



UNIVERSITY OF
CALGARY

Taylor Institute
for Teaching and Learning

Incorporating Universal Design for Learning in Disciplinary Contexts in Higher Education



Mayi Arcellana-Panlilio and Patti Dyjur | Editors

TEACHING ACADEMY

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UNIVERSITY OF CALGARY | TEACHING ACADEMY

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About the Teaching Academy

The Teaching Academy is a community of instructors who have received University of Calgary Teaching Awards in recognition of their exemplary contributions to teaching and learning. The members of the Teaching Academy form a dynamic community of teaching and learning scholars from different ranks and disciplinary backgrounds, positioned to engage in and cultivate educational leadership at the University of Calgary. The collective depth and diversity of backgrounds and experiences allow engagement with the entire breadth of the teaching and learning community on campus, encouraging the free flow of ideas in a vibrant and dynamic network of educators and educational innovators. The Teaching Academy operates as a working group of on-the-ground professionals interested in supporting the development of teaching and learning expertise at the University of Calgary.

As demonstrated in this guide, the Teaching Academy is committed to communicating the importance of teaching, modelling the potential for Universal Design for Learning to promote equity, diversity and inclusion, and investing in a positive learning environment.

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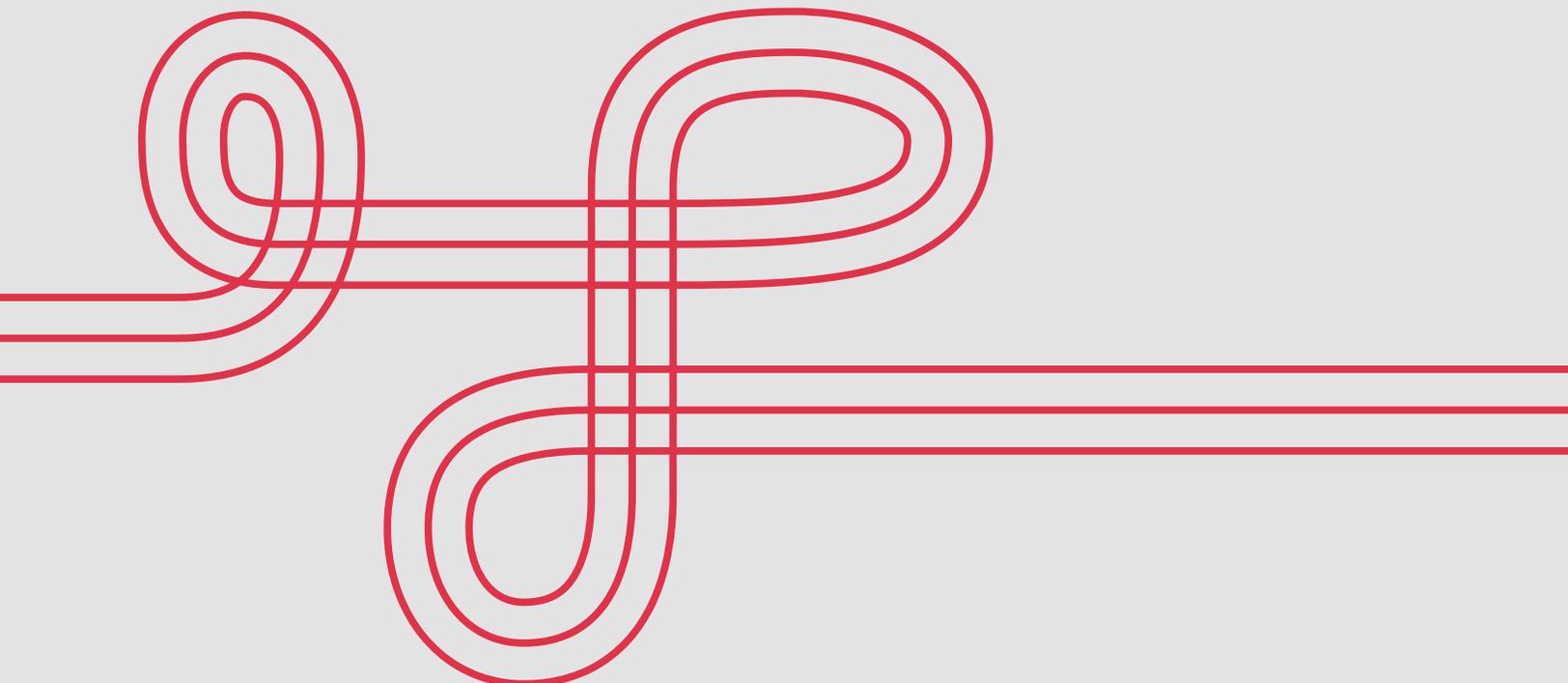


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Foreword

On behalf of the Taylor Institute for Teaching and Learning, I welcome you to this guide on *Incorporating Universal Design in Disciplinary Contexts in Higher Education*. Through this guide, a committed group of educational leaders and teaching award recipients have come together to explore, demonstrate and provide practical examples of how the principles of Universal Design for Learning (UDL) can be applied across disciplines to support student learning and success. This guide builds upon the foundations provided in the TI's 2018 guide *Universal Design for Learning in Higher Education*. Each article is grounded in scholarship, practice, and the wisdom of experience of the authors. This guide truly brings UDL to life for higher education!

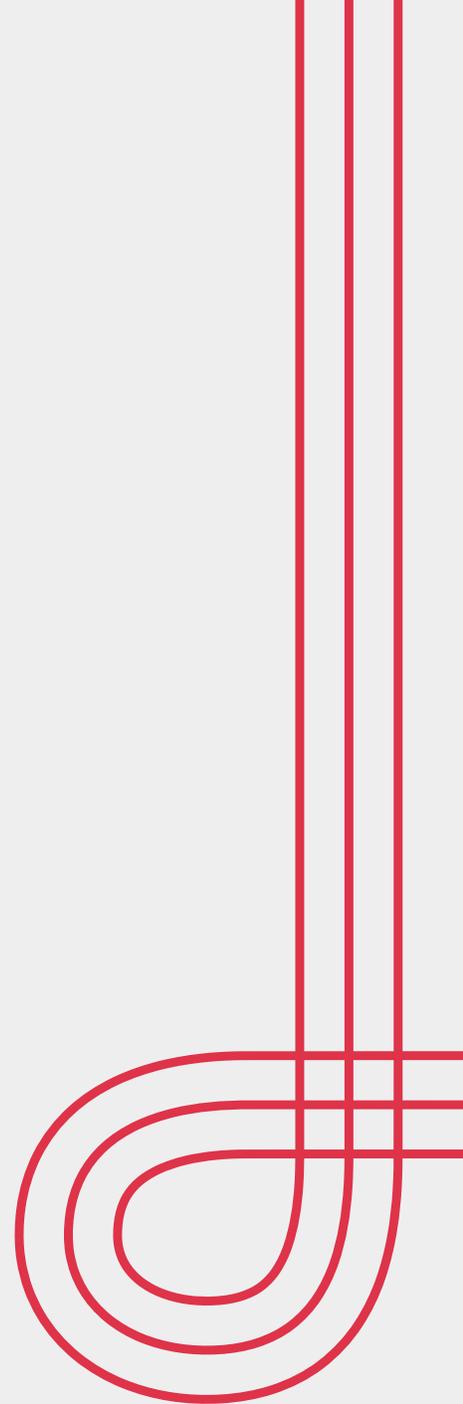
The launch of this guide hits close to home for me. My daughter has dyslexia. I have seen the benefits of learning experiences, which model the principles and practices of Universal Design for Learning, firsthand. My daughter's learning, confidence, sense of inclusion, wellbeing and success have flourished in courses that modelled UDL principles and strategies. The benefits of UDL go beyond academic success – they support the whole learner and strengthen access and inclusion across our teaching and learning communities.

The three overarching principles of UDL (multiple means of engagement, multiple means of representation and multiple means of action), provide a framework for all academic staff and teaching assistants to improve student learning, and increase access and inclusion in a variety of contexts across disciplines. UDL seeks to engage and remove barriers for all learners. I invite you to explore the articles and examples highlighted throughout this guide. I am confident that you will find practical strategies to adapt and apply to improve student learning and success in your teaching context. Most importantly, implementing these strategies will make a difference to student success and increasing access and inclusion across our teaching and learning communities.

Dr. Natasha Kenny, PhD



Senior Director, Taylor Institute for Teaching and Learning



Introduction

Universal Design for Learning (UDL) is a set of principles that can be used to guide course design and delivery with the goal of enhancing the learning for the greatest number of students (Al-Azawei et al., 2016; CAST, 2018; Rose et al., 2006). CAST (2018) has further identified three overarching principles for UDL: multiple means of engagement, multiple means of representation, and multiple means of action and expression.

The first principle, multiple means of engagement, refers to opportunities for student involvement in learning, building community and collaborative learning, student agency in learning, and varying levels of challenge: it is about how students learn. Multiple means of representation focuses on the ways in which students access and understand course information, including pedagogical approaches, learning technologies, student choice, different ways of comprehending content and concepts, and diversity in

perspectives that are represented. The third principle, multiple means of action and expression, emphasizes student demonstration of learning. In higher education, this includes the different ways in which students are able to demonstrate their learning, opportunities for feedback on their work, and assessing student learning at different levels, such as applying concepts and evaluating a case study. The following chart summarizes the three principles; for a full description please see CAST (2018).

Principle	Description	Examples from Higher Education
Multiple Means of Engagement	Stimulate learning through opportunities for student involvement in learning, building community and collaborative learning, student agency, and varying levels of challenge	<ul style="list-style-type: none"> • Variety in teaching and learning activities • Peer interaction and collaboration through discussion, group activities and assignments, online discussions, study groups and TAs • Engagement through problem solving, inquiry-based learning, case studies, labs, and other approaches to learning
Multiple Means of Representation	Present content in different ways and from different perspectives	<ul style="list-style-type: none"> • Use learning technologies to present content in different ways, multimodal sources of information, student-created materials, different perspectives represented,
Multiple Means of Action and Expression	Student demonstration of learning	<ul style="list-style-type: none"> • Variety in student assessment methods, including question type on exams • Authentic assessment of learning • Student choice where possible, such as essay topic or how to do a presentation (in person, recording, or infographic for example) • Opportunities for feedback

(CAST, 2018; La, Dyjur & Bair, 2018)

Incorporating UDL in higher education is complex, varied and nuanced work that instructors are doing to meet the learning needs of students in their classes. In this guide we illuminate different ways in which UDL principles have been implemented across disciplines and in different ways to enhance student learning. Each chapter offers a case of how UDL has been incorporated into learning experiences in higher education. As you read through the chapters you may notice a number of characteristics emerging that are typical of UDL in higher education:

- Although disability is certainly important, UDL in higher education has a far broader reach, focusing on issues in equity, diversity and inclusion. (Chapters 1, 4, 11)
- When incorporating UDL, instructors embrace student and disciplinary diversity as a feature that can be used to make learning experiences richer. (Chapter 10)
- Many instructors are quick to point out that their courses are not perfect examples of UDL and that more work needs to be done to make them accessible and inclusive. Rather, they are part of a continuous improvement cycle resulting in stronger courses with each iteration. It is common for instructors to start out by incorporating quick but impactful UDL strategies into their courses and build on them over time. (Chapters 7, 12, 13)
- Incorporating UDL in higher education goes beyond maximizing learning, to creating meaningful learning experiences. (Chapters 4, 6, 11, 12)
- Students and instructors work to incorporate UDL into courses. For example, students might create class notes or graphic organizers, track their own progress and make decisions about which readings and activities to do. Group work and peer feedback can be effective ways for students to learn from one another. (Chapters 2, 10)

- Student agency is a common theme. Sometimes this requires the instructor or leader to let go of the reins and allow students to set the direction for learning. (Chapters 3, 8, 9, 13)
- Student assessment is a critical component of course design in higher education and therefore is a fundamental part of UDL. From authentic assessment to student choice and reflection activities, instructors are prompted to examine their assessment practices so that they support the goal of enhancing student learning. (Chapters 1, 6, 8)
- Intentional course design is crucial to meeting the learning needs of all students (Chapters 7, 11)
- Instructors face numerous challenges in incorporating UDL principles into their courses, as evidenced by the COVID-19 pandemic, but the effort to do so is worthwhile in terms of student learning. (Chapters 2, 5)

Our goal is to provide discipline-based examples of courses that illustrate how UDL can be incorporated into a higher education context. Along the way, we hope you will be inspired by the work of others. We wish you great success in your journey to teach courses that are increasingly accessible and inclusive!

Patti Dyjur and Mayi Arcellana-Panlilio | Editors

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Chapter 1:

UDL Across the Undergraduate Music Curriculum

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Field/Discipline:

Music

Course Level:

Undergraduate

Key Words:

Diversity and Inclusion, Music Programs, Authentic Learning, Student Choice, Equity, Equitable Learning Experiences

Introduction

In this chapter I will survey how UDL can be incorporated throughout the diverse course types in the undergraduate music program. I will argue for its application not only within courses, but at the curricular level.

Music programs generally include: 1) lecture courses (such as music history), 2) skills training courses (music theory and ear training), 3) performing ensembles (orchestra, choir, small ensembles, etc.), 4) private lessons and masterclasses (in performance and composition), and 5) music education courses, which combine classroom and experiential learning. Some courses are hybrids of the above.

The students in these programs are just as diverse, representing differences in musical and cultural background, aptitude, career aspirations, the music they identify with and are dedicated to, and the means of engagement that excite their passion.

Myriad forms of musical creativity have validity in the industry, but the approaches to learning and the means of engagement offered in undergraduate music programs are often limited. Students with strengths,

identities and goals aligned with those approaches are advantaged, while others struggle. This is true across the various course types. By incorporating multiple means of engagement, representation, action and expression into music courses, all students will have the opportunity to find their own paths to success.

In this chapter I will present what UDL can look like across the curriculum, along with the benefits this offers to students.

Diversity of Students

Undergraduate music students have many different artistic and cultural backgrounds, skills, aptitudes, career goals and musical passions.

Many different musical paths lead students to post-secondary music study, and these backgrounds result in different skills and aspirations. Some students train formally through private lessons from a conservatory or private teacher. Others develop in school and marching bands. Some take lessons in American popular styles or jazz. Many form identities around the instruments and musical styles they play. String players and pianists, for instance, come from conservatories and play Western classical music, winds and brass players come from school and marching bands, while guitarists, drummers and vocalists often come from mixed backgrounds. Their dreams, aspirations and artistic values are often firmly in place prior to arriving at university, owing principally to the path they took to get there.

By incorporating multiple means of action, engagement, representation, and expression into music courses, all students will have the opportunity to find their own paths to success.

Cultural background is also a source of diversity among music students, though not nearly as much as would represent the diversity of society on the whole. Nevertheless, students' skills, aptitudes, passions, aspirations and identities are significantly shaped by their cultural backgrounds.

For many students, musical identity is constructed around a particular musical form with a deep sense of dedication. Musicians generally dedicate their careers to a particular music, such as classical music, jazz, or any of the diverse array of forms in our world. This dedication is clearly evident in many students early in their musical development, and only strengthens as they invest time in their training.

The wide range of musical and cultural backgrounds outlined above results in different skill sets and aptitudes. For instance, students with classical training tend to be strong readers of notated sheet music, such as the orchestral violinist who can read their part of a forty-minute Beethoven symphony accurately without a lot of practice. Students from other backgrounds are sometimes weaker music readers and prefer to memorize their music or to play improvised forms. These tendencies can have profound impacts on how students engage with musical performance.

Students also engage with the academic study of music in very different ways. Music history courses are generally delivered through lecture and readings with written assessments. While some students excel in literary engagement and written expression, most are better equipped to engage and express in ways that are aligned with the source of their passion: musical creativity and performance.

Finally, students aspire to a staggering array of career goals and specializations: in performance (orchestra, opera, solo, jazz, rock and other popular styles, and non-Western music), composition (classical, film, musical theatre, song writing), academics (historical musicology, music theory, ethnomusicology), education (primary, secondary, tertiary, studio, online), as well as arts administration, music business, and entertainment law.

How Students are Disadvantaged and the Potential for UDL

University music programs are generally designed around a set of core values and beliefs that naturally benefit students with skills and interests aligned with those values. With dedication and hard work those students can achieve lasting success in their careers. But many very talented students, whose skills and interests are not in alignment with those values, struggle. They become discouraged, come to believe that they are not very talented musicians, and drop out in favour of other careers.

Nearly all undergraduate music programs are built around a common core of study and training in European classical forms. While many offer training in jazz, they rarely offer anything more than a few academic electives in popular music or non-Western musical traditions. Even when majors like jazz are formally offered, those students are still often required to take history and music theory courses in European classical forms, as these form the core curriculum. These students often find it difficult to engage with material they consider irrelevant to their success. More choice in the curriculum would offer these students broader means of engagement, representation, and action and expression, empowering them to build a program that is best aligned with their dreams, as well as their strengths as learners.

Many different musical paths lead students to post-secondary music study, and these backgrounds result in different skills and aspirations.

UDL can be incorporated throughout the undergraduate music curriculum to offer increased accessibility to a diversity of students with different backgrounds, aptitudes, aspirations, musical identities and passions.

Students with strong music reading skills naturally engage with performance via the printed page. Often with classical conservatory training from childhood, such as pianists and orchestral string players, these students read well but are typically very uncomfortable with improvisation. Since most undergraduate music programs are designed around the study of classical music, most performance courses assume a high level of reading ability with little expectation of improvisation. This advantages strong readers while disadvantaging those who are very talented, but weak readers, making them feel that they are not good musicians or not talented.

Of course, many music careers require strong music reading which students must develop. Offering graduated levels of training to develop this skill can build up, rather than tear down, the student's self-esteem and self-image, helping them to persevere.

Courses where students learn about music are generally offered as academic courses, such as music history, in which students engage with textual material (readings) and lecture. For those pursuing academic careers in musicology or ethnomusicology, these academic skills are central, and these students will succeed because their passion is engaged. But for those pursuing careers in creative disciplines such as performance or composition, the weight of less engaging academic work often causes talented musicians to struggle.

Because few undergraduate programs offer serious training in non-Western musical forms, students interested in careers in popular music and non-Western musical traditions are generally unable to enter; they are blocked at the entrance audition. If these students can't pursue degrees, then they can't become the teachers and professors of the future, and in a generation, schools and universities will still lack the expertise to offer programs in these musical traditions. It is a cycle that entrenches the colonial position that European classical music is the supreme musical art, a position that is increasingly untenable in our society.

UDL can be incorporated throughout the undergraduate music curriculum to offer increased accessibility to a diversity of students with different

backgrounds, aptitudes, aspirations, musical identities and passions. Through multiple means of engagement, representation, action and expression, UDL can move the curriculum towards more equitable access to learning for all students.

How UDL Can Be Incorporated and Its Benefits

In the Introduction, I described the typical music curriculum as having five types of courses. I will offer an example of UDL and how it can increase accessibility and equitability in each learning environment. While some may view these approaches as radical, many of the general principles have been advocated for by the College Music Society's Task Force on the Undergraduate Music Major (Campbell et al., 2014).

