B. L., & Westine, C. (2021). Adopting and applying the universal design for learning principles in online courses. *The Journal of Applied Instructional Design, 10*(1), 78-87. Retrieved June 18, 2022, from https://edtechbooks.org/jaid_10_1/adopting_and_applyin

Roberts, K. D., Park, H. J., Brown, S., & Cooke, B. (2011). Universal design for instruction in postsecondary education: A systematic review of empirically based articles. *Journal of Postsecondary Education and Disability, 24*(1), 5-15.

Rodesiler, C. A., & McGuire, J. M. (2015). Ideas in practice: Professional development to promote universal design for instruction. *Journal of Developmental Education, 38*(2), 24-26, 28-31.

Rogers, S. A., & Gronseth, S. L. (2021). Applying UDL to online active learning. *The Journal of Applied Instructional Design, 10*(1), 7-20. Retrieved June 18, 2022, from https://edtechbooks.org/jaid_10_1/applying_udl_to_onli

Saldaña, J. (2021). *The coding manual for qualitative researchers* (4th ed.). Sage Publications.

Schelly, C. L., Davies, P. L., & Spooner, C. L. (2011). Student perceptions of faculty implementation of universal design for learning. *Journal of Postsecondary Education and Disability*, *24*(1), 17–30.

Seok, S., DaCosta, B., & Hodges, R. (2018). A systematic review of empirically based universal design for learning: Implementation and effectiveness of universal design in education for students with and without disabilities at the postsecondary level. *Open Journal of Social Sciences, 6,* 171-189. https://doi.org/10.4236/jss.2018.65014

Singleton, K., Evmenova, A., Jerome, M. K., & Clark, K. (2019). Integrating UDL strategies into the online course development process: IDs' perspectives. *Online Learning Journal, 23*(1), 206-235. https://doi.org/10.24059/olj.v23i1.1407

Smith, S. J., Rao, K., Lowrey, K. A., Gardner, J. E., Moore, E., Coy, K., Marino, M., & Wojcik, B. (2019). Recommendations for a national research agenda in UDL: Outcomes from the UDL-IRN preconference on research. *Journal of Disability Policy Studies, 30*(3), 174-185. https://doi.org/10.1177/1044207319826219

Smith Canter, L. L., King, L. H., Williams, J. B., Metcalf, D., & Rhys Myrick Potts, K. (2017). Evaluating pedagogy and practice of universal design for learning in public schools. *Exceptionality Education International*, *27*(1), 1–16.

Toutain, C. (2019). Barriers to accommodations for students with disabilities in higher education: A literature review. *Journal of Postsecondary Education and Disability, 32*(3), 297-310.

Van Kraayenoord, C. E., Waterworth, D., & Brady, T. (2014). Responding to individual differences in inclusive classrooms in Australia. *Journal of International Special Needs Education*, *17*(2), 48–59. https://doi.org/10.9782/2159-4341-17.2.48

Westine, C. D., Oyarzun, B., Ahlgrim-Delzell, L., Casto, A., Okraski, C., Park, G., Person, J., & Steele, L. (2019). Familiarity, current use, and interest in universal design for learning among online university instructors. *International Review of Research in Open and Distributed Learning, 20*(5), 20-41. https://doi.org/10.19173/irrodl.v20i5.4258

Yang, M., Duha, M. S. U., Kirsch, B. A., Glaser, N., Crompton, H., & Luo, T. (2024). Universal design in online education: A systematic review. *Distance Education.* https://doi.org/10.1080/01587919.2024.2303494

Appendix

Faculty and Instructional Designer Perspectives on Universal Design for Learning (UDL) Implementation in Higher Education Survey

Demographics

Please select your gender identity.

- Female
- Male
- Non-binary
- Prefer not to answer

Select your ethnicity (please check all that apply).

- African-American or Black
- Asian
- Caucasian
- Latino or Hispanic
- Native American
- Native Hawaiian or Pacific Islander
- Other/Unknown
- Prefer not to answer

Please select your current age range.

- 18-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70+

Where do you live?

- Africa
- Asia
- Australia
- Caribbean Islands
- Central America
- Europe
- North America-Canada
- North America-Mexico
- North America-United States
- Pacific Islands
- South America
- Prefer not to say
- Please type in the country name, territory, or city where you live.

Professional Practice

Where do you work? If you work for multiple institutions, please check all that apply.

- Public University
- Private University
- Public 4-year College
- Private 4-year College
- Community College
- Vocational/Trade School/Institute of Technology
- I do not work in a higher education institution

Select your broad discipline or academic area.

- Humanities (i.e., history, religion, arts, philosophy)
- Social Sciences (i.e., political science, psychology, sociology, social work)
- Natural Sciences or STEM (i.e., biology, chemistry, physics, computer science, mathematics)
- Applied Sciences (i.e., agriculture, architecture, business, education, instructional design, law, transportation)
- Other

What is your institutional status? Please select the option(s) that apply to your current position.

- Staff, instructional designer, or educational technologist
- Adjunct
- Instructor or Lecturer
- Faculty, non-tenure track
- Faculty, tenure-trace
- Faculty, tenured
- Other

Are you familiar with the Universal Design for Learning (UDL) Framework (with the overarching principles of providing multiple means of engagement, representation, or action and expression)?

- Yes
- Maybe
- No

How did you learn about the UDL Framework? Please select all that apply.