Lecture Courses

In music history and ethnomusicology courses, students learn about music – how it developed and what it means to people. Content is represented through lecture and reading while students express their learning in written assessments and exams. These courses have two objectives: learning the material and developing academic skills. The latter obviously requires engagement with literature and written expression. But the former objective, learning the material, may be better served by a combination of literary and non-literary means of engagement and expression. Students learn best through the excitement of their passion, and most music students' passion is music making, not music literature.

Music history courses typically culminate in a final project such as a term paper. For his courses at the University of Texas at Austin, musicologist Andrew Dell'Antonio (Nave, 2019) gives students a choice of action and expression for their final projects on a given period of music history. They can prepare a performance of music in the style of that period, compose a piece of music in that style, write a traditional paper, or design their own project that he calls "choose your own adventure". By offering these multiple means of engagement, action and expression, students can choose one that excites their passion leading to deeper, more meaningful learning.

Skills Training Courses

In music theory and ear training courses, students learn to understand and analyse the nuts and bolts of music and develop their general musicianship skills around these concepts. Rooted in the European classical tradition, ear training courses often emphasize music reading skills. Students that are good readers are more able to accomplish the tasks. But music reading is not the only objective in these courses. Pitch/chord recognition, rhythm training, musical/physical coordination and reinforcement of concepts from music theory are also important.

In my ear training courses, I'll regularly bring the class to a room full of digital pianos, having the students practice simple, repetitive progressions of jazz chords. I teach the chords using a combination of rote demonstration and verbal description, but crucially, avoiding the use of sheet music. The students are then tasked with practicing these chord progressions aurally and by memory, without sheet music, using their ears and their understanding to find the notes. This challenges the strong readers to play music away from the score, and gives the weaker readers, who generally excel at this task, alternative means of engagement and expression. This exercise turns the classical notion of the supremacy of musical notation on its head. It shows the strong readers that, beyond the ability to read, improvisation and memorization are important skills. It also edifies the weaker readers, unaccustomed to excelling, by validating their strengths.

Performing Ensemble Courses

Ensemble courses, such as orchestras, bands, choirs and other specialized performing groups provide an array of performing experiences. What ensembles are offered is generally based on what is found in the world of professional performance and education. Orchestras provide training for aspiring orchestral performers, while the bands and choirs prepare future schoolteachers. These are important course objectives, to be sure, but they primarily serve students with these specific aspirations. For others who may be dedicated to, and identify with, other musical forms, participation in orchestras, bands

and choirs is tolerated because it is required.

To offer broader means of engagement in the ensemble offerings, ensemble course offerings could be based on a rationale that also considers the strengths, aspirations, musical identities and passions of students who are not future orchestral performers or band/choral teachers. This could include improvisation ensembles, jazz ensembles and rock bands, or ensembles of non-Western music (led by culture bearers). A variety of ways to engage would enhance relevance, value and authenticity, and empower students to make connections between content and their goals. The rationale for offering these ensembles can consider their value in providing these multiple means of engagement, representation, action and expression for a diversity of students. This requires thinking about UDL at the curricular level.

Private Lessons

At the heart of performance training in undergraduate music programs is private lessons, one-on-one mentorship in the performance of a musical instrument, or in composition, for one hour each week.

Similar to performing ensembles, students can be given a broader choice of content in private lessons to heighten relevance, value and authenticity. Lessons generally focus on studies and repertoire from the European classical tradition to prepare students for orchestral or solo performance careers. A curriculum centered on a European-classical core has the effect of leaving other ethnic and cultural backgrounds out. Many programs do offer private instruction in jazz, but to enhance the salience of content, much broader choices of study could be made available. Performance lessons could be offered in popular styles and non-Western musical traditions taught by culture bearers, while composition lessons could be offered by specialists in film, musical theatre, and song writing.

Again, this requires thinking about UDL at the curricular level. It may require instructional expertise beyond full time faculty, but since virtually all music programs rely on sessional contract instructors for these lessons, offering this breadth of choice would simply require a shift in sessional hiring within current budgets.

Music Education Courses

Combining classroom and experiential learning, music education classes offer skills and experience to prepare tomorrow's school music teachers. Content is based, sensibly, on a practical rationale: such as to prepare teachers to direct bands and choirs. But this excludes virtually all non-Western musical traditions. Prospective student musicians, wishing to further develop their skills in a non-Western musical tradition, are blocked at the entrance audition, justified by the fact that the program has little to offer them.

To improve this situation, programs could offer a broader range of courses, including and validating non-Western musical traditions. This would make the undergraduate music program more accessible to all students with more equitability in the available means of engagement, and action and expression, offering more choice, relevance and authenticity. It would make the enrolment of students of non-Western musical traditions possible, diversifying the student body and enriching the educational experience for all. The inclusion of other cultures would benefit the learning of minority students already in the program, by valuing their own cultural inheritance and offering a means to develop their art within it. It would also prepare a new generation of music teachers to further extend this diversity into their classrooms.

Conclusion

The incorporation of UDL can benefit students disadvantaged by the standard way undergraduate music programs are offered. It can be applied within specific courses across the curriculum, but also at the level of curricular design. By offering multiple means of engagement, it can make the study of music more accessible, equitable, relevant and authentic for students with diverse musical and cultural backgrounds, aptitudes, aspirations, identities and passions. It enhances the learning of all students by providing a balance between addressing weaknesses and taking advantage of strengths to develop positive identities. It engages students in alignment with their passions, and it has the potential to greatly diversify the undergraduate music program, and schools by extension.

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Chapter 2:

Creating Flexible Learning Opportunities in an Online Linguistics Course in the Time of COVID-19

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Field/Discipline:

Linguistics

Course Level:

Undergraduate

Key Words:

Online Learning, UDL, Student Diversity, Synchronous and Asynchronous Delivery

Course Context

Course Level And Details:

300-level, third-year linguistics course, no prerequisites. Frequency and duration: two 3-hour classes a week. A course on connections between language, ideologies, power and social inequalities.

Course Context:

This third-year linguistics course of 80 students, normally given in person, had to be redesigned for the web-based format as the university transitioned to online course delivery due to the COVID-19 pandemic. The course had no prerequisites and attracted a heterogeneous student population from linguistics majors and minors to students completely new to linguistics who were taking it as an elective. Furthermore, due to border closures, some international students were pursuing the course from their home countries, located in different time zones, which made it difficult for them to attend synchronous online classes and participate in live presentations. Finally, the course also included students with special needs who had to be provided with equal learning opportunities.

Application of UDL Principles

Given student diversity, it was evident that I had to be extremely flexible and inclusive in course design in order to accommodate varied student needs. Also, I was eager to adapt the course to online delivery in a way that would ensure student engagement and

interactivity, which took more effort to recreate in an online environment, especially considering the class duration (three hours).

Consequently, I chose to apply UDL principles to the course design because it allows taking into account the complex factors of learning and address the diversity of learners (La et al., 2018, p. 3). Ralabate (2016) points out that instruction infused with UDL strategies “emphasizes interactivity, heterogeneous grouping, rich scaffolds and supports for learning, and independent learning” (p. 85).

My ambition was to move away from traditional lectures in order to provide students with hands-on experience in sociolinguistics and demonstrate how linguistic concepts taught in class relate to the life of our community and students’ own life. I set the goals in my course outline to:

- increase students’ awareness of connections between language use, ideologies and power;
- provide students with practical experience of devising language policy;
- develop greater linguistic tolerance and empathy.

Based on course objectives and context, I incorporated in class format and assignments the three UDL principles, namely multiple means of engagement, multiple means of representation and multiple means of action and expression. Below I present the choices of formats and activities I provided for students, which speak to each of the above principles.

Multiple Means of Engagement

Discussions:

I offered discussions of course material both synchronously as part of live Zoom classes and asynchronously as topics in online forums.

Synchronous discussions included class debates in Zoom meetings, where I brainstormed general ideas on a whiteboard, in the chat or live, and peer-to-peer conversations in Zoom breakout rooms, where students analyzed examples of the studied concepts. The learners could connect their existing knowledge and interests with the theory presented in the course, which increased their motivation and understanding of the material.

Asynchronous online discussions on D2L, where students summed up assigned readings and connected the discussed concepts with examples from their own life experience. Asynchronous discussions also provided the students unable to attend live class sessions with an opportunity to share their ideas on the class content. During the six-week summer semester, there were two vast discussion forums with ten topics for students to choose from. The students contributed at least two threads in different topics and two responses to their peers in topics other than those to which they posted threads.

Group Projects (3-4 Participants Per Group):

In order to provide students with real-life experiences of designing a language policy and to promote student independence in learning, I designed a group activity in which the students researched the linguistic landscape of a range of countries of the world (four different continents were represented). The students self-enrolled into groups based on their choice of country and assigned tasks and areas of investigation to each group member. The students put themselves into the shoes of professional sociolinguists: they analyzed the linguistic situation of the country they selected, identified issues within its existing language legislation and proposed a more inclusive language policy. The group project provided students with multiple means of engagement: teamwork coordination, individual topic research, group presentation, peer feedback and finalization of the last project version.

Multiple Means of Representation

Class Format:

I presented lectures both as live Zoom classes and as recordings posted on D2L. This way, the students who were unable to attend real-time classes could watch class recordings. I structured the class to cover the content and do activities in the first two hours of class time and dedicate the third hour to the Q & A period and student-led class summary, for which I used Google Jamboards and Zoom whiteboard. The class was highly interactive with students constantly participating in exchanges with their peers, TA and myself.

Presentation of New Material:

I presented the new material inductively (starting with examples and small observations and leading the students to a new concept) as well as deductively (from general rules to instances). Using these approaches challenged students to think in different ways and to make important connections between individual cases and bigger concepts. I used multiple media to introduce and discuss the material: videos (TED Talks, interviews and demos), audio (voice recordings and speech samples), graphic images (graffiti, advertising billboards, memes and other signs representing linguistic information) as well as more traditional Powerpoint presentations and assigned readings. The textbook was available in electronic format on the University library website and compatible with text-to-speech software in case students wanted to listen to it in audio format.

I presented the new material inductively (starting with examples and small observations and leading the students to a new concept) as well as deductively (from general rules to instances). Using these approaches challenged students to think in different ways and to make important connections between individual cases and bigger concepts.

Group Project Feedback:

The students received instructional scaffolding and feedback at several stages of the group project: 1) when presenting a rough draft of the project to their TA; 2) when sharing the project with their peers in online discussion posts and providing feedback to other groups in response posts; and 3) after submitting the completed project to the instructor. This enabled the students to stay on track of the instructions and expectations, assess their progress and improve the aspects of their work that needed attention.

Multiple Means of Action and Expression

Discussion Postings and Their Assessment:

In their online posts, students were encouraged to include multiple media (videos, memes, audios, graphic images, etc.) as well as thought-provoking statements and questions to spark other students' interest and open up further discussion. To assess student contributions to discussions, I used rubrics in which I included performance levels based on such criteria as critical analysis of assigned readings, creativity and innovation (original ideas, visual appeal of postings, cues opening further discussion) and participation (active engagement in the forum, responses to other students).

Group Project Presentation:

I offered students two options for group project presentations: synchronous, given to the TA in a Zoom meeting, and asynchronous, posted as a pre-recorded video. This allowed the students who were unable to or did not feel comfortable presenting live to select an alternative way to present their project.

Final Exam:

For an end-of-semester assessment, I chose to engage students in a critical reflection of the course. The final exam resembled a take-home essay and included ten questions encompassing all of the course material and connecting different topics of the course (e.g. different types of linguistic discrimination). The last exam question focused on the students' general experience with the course: it asked which topic the students most identified with and why. This type of final assessment presented students with the opportunity to look back on the course, reflect on their understanding of the content and explain the main concepts with examples from their own experience.

Implications and Recommendations

Outcomes:

The incorporation of UDL in course design improved the flexibility and inclusivity in this heterogeneous class. Students responded very positively to the approach and appreciated having a choice of ways in which they could access the class material, carry out assignments and interact with their peers. As a result, their motivation was high, and their participation was enthusiastic. Despite the challenges of group heterogeneity, time differences and distances, I believe I managed to create a community of learners, connected by ideas, collaboration and activities in a virtual setting (Wenger et al., 2002).

Students responded very positively to the approach and appreciated having a choice of ways in which they could access the class material, carry out assignments and interact with their peers. As a result, their motivation was high, and their participation was enthusiastic.

Issues and Lessons Learned:

When the students were doing the group projects, two groups experienced collaboration issues caused by the differences in the group members' work styles. Some students insisted on planning and fulfilling the project tasks well in advance, whereas others would wait until the last moment, not replying to emails or messages in a timely manner. This problem was further exacerbated by the COVID-19 quarantine adjustment the students were going through and by the difficulty of remote communication during the lockdown. If I was teaching this course again, I would introduce group contracts that would clearly define the roles and duties within each group. Group members would have to establish a protocol of behaviour that the group would be expected to follow while participating in this collaborative activity.

Recommendations:

Instructors should have a clear idea of how they will distribute grades and design assignments for their course. I would therefore recommend designing the course well in advance to make sure the course components complement each other and match with the outcomes. Every course element must be well-thought out and tested before it is assigned to students: for example, setting up the D2L shell for the course, agreeing on the role of the TA and creating rubrics for assignment evaluation. Furthermore, instructors teaching online should also make an efficient use of learning technologies supported by their university to provide students with a choice of media and an engaging online learning experience.

Impact as an Instructor:

The success of the course made me realize that application of UDL in higher education contexts is not only feasible, but vital. Although I turned to UDL out of necessity caused by courses transitioning online due to COVID-19, I intend to continue incorporating UDL in course design beyond the pandemic and cannot envision returning to traditional rigid lecture routines. I strongly believe that university classes should keep pace with changes taking place in our community and in the world at large. The pandemic has taught us, instructors, to be dynamic, flexible and resourceful, and we should continue honing these skills in the post-pandemic world.

Application of UDL in higher education contexts is not only feasible, but vital because it makes classes more dynamic, flexible and creative.

Conclusion

The application of UDL in an online linguistics class has yielded positive results. First, it allowed to accommodate diverse student needs by providing them with a range of material presentation forms, assignment types and interaction methods. Second, the use of online learning technologies enabled me to provide students with more choices in different formats and media. Finally, the integration of UDL contributed to increased student agency and motivation. I believe UDL is an efficient framework to facilitate this undertaking, and, when coupled with the use of learning technologies, it can support innovative developments in higher education.

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Chapter 3:

Engagement at the Intersection of Community and Academia

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Experiential, place-based, community-driven, transformative, UDL

Introduction

Universal Design for Learning (UDL) in higher education is grounded in engagement, representation, action, and expression, which, I argue, are likewise integral to place-based (Mannion, Fenwick, & Lynch, 2013) and community-driven pedagogy (Gruenewald & Smith, 2014). In higher education, UDL is used as an educational framework that “guides the design of courses and learning environments to appeal to the largest number of learners” (La, Dyjur, & Bair, 2018, p. 3). Through this, UDL is meant to improve the educational outcomes of students through changes in course design, learning experiences and environments, teaching practices, and student assessments, making learning more accessible to students with diverse backgrounds (Al-Azawei, Serenelli, & Lundqvist, 2016; La, Dyjur, & Bair, 2016).

This chapter focuses on how “multiple means of engagement,” can enhance student learning at the intersection of community and academia. In UDL, engagement strategies are employed to better connect course instructors with the interests of their learners, support self-reflection and self-regulation of learning, and promote collaboration among peers and instructors (La, Dyjur, & Bair, 2016). Multiple means of engagement allow the instructor and students to meet at different learning levels and recognize the diversity in not only student bodies, but also in instructors and their teaching methods (La, Dyjur, & Bair, 2018).

Background

When the University of Calgary (UCalgary) campus closed in March 2020 due to the COVID-19 pandemic, our academic community was faced with unprecedented challenges as classes shifted online and distant travel was halted. When my fieldwork was placed on hold, I turned my attention to local food networks in Calgary, observing gaps in access to, security with, and sovereignty over healthy food choices for our most food-insecure populations. To engage with local food politics, and to gain hands-on experience in community-based agrarian research, I entered into a Faculty of Graduate Studies Transformative Talent Internship (TTI) (Transformative Talent Internships, 2020) as the Executive Director of the not-for-profit Grow Calgary. Run entirely by volunteers, 100% of the non-GMO food produced is donated to 21 food access agencies serving Calgarians living below the poverty line. While supervising 40 coordinators across 16 departments, over 500 volunteers, and 83 Small-Scale Agricultural Farm Management Certificate trainees (many of whom were UCalgary students), I employed a praxis influenced by the UDL principle of multiple means of engagement. For four months, my facilitation techniques were aligned with learning outcomes for both myself and my trainees to guide our learning processes and facilitate continual reflection.

Learning Outcomes

In any course, learning targets serve as indicators to measure and evaluate engaged learning (for both the instructor and students or trainees) (Ambrose, et al., 2010). At the onset of my TTI, I set five specific, measurable, attainable, relevant, and time-bound (SMART) goals for my position as Executive Director (Lawlor & Hornyak, 2012). My first task was to develop a multi-level, free training program to build the capacity of aspiring agrarians in advanced urban farming and leadership skills. Trainees would accrue hours at their own pace while striving to meet learning outcomes in agroecology, crop care, water, soil, greenhouse design, safety, and management. Within each category, SMART goals on composting, irrigation, seed diversification, crop rotation, and many more practices were determined in collaboration with the trainees. For instance, “by the end of my certificate program, I will be able to:

1	Facilitate discussions on sustainability, biodiversity, and the ecological benefits of small-scale agriculture.
2	Transplant seedlings safely.
3	Identify common pests and manage harmful species naturally.
4	Harvest and process different varieties of crops.”

UDL in Action

Situated as both a learner and instructor, I worked with trainees to operationalize the UDL principle of multiple means of engagement by differentiating teaching and learning activities, and integrating opportunities for interaction and collaboration, choice, feedback, reflexivity and self-regulation. By emphasizing distributed knowledge and a repositioning of the singular ‘gatekeeper of knowledge’ in a lecture hall to one that is part of the aggregate knowledge of a community, a learner-centered environment was built that fostered intentional community-building, exchange, and polyvocality (McCombs & Whistler, 1997). This was accomplished by creating shared norms and expectations; highlighting and valuing intersectionality within our learning community; relating content to trainees’ lives; and promoting a dialogic learning environment. These are just some of the ways in which engagement was diversified to enhance learning within a larger transformative agenda

(Pisters, Vihinen, & Figueiredo, 2019).

I then developed assessments, guided practice, formative and summative applications that would measure deep learning. It was also important for me to factor in dynamic elements influencing the learning environment, such as facilitation style and approachability; cultural customs and native languages of my learners; and dominant theories and practices of my Food Studies discipline’s time. In both my TTI and the training program, factors such as weather, pests, transportation, number of other trainees present, and growth rates of crops further influenced the feasibility of particular teaching and learning activities.

A Day in the Experiential Classroom

Winding my way through an awakening city, a clear sky and crisp morning chill indicated it would be an enriching day out on the land. With a coffee in hand, my mind began preparing for the 8 A.M. shift ahead, including which learning targets and activities we would set out to achieve. Soon, horizons of prairie pastureland came into view as the city sprawl faded into the distance. As my car rattled down the long, dirt path, eight greenhouses dotted the landscape, sheltering tomatoes from yesterday’s hailstorm. I wondered what the damage would be for the rest of the produce growing outside in no-till ‘lasagna’ beds. To my delight, several certificate trainees had already arrived and begun surveying the land for potential hazards, plants in need of water, and tools left outside from yesterday’s shift.

Once everyone arrived, we came together in a circle to introduce ourselves, acknowledge the land and its long-held stewards, and discuss the safety protocols and learning objectives for the day. Teamwork and cultural awareness were built by encouraging the use of trainees’ first names and preferred gender pronouns, as well as common phrases in their language if they were not primarily English-speakers. Cultivating an intentional and safe environment for all trainees to be heard and understood was central to our experiential learning program. This was especially important as some trainees were joining for the first time while others had already accrued over 50 hours. Therefore, as an instructor, I had to be mindful

of differentiating instruction and tailoring learning targets to meet the needs of my learners. To facilitate this process, I worked alongside Farm Managers (similar to Teaching Assistants), who supported trainees in meeting their SMART goals, as well as delegating tasks, monitoring progress, and making adjustments as necessary.

The overarching goal or thread that tied each lesson together was ‘Keep Plants Alive’ (KPA—acronyms are used to engage learners and help them recall important concepts and practices). From that point of departure, we started morning shifts by prompting trainees to irrigate all crops on the farm. This 20-30 minute group activating strategy encouraged interaction among trainees, thereby strengthening cohort bonds and lines of effective communication. First, a Farm Manager facilitated a tutorial for using the water pump, handling hoses, and differentiating between soft, aggressive, low and high watering techniques. Trainees were given the choice to water outdoor crops (i.e. squash, corn, kale, and peas) with the hefty hoses (*Figure 1*), or tomatoes in greenhouses with watering cans. During this task, the Farm Manager and I would walk around the outdoor classroom prompting trainees to identify the plants they were watering, the pollinators they observed, and any changes in plant health they had noted. We would pose questions such as, “which plants require more mulch around their bases? Were any plants damaged by sun exposure or hailstorms? Which plants need to be thinned, pruned or harvested?” If I noticed that a trainee was using an aggressive, low watering technique for plants that required soft, high watering, I would gently instruct them to adapt their approach and review the reasoning behind the methods.

Before diving into a guided practice on transplanting seedlings, all trainees were encouraged to take a break and rehydrate. During this time, we reflected on the learning process thus far and discussed best practices for water conservation, effective irrigation engineering, soil erosion management, companion planting and mulching for soil structure, and environmental conservation via minimization of the farm’s impact on the land (meeting Learning Target 1). We next gathered around an outdoor table to learn

proper handling techniques for transplanting peas. After several demonstrations by a Farm Manager, trainees took their places in an assembly line, mixing soil and compost to prepare the pots, transplanting seedlings from smaller into larger pots, watering and covering the roots with mulch, and placing them in a shaded spot for 24 hours (meeting Learning Target 2). If I observed a trainee pulling the seedling out of its germination tray from the root, forgetting to water or mulch, or placing it in the sun, I would prompt another trainee to reiterate the process and, if necessary, assign pairs for guided mentoring.

After 20-30 minutes, we took another water break, reflected upon the learning outcomes from transplanting, and discussed best practices for seed germination, indirect versus direct planting, sun exposure and irrigation frequency, and how to test the soil to determine watering needs. We then shifted to independent learning activities to promote student choice and self-regulation. One trainee chose to work in the seed bank, sorting mixed packets of seeds into their corresponding containers and compiling a database of seed varieties (*Figure 2*). Another artistically inclined participant painted signage around the farm to help other volunteers identify crop types, waste management stations, and greenhouse numbers. A pair of trainees tended to the carrot beds, weeding thistles and thinning rows for optimum sun exposure and resource allocation below the surface. Others pruned and processed tomato leaves for a natural pest management spray (meeting Learning Target 3), constructed a new greenhouse out of recycled materials, and turned the compost piles. Again, the Farm Manager and I walked around to each station answering questions, instructing best practices in an approachable tone, and consistently aligning their activities back to the learning target of the day: KPA.

In the last half hour of the morning shift, all trainees would harvest produce to donate to one of our 21 food access agency partners (meeting Learning Target 4). I would instruct the Farm Manager to demonstrate optimal techniques for harvesting zucchini, chamomile, kohlrabi, cauliflower, beans, and more, which were placed into 5-gallon buckets for

easy transport. Everyone dispersed independently or in pairs to harvest a crop of their choice. With bountiful produce in hand, we returned to where we began in a closing circle. Reflecting on our morning, each participant, whether they be a trainee, instructor, or Farm Manager, indicated what they would ‘Add, Remove, and Keep’ (ARK) from their shift. This dialogic practice encouraged learners to critically engage with and become invested in their learning process and leadership abilities. The closing circle also served as a formative assessment to measure deep learning. I would ask, “in which learning activity did you absorb the most information? Do you now feel confident teaching that activity to a peer? Which instructions could have been presented more clearly? How could we have completed a task more efficiently and effectively?” With all voices and opinions heard, we captured the day with a photograph holding up our buckets of produce that we delivered to a social agency in Calgary.

Exhausted and covered in dirt on my drive home, I reflected upon my approaches to teaching and learning, and my own access to food and the nutritional security I am privileged to have. Many of our food recipients living below the poverty line do not have the means to grow their own fresh produce and must make difficult decisions around affordable food purchases. Bridging the gap between academia and community-driven initiatives through engaged learning can play a key role in rural, urban, and agrarian development. In turn, this will build the capacity and knowledge of ecologically sustainable and culturally relevant food production.

Lessons and Recommendations

In this chapter, approaches to engagement were contextualized within a framework of place-based, community-driven transformative agendas addressing food insecurity. Examples of differentiated teaching and learning activities, opportunities for interaction and collaboration, choice and feedback, reflexivity and self-regulation, and diverse means of engagement were provided. Incorporating UDL into the design and learning outcomes for the TTI and certificate course encouraged trainees to be active participants in their own teaching and learning

processes. Trainees not only developed technical skills in advanced urban agriculture, but honed their interpersonal leadership abilities to train future agrarians in agroecological methods. In the words of a participant, “I liked how in the multi-tiered training program I could accrue 50 hours before taking on a leadership position. Having the previous experience gave me more confidence, foresight, and empathy for newer volunteers.”

By the end of the season, a total of 83 trainees were enrolled in the certificate program, eighteen of whom accrued 50 hours in Level I, progressed to Level II, and became Farm Managers who trained incoming volunteers. From the Level II cohort, three trainees accrued an additional 100 hours, progressed into Level III, and were responsible for leading a project on the farm. These numbers support the argument that when approaches to instruction align with UDL principles, learners are more likely to become invested in the material and learning process, and therefore are more likely to enhance their cognitive, technical, and interpersonal capacities.

If this training course in Small-Scale Agricultural Farm Management were taught in a post-secondary setting, it would benefit from more direct student responsibility over their specific learning activities and associated learning outcomes. From the perspective of Farm Managers and lead instructors, it sometimes proved difficult to pre-plan group learning activities as all participants had varying levels of prior training. Each student could create their individualized weekly learning target and align it with applications and assessments determined in partnership with the Farm Manager and the overall needs of the farm.

Reflecting on our morning, each participant, whether they be a trainee, instructor, or Farm Manager, indicated what they would ‘Add, Remove, and Keep’ (ARK) from their shift. This dialogic practice encouraged learners to critically engage with and become invested in their learning process and leadership abilities.

Further Reflections

While our UCalgary campus, and many others around the world, remain partially or fully closed due to the pandemic, it may prove difficult or impossible to employ place-based and experiential learning lessons in the near term. Nevertheless, post-secondary courses—in virtual settings—can still be scaffolded by transformative community-driven agendas and grounded in the UDL principle of multiple means of engagement. For instance, instructors can connect groups of students with community organizations to support their social justice and organizational frameworks. Students can conduct needs assessments, develop strategic plans, increase media presence, write policy reforms, and network with stakeholders to support the organization's goals. By creating a learner-centered classroom with differentiated instruction, student choice, reflexive learning, opportunities for collaboration, and exchange of diverse perspectives, the student learning experience can be enhanced, and community connections built.

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Chapter 4:

Diversity and Inclusion in the Design Studio

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Introduction

The design studio has a long history in design education, both as a method for learning and as a place for learning (Drexler, 1984; Madrazo, 1994; Peters, 1979; Schön, 1985; Van Zanten, 1975; Wingler, 1975). This case study explores how the practice in the design studio links with the Universal Design for Learning (UDL) framework (La, Dyjur & Bair, 2018) and in particular the UDL principles: Multiple Means of Representation, and Multiple Means of Action and Expression. The UDL framework models the idea of Universal Design (Centre for Excellence in Universal Design, 2020), which is the design of the built environment and of artefacts so they can be

Design studio education, in person, and even more so online, needs to be diverse so all students can succeed.

used by the widest range of people in the widest range of circumstances without the need for adaptation (The Center for Universal Design, 1997). Thus, as a starting point, we assume a close link between the UDL framework, and the teaching and learning in Architecture, Planning and Landscape Architecture. The chapter aims to critically reflect on that assumption with the help of two case study examples: the interdisciplinary advanced design studio course 'Interchange: Cross Culture Approaches to Design' and the urban design studio course 'Kuniya' that was

delivered entirely online because of the Covid-19 pandemic. The chapter argues that design studio education, in person, and even more so online, needs to be diverse so all students can succeed. An inclusive design education is a pre-set for developing Universal Design in professional practice, as a fundamental condition of good design.

Case Studies:

The Interdisciplinary and Urban Graduate Design Studio Courses

The discussed design studio courses are taught at the School of Architecture, Planning and Landscape (SAPL): the fall 2019 course 'Interchange: Cross Culture Approaches to Design' and the fall 2020 course 'Kuniya'. Design studio courses, at SAPL and other higher education institutions, provide students with opportunities for experiential learning (Chickering, 1977; Gibbs, 1988; Kolb, 1984, Moon, 2004). Largely student-directed, these are educational settings to practice skills and apply knowledge gained in previous or parallel courses. While the Interchange studio was open to graduate students from Architecture, Planning and Landscape Architecture, the Kuniya studio was aimed at graduate Planning students. The instructors of the interdisciplinary design studio course consisted of Dr. Fabian Neuhaus, Associate Professor Planning and Dr. Graham Livesey, Professor Architecture. The urban design studio course was led by Dr. Fabian

Neuhaus. Hal Eagletail, a traditional Knowledge Keeper from the Tsuut'ina Nation, was appointed by the School as an additional instructor for both courses, leading students' introduction to Indigenous cultures, histories, languages and spiritual beliefs. The two courses had also a research project embedded that explored the application of a design process management tool, the Design Studio Matrix, focusing on students' learning. The fieldwork was led by Sandra Abegglen who was present as a researcher in both studios. This means, the courses were interdisciplinary and cross-cultural in the make-up of its instructor/teaching teams.

In both studios, students were asked to develop an urban design proposal on a specific site on the Tsuut'ina Reserve adjacent to the City of Calgary. As part of this task, they had to engage with Indigenous ways of knowing and living and explore different cultural approaches to design. Through Hal Eagletail's inputs, students got to know 'the land' and its people. In addition, both in person and virtual, Tsuut'ina Elders shared their knowledge with students through storytelling, and traditional Indigenous practices such as praying and smudging. Invited guests, many with an Indigenous background themselves, provided further input and feedback on students' work. The interdisciplinary studio allowed students to go on a guided field trip to the Tsuut'ina Reserve and they visited the sacred mountain of the Tsuut'ina Nation, Moose Mountain. This experience provided students with a better understanding of the project site and its meaning for the Indigenous community. In the urban design studio course, delivered online, students explored the project site through visual means: videos of the project site taken with a 360-degree camera and image stills of relevant locations shared by their instructors.

Teaching Approach

The Interchange and the Kuniya course took an inquiry- or problem-based learning and teaching approach (Centre for Excellence in Enquiry-Based Learning, 2010; Dewey, 1997; Duch, Groh & Allen,

2001), meaning students were asked to tackle the design brief independently, but guided by the instructors, and through inputs by Elders and professionals. They were expected to actively engage with the tasks set, the inputs provided, and the materials presented. For example, in the Interchange studio, students were asked to make a video about the site in the initial phase of the project. In the Kuniya studio, they were asked to produce a video log as part of their reflection on the design process. Students were also expected to utilize their knowledge and skills from theory courses and previous studios into the development of their project. This was meant for them to integrate substantive theoretical understanding and practical experience into a single course. As such, the studios built on what Donald A. Schön (1983) describes in his work as "reflective practice": by 'doing' students extended their thinking, and by thinking students refined their doing.

While the design briefs asked students to develop a specific proposal, the process that led to this proposal formed a crucial part of their learning. Thus, both studio courses had a strong emphasis on teamwork, asking students to work in groups of various sizes, to jointly develop their projects and to collaborate on tasks for assignments. Online this was facilitated by video conferencing and a shared whiteboard platform. In person this took place in the studio space. This meant, students had to develop a shared and inclusive work ethic, modelled on the UDL framework (Centre for Excellence in Universal Design, 2020). This would include actively listening to each other and developing strategies to communicate ideas. The teaching team modelled this practice by sharing responsibilities and duties. Further, they collaborated with Elders and invited guests - design professionals, developers, planners, and community and city representatives - to provide the best possible learning experience and outcomes for students. Hence, both studio courses could be described as a 'socially active environment of experimentation' (Ioannou, 2018) where students learnt by doing and thinking in a constant exchange with others - a collaborative endeavour.

Design Studio Education & UDL

The design studio has a long tradition in design education (Schön, 1984): it is the signature pedagogy of the design disciplines (Motley, 2017; Peel, 2011; Schrand & Eliason, 2012; Shulman, 2005). Students work either individually or in teams to develop the design of both small- and large-scale objects, structures and environments. Usually, design educators and design studio instructors in particular develop a comprehensive scenario to which the students respond. In the case of both the fall 2019 design studio course Interchange and the winter 2020 design studio course Kuniya, this meant working on specific sites on the Tsuut'ina Reserve, with the aim to develop urban design proposals that respect and acknowledge traditional knowledge and Indigenous culture.

Uniquely, the studios not only asked students to work on a cross-cultural project but embedded a cross-cultural approach in the studio. This was realized by the appointment of Hal Eagletail as an instructor and the direct collaboration with Tsuut'ina Elders and Indigenous professionals. The intention was to proactively engage with Indigenous ways of knowing and living, and to develop a constructive dialogue across cultures so students could develop proposals that pay respect to the traditional stewards of the land, both past and present. In addition, the design studio format provided learners with various ways to access and engage with the topic, while encouraging them to demonstrate their learning through different forms (proposals, essays, portfolios, exhibitions) and media (sketches, drawings, 3D models, animations, videos). The researcher embedded in the studios provided further opportunities for students to reflect on the design process and their learning in a broader context.

In both the fall 2019 design studio course and the winter 2020 design studio course, there was a particular emphasis on Multiple Means of Representation, and Multiple Means of Action and Expression (CAST, 2020). Students could engage with the course themes and project briefs by talking to people, attending lectures, reading lecture materials and notes, consulting books and articles, going on fieldtrips (physically and virtually), and conducting their own explorations and research. Similarly, they

could demonstrate their learning through various forms and media. For example, most assignments had various components to them, giving them the opportunity to talk about their work, present visuals and objects, and write about their findings and experiences. As such, the design studio pedagogy was 'student focused' meaning students and their learning stood at the center linking it closely to UDL that aims to maximize learning opportunities and learning outcomes for all learners (CAST, 2020)

Implications and Lessons Learned

As instructors and researchers, we aim to enrich the quality and breadth of learning for our students. We also strive to create learning experiences that meet the demands for future professional practice. Based on our design studio teaching experience, and the formal and informal feedback received from students, colleagues, collaborators and guest reviewers, the fall 2019 and the winter 2020 studios had a significant impact on the learning and the learning experience of students. In particular, students learned a lot about Indigenous culture and cross-cultural approaches to design through the inputs of Hal Eagletail, Tsuut'ina Elders and Indigenous design professionals. They learned to work with others, and to appreciate different views and approaches. At the same time, through their projects, they explored what it means to develop 'inclusive' design proposals.

There are certainly refinements that can be made to the courses, in particular to some of the assignments. For example, the task that asked students to work in groups of ten in the interdisciplinary studio to combine some of their ideas into a larger proposal was too challenging. The group size was simply too large to achieve a meaningful outcome in the timeframe provided. Similarly, some of group work tasks in the planning studio required more time for students to complete because figuring out how to collaborate online was an additional, new challenge. However, overall, the design studio courses were highly successful enabling a reciprocal exchange between students, instructors and the different stakeholders, through which we all have learned. As Donald A. Schön (1983, p.31) states: "Reflective practice is a dialogue of thinking and doing through which I become more skillful."

Recommendations

Design is described as a process of making decisions based on reflection in and on action (Schön, 1983). It is a complicated process for which everything matters. Thus, design education is challenging, especially with the Covid-19 pandemic when teaching had to be moved online. It appears that studio learning needs to adapt and evolve to align with today's complex and fast-changing world. As Findeli (2001) argues, we need to rethink design education - theoretically, methodologically and ethically - for it to be 'fit' for the 21st Century. In addition, design students need to learn more than to produce 'good' designs and be 'good' designers. They need to be able to make their designs accessible and usable for everybody. This requires "a new paradigm for design studio education" (Wang, 2010), one that allows for a purposeful engagement with topics and issues, together with stakeholders. Thus, what is required in courses is not a third person perspective but a discourse with actual people, a subject that is very much alive and lived.

The learning and teaching approach adopted in the design studio courses Interchange and Kuniya certainly has the potential to act as a formula for other courses on how Indigenous knowledge and traditional ways of doing can find their way into the classroom. The outcomes demonstrate that a cross-cultural approach in both course instruction and course content supports an inclusive practice. It is a setting that all learners can access and participate in meaningfully, modeling the idea of UDL and projecting it through studio practice onto the work produced by students. One could argue that this reverses what was originally the point of departure with UDL that models the idea of Universal Design. In our studios, Universal Design was implied and fostered through UDL practice, challenging the traditional one-size-fits-all model. However, for this approach to be successful, instructors need to actively support and foster collaboration and, especially online, allow enough time for a meaningful exchange.

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Design students need to learn more than to produce 'good' designs and be 'good' designers. They need to be able to make their designs accessible and usable for everybody.

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Chapter 5:

A Case Study of Using UDL to Develop the Skill of Failing Forward in Undergraduate Business Students

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Entrepreneurship and Innovation

Course Level:

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Key Words:

Entrepreneurial Thinking, Signature Pedagogy, Case Study Approach, Multiple Means

Background

Pandemics. Black Lives Matter Movement. Climate Change. Political instability. Poverty. Me Too Movement. There is an extraordinary amount of change and uncertainty in our local and global business environment. Many business schools follow an outdated signature pedagogy (Shulman, 2005; Tufano, 2020) that is unable to prepare students to become successful business leaders given this uncertainty. The United Nations have outlined seventeen Sustainable Development Goals, and the fourth is Quality Education (UN, 2020). To achieve a quality post-secondary education in today's challenging environment, the authors have proposed a new signature pedagogy is required for business schools to adopt to ensure they are teaching the skills required to safely navigate the uncertain and turbulent future (Peschl, 2020). New business graduates will work in many different sectors such as healthcare policy, alternative energy, and agriculture – all of which strive to innovate, and thus demand a new skillset and ways of thinking (O'Connell, McNeely, & Hall, 2008).