- Book(s)
- Journal Articles
- Internet Searches
- Conference Session or Workshop
- Course
- Training (webinar or one session)
- Training (a daylong session)
- Training (multiple days/sessions)
- Word of Mouth from Colleagues
- Other

Which of the following UDL guidelines do you use in your teaching or work? You may not have been familiar with the UDL framework, but you may apply aspects of the UDL guidelines in your courses. Please read through the guidelines and examples carefully and select all that apply.

- 1: Provide options for perception (For example: alternatives for auditory and visual information or offering ways of customizing the display of information)
- 2: Provide options for language and symbols (For example: clarifying vocabulary, symbols, syntax, and structure; promoting understanding across languages)
- 3: Provide options for comprehension (For example: activating or supplying background knowledge; highlighting patterns, critical features, big ideas and relationships; guiding information processing and visualization)
- 4: Provide options for physical action (For example: varying the methods for response and navigation; optimizing access to tools and assistive technologies)
- 5: Provide options for expression and communication (For example: using multiple media for communication; using multiple tools for construction and composition; building fluencies with graduated levels of support for practice)
- 6: Provide options for executive functions (For example: guiding appropriate goal setting; supporting planning and strategy development; facilitating the management of information and resources; enhancing capacity for monitoring progress)
- 7: Provide options for recruiting interest (For example: optimizing individual choice, autonomy; relevance, value, and authenticity; minimize threats and distractions)
- 8: Provide options for sustaining effort and persistence (For example: heighten salience of goals and objectives; vary demands and resources to optimize challenge; fostering collaboration and community and increasing mastery-oriented feedback)
- 9: Provide options for self-regulation (For example: promoting expectations and believes that optimize motivation; facilitating personal coping skills; developing self-assessment and reflection)
- None of these

What is your level of comfort in applying the UDL framework in your teaching or work? Please select one that best describes your overall level of comfort.

- I am comfortable training others in their application of the UDL framework.
- I am comfortable mentoring others in their application of the UDL framework.
- I am comfortable applying aspects of the UDL framework in my courses without assistance.
- I am comfortable applying aspects of the UDL framework in my courses with assistance.
- I am not comfortable applying the UDL framework.

IDs Only: Have you ever helped faculty learn about or implement UDL techniques in their courses?

- Yes
- Maybe
- No

IDs Only: Which of the following ways have you trained faculty in the UDL framework or aspects of UDL. Select all that apply.

- Met with a faculty member individually (in person or virtually) and discussed UDL
- Facilitated a UDL related book club
- Facilitated a faculty learning community on UDL
- Led a webinar or one session on UDL
- Led a daylong session on UDL
- Led a multiple day training on UDL
- None of these, I have not trained faculty in the UDL framework or aspects of UDL.

Which of the following best describes the way you present information in your courses? For example, using more than one way (simultaneously/at the same time) could be a recorded lecture with captions available or providing a visual with a text-based description.

- I use more than one way (simultaneously) within ALL units of the course.
- I use more than one way (simultaneously) within MOST units of the course.
- I use more than one way (simultaneously) within SOME units of the course.
- I use more than one way in different units of the course.
- I use one way in all units of the course.

Which of the following best describes the way you encourage student engagement in your courses?

- I use more than one way (simultaneously) within ALL units of the course.
- I use more than one way (simultaneously) within MOST units of the course.
- I use more than one way (simultaneously) within SOME units of the course.
- I use more than one way in different units of the course.
- I use one way in all units of the course.

Which of the following best describes the way you assess learning in your courses?

- I use more than one way (simultaneously) within ALL units of the course.
- I use more than one way (simultaneously) within MOST units of the course.
- I use more than one way (simultaneously) within SOME units of the course.
- I use more than one way in different units of the course.
- I use one way in all units of the course.

How valuable are each of the UDL guidelines to you? Rank order the nine guidelines (from 1 to 9), with 1 being the most valuable and 9 being the least valuable.

- Provide options for perception (For example: alternatives for auditory and visual information or offering ways of customizing the display of information)
- Provide options for language and symbols (For example: clarifying vocabulary, symbols, syntax, and structure; promoting understanding across languages)
- Provide options for comprehension (For example: activating or supplying background knowledge; highlighting patterns, critical features, big ideas and relationships; guiding information processing and visualization)
- Provide options for physical action (For example: varying the methods for response and navigation; optimizing access to tools and assistive technologies)
- Provide options for expression and communication (For example: using multiple media for communication; using multiple tools for construction and composition; building fluencies with graduated levels of support for practice)
- Provide options for executive functions (For example: guiding appropriate goal setting; supporting planning and strategy development; facilitating the management of information and resources; enhancing capacity for monitoring progress)
- Provide options for recruiting interest (For example: optimizing individual choice, autonomy; relevance, value, and authenticity; minimize threats and distractions)
- Provide options for sustaining effort and persistence (For example: heighten salience of goals and objectives; vary demands and resources to optimize challenge; fostering collaboration and community and increasing mastery-oriented feedback)
- Provide options for self-regulation (For example: promoting expectations and believes that optimize motivation; facilitating personal coping skills; developing self-assessment and reflection)

Short Answer Questions:

IDs Only: How have you supported faculty in applying the UDL framework in their teaching and courses? If you have not supported UDL application, why not?

Why have you applied aspects of the UDL framework? If you have not applied aspects of UDL, why not?

What are the benefits of implementing UDL? If there are none, please explain why there are none.

What are the challenges of implementing UDL? If there are no challenges, what supports do you have that create a challenge-free environment?