ENTI 317 “Entrepreneurial Thinking” is a mandatory second year Bachelor of Commerce course, consisting of twelve sections of 80 students each, offered over a thirteen week fall or winter semester. Over 6 years, this course developed a unique pedagogical approach for entrepreneurship education anchored in seven essential and teachable entrepreneurial thinking skills (ET-7) to prepare future leaders: (1) problem solving, (2) tolerance with ambiguity, (3) failing forward, (4) empathy, (5) creativity with limited resources, (6) responding to critical feedback, and (7) teamwork approach. What is vital to emphasize is that most of these undergraduate students do not identify as entrepreneurial nor do they want to start their own company. Rather they want to work for existing organizations in traditional business roles like accounting or finance (Peschl, 2020), however, these seven skills will be beneficial, regardless of their career path.

Highlights: Entrepreneurial thinking, signature pedagogy, UDL, multiple means of action and expression.

Case Study Learning Objectives

For this case study, we will focus on the skill of “failing forward”, which reflects an individual’s ability to quickly learn from their experiences, especially from negative ones with minimal risk. There are two underlying components of this skill that the students learn through our signature pedagogy 1) self-confidence, which is belief in one’s skills and talents, and 2) persistence, which is the ability to bounce back and keep trying after disappointment (Peschl, 2020). Failing forward also develops the student’s ability to have practical imaginativeness, such that they can develop the skill to extrapolate lessons from one’s experiences for use in future situations.

The skill of Failing Forward will be presented through the lens of **UDL Principle 3: Multiple Means of Action and Expression**.

UDL Principle 3: Action and Expression

The UDL principle of Action and Expression has been foundational in the design of our course. We know our students come to our class with great resistance and trepidation as our required course challenges many of our students with learning objectives that do not have a clear “correct answer” or a single path to an “A” grade. We are teaching our students skills like empathy and learning from their failures, skills that can be entirely dependent on context. Failures in business are not typically celebrated, even though there is significant evidence that it is the failures of successful entrepreneurs and business leaders that teach them significant and important lessons (Aldrich H, 2014).

Guide Appropriate Goal-Setting

Our course articulates clear weekly goals for the students to do through the development of 18 worksheets that guide the students and establish what success looks like through their journey. Each worksheet sets out a few key “experiments” that the student must conduct between classes. These experiments always end in asking the students what did they learn and what are they going to do with this information? These self-reflections clearly establish goals for each week.

To support our students through this journey of learning from their failures, we have focused on creating a healthy amount of anxiety through incomplete information in the course content and deliverables, and then allowing them the ability to adapt and be rewarded for their journey rather than the ultimate success of their business idea. Incomplete information is typically arrived from the customer interviews they conduct, and typically do not get enough information to confirm that their idea is a great idea. Based on this incomplete information, their first assignment is a 3-page self-reflection on their innovative business idea. Students can achieve a top grade with an idea that is strong (persevere), an idea that needs to be changed (pivot), or an idea that should be completely abandoned because it is a failure. Their reflection on why their idea is a success or a failure is graded, rather than the actual idea itself. We approach all individual and group assignments through a scaffolding method, where students build upon the previous assignment and need to demonstrate how their business is evolve through “experiments” that they are conducting every week with their potential customers.

Solve Problems Using A Variety Of Strategies

Students can choose any problem that they are passionate about solving, which provides them freedom to apply the skills to an idea with which they resonate. Students will typically “abandon” three to five ideas, before they get to the second reflective assignment due in week 6. We equate this learning approach to learning to ride a bike. A typical pedagogy in business is the equivalent of giving students case studies on failures from riding a bike or a textbook outlining the physics of riding a bike. Our approach is to give them a bike with training wheels and wrap them in safety equipment so when they fall off, they learn quickly and safely. We have established clear goals set each week through interactive worksheets and checklists on our Open Educational Resource called Failing Forward. These worksheets allow students to learn at their own speed and guide them through the process. This helps them navigate the “potholes” on their learning journey. An example of a worksheet is in **Appendix A**.

Support Planning and Strategy Development

A major success of this pedagogy has been the support network we have created for students inside and outside of the classroom. We train twelve undergraduate teaching assistants to help guide the students on their journey. The ability for students to talk to their peers on how to navigate such a fast-paced course is essential. In addition to marking, the TA's host online office hours, create pre-recorded video tutorials, and monitor the chat rooms for discussions. We also record all the final student projects from the past six years and provide the videos of strong student projects on the OER. The ability to see their peer's final projects demonstrates that while the project can seem daunting, they can see success in their peers.

Outside of the classroom, with the support of The Hunter Center for Entrepreneurship and Innovation, we have over 100 business mentors that come to support the students' business ideas. This happens in three classes during the semester (week four, eight, and twelve), and allows students to pitch their ideas to experienced business leaders and hear about what these experts would do. This sometimes results in conflicting feedback, where one mentor loves the idea and the other does not like it. It is this tension that allows the students to learn that business decisions are not always as clear as is sometimes demonstrated in textbooks or case studies. Students' journeys through the startup process can get messy and confusing, but in our class, it is the students' ability to "stop and think" and provide informed justification for their decision that is graded.

Incorporate Technologies That Facilitate Class Communication and Participation

Transitioning this highly experiential course to an online learning environment, due to the Covid Pandemic has been challenging and rewarding. We have strived to keep the learning objectives and weekly lecture content the same as in-person lectures. We have brought in two new technology platforms, the

first is a peer to peer feedback platform called Kritik. To replace the in-class peer to peer feedback that took place during most classes. We have had great success with Kritik. This platform allows students to anonymously upload their reflection assignments and then 3 of their peers evaluate the submission, using the same rubric as the instructors, and provide written feedback on how to improve the student's work. The student's evaluation and comments for improvement is then scored by the student who received it. If a student provides strong feedback to help the student improve their next assignment and it is motivating, the student who provided the evaluation will receive a high Kritik score. If the student provides a discouraging evaluation or comments that are not helpful, their Kritik score is reduced. This Kritik score is then turned into a participation grade. By providing feedback on reflective assignments, we have found that the students' understanding of the concepts and ability to give valuable feedback increases.

The second technology platform is Miro, which allows students to enter a virtual whiteboarding and collaboration space that is very dynamic and has many tools that help to facilitate large workshops. In class two, we do a "gift giving exercise" that walks through the five stages of the Design Thinking methodology. In an in-person class, this exercise would have had 80 students running around the classroom using crafts like pipe cleaners and popsicle sticks to make prototypes of their ideas. In Miro, we can create a very similar environment, but they are able to use images from the internet and the drawing tools in Miro to create their prototype. When we polled the students about this experience many of them found the Miro experience to be valuable and high energy.

Reflective Critique

We will briefly summarize how the UDL Principle 3: Multiple Means of Action and Expression were used throughout this course. We have created a chart that on the left provides an aspect of the UDL principle three, and then on the right we have outlined how these aspects supported our course (UDL, 2020).

UDL Principle3: Multiple Means of Action & Expression	Examples of the UDL aspect supporting ENTI 317
Optimize Individual Choice and Autonomy	Students can choose any problem for their idea generation
Optimize Relevance, Value, and Authenticity	Students are encouraged to focus on problems that they are passionate about solving with an innovative business idea.
Minimize Threats and Distractions	Guiding worksheets, peer to peer feedback (ie: Kritik), and continuous mentorship through advisor pitches
Heighten Salience of Goals and Objectives	Students have control to decide if they want to continue with their idea, change it or abandoned it and start again each week.
Vary Demands and Resources to Optimize Challenge	Students are required to make decisions about their ideas with incomplete information that create learning opportunities.
Foster Collaboration and Community	100+ business advisors support students through multiple pitch presentations, peer to peer kritik reviews, Teaching assistants support through weekly tutorials run by former students.
Increase Mastery-Oriented Feedback	Feedback takes place every class, through in-class experiential exercises, advisor pitch sessions, and regular customer interviews.
Promote Expectations and Beliefs that Optimize Motivation	The ability for students to continuously evolve their idea as they see fit through scaffolding all assignments.
Facilitate Personal Coping Skills and Strategies	Use ITP Team Dynamics platform to help develop strong team skills and foster task conflict while reducing relationship conflict.
Develop Self-Assessment and Reflection	All individual assignments are self-reflections. Students must justify their decisions based on primary research they have conducted.

The authors feel very strongly that as post-secondary educators, we must strive to prepare our students for a turbulent and uncertain future, no matter what their career goals are. When we look at the seventeen United Nations Sustainable Development Goals (SDG's), there is no shortage of wicked problems for which post-secondary students can help to create solutions to benefit our society. In conclusion, the Universal Design for Learning approach, specifically multiple means of action and expression (CAST, 2020), has provided a strong foundation to teach seven Entrepreneurial Thinking skills to business undergraduate students.

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Websites

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- Failing Forward Open Educational Resource** Peschl, H., Peschl R. <https://failingforward.ca/>
- United Nations Sustainable Development Goals**, Goal 4 Quality Education. <https://www.un.org/sustainable/development/education/>

Appendix A: Example of a Worksheet

Worksheet: Advisor Pitch Feedback: Pivot or Persevere

Entrepreneurial Thinking Concept: Pivot, Persevere or Abandon

Learning Objective

You have been rapidly developing your idea based on the Lean Start up Methodology. The goal of the Lean Start Up Method is to quickly and cheaply “learn” if you have a good idea, and you just received feedback from a panel of experts and your classmates. Interpret this feedback and decide how to improve or pivot your idea. Remember, if you get consistent bad feedback, you have time to pivot your problem and solution, rather than sticking with a bad one.

Instructions

1. During the zoom advisor breakout sessions, you will play your pitch video for the advisors. Then the advisors will give you feedback on your idea. Everyone in the team takes individual notes on what the Advisors told your team about what to do with the teams’ idea. The reason everyone takes notes, is that sometimes people understand feedback differently.

2. After the advisor session online, meet with your team and apply SUI training to decide if the team should abandon, pivot or persevere. If the team decides to abandon to a new idea, then arrange a time to meet with your instructor to support you on this decision.

You will likely get conflicting advice from so many advisors & classmates; your job is to wade through this information and decide which parts are most relevant and important to your group. If you get negative feedback, this does not necessarily mean that you have to pivot, but it does mean that you have to be able to address these concerns before the final pitch.

Additional Resources:

What advice do you listen to?

<https://www.fastcompany.com/3054544/when-to-ignore-feedback-and-when-you-should-listen>

Chapter 6:

Promoting Reflexivity Through Multiple Means of Engagement: A UDL Approach to Enhancing Cultural and Social Justice Responsiveness

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Course Level:

Undergraduate

Key Words:

Cultural and social justice responsiveness, self-awareness, reflexivity, multiple means of engagement

Introduction

The cultural landscape in Canada and around the world is continuously shifting (Arthur, 2013; de Haas et al., 2013). Graduate students in counselling psychology alongside those in other helping professions require specialized training to be in a position to ethically work with a wide range of diverse clients and communities. With the recent resurgence of movements like Black Lives Matter and Scholar Strike Canada, these training efforts are more relevant than ever.

Progressively over the past thirty years, the concept of cultural and social justice responsiveness has moved to the forefront of many training programs in counselling psychology. This type of responsiveness has been said to include students' awareness, knowledge, skills, multicultural relationships, and advocacy (Collins & Arthur, 2010; Kassan & Sinacore, 2016; Sue et al., 1992; Ratts et al., 2016). Self-awareness – the process by which one engages in purposeful reflexive practice to unearth their values, beliefs, attitudes, biases, and assumptions – plays a central role in the development of cultural and social justice responsiveness (Arthur & Collins, 2014; Kassan & Green, 2019; Kassan et al., 2019; Kassan & Green, 2016; Ratts et al., 2016). Thus, reflexivity represents

a purposeful focus on one's values, beliefs, attitudes, biases, and assumptions; and reflexive activities are used in the classroom to help deepen students' understanding of these factors.

Universal Design for Learning (UDL), in particular multiple means of engagement, represents an ideal approach to promote reflexivity among graduate students, which in turn can enhance their cultural and social justice responsiveness. This chapter will illustrate the manner in which I have employed multiple means of engagement (e.g., variety of teaching and learning activities, individual reflexive time, interaction with peers) to enhance graduate students' training in counselling psychology. Implications for teaching and learning as well as applications across helping disciplines will also be presented.

Cultural and Social Justice Responsiveness

The multicultural and social justice movements have been called the fourth and fifth forces within counselling psychology (Fouad & Prince, 2011). This is a testament to the rigorous scholarship that has taken place across the discipline. Cultural and social justice responsiveness (also referred to as multicultural and social justice counselling competencies) have been

one of the driving forces behind this scholarship (Collins, 2018; Kassan, 2017; Ratts et al., 2016; Sue et al., 1992). As noted above, such competencies have been defined as awareness, knowledge, skills, multicultural relationships, and advocacy (Collins & Arthur, 2010; Kassan & Sinacore, 2016; Sue et al., 1992; Ratts et al., 2016).

For many, including myself, self-awareness (identifying one's biases and assumptions), is thought to be a critical point of entry for developing cultural and social justice responsiveness more generally (Arthur & Collins, 2014; Ratts et al., 2016). Hence, it is critical for counselling psychology students, educators, and practitioners to continuously examine their own values, beliefs, attitudes, biases, and assumptions – to better understand how they might influence their work. To promote self-awareness, students are often encouraged to engage in the practice of reflexivity as a means of identifying their core attitudes and beliefs. Reflexivity is said to be a two-way process, where one has the potential to learn from and be changed by their deepening self-awareness. In turn, the way in which one learns and changes can influence those around them.

Engaging in activities that stimulate reflexivity can be difficult in that they can bring up many emotions and lead to surprising new insights (Arthur & Achenbach, 2002; Boud et al., 1985). However, given that reflexivity is key to developing cultural and social justice responsiveness, it is critical to preface it in the classroom. In this way, I believe that positioning this practice as central to student training can be considered UDL. While not an easy goal, this can be achieved through multiple means of engagement.

Multiple Means of Engagement

When instructors adopt a UDL approach, they can maximize learning for a greater number of students (National Center on Universal Design for Learning at CAST, 2017). Engaging students through multiple means of engagement requires different learning opportunities; for example, involving them in interactive activities, group discussions, online discussion boards (La et al., 2018). This principle

takes into account the fact that there are different motivations behind each student's learning process. For learning to be meaningful to the largest number of trainees, it is important to provide them with different options and points of entry to explore the subject matter.

In the case of reflexivity, multiple approaches can be employed to encourage students to focus on and increase their self-awareness. Through my own teaching, I have noticed that when students are actively engaged in their learning, they are more likely to be enthusiastic about applying their new knowledge to real-life situations. Further, they will have a greater desire to continue to learn more on their own (La et al., 2018). Applied to cultural and social justice responsiveness, students will be motivated to use their emerging competencies in their counselling work. In this way, deepening one's reflexivity (and in turn increasing cultural and social justice responsiveness) is not simply for the benefit of future clients; it is also for the immediate benefit of students themselves.

Deepening one's reflexivity (and in turn increasing cultural and social justice responsiveness) is not simply for the benefit of future clients; it is also for the immediate benefit of students themselves.

Activities that Promote Reflexivity

There are many activities that I integrate into my graduate courses to help promote student reflexivity. These can be used in specific diversity-related courses or other more general counselling-related courses. The three activities that I find most effective in combination include: (1) a cultural self-assessment tool (Hays, 2008), (2) an exercise in economic privilege (Audet et al., 2014), and (3) a political analysis (Morrow & Hawxhurst, 2013). While a thorough explanation of each of these activities goes beyond the scope of this chapter, they are summarized in Table 1.

Table 1: Reflexive Activities that Prompt Cultural and Social Justice Exploration

Reflexive Activities	Descriptions	Aims
Cultural Self-Assessment (Hays, 2008)	Students name some of their cultural identities and social locations with respect to the ADDRESSING framework: Age, Developmental disability, Disability acquired later in life, Religion/spirituality, Ethnicity, Social class, Sexual orientation, Indigenous heritage, National origins, and Gender.	Identify areas of privilege in each of the areas included in the ADDRESSING framework.
Economic Privilege (Audet et al., 2014)	Students answer a series of questions about their economic situation growing up.	Observe areas of economic privilege (e.g., growing up in a home that parents owned) and challenge (e.g., going hungry because there was not enough food in the house).
Political Analysis (Morrow & Hawxhurst, 2013)	Students analyze situations in which they may hold differing levels of power.	Consider the socio-political forces (e.g., racism, sexism, heterosexism, ableism, weightism) that have historically and/or continue to impact one's life.

Generally, the reflexive activities prompt learners to reflect on their multiple and intersecting cultural identities and social location as well as the socio-political contexts in which these develop and change over time. Students are asked to think about certain concepts (e.g., whether they are part of a dominant racial group or how much economic access they had in their life growing up) and reflect on how this might impact their current worldviews. In this way, the reflexive activities allow students to think critically about the areas of their lives where they hold privilege and areas where they might have endured oppression. Ultimately, students are encouraged to use the learning that they gain from these activities to leverage how they will work with clients from diverse backgrounds.

Each reflexive activity presented in Table 1 has its own purpose and process. Any given activity can be used on its own or in combination with others, depending on the intended domains of exploration (e.g., cultural, economic, and/or socio-political). In many of the courses I teach, I used the three reflexive activities discussed above as a starting point to reflexivity. Then, I follow-up with different means of engagement to help consolidate students' learning (see Table 2).

Table 2: Multiple Means of Engagement in a 500-level Counselling Psychology Course

Multiple Means of Engagement	Descriptions	Aims
Reflexive Journaling	Individual journaling inside and outside of class time.	Provides students with time to think about and consolidate learning on their own (before sharing with others).
Group Discussions in Small and/or Large Groups	Sharing emerging self-awareness in class contexts,	Offers students an opportunity to share their learnings and help one another continue the two-way process of reflexivity.
Case Vignette	Analysis of a counselling case where students can link their self-awareness to other competencies (i.e., knowledge, skills, multicultural relationship, advocacy).	Helps students apply their recent learnings to other domains of cultural and social justice responsiveness and develop a better understanding of how they might work with a particular client.

Although the process might seem linear (from reflexive activities to case vignette), it is actually quite fluid; some insights might be immediate while others will develop over time. For example, one might identify an area of privilege through one of the reflexive activities; however, they only come to embody it when analyzing an actual counselling case. It is important to note that students will likely engage with course exercises in differing ways. Thus, the different means of engagement help ensure that everyone will have an opportunity to learn about and consolidate their self-awareness in a way that meets their individual needs and styles.

Implications and Transferability

It is critical for educators who promote reflexivity in their classrooms to consider some of the following caveats. First, since self-awareness is said to be the cornerstone of cultural and social justice responsiveness, it is incumbent on counselling psychology instructors to integrate regular reflexive practices in their own personal and professional lives (Kassan & Green, 2016). Second, it is necessary for them to possess strong group facilitation skills and be able to manage difficult discourses in the classroom (Kassan et al., 2019). Third, given the sensitive nature of reflexivity, students sometimes face uncomfortable realities during the process (e.g., they have been

raised with racist ideologies); hence it is necessary for instructors to know when to preface empathy in the classroom (Arthur & Achenbach, 2002; Boud et al., 1985; Kassan & Green, 2019).

While counselling psychology is a unique discipline, one that trains future counsellors and psychologists, there are many related helping professions that also centralize reflexivity in their courses. For example, the fields of social work and family therapy regularly work with reflecting teams to help emerging clinicians think about how their own values and beliefs might be influencing their work with clients (Pender & Stinchfield, 2012). In my opinion, the most important aspects to consider include student readiness and class size. For example, the role of cultural and social justice responsiveness is prominent in many counselling psychology training programs. As such, students are oriented to the idea that they will need to engage in a reflexive practice early on in graduate school. This is positioned as a lifelong practice to cultivate, not simply a short-term exercise. Further, graduate courses in counselling psychology can be relatively small, ranging from 5 to 30 students, depending on the course content. As such, it is potentially safer and more manageable to engage in reflexivity within such contexts. In considering transferability to other helping professions, it is important to consider these factors.

Conclusion

Cultural and social justice responsiveness are foundational to counselling psychology practice (Foud & Prince, 2011; Ratts. et al., 2016). Reflexivity is a central aspect of this responsiveness. In fact, it is said to be an essential starting point to building cultural and social justice competencies (Arthur & Collins, 2014; Collins, 2018; Kassin, 2017; Kassin & Sinacore, 2016). To maximize student reflexivity, it is important to consider how multiple means of engagement can be leveraged to meet their diverse learning needs (La et al., 2018). The steps outlined in this chapter, to prompt reflexivity throughout multiple means of engagement, are transferable to other helping disciplines.

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Chapter 7:

Incorporating UDL Principles in an Online Graduate Course Using a Backward Design Approach

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Field/Discipline:

Education

Course Level:

Graduate

Key Words:

Online Graduate Course, Instructional Design, UDL, Backward Design

Course Context

The online course, Leading Citizenry in a Digital Age (EDER 678.70), is required in the Master's Certificate (4-course topic), Leading and Learning in a Digital Age in the Werklund School of Education, Professional Graduate Programs in Education, University of Calgary. This course was offered during the Spring 2020 term.

Universal Design for Learning

Universal Design for Learning (UDL) has been successfully implemented by instructors in online courses to provide students with an opportunity to learn in an inclusive learning environment (Al-Azawei, et al., 2016; Rao et al., 2014). UDL implementation is often guided by principles for providing learners with multiple means of engagement, expression, and representation but is also recognized by instructors as a process of continual improvement with repeated design cycles and improvable ideas (Rose & Meyer, 2002). As an essential component of teaching and learning in the digital age, UDL continues to “seize[s] the opportunity brought by rapidly evolving communication technologies to create flexible methods and materials that can reach diverse learners” (Rose & Meyer, 2002, p. 3). I describe below how I used a backward design approach (starting with the end in mind) for teaching an online graduate course in education that incorporates the UDL

guiding principles to support student interaction, communication and demonstration of their learning. Recommendations are also provided for future iterations of this course.

The primary goal for implementing UDL principles in this course was to increase students' accessibility to online course content and to provide students with multiple ways of engaging in their learning. The approach I used is grounded in constructivist learning theory and includes: (1) identifying and clarifying desired results, (2) determining acceptable evidence and multiple means of expression and representation, (3) planning accessible learning experiences and instruction with attention to pre-instructional decisions (Wiggins & McTighe, 2005; Mazur, 2018). I designed the course using pre-recorded videos with synchronous and asynchronous learning activities to provide all students with multiple means for accessing and engaging with course content, and for representing and expressing their learning. Technologies selected for the online interactions (synchronous interactions – occurring at the same time; asynchronous interactions – occurring at different times) primarily included applications purchased and supported by the institution (e.g., Learning Management System, web conferencing applications, email). However, I also considered other applications preferred and commonly used by students and invited students

to use other applications for communications and collaboration (e.g., messaging applications, shared online documents). In my courses, I do not limit or discourage the use of student-selected applications for engaging in learning. Learners are empowered to select and use the tools of their choice.

A common theme that cut across the principles of UDL is providing multiple means for communication. In this section, I will provide examples illustrating how I incorporated UDL into the online course, EDER 678.70 Leading Citizenry in a Digital Age. The following are selected examples of teaching approaches used in the course that are connected to this cross-cutting theme:

1. Identifying and clarifying desired results by creating pre-recorded one-take videos with transcript:

I pre-recorded a video to help communicate and clarify desired learning outcomes and learning activities in the course. The recording was shared with students in the Learning Management System (LMS) prior to the commencement of the course. I also shared the written transcript that I used when creating the video. Some instructors create the video first and then generate a transcript from the video. For example, applications such as Yuja can be used to generate a transcript from the recording for digital accessibility. My process involved writing a transcript first. Next, I used the transcript to help create the multi-media recording. The final recording was then uploaded to the online course content in the LMS. I informed students when the recording was available for their review by sending the students in the class an email message and by posting a news item in the course announcing that a video recording was available. In my messages, I provided a link to the recording and the transcript to make the content accessible to students and to accommodate different preferences for reviewing course information. Some students preferred to review the recording and also read the transcript for clarity. Students indicated that accessing the video and transcript was helpful for identifying and clarifying learning outcomes. Students also noted they appreciated when the recording was not too long in duration (recommended length is 5-10 minutes) (Brown, 2019, 2020).

2. Using synchronous sessions help students determine acceptable evidence and use multiple means of representation:

In this course, I scheduled three synchronous sessions during the 6-week term. I also offered drop-in sessions, known as virtual office hours, for students to meet with me individually and to ask questions. Synchronous sessions with audio and video features online can be helpful for meeting live with students and discussing multiple means of representation and acceptable evidence of learning.

In online synchronous sessions, the “share screen” feature can be used to share applications and provide visuals and representations during synchronous session presentations. I have noted that this feature benefits students particularly when they share work created in an application that is different from what peers are using. Students are invited to create and collect feedback live using their preferred applications and programs. When students continue working on, refining and editing their presentation live while using the screen share feature during a synchronous session, UDL is enriched and the notion that all work is improvable (Scardamalia & Bereiter, 2014) is supported. Students discovered through this course that draft work can be edited and improved with support from an online community of learners.

In this course, I also provided students with time during the synchronous sessions to meet in small groups with peers (~3 members) using the breakout room feature. When organizing a small group activity, I’m aware that students appreciate receiving directions in advance of the session. As I reflect on this, I would improve this strategy in future iterations of the course and provide more advance notice to help students prepare for the synchronous learning activities. I could help students prepare for a synchronous session by providing explicit directions about what a student can do or think about prior to attending the synchronous session. Asking a guiding question can help guide interaction when students meet in breakout rooms. Providing the question in advance can give students extra time to think about and articulate a response to the questions. The following is an example of a breakout room question used in the class:

How Will You Lead Technology in Action in Your Current Work Context?

When meeting in a breakout room, assigning roles can help promote interaction and make the activity accessible for all members of the group. The following roles can be used during a small group discussion and help ensure everyone has equal opportunity to contribute:

- **Moderator:** responsible for facilitating discussion and managing the breakout room by calling on each person one-at-a time in the group to share their ideas; each member can be provided with up to 5 minutes to share their response and then move to the next member in the group, and end with the moderator sharing a response.
- **Reporter:** responsible for sharing one key idea from the group to large group after the conclusion of the small group breakout time.
- **Recorder:** responsible for keeping notes of key ideas during the discussion; the recorder may choose to prepare a visual or manage notes in a shared digital space.

Another strategy I use to provide students with opportunities to determine and discuss acceptable evidence of learning is to remain online after the end of a scheduled synchronous session. Once I turn off the recording at the end of the synchronous session, I remain online and respond to individual student questions.

3. Using asynchronous discussion forums to provide accessible learning experiences and instruction with attention to pre-instructional decisions (and set-up):

Asynchronous interactions in online courses can support learning and make learning experiences accessible and flexible for all students. During asynchronous activities, students are often provided with a timeframe (e.g., two weeks) and can interact at any time in this period. For example, discussion forums can be used to organize and guide asynchronous peer feedback loops. This requires pre-instructional decisions, such as determining the size of the group, how the groups will be formed, what will be the lens

used for the feedback, will the groups be open for all members of the class or closed and only visible to group members, will outside experts be invited to provide feedback, and at what point will the instructor engage with the group members during the feedback process?

Peer feedback can help students review the criteria for an assignment by helping their peers recognize areas of strength and areas for improvement in their work. In this course, I arranged small groups of students (-4) and set-up a discussion forum for each group in the institutional LMS. Within the discussion forum, I organized threads with directions for the peer review process. For example, the peer review cycle occurred over a two-week period. During the first week, students were required to post their draft work under the discussion thread entitled, Week 1 Drafts within their group forum. During the second week students were required to review the draft from one peer and then post their feedback in the discussion form entitled, Week 2 Peer Review. One way to organize the peer feedback loops is to assign a number to each student and then inform the process for peer feedback (e.g., student 1 provides feedback to 2; student 2 provides feedback to 3 and student 3 provides feedback to 1) to ensure each student provides and receives feedback. A rubric can be helpful for students to use as a lens for providing constructive feedback to peers. Making the feedback visible in the discussion forum for each group allows me to review the feedback, make sure students are on track, and provide further input and feedback as needed. This format and process allows students to review the peer reviews and enrich their own work and skills for providing critical feedback.

Use multiple modes of communication (e.g. pre-recorded one-take productions and written transcript, and synchronous and asynchronous activities)
Provide advance information (e.g., questions that will be discussed during the synchronous session)

Implications

I noticed that using different modes of communication throughout the course created a safe and inclusive learning environment conducive for peer-to-peer and student-instructor interactions. The practical and literature-informed approaches used in this course can serve to inform instructors, instructional designers, and program developers with interests in online teaching and making learning experiences engaging and accessible for all students through the use of pre-recorded videos and synchronous and asynchronous learning designs.

Lessons Learned

Next time I teach this course, I plan to provide students with more details about how I will use multiple modes of communication throughout the course. I will also provide detail about how students could prepare for synchronous sessions by reviewing pre-recordings and questions that will be used during the synchronous sessions.

Recommendations

Reflecting on the design and implementation of the course helped me recognize that the time devoted to creating resources and planning synchronous and asynchronous learning activities prior to the start of the course is time well spent. Creating resources or thinking about ways to make resources accessible can be helpful in making all students feel safe and comfortable interacting with others in the course and learn as part of an online scholarly community.

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Chapter 8:

Assessment as a Tool for Learning – How Portfolios Were Designed to Improve Student Learning and Wellbeing

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Field/Discipline:

Engineering

Course Level:

Undergraduate

Key Words:

Engineering Education, Engineering Design, Project-Based Learning, Reflection Portfolios, Multiple Means Of Action And Expression

Course Context

In second-year electrical engineering there is a project-based integrated learning cohort, where the cohort of the students experience all five of their required courses for their second term of second-year in an integrated format. This chapter specifically discusses the final portfolio assessment which was part of a required core course on Engineering design, ENEL 300. The authors of the chapter were the instructor and one of the teaching assistants for the course. The primary author was specifically responsible for supporting the development, implementation, and assessment of the final portfolio assignment within her TA duties. The cohort consisted of 70 students.

Universal Design for Learning (UDL)

The UDL discussed in this chapter was designed with the primary goal of using assessment as a tool for learning and reflection, and the secondary goal of giving the students a tool to showcase their learnings to stakeholders outside of the classroom. Students' well-being and mental health were a decision vector in assessment design for the teaching team, therefore, several techniques were used to mitigate assessment anxiety.

The assignment criteria were designed to provide students with multiple means of action and expression, where the goal was to provide “learning environments to appeal to the largest number of learners” (La, Dyjur & Bair, 2018, p.3). This chapter focuses on having multiple means of action and expression, as assessment relies heavily on how students demonstrate and express their learning (Rose et al., 2006). Specifically, there were three UDL themes we will highlight: student choice, opportunities for feedback, and mitigating assessment anxiety.

It is important to note that the goal was not to cater to a specific student demographic, rather, as instructors, we acknowledge that our classroom includes a diverse range of students and we wanted to design for the widest range of students possible. For example, in the 2016-17 academic year, 20% of students were mature (25+), 2% of students self-identified as Indigenous, and 7% of students were international students (La, Dyjur & Bair, 2018). These are just a few examples of the diversity of students in the classroom, but there are many other dimensions such as diverse gender identities, sexual orientation, neuro-ability, race, culture, and language. For this reason, we aimed to use UDL principles to help reduce the barriers to education as well as increase the engagement students had with the material, acknowledging that there is no single approach that is ideal for all students (Rose et al., 2006).

In the rest of this section, we will discuss the design of the UDL, student's choice in the delivery of the assignment, opportunities for feedback, and the methods used to mitigate anxiety.

Design of The Portfolio Assessment Modules

The final portfolio assessment discussed here was specifically designed for the course ENEL 300, an electrical engineering design course. Students in ENEL 300 were asked to create a final portfolio, worth 20%, to synthesize their educational experiences as part of their final assessment. The students were asked to develop a portfolio document that would be used to plan, organize, document and showcase their learnings. This reflective activity allowed the students to practice self-regulation, where they were asked to “consistently reflect on the learning process” so they could “become self-directed learners who grow over time (Novak & Rodriguez, 2018, p. 3). The portfolio included a summary about the learner, the designs they had made, the skills the learner had acquired, and a description of technical artifacts they had developed. Portfolios included both written text and graphic representation of the material. To give the students further motivation to excel in the assignment, they were made aware that the portfolios can help them become prepared for job interviews and career development as the portfolios can be used to augment their CV when looking for summer positions.

Each student portfolio included five categories as listed in Table 1 below. Even though the grading of the portfolio only counted towards the marks for ENEL 300, the portfolio content spanned across all five courses and prompts were solicited from all instructors teaching the cohort.

Table 1. Student Portfolio Categories

Category	Sample of Student-selected Artifacts
1. Introduction	Students introduce themselves, description of practical skills for conducting electrical engineering designs
2. Learning outcomes	Description of learning from all courses that term
3. Reflection	Students reflection on their learning specifically within the project course and project design process: what they learned, what was challenging, next steps in their learning process
4. Teamwork	Reflection on teamwork learnings: personal contributions to the group, what worked well, and areas for improvement
5. Student choice	Student agency to choose. Some examples included: description of DIY electrical engineering hobby projects; reflections on club participation activities; and thank you cards for the instructors and TAs of the course.

Student Choice

As part of the final portfolio assignment, students were given multiple options on how to complete their assignments. They could choose both the format (ex. webpage, PowerPoint, video) and the content of their portfolio entries, allowing them to have multiple means of expression and communication to create authentic and innovative products which showcased their learnings (Novak & Rodriguez, 2018). We recommended portfolio entries based on their second-year courses, but we also encouraged students to propose any alternative reflections from previous courses or personal projects. This flexibility and opportunity for choice allowed students to choose how they demonstrated their learning, and strategically apply their learning (La, Dyjur & Bair, 2018). For example, here is an excerpt from the assignment guidelines which provides some structure for students, but also encourages them to highlight their own personal learnings.

Format for the Portfolio:

A portfolio entry should consist of a short description (one to two paragraphs) and a graphic that can go along with it. The paragraph should be highlighting a skill you have acquired or a technical description of the material you have learnt. It is helpful to bold keywords or a key phrase in the paragraphs to really highlight your important takeaways.

Opportunities for Feedback

As the assignment was regarded as a tool for learning, students were provided with opportunities for formative feedback, where they could submit a first draft of the assignment. As the teaching assistant, Robyn's role was to provide feedback on these drafts and support students in improving their portfolios. The goal of this formative feedback was to challenge and empower students, where they could take the feedback to develop and grow "toward mastery rather than a fixed notion of performance or compliance" (Novak & Rodriguez, 2018, p.2). Additionally, there is evidence that formative assessment is a high-impact instructional practice, and perhaps one of the most effective interventions to increase student engagement and learning (Offerdahl et al., 2018). By providing iterative feedback loop(s) where progress towards the learning goals is monitored, we can adapt practices to further support students' achievement of the learning goals (Paul, 2019).

For example, the following excerpt from the assignment guidelines shows the submission guidelines. It is worth noting that initially the deadlines below were set for a few weeks earlier, however, the guidelines were updated when the transition to remote learning occurred to provide students with more time to complete their drafts.

Submission Guidelines:

Submit the completed portfolio in the D2L Dropbox. If you want feedback on draft entries, submit them by April 14 and you will receive feedback by April 17. The deadline for the final submission of all entries is April 23rd. If you are unable to submit because of the Covid-19 interruption, please contact Dr. Behjat and/or Robyn Paul for either an extension or a replacement.

Mitigating Assessment Anxiety

Lastly, the assignment was flexible and designed to mitigate assessment anxiety. Students had clear rubrics and expectations, and flexible deadlines. For example, due to the stress of remote learning in April 2020, four students did not submit anything by the deadline. Robyn contacted each student to give an extension and to check in on their mental wellbeing (research shows that upwards of two-thirds (Husky et al., 2020) or higher than 70% (Son et al., 2020) of students had increased stress and anxiety due to the COVID-19 outbreak). As the project was worth 20% of their mark, Robyn was able to work with these students so that they could submit something, even if it was a draft of only a few entries that would earn them 25-50% on the assignment, this was still significantly better than a grade of zero. Students greatly appreciated this personal support, and they often responded to the email letting Robyn know how difficult the pandemic and transition to remote learning had been for them. Many students opened up about their mental health had been struggling, and that they just hadn't been able to keep on top of everything. All students who Robyn contacted and who had submitted nothing by the deadline, submitted at least enough content to get them 7/20 on the assignment (and thus 7% more towards their final grade).

Overall, the portfolio assignment was a valuable personal reflection for students that provided multiple means of action and expression. The chapter will also reflect on areas for improvement.

Through incorporating multiple means of action & expression, it was evident that students were able to enhance their learning experiences through creative outlets, personal growth opportunities, and tailoring the assignment for their personal situation.

Implications

Through incorporating multiple means of action & expression, it was evident that students were able to enhance their learning experiences through creative outlets, personal growth opportunities, and tailoring the assignment for their personal situation. For example, in the previous year before the UDL approach was in place, the portfolio submissions from students were almost all identical, and there was a lack of personal meaning in their submissions. After implementing the UDL modifications, we noticed that students used the opportunity as a creative outlet and personal development opportunity. For example, they learned website design for the assignment so they could create an e-portfolio, or they used a graphic design software to create their learning portfolio. We also received many requests from students asking if they could adjust the content requirements slightly based on their personal interests. For example, one student worked on personal electrical engineering hobby projects at home and wanted to highlight these. Another student was passionate about math and wanted to reflect on how he has been applying math to electrical engineering rather than focusing specifically on the electrical engineering topics. By providing them with multiple means of action & expression, students took responsibility for their own learning and made adjustments for themselves.

We were also able to provide a space for students to reflect on their learning not only about the course in question, ENEL 300, but also as how it related to the other courses they have taken throughout the term, and in previous terms. This assessment was different from other assessments in engineering and sciences in the sense that students could use the final results for their professional improvement.

By encouraging the students to choose a preferred medium for their portfolios, instead of restricting it to teachers' preferred medium, we were able to capitalize on the students' creativity and learn of new ways students engage with technology.

By encouraging the students to choose a preferred medium for their portfolios, instead of restricting it to teachers' preferred medium, we were able to capitalize on the students' creativity and learn of new ways students engage with technology.

Finally, a positive implication for the instructors was that grading these portfolios was a pleasant task where we knew that our work was going to be used by the students to improve their technical and creative work versus a repetitive task of assigning marks and ranking students while knowing that the students will not look back at the work later on.

Lessons Learned

Although the portfolios were designed as an open-ended assignment to make room for creativity and reduce stress, we learned that at first students did not like the format because they were too open. This caused them anxiety due to the lack of clarity and fear of grading. However, through coaching and guidance, and particularly with the use of formative feedback opportunities, students were able to grasp the flexibility of the assignment and use it to their benefit where they really thrived in the learning environment. In the future, we propose to give more structure and examples to alleviate some of the anxiety that was felt at the beginning of the assignment. As is described in the UDL Progression Rubric, we want to ensure that we are able to “build fluencies with graduate levels of support for practice and performance” (Novak & Rodriguez, 2018, p.7). This allows us to empower students to be creative, while mitigating anxieties and uncertainties in the assignment. We also learned that it was essential for us in our grading to have clear rubrics so that we were not biased towards students who took a more creative route, as this was not one of the learning outcomes of the assignment.

We had planned a formative feedback process for the students to be able to receive early feedback on their assignment, however, some students did not use this process as there was no penalty associated with not submitting an early version. The lesson learned in this regard is to provide stronger motivation for submitting the first draft, and emphasize that it

doesn't need to be the fully complete assignment. For example, we could use a cumulative assignment where we provide students with a 5-10% incentive to hand-in a first draft to motivate students to submit earlier and receive an opportunity for feedback. In addition, we will consider how we can provide an incentive for making improvements between the first and second draft as it is important to ensure students actually review and integrate the feedback.

We view the feedback more as dialogue than a one-way transmission of information. Therefore in the future, we will provide an opportunity for students to contradict or complement the feedback they receive.

Overall, through the process of UDL integration, we learned about our own style of teaching and it impacted us in our development as educators. We are grateful for the students' contributions and the learnings they provided for us.

Recommendations

Our main recommendations are as follows. We believe that giving students autonomy to show their learning outcomes will improve their learning. The feedback provided to the students in these cases can also be used more effectively as a means for further learning and learning topics that are not directly in the curriculum.

The students, in general, are very creative but need guidance to be able to effectively use their creativity. As open-ended assignments engage students more deeply in the activity, it enhances their learning and results in a deeper understanding of the material.

Finally, we observed that formative feedback can be implemented even in large classes, the marking can be fun and the assessment can be useful in the student's future endeavours.

- **Provide structure for open-ended assessments**
- **Use rubrics to support assessment being a tool for learning**
- **Feedback as a two-way process**

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Chapter 9:

Student Agency in an Undergraduate Leadership Course

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Field/Discipline:

Leadership in Kinesiology

Course Level:

Undergraduate

Key Words:

Student Agency, Leadership Practice, Experiential Learning, Community-Integrated Learning

Course Context

Kinesiology is the study of human movement. Leadership in kinesiology is the interpersonal and relational process of empowering and enabling peoples' holistic wellness through movement. Kinesiology 311: Leadership Foundations (KNES 311), is a senior undergraduate course where 75 students learn and develop their leadership behaviours through applying, practicing, and reflecting on them. This is an option course for most students and required for Leadership and Coaching majors in the Faculty of Kinesiology.

I conceptualize and teach leadership as a body of specific evidence-informed behaviours and skills we can practice. Students learn and apply transformational leadership (Bass & Riggio, 2006) in KNES 311. Transformational leadership behaviours have been empirically examined in business, education, healthcare, spiritual, and physical activity settings (Din et al., 2015). Transformational behaviours include modelling our values and purpose, getting to know individuals, challenging them to problem solve and inspiring commitment to shared aims.

What Happens in the Course?

The cornerstone of this course is a collaborative leadership challenge. Students are randomly assigned to teams of five and engage in a term-long process of positively impacting a community they collectively care about through applying the leadership behaviours they are learning in class. Examples of communities KNES 311 students have influenced in the Community Impact Project (CIP) include: first-year undergraduate students, children in an afterschool program, older adults working from home, youth living with a physical disability, children living with chronic disease, female athletes, and high school students.

I teach leadership as a group of behaviours we learn best through practice, regardless of our position in a group. The term-long opportunity to practice, reflect on, and improve leadership behaviours in a small team of peers demands significant student agency.

- **Student agency as UDL through line**
- **Practicing leadership to learn it**
- **Project-based learning**

UDL and Student Agency

The UDL thread which connects all elements of this course is student agency. It enlivens every layer of KNES 311. A range of learning activities and assessments empower students to personalize and author their learning. **What I mean by agency is:**

When we make voluntary actions, we tend not to feel as though they simply happen to us, instead we feel as though we are in charge. The sense of agency refers to this feeling of being in the driving seat when it comes to our actions (Moore, 2016, p. 1).

I describe agency to students as contributing their voice and exercising choice in the course. Student voice and choice reflect the UDL principles of *multiple means of engagement, representation and expression* in learning.

Facilitating student agency has been shown to increase undergraduate's learning (Klemenčič, 2017) and sense of belonging (Pym & Kapp, 2013). Agency is positively impacted by supportive peer and instructor-student relationships (Klemenčič, 2017). I focus on getting to know students, demonstrating I care about them as people and holding very high expectations for their work. Despite this being a 75-person class, I strive to create a small seminar feel when we meet. This looks like table discussions, structured small group learning activities and an upbeat, interactive atmosphere.

Student Voice and Psychological Safety

Through designing reflective practice into learning activities and assessments in this course, I encourage student voice. Reflective conversations and writing are central learning activities. For example, the first reflective writing assignment, focused on unearthing core values, sets the tone for the course. Former KNES 311 students describe self-reflection as an important influence on their learning and a key takeaway skill. Students' voices enrich mini-case analysis activities, whiteboard representations, and example-harvesting stations during class. Encouraging and including student voices enables personalized connections with the course content and peers.

Because I ask students to actively contribute to in-class learning activities, psychological safety in my classroom is essential. It exists when people

feel comfortable speaking up without fear of being embarrassed by others in the group (Edmondson & Lei, 2014). An instructor can foster a psychologically safe environment by inviting feedback, supporting interpersonal connectedness, and valuing all contributions. For example, to nurture psychological safety, I use acknowledgement and praise often throughout the semester.

Students in this course describe embracing discomfort as part of practicing agency and seizing opportunities to author their learning. I introduce Nottingham's (2017) metaphor for learning as moving down into a pit, where discomfort and confusion are worked through for learning to occur. We emerge from the Learning Pit with new knowledge. I let students know in the first week of class, the Learning Pit is navigated best with trusted peers. Facilitating a sense of connection and shared humanity between students is part of my teaching philosophy and practice.

Student Choice

Students are invited to express and represent their learning in ways which are meaningful to them and their peers. For example, reflective assessments can be created in written, video or audio form. The application of theory to cases may be represented in slides, images, vignettes, drawings and even memes. Student choice in KNES 311 supports the UDL principles of multiple means of expression and representation.

Perhaps the student choice with the greatest ripple effect in this course happens in their five-person CIP team. Teams are randomly selected at the start of term and asked to identify a community they collectively care about. Teams then develop a project aimed and positively impacting this community. CIP teams are charged with practicing the leadership behaviours we are learning in the course with each other and their community of focus. Project teams create evidence of their learning and present it near the end of term. Project-based learning (PBL) has been found to improve students' capacity to self-reflect and begin forming a sense of self and identity beyond being a university student (Vande Wiele, Morris, Ribièrè & Ermine, 2017).

Additional Examples of How I Design Student Voice and Choice Into This Course Include:

1	Providing rubrics at the beginning of an assignment to prompt self-assessment
2	Posting a Road Map of each week's content and learning activities to give students a sense of the driving questions, foundational knowledge and skill of the week before we begin.
3	Including a mix of individual and team assessments, using multiple mediums.
4	Collecting formative feedback regularly.

My Learning Over Time

The design and experience of this course brings me energy, empathy, and gratitude. I am energized by student creativity, their reflective practice and ever-improving leadership skills. I feel empathy for students in this class because I did not feel confident sharing aloud or personalizing my learning in the first $\frac{3}{4}$ of my undergraduate program. I am grateful for the risks students take in this course, for the support they give and receive from each other, and for the chance to witness deep learning.

In this course, I have observed how students must decide and take seriously their role as contributors and agents in the learning process. I have noticed ways of interpreting and applying theory which I would not have thought of without inviting students to make this work their own.

I have learned I need to clarify the purpose behind the design of the CIP, including each learning activity, assessment, and learning outcome. I need to highlight the students' role as resourceful, curious, reflective agents of their learning. I need to remember that many students are not accustomed to making choices or contributing their unique voice in undergraduate classes and find ways to strengthen their appreciation of this pillar of the course early on. Furthermore, I need to show students how their meaningful contributions can bolster an inclusive and healthy learning atmosphere.

Recommendations

You can design student agency into your courses and seize the opportunity to be transparent about its role. I recommend describing agency and communicating its value clearly at the outset of the semester. You can start small by offering low stakes-high impact choices to students and providing clear, timely, specific, and encouraging feedback for their contributions. Celebrate the smallest of steps students take and meet them where they are when they show up in ways which are meaningful to them.

Hold students to a high standard while demonstrating you care about them as people. Invest in professional learning focused on creating a sense of belonging and psychologically safe learning space (Gayle et al., 2013). I often tell students I will strive to earn the right to challenge them through supporting them first. Caring instructors who set and maintain high expectations for students enable student agency (Weimer, 2013).

The beauty of designing student voice and choice into a course is revealed in students taking responsibility for their learning and representing it in original and personally relevant ways.

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Chapter 10:

I Get By With a Little Help from My Friends: Applying UDL to Group Projects

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Health Sciences

Course Level:

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Key Words:

Group Work, Interdisciplinary, Student Choice and Autonomy, Student Motivation, Self-Regulation

Group Work and Universal Design for Learning

Group work is one of the most commonly utilized collaborative learning strategies in post-secondary education, promoting active learning in a number of learning contexts (Springer & Stanne, 1999). Group projects require learners to collaborate with peers on a set of tasks; these projects serve as both a learning activity and an assessment. The value of group work has been well established in a variety of disciplines across different learner levels, including mathematics, life sciences, social sciences, engineering, business, computer sciences, and training in law school and medical school (Brown & McIlroy, 2011; Carver & Stickley, 2012; Kågesten & Engelbrecht, 2007; Kemery & Stickney, 2014; Plastow, Spiliotopoulou, & Prior, 2010; Springer & Stanne, 1999).

Group work develops important collaboration skills, including problem-solving, communication, negotiation, and time management (Cooley, Holland, Cumming, Novakovic, & Burns, 2014; Gagnon & Roberge, 2012; Pham, 2013; Springer & Stanne, 1999). Participation in group work also helps develop critical thinking, deep-learning of concepts, and increased engagement (Bourner, Hughes, & Bourner, 2001; Carver & Stickley, 2012). Although there are challenges to group work, such as free-riding and negative group dynamics, most students engaged in group work report a positive learning experience (Bourner et al., 2001; Carver & Stickley, 2012; O'Neill et al., 2020; Pauli, Mohiyeddini, Bray, Michie, & Street, 2008).

This case study will highlight the application of three themes that cut across Universal Design for Learning (UDL) principles – promoting collaborative learning, providing student choice and autonomy, and fostering motivation and self-regulation – in a required second-year undergraduate course in the health sciences (*Figure 1*).

MDSC 308: Interdisciplinary Approaches to Research

The case study described in this chapter comes from a full-year health sciences course (MDSC 308) entitled Interdisciplinary Approaches to Research in the second year of the Bachelor of Health Sciences (BHSc) program at the University of Calgary. The BHSc program is a four-year, honours only program in which, through inquiry-based learning (IBL) and with a research-intensive focus, students learn about health from one of three perspectives as distinct majors within the program: bioinformatics, biomedical sciences, or health and society. MDSC 308 is a required course, with a typical enrolment of 100-115 students. For interdisciplinary, team-based assignments in this course, groups are intentionally created to have student representation from each major of study in the program. Two course instructors, each of whom represents the biomedical or the public health perspective, manage all aspects of the interdisciplinary projects. Both instructors are involved in the assessment design, managing group issues and grading of the final projects.

UDL in Interdisciplinary Group Projects

MDSC 308 Group Projects

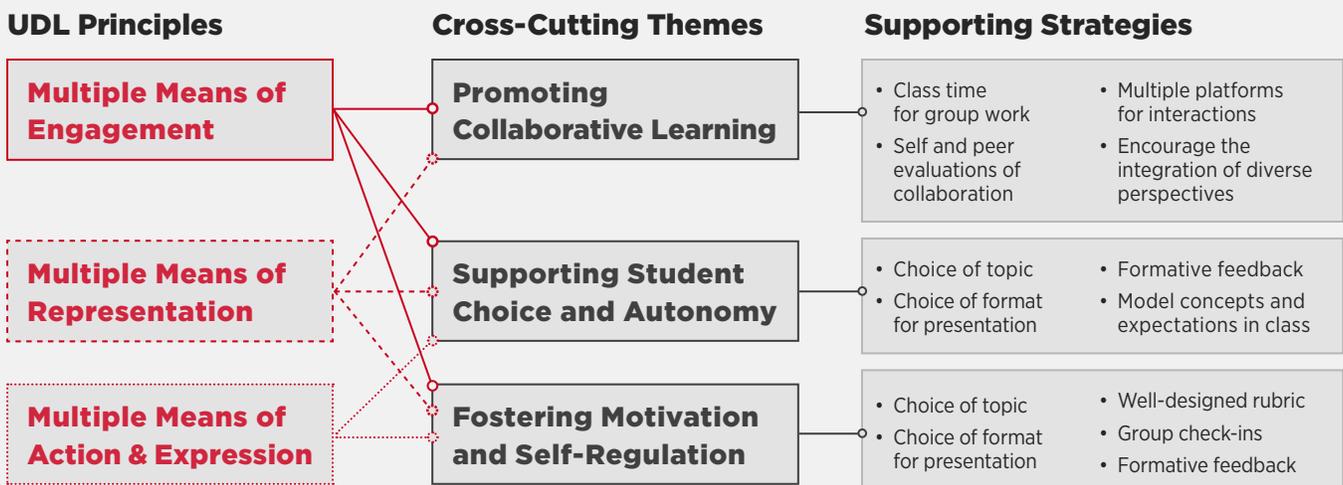
Two team-based interdisciplinary projects are used in our course. Groups are formed by the instructors to ensure that each group of four to five students consists of at least one member from each of the three majors. MDSC 308 students are familiar with how to work in groups from their introduction to teamwork and team-based projects in the pre-requisite course, MDSC 203. We use scheduled group check-ins and offer opportunities for additional support from the instructors to keep groups on track and to facilitate positive team dynamics.

In the first interdisciplinary group project, teams explore a public health concern chosen by the group from different perspectives (biomedical and social science) to create an evidence-informed public health poster that outlines the steps that members of the public can take to reduce their risk of disease. With information and solutions derived from academic literature, students are given about four weeks to prepare an eye-catching poster geared appropriately for their chosen audience. For example, a poster focused on dental health, such as the prevention of cavities, will differ in message and style if it is geared at elementary school children versus one targeting their parents. The poster is submitted for assessment together with an annotated bibliography that allows

groups to share their research exploration efforts. Groups also present their posters in class, explaining both their findings and recommended calls to action as well as justifying their design choices in creating the poster, in addition to answering questions from their peers. This project is worth 10% of the final grade.

The second team-based interdisciplinary project casts the same groups as ‘disciplinary experts’ who have been invited to address a community regarding a health concern. Team-chosen topics vary widely, and range from clinical disease (e.g. cardiovascular diseases, type 2 diabetes, depression) to broader public health issues (e.g. homelessness, addictions, mental health), and they target a variety of Canadian communities (e.g. families, immigrants, refugees, military veterans, first responders or individuals sharing common characteristics). Students are also given choice in how they present to their chosen community, provided that the chosen format resonates with and is accessible to their target audience. The only restriction given is that PowerPoint-style presentations are not permitted. This encourages students to think creatively and non-traditionally in how health information can be shared. Groups are assessed on 15-minute presentations in class, accompanied by a question and answer period. Groups also submit a formal written report, through which the depth of their research efforts are reflected. Students have approximately six weeks to complete this project worth 20% of the final course grade.

Figure 1. Overview of UDL in MDSC 308 Group Projects



Promoting Collaborative Learning

Collaborative learning strategies are often used in IBL because these strategies improve inquiry skills and provide social support through the inquiry process (Levy, Little, McKinney, Nibbs, & Wood, 2010). Collaborative learning is rooted in the social constructivist view that the socio-cognitive conflict that results from working with peers who have different ideas and perspectives can stimulate reasoning and critical thinking (Butera, Sommet, & Darnon, 2019). Group work also provides an alternative way to engage with the with course material.

In MDSC 308 group projects, students from three different disciplines actively exchange ideas and shape project outputs through discussion and collaboration (*Figure 1*). Importantly, the group projects are designed so that students learn from each other. Students are encouraged to divide up the some of the project tasks based on individual strengths; however, the final product requires an integration of concepts and materials. For example, a student with a passion for visual arts may take the lead on the poster design, but the health promotion poster must present a cohesive message and layout across all required content areas. Similarly, the final report for the community assessment is expected to synthesize both the biomedical and social science academic literature to recommend evidence-based disease prevention strategies; while students may divide the task of collecting discipline-specific content, the final report must be cohesive and integrated. The integrated design of each project promotes engagement with the material at a much deeper level, enhances critical thinking and supports retention of information (Davidson & Major, 2014). This design also provides opportunity for different representations of course concepts through learning from peers' ideas and understandings as the group creates the final product together.

Beyond the project, we have built-in supports for the group work process and concept mastery that work to overcome some of the well-known challenges of collaborative learning (Levy & Petruilis, 2012). For

example, coordinating schedules for group meetings can be a challenge for busy undergraduates. In response, we provide designated class time for groups to work on their projects. This approach facilitates face-to-face interactions, in addition to the other ways in which groups interact – including digital file sharing, social media platforms and email. Providing opportunities for groups to work together using different formats supports multiple individual preferences for engaging in collaboration.

Providing Student Choice and Autonomy

By its nature, IBL puts students in control of their learning (Spronken-Smith, Walker, Batchelor, O'Steen, & Angelo, 2011). While inquiry-based activities can range from structured to completely student-driven, all IBL includes some level of student autonomy. As such, this pedagogical approach provides opportunities for student choice and it is up to the instructor to match the amount and type of student choice with learners' knowledge level and capacity for self-directed learning (Aparicio-Ting, Slater, & Kurz, 2019). BHSc students complete a structured form of IBL in their first year and are ready for increased autonomy in MDSC 308. In this context, a key responsibility of the instructor is to provide a supportive environment and to foster independence (*Figure 1*). The learner should feel challenged, yet appreciate that support is available when needed (Levy et al., 2010; Spronken-Smith et al., 2011).

For both group projects in MDSC 308, groups are given the freedom to choose their health topic of interest and their areas of inquiry. In addition, for the health promotion posters, students have complete creative freedom with respect to layout and design; for the second project, students are free to choose the format for their community presentation. Examples of the diversity of presentation formats chosen by students include a town hall, debate, talk show, game show, community workshop, slam poetry and informational video. Students are encouraged to think creatively to deliver an engaging presentation suitable for their intended target community.

The freedom to drive their own learning and absence of a “right” answer can become a source of anxiety for some learners (Spronken-Smith et al., 2011). Using multiple approaches to present concepts and modeling assessment expectations in class can help reduce anxiety. For example, learners participate in an interactive session about health promotion principles where they critically analyze an existing health promotion campaign using a case-study approach, applying the same principles that are expected in their group projects. We also provide the basics of health communication techniques using real-world examples, as they may apply to designing a poster and a community presentation. Although group topics vary, providing multiple means of representation optimizes student familiarity with the concepts and level of critical thinking they are expected to apply to their projects.

Fostering Motivation and Self-Regulation

There is a reciprocal relationship between student motivation and self-regulation. Self-regulation, defined as the ability to regulate one’s learning through the use of strategies like goal setting, time management and anxiety management, is associated with higher levels of student motivation, or the willingness to exert effort on academic tasks (Ning & Downing, 2010). Similarly, high levels of motivation can result in students engaging in self-regulation strategies (Pintrich, 2004). It is important to support strategies for self-regulation and motivation since learners vary in their ability to self-regulate and to find motivation, even within the same year of study (*Figure 1*).

Providing students choice in topics and presentation styles helps to align the learning with student interests and embraces diversity in how students want to express what they know, which can increase motivation (Evans & Boucher, 2015). In addition, this approach also allows students to choose a topic and presentation format with a perceived level of challenge that aligns with the learner’s perceived competence, which also helps to increase motivation and reduce assessment anxiety (Evans & Boucher, 2015). To help manage assessment anxiety that may come with student choice in topic and presentation format, we use heuristic rubrics to outline

expectations for level of critical thinking and what the inquiry project might consider. These rubrics focus on application of concepts and synthesis of academic literature and different disciplinary perspectives, rather than on specific content. Rubrics are provided at the beginning of the project for students to use as a guide for the project activities and to help with goal-setting and time management (Panadero & Jonsson, 2013). Rubrics also provide a sense of control over academic performance and reduce anxiety (Cooper, Downing, & Brownell, 2018).

Multiple opportunities for feedback throughout the project are also used to increase motivation and support self-regulation. Designated time for group work facilitates formally scheduled group check-ins, as well as informal opportunities to ask questions, since the regularly booked theater is available as a workspace and an instructor is present during these group work sessions. We have found scheduled group check-ins to be helpful for identifying group issues early, including personality conflicts and difficulties with collaboration, keeping students on track to meet project learning objectives thus supporting self-regulation. Group check-ins are also a source of formative feedback, which can reduce assessment anxiety and further promote self-regulation by highlighting early success (Nicol & Macfarlane-Dick, 2006; Ning & Downing, 2010).

Peer evaluations of group collaboration are also used as a form of feedback. Students submit a peer and self-evaluation at the completion of each project, in which they rate several collaboration skills and participation among group members. The peer evaluation rubric is adapted from the teamwork assessment criteria developed by Tracey Carver and Amanda Stickley (2012). Peer evaluations contribute to the final grade, but are also important for increasing self-regulation and critical reflection (Carver & Stickley, 2012; Nicol & Macfarlane-Dick, 2006; Topping, 1998). Students can apply the feedback received after the first group project to improve their performance on the second group project. The peer evaluation framework is also used to gain insight into individual contributions to a group project; however, a failsafe is incorporated that requires timely reporting of peer concerns such that instructor intervention can take place where needed.

Implications for Practice

We use a number of strategies that align with UDL principles to engage students in these team-based projects. Some of these are cross-cutting (Figure 1), including student choice in topic and presentation style and supporting teams with multiple opportunities for formative feedback. As illustrated by the diversity of our team-based projects, UDL can be achieved in team-based learning across disciplinary boundaries and can readily be integrated across diverse learning contexts and subject areas. This approach requires intentional design and a commitment from the instructor(s) to support and mentor students, roles that step beyond those traditionally associated with post-secondary instruction.

Recommendations for Applying UDL in Group Projects

We have been using and revising these two group assessments for the past four years in MDSC 308. Every year we use student feedback and our instructor reflections to revise the project design, marking guidelines, and approaches to supporting students in the group work process, as needed. The following are recommendations for applying UDL principles into group work based on multiple cycles of revision and our ongoing experience.

Consider the Logistics of Collaborative Work:

- Provide various platforms for interactions (digital and in-person).
- Give students time for topic selection and deciding presentation format, and set a deadline for these decisions.
- Use designated class time for group work to facilitate in-person interactions.

Prepare Students for Group Work:

- Model concepts and skills that are expected to be applied in the group project in class and through various formats.
- Give students a chance to engage with concepts individually and collaboratively outside of the project.

Be Mindful in Project Design:

- Include a variety of skills and range of knowledge in the design so that different students can contribute according to their strengths.
- Projects should encourage the integration of diverse perspectives.

Set Clear Expectations:

- Provide well-designed rubrics.
- Use self and peer evaluations of collaboration skills.
- Provide multiple opportunities for formative feedback.

Support Student Autonomy:

- Allow student choice of inquiry topic.
- Support student choice in presentation format.
- Use group check-ins to highlight early success and redirect efforts where necessary.
- Provide multiple opportunities for formative feedback.

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Chapter 11:

Accommodation is Not Inclusion: Application of UDL Principles to Support Disability Diversity in a Post-Secondary Classroom

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Why UDL: Confronting Systemic Ableism

Discrimination based on race, ethnicity, sex, ability, sexual orientation, religious diversity and classism, oppress and ignore the social realities of university students. Action that raises awareness and influences inclusive institutional policies, practices, course design and delivery is evident when institutions of higher learning begin to address issues of diversity, equity and inclusion across programs of study and in course delivery (University of Toronto, 2020; Universities Canada, 2019).

In post-secondary education, ableism remains a contested theory, the implications not fully articulated or embraced within teaching practice and administrative processes. Specifically, ableist thinking (discrimination of and social prejudice against disabled people based on the belief that typical abilities are superior) is at the heart of institutional elitism. This is problematic for disabled students who seek admission and course accommodations. Here, as in many universities, students must provide legitimate, medical assessments to 'prove' they have a right to adjusted course assignments and evaluations. Upholding academic standards and integrity is perceived as a problem to be solved, when puzzling over authorizing

'the duty to accommodate'. Dolmage (2017) counters by noting disability is central to higher education and building more inclusive schools allows better education for all.

It is in the spirit of addressing systemic ableism that principles of Universal Design for Learning (UDL) are designed to address the learning needs of all students. The early adoption of UDL, in the United States, was intended to assist disabled children to participate fully in inclusive K-12 public education classrooms; "Exactly 'where' a student with a disability should be educated is no longer the most relevant question." (Jiminez et al., 2007 p.43). In Canada, where education has no federal constitutional legislation to ensure the right to inclusive education, each province and territory has inclusive education policy that varies in definition, practice and funding (Towle, 2017). Conceptually, momentum grows for a national strategy of UDL implementation across Canada, in both the K- 12 sector and the higher education landscape (Royal Roads University, 2019).

Ableist thinking (discrimination of and social prejudice against disabled people based on the belief that typical abilities are superior) is at the heart of institutional elitism.

Without legislative mandates, the adoption of UDL principles in higher education settings require key institutional actors to acknowledge and welcome disabled students as wanted and needed in campus life. We argue that to accommodate students with physical, cognitive, mental health or learning differences increases diverse student participation, enriches all student learning and builds a more socially just university culture that better reflects and even contributes to the greater societal good. Universities that champion equality, diversity and inclusion aspire to uphold the ideals of social justice and challenge the history of elitism in higher learning. Proactively adopting UDL principles in the design and delivery of subject matter assumes every student learns, regardless of identity; “UDL puts the tag ‘disabled’ where it belongs—on the curriculum, not the learner. The curriculum is disabled when it does not meet the needs of diverse learners” (Davies et al., 2013 p.195).

How Does it Work? UDL in CRDS

What follows below, is a case example of implementation of UDL principles by instructors in the Bachelor of Community Rehabilitation (BCR) degree program, Community Rehabilitation and Disability Studies (CRDS), Department of Community Health Science, Cumming School of Medicine. Introduction to Disability Studies, reflects UDL principles within the specific pedagogical theories applied to the delivery of content and assignments. Of the 70-80 first year students enrolled over the past five years, Student Accessibility Services (SAS) has sent course accommodation requests for approximately 5- 8% of students identified with a ‘disability label’ in this course. This percentage is consistent with the SAS report stating approximately 7% of all university students accessed their resources in 2019-20 academic year (B, Sahota, personal communication, Oct 22, 2020).

SAS is a key player in ‘duty to accommodate’, should a disabled student seek accommodations. To comply with current institutional processes, students can access specified resources once formal evidence of their disability has been provided and registered with SAS. In turn, students, themselves, must secure

instructor consent, long after a syllabus has been developed and approved by respective departments.

We offer a proactive integration of course accommodations and UDL principles to avoid the typical practice of ‘add on’ accommodation plugged into course curriculum post hoc. Submitting a medicalized disability diagnosis to access learning accommodation means the system does not anticipate diversity but perpetuates an ableist mindset by presuming the disabled student is less desirable than the non-disabled. In effect, the ‘after the fact’ duty to accommodate assumes every student has the power, knowledge and capacity to know when and how to communicate their educational needs to SAS and course instructors. Significantly, however, a number of students receive a disability diagnosis after their transition into higher education and forego accessing supports for fear of the stigma and shame attached to doing so (Wagner et al., 2005). Such internalized stigmatization often shapes conscious and unconscious assumptions, not only for students, but hinders instructors seeing value in the participation of disabled students in university settings. In this chapter, CRDS course instructors assume self- disclosure for a first-year student is difficult and amelioration of undue stress is essential to learning success.

Avoid ‘add on’ course accommodations for students with disabilities, by proactively applying UDL principles to course design.

CORE 205: Introduction to Disability Studies – An Overview

Introduction to Disability Studies (DS), a foundational undergraduate course in CRDS, introduces the values and beliefs that infuse curriculum throughout the BCR degree. This course emphasises Disability Studies as an academic discipline, and explores the scope, ethical dilemmas, organizing social structures, and identity theories, that inform the lives of those who live with disabilities. Course topics challenge our student’s prevailing world view of what it means to

live with a disabling condition and the personal views that inform their educational/career aspirations.

UDL principles guide how the instructors engage students in learning and meeting expected academic standards. In practice, CORE 205 assignments involve the application of skills that demonstrate critical thinking, scholarly analysis, review of competing worldviews regarding disability and identifying the connections of theory to practice. The details of every assignment provide each student with choices on what they research, how they represent that research and where they make connections between what they know and what they have learned.

Course delivery utilizes UDL inspired approaches such as cooperative learning, community-based practicum, Curricular Peer Mentors (Smith, 2013) and the students themselves. Students are given time to prepare for classes through online access to readings, videos and PowerPoint slide decks, prior to delivery of lectures and to post questions prior to each lecture in case they are uncomfortable speaking up in class. They take part in small peer group discussions, write follow up reflections, engage in community based experiential learning, participate in peer mentor supported seminars and engage in interactive and creative in-class activities. These approaches allow all students to draw from their differing strengths and seek resources related to their own personal learning while still adhering to the course expectations.

UDL Application in Classroom Delivery

Delivering meaningful experiential learning for diverse learners is anticipated by inclusively adapting for the following: (i) students who request accommodations; (ii) those who may not recognize a potential learning challenge; and (iii) those who intentionally choose to forego requesting accommodations despite having processed the documentation. Toward this objective, course instructors incorporate lecture topics with in-class activities, using cooperative and scaffolded learning schemas (Tombak & Altun, 2016) that draw from a wide variety of learning contexts. Assuming each student can and will represent their learning in different ways, each required assignment is directly

related to various in-class discussions and activities involving interactions with course instructors, curricular peer mentors, fellow classmates, and professionals and disabled individuals in the local community.

UDL Application in Assignments

The intent of every evaluative activity is to help students determine what they gleaned from classroom activities, lectures, experiential learning and course readings. Additionally, the course assignments assess how students interpret and/or diversely represent their own learning. As such, multiple assignments draw on all UDL principles to encourage each student to capitalize on strengths and reveal areas for growth.

Community Based Practicum:

Students access multiple forms of engagement, and representation through placements formally arranged with one of various community-based organizations that support disabled individuals and their families. The instructor's introduction to this 'world' deepens student understanding of course topics, drawing connections between in-class discussions and what ideas they take away from time in the community. Curricular Peer Mentors facilitate class discussions of each student's individual interactions with disabled individuals in their community-based practicum. Instructors report that student learning is enhanced through such real-life interactions, leading to more effective engagement with course objectives and how they represent the context of their experience in their discussions of key course topics.

Writing Skills:

Critical analysis of literature: Informed by Knowles Adult Learning Theory principles (Kenner & Weinerman, 2011), this two-part assignment, illustrates the UDL principles of multiple means of action/expression and representation, by explaining how instructors designed assignments to help students hone critical analysis and scholarly writing skills.

Students first choose, read and summarize any chapter from the required course text. They are invited to include any additional relevant peer reviewed journal articles to support their written perspective about the topic. Part Two requires students to integrate and reflect on the publications they chose, to describe the

process they applied to interpret the discourse and to draw out their perspective, knowledge and experience. The intent is to teach students to recognize how scholarly information is diversely represented in course material and in their own writing. This further enables them to explore their emerging research and writing skills in ways that give room to showcase their strengths.

Small Group Discussion Activities:

Assuming first year students may be reticent to volunteer thoughts or ask questions during class discussions, this activity/assignment draws on all three UDL principles of engagement, action/expression and representation. It gives students space to explore course concepts in a format that is peer created, driven and evaluated. Students are given class time to address five key course themes, previously presented in lecture format, with and from each other in small groups. Lead students are not expected to present as expert knowledge holders, but rather to design an activity and oversee it as a group facilitator/moderator. They are encouraged to analyse their chosen theme and, to create a discussion plan that draws on their personal strengths, experience and understanding of that theme. Discussion plans are expected to actively engage their peers, using a wide variety of formats (e.g., problem-oriented approach, game play, role play, debate etc.). In turn, their peers provide feedback on the session. Each lead student reflects on what they learned in the development and implementation of their session through a guided written reflection submitted for further instructor feedback. As such, by course end, every student has planned, led, participated, provided and received feedback and reflected on relevant course themes that would have otherwise only been addressed in a lecture and course readings.

Awareness Exercise:

The Bias Free Framework (Burke & Eichler, 2006) introduces a practical and pragmatic way to interpret an attitudinal instrument for measuring social injustices.

This exercise illustrates student use of multiple forms of representation as they are required to match personal rationales to real world examples of specific social biases, including ableism. The assignment encourages students to draw together all the key ideas explored in CORE 205 topics and convey it in a way that demonstrates their understanding of the

course content, connects their experiential learning to that content and consolidates their analysis when adopting their personal lens, perspectives, observations and new insights.

Lessons Learned:

Over the last seven years, the co-instructors have gained valuable insight into the strengths and challenges of building learning frameworks that increase first-year students' grasp of social structures, issues, values, beliefs and lived experiences. This chapter has shared ways students can participate in and represent relevant disciplinary theories and practices using interactive formats intended to sharpen learning about complex ideas. Applying UDL principles allow students to communicate a body of knowledge in safe constructive spaces. Instructors expect that this course is a significant undertaking for first year students in the first term of their university experience, as they find most of these students seem to take a passive learning stance and defer to instructors.

Instructors recognized that of this type of passive learner response to typical classroom delivery limits their actual representation of knowledge and often left students quite unprepared to effectively tackle more advanced courses and nuanced applications of disability theory. Recognizing these limitations helped instructors acknowledge that active engagement was missing. The question was raised – what other ways might catalyze students to consider what it is required to transform their world views and engage in social change? Intentional incorporation of UDL principles is an approach that has raised expectations, student performance and creativity through more diverse forms of immersion in the course content. Course instructors report that offering and building multiple levels of engagement, expression and representation confirmed their assumptions that effective student learning is drawn from multiple relationships and contend that such practices help all students meet higher performance standards.

Instructors are inspired when they find first year students can actively discuss the controversies, the debates, and critically examine and explain their worldviews given safe space and structured options to do so. Fundamentally, applying UDL principles

promotes space for more representative forms of expression for disabled students which, of course, also facilitates and meets the diverse learning demands facing all first-year students. It is clear that that designing accessible course delivery goes beyond permitting exam accommodation and adjusted assignment deadlines for disabled students. Alone this is insufficient to meeting the greater purpose and goals of good teaching. Instructors have learned that creating ways for students to represent learning that is embedded in multiple relationships invites engagement in an inclusive classroom that is exciting and inspiring for students and instructors alike.

Conclusion

University campuses reflect the larger society and work to advance a mission of creating more inclusive communities that are free of prejudice and discrimination. Ultimately, they must also come together as leaders who understand ableism and recognize disability as an asset not an obstacle. Embracing UDL principles is part of seeking such laudable goals. Disabled students are often unexpected, excluded or denied equal access to authentic learning, not always intentionally, but “through mishandling student concerns and lack of familiarity (Black et al., 2014, p.51). When disabled students need to rely on bureaucratic strategies of accommodation by permission, these limiting systemic processes neglect the assumption that they belong there and their participation is valued and fully included in the classroom (Hutcheon & Wolbring, 2012). Disabled students learn, belong and succeed. UDL principles offer integrative teaching strategies in advance, not ‘add on requests’ permitted ‘after the fact’, reminding instructors, that without compromise, they can design their course delivery to increase the likelihood that EVERY student has a fair opportunity to participate. Students who report a sense of belonging, find focus, and fulfill their dreams are the best measure of best teaching practices.

Students who report a sense of belonging, find focus, and fulfill their dreams are the best measure of best teaching practices.

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Chapter 12:

Reflections on the Influence of UDL Within a Nurse Educator Course

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Key Words:

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Students as Partners

Course Context

This theory course is available as an option to students in the Faculty of Nursing. Each offering of the course sees approximately 24 students, with most of them from the undergraduate

program. The overall goal of the course is to enhance students' level of awareness of the role of teaching within their practice as registered nurses. For this chapter, we will focus our considerations on the undergraduate course and how our teaching practices and students' learning has transformed in response to a Universal Design for Learning (UDL) approach.

Renewed Vision for Teaching and Learning Through UDL

When the Principles of Teaching and Learning for Nursing Practice: Nurse as Educator course was created in 2012, principles of UDL were unbeknownst to us as nurse educators. With health education being an essential part of our scope of practice as registered nurses (CARNA, 2019), we know the value the course can offer nursing students in realizing their teaching role. Reflecting on and debriefing our experiences co-teaching the course, we often discussed the results of the course evaluations and wondered about the perspectives of students who sometimes expressed a dissonance between content they were learning and how they were supposed to apply their understanding within their clinical practice. Given the significance of the educator role on patients' overall health and quality of life, our desire was to optimize student engagement

and communicate the relevance of their learning as it informed their practice. On a deeper level, we wanted to challenge our students and provide opportunities to engage them meaningfully by reflecting not only on the content and 'what' they were learning, but more importantly, to focus on 'why' they were learning the material, to personalize 'how' they could apply what they were learning to their teaching practice. The assessment strategies within the course were adopted from an earlier course on Peer Leadership and consisted of a health teaching assignment, a peer teaching assignment, and a scholarly reflection on students' teaching philosophy. All assignments were written papers except for the peer teaching assignment, which involved senior student pairs teaching junior student peers in a lab setting.

Over the past five years, student course feedback along with our natural inclination to reflect on our teaching practice and student learning experiences have become a compass that have guided us to embrace the principles of UDL. The principle of multiple means of engagement helped us think about recruiting learners' interest through ways that fostered cognitive engagement to emphasize the value of this course. Without sufficient cognitive engagement, learners are unable to attune to information in meaningful ways which renders that information inaccessible (CAST, 2018). Meaningful learning is realized through optimizing individual choice and autonomy by offering students alternatives around what they learn, how they learn, and how they express what they know (CAST, 2018).

Engaged learning is realized through optimizing relevance, value, and authenticity. Educators can enhance authentic learning through encouraging students to share what is relevant and valuable and then offer choice for learners to engage in ways that align with what resonates for them.

In the tables below, we outline the transformation of the teaching and learning activities embedded in this course and how these activities have influenced learner engagement. We share reflections and address how one assessment strategy, a teaching philosophy assignment, has evolved over time; with emphasis on recruiting interest, optimizing individual choice and autonomy, and relevance, value, and authenticity (CAST, 2018; Novak & Rodriguez, 2018). The purpose of the teaching philosophy assignment is for students to express their values and beliefs about teaching and learning and develop an awareness of themselves as an educator within their practice as a nurse. Year after year, student feedback indicates this assignment to be the most challenging compared with other assignments in the course.

When we first began teaching the course, we attempted to engage students through presenting information in a variety of ways to accommodate diverse learning styles. Despite our intent to promote deep learning within the class, our assessment strategies remained static and consisted of writing as the primary means for students to represent understanding. Although students participated in activities designed to engage them during class, we found that learners' understanding depicted surface learning. We interpreted this to mean we were simply not getting to the heart of the matter despite the repetitive reminder of the value of the course in their nursing practice. Our solution was to provide more active learning strategies to bring course content to life. What we did not recognize was the lack of alignment between how we were teaching and how we were assessing student learning. We began to recognize that participation in active learning did not necessarily equate to enhancing motivation, cognitive engagement, or authentic and meaningful learning for our students. Table 1 indicates our lack of awareness of UDL and influence on student learning.

Table 1: Lack of Awareness of UDL

Provide Options for Recruiting Interest	Teaching and Learning Activities/Events	Impact on Student Learning (Baseline)
Optimize individual choice and autonomy	Students had no other options for expressing their teaching philosophy other than through writing in a prescribed scholarly format.	Students' assignments reflected a superficial understanding of the course material and how this applied to their practice.
Optimize relevance, value, and authenticity	Graded as a scholarly paper, the assignment became an exercise in students' ability to express their understanding of theory but did not hold space for students to express their authentic learning.	Students' writing was often an impersonal connection of course material to generic nursing practice. Students struggled to see themselves in a 'teaching' role, and their assignments reflected a regurgitation of course theory disconnected from a personal expression of understanding.

With a growing awareness of the critique associated with learning styles as a means of accommodating individual difference (Al-Azawei & Lundqvist, 2015; Willingham et al., 2015), we began searching for a more comprehensive way to meet the diverse learning needs of our students and teach in ways that fostered deep meaningful learning. The UDL framework provided us a different perspective to broaden our consideration of learning and attune to the experiential environment we were creating

for our students (Al-Azawei et al., 2016; Palmer, 2017). We began to grow more intentional in aligning pedagogical approaches to assessment strategies and consider student engagement in ways that transcended involvement in learning activities. Within UDL, we found language and strategies enabling us to engage learners in ways that were relevant and valuable for them. Table 2 describes our emerging awareness of UDL and how this began to change our teaching practice and student learning outcomes.

Table 2: Emerging Awareness of UDL

Provide Options for Recruiting Interest	Teaching and Learning Activities/Events	Impact on Student Learning (Emerging)
Optimize Individual Choice and Autonomy	<p>Students shared their expectations for their learning in the course on the first day of class.</p> <p>Added a visual element for students to capture their teaching philosophy in the form of a conceptual framework to go with their scholarly writing.</p>	<p>Students saw the various assignments within the course as a way of addressing their learning needs which promoted accountability for learning and enhanced motivation.</p> <p>Although there was a learning curve associated with understanding a conceptual framework, the students were able to express their understanding of theoretical connections as an expression of their teaching philosophy.</p>
Optimize Relevance, Value, and Authenticity	<p>Intentionally linked student expectations to course overview to explicitly bridge content to their expected learning outcomes to enhance relevance.</p> <p>Offered the chance to express student understanding of their teaching philosophy through a visual representation to promote authentic learning.</p>	<p>Students began to gain an awareness of how what they were learning was personally relevant to them and their practice.</p> <p>Some students embraced the creative aspect of the visual element of their teaching philosophy assignment while others did not.</p> <p>Diversifying opportunities to engage in expressions of their understanding, we noticed glimpses of deeper expressions of students' awareness of the relevance and value of what they were learning and how this informed their practice.</p>

We were encouraged by the subtle shift in student awareness of the value of course material to inform them personally and influence their teaching practice as nurses. There was a palpable current of excitement coupled with some trepidation when we discussed the opportunity to represent their understanding through a more creative means. It was as if students did not fully trust that they were given the freedom to represent their learning in a way that was meaningful to them. Along with the sense of freedom there was a shift in the accountability for learning, from educator to student. This shift in accountability fostered motivation and a sense of autonomy that prompted

deeper levels of engagement in learning. The authentic nature of the learning created meaning and situated students beyond the classroom and into the context of their lives as becoming registered nurses (Pearce, 2016; Zuban et al., 2019). Table 3 shows our growing comfort and proficiency with UDL which was evident in our flexibility and in our students' response.

Universal Design for Learning offers us a comprehensive way to meet the diverse learning needs of our students and engage them in ways that foster deep meaningful learning.

Table 3: Aiming for Proficiency Related to UDL

Provide Options for Recruiting Interest	Teaching and Learning Activities/Events	Impact on Student Learning (Proficient)
Optimize Individual Choice and Autonomy	<p>Students had the choice to represent their teaching philosophy via a conceptual framework, or through another visual representation.</p> <p>We shifted our expectations about the length of the written component of the assignment.</p> <p>Introduced a weekly low stakes discussion board assignment that later informed their teaching philosophy assignment. During the first four weeks of classes the students were asked to produce a metaphor for teaching and learning which took place during the first four weeks of class.</p>	<p>Students expressed excitement about having the choice of ways to express their values and beliefs. Some students chose to do the conceptual framework, others chose a single photograph as a representation of their teaching philosophy. One brave student, who was an artist, asked if she could draw an image that reflected her philosophy.</p> <p>The quality of the students' writing improved as what they were writing was resonating for them in relation to their chosen visual. They began to express their learning in a more personal way.</p>
Optimize Relevance, Value, and Authenticity	<p>Created opportunities for students to engage in one-on-one conversations to express why they had chosen to represent their teaching philosophy in the way that they had and articulate how they were seeing their values manifested within their work. Conversations were offered as students were working on their assignments.</p> <p>We were flexible when a student asked if she could come and offer us an oral overview of her philosophy in lieu of the written component.</p>	<p>The opportunity for students to come and share, from their perspective, how they could see their values and beliefs represented within their visual was powerful and promoted authentic engagement. The students let go of 'getting it right' to share a genuine expression of their values and beliefs in their written work, and a growing awareness of the influence on their practice.</p> <p>The students who chose an oral overview came with written notes and were very receptive to real time questions and feedback. This assignment became a very personal and relevant expression of how they understood themselves and their role as nurse educators.</p>

Experiencing the students' level of engagement and motivation was energizing. The pivotal moment of the course was the realization that offering students' choice and freedom to navigate their learning experience in ways that were meaningful for them had a profound influence on engagement and motivation to learn. We were learning to trust how UDL principles could transform teaching and learning. Through our responsiveness to our students' request to share their understanding in an alternative format, we were expressing that we cared about supporting them to

engage in deep learning. We were amazed at the courage of the undergraduate students to come and express their understanding in front of us and their receptivity to real time questions and feedback. The depth of their learning and capacity to share their understanding was remarkable. UDL became a mindset and intentional attribute in our course planning. Table 4 offers a glimpse into how we are planning to enhance our UDL practices and empower students to reflect on their own choices and design their own learning experiences.

Table 4: Plans for Progressing Towards Expert Practice

Provide Options for Recruiting Interest	Teaching and Learning Activities/Events	Progressing Toward Expert Practice
Optimize Individual Choice and Autonomy	<p>Empower students to make choices or suggest alternatives for how they will learn and express what they know in authentic ways.</p> <p>Design more opportunities for self-monitoring and reflecting on their choices with teacher facilitation and feedback.</p>	<p>Offer opportunities for students to create their own way(s) to express their understanding.</p>
Optimize Relevance, Value, and Authenticity	<p>Encourage students to make connections between the content, their own interests, and support them to link their understanding to authentic real-world experiences by engaging in co-design of the course activities (teaching and learning approaches).</p> <p>Encourage students to engage in authentic assessment and design their own learning experiences.</p>	<p>Create space for intentional reflections linking their learning to real-world experiences they are having in practice.</p> <p>Prompt actionable opportunities.</p>

Our Recommendations

Reflecting on course evaluations through the lens of UDL and employing revisions to draw out the ‘why’ in teaching and learning has resulted in improved engagement for both the educator and students. Redesigning course activities that targeted motivation and engagement through authentic learning and assessment has sparked curiosity and commitment to learning. We offer the following words of wisdom for those considering optimizing individual choice, autonomy, and relevance, value, and authenticity (CAST, 2018) in their courses:

- Begin by incorporating small changes within your course, perhaps choosing an assignment where you can offer two alternative ways for students to express their learning.
- Be transparent with students about why you are incorporating the changes that you are making to foster trust and enhance students’ motivation, level of engagement, and sense of accountability for their learning.
- Follow up with students to assess whether the alternative assignment formats are beneficial for them and invite their perspective on how incorporating choice has influenced their learning. Keep in mind, each student cohort is unique and will respond in ways that are meaningful to them.
- When you have incorporated choice and opportunity for students to engage in meaningful ways, be open when students make suggestions for how you could incorporate UDL to other aspects of the course.
- Continue to critically reflect on your teaching approaches and influence on student learning. Be intentional in how you are incorporating UDL within all aspects of your course. Offering too much choice may feel overwhelming for students.

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Chapter 13:

UDL in a University Cell and Molecular Biology Classroom

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Cell and Molecular Biology

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Course Context

This chapter traces the natural development of a university undergraduate course in cell and molecular biology that, in retrospect, aligns well with Universal Design for Learning (UDL) principles (La, Dyjur & Bair, 2018). MDSC 351 (Honours cell and molecular biology) is a core course in the Bachelor of Health Sciences program at the University of Calgary, foundational in preparing students for their upper-level courses, including the honours thesis. It is offered every winter term and is taken by biomedical sciences majors in their second year and bioinformatics majors in their third year of study. The course is delivered through interactive lectures, presentations, and tutorials, and assessed through in-class exams, inquiry essays, tutorial worksheets, short assignments, and a group final project. Class size ranges from 80 to 100 students. Graduate teaching assistants help in course delivery and grading of student work. Starting in winter 2021, a peer mentor will be formally integrated into the course.

Since its first offering in 2005, MDSC 351 has undergone multiple changes in design and delivery, from a completely exam-free course, with four inquiry essays and a presentation as the means of assessment, to the course it is today, with multiple course components that provide opportunities for both formative and summative assessment. As the course coordinator and instructor of MDSC 351, I have made these changes over its many iterations and continue to refine the course based on a critical

reflection of contemporaneous notes recorded in my teaching diaries and responses to course-focused questionnaires that students complete anonymously at the end of the semester.

What I Want My Students to Learn

The main question for me, as an instructor, has always been: What should students take away from being in MDSC 351 for a term? They should certainly have a firm understanding of the basic concepts, not as isolated facts but as integrated into a field of knowledge that continues to grow. They should have lots of practise framing questions and seeking answers. They should learn to read the literature, to evaluate, to understand, and to use information. They should know how to communicate ideas, their own and those of others, always giving due credit. They should achieve a level of scientific literacy in cell and molecular biology to help them to succeed in their upper-level courses, but more importantly, to enable living in our world: to ask questions, to understand the issues, to respond intelligently, and to act accordingly.

Through the years, I have integrated class activities and demonstrations into the lectures, to reinforce important concepts and to give students with different learning preferences an alternate route to understanding. One activity that students have remembered long after graduation portrayed the importance of the quality control (QC) of protein folding in the endoplasmic reticulum by showing

how a paper airplane had to be folded properly in order to fly. Student volunteers acting as protein chaperones, glucosidases, and monitoring enzymes, folded, checked, and routed attempts to produce a delta flier. Paper airplanes flew about the classroom as structures passed QC, even as some hopelessly mis-folded planes were tagged and consigned to the trash. When asked on the exam to explain quality control in the endoplasmic reticulum, the students' recall of their lecture notes is brightened by their memory of the paper airplanes.

How Do I Know What They Know?

The necessary, corollary question is: How do I know that the students are taking away what I envision they should be learning? When I first taught the course, I assigned four inquiry essays to make up 80% of the final grade, thinking naively, that these assignments would give me ample evidence of their learning. The essays did not disappoint, and in their course evaluations, students commented that by delving into their essay topics, they gained a deep understanding of the material. The essays remain a MDSC 351 staple, now constituting 40% of the final grade, because they are an excellent means of showing a student's ability to search and to read the literature, to understand what they read, and to integrate information into their writing. However, essays are not the only way that students can demonstrate their learning, and I quickly saw that I needed to provide my students other opportunities to show me, and quite importantly, to realize for themselves, what they had learned.

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The Final Term Projects

The strongest indication that I had to open up other means of expressing learning was brought home to me in the final projects, which in the first few years, were an individual endeavor. As I observed the students plan, research, and present their project,

I realized that to rely solely on essays to show learning was to miss seeing evidence of learning by a whole group of students who were not necessarily good essayists, but were good orators, musicians, or artists. One memorable individual project was a series of 6 x 6-inch oil canvasses depicting the various stages of the cell cycle, with short narratives to explain and to connect each painting to the next. In the student's reflection on the project, she wrote that painting the oils had helped her to learn the cell cycle as she paid attention to how the structures were changing during the process. Long after I had introduced exams and short assignments to gauge content mastery, and the term projects had been taken up by groups rather than by individuals, these project submissions have continued to uncover evidence of learning that would have otherwise escaped notice.

The Novel Problem project, as this final project is called, is designed to be a culmination of what we had learned in the course, in terms of both content and process. The project has two components and is typically described to the students as follows:

- 1.** Group presentation (10% of final grade): 12-minute presentation in any format, on any topic of inquiry in cell and molecular biology. Although the presentation may provide some background information, the primary objective is to raise issues on recent findings, in an imaginative yet informative manner, and to invite questions. Allot 9 min for the presentation proper and 3 min for brainstorming and discussion.
- 2.** Individual inquiry essay (10% of final grade): Each group member chooses a novel finding from the recent literature (< 7 years) in the area of their group presentation topic. Please refer to the essay guidelines posted at the beginning of the term.

The features of the project that support UDL are: (1) the group presentation can be in any format; (2) it can be on any topic of inquiry in cell and molecular biology; and (3) the individual essay can be on any novel finding in the area of their presentation topic. The students have the freedom to choose their topic and how they will present it, and for the individual essay, each can choose a novel finding to write about.

To model how the final project might be presented using multiple means of expression, I demonstrate multiple means of presentation to the class, thus utilizing one UDL principle to foster the development of another.

On the very first day of class, I lead a brainstorming session to raise questions that need to be answered to understand a phenomenon shown by a pair of pictures. Over the following weeks of the semester, I present the topics of the inquiry essays in different formats, to demonstrate how an issue or outstanding question might be highlighted in an engaging manner. One year, to introduce the topic of cystic fibrosis (CF) as being caused by aberrant ion transport across the plasma membrane, I imagined a blog that a CF patient might have written. Another year, I re-wrote a song entitled Hello to speak instead of cell-to-cell communication. With the new words printed on a sheet and a simple instrumental track playing, the students were delighted to sing the new lyrics to a popular song. After each presentation, the students brainstormed ideas and issues that arose, and together, we defined learning tasks for the essay.

Exposed to these examples of different ways of presenting material, students could now develop their own ideas of highlighting a topic of their choice in the Novel Problem project. Employing multiple means of presentation of the subject matter then becomes more than a means to enhance understanding and learning. It enjoins students to think about how they are learning and how they might express that learning in different ways.

In the earlier iterations of the course, when exemplars were few, some students were daunted by so much freedom and asked to be told what to do. In answer, I asked them what topic/s in the course made them curious to learn more, then what kinds of activities they enjoyed. From those informal conversations, ideas grew into project presentations, such as what became a sonnet on cell signalling, recited before the class in Elizabethan garb.

To alleviate the anxiety that even the more recent students have about possibly not choosing the 'right' topic or the 'right' way of presenting, I require each

group to submit an outline of their plans for the project, and quickly give them formative feedback, so that they can make changes, if needed, and proceed with confidence.

The Novel Problem project's becoming the product of group work introduced new challenges. Several years ago, I shifted from randomized assignments to more informed groupings based on topics of interest, skill sets, and personal preferences. To get a sense of how the groups were working together, I had students conduct their first few meetings during class time, while the teaching assistants and I moved about the room. To obtain a richer picture, I asked students to comment on their group work in their personal reflections on the assignment and to complete self- and peer-assessments.

With the COVID19 crisis forcing a shift to online delivery barely a month before the end of the term, rather than dropping the Novel problem project altogether, I chose to keep it as a course component, essentially intact, but with the stipulation that everything about the presentation had to be done virtually: planning, execution, and presentation. There were to be no face-to-face meetings. As I thought about what to do with the Novel Problem, I asked myself, would the pandemic constraints stifle creativity and lead to sub-par presentations? Knowing my students as well as I did by that point, I answered my own question with a defiant No way! And pushed on.

The students of winter term 2020 proved themselves more than equal to the task and delivered the most imaginative yet satisfyingly informative novel problem presentations. Students took videos of themselves in their own homes or backyards with props or siblings' backs or profiles standing in for classmates on the other side of the country, who would in the next shot be shown in full face responding appropriately.

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They created storyboards and animations, imagined scenarios that parodied police procedurals, news broadcasts, and reality TV. They presented case studies and mad scientists. All 14 presentations had the common objective of showcasing a topic in cell and molecular biology and some of the outstanding questions pertaining to the field. Each was unique in their perspective and in their demonstration of how the students had internalized knowledge and made it their own.

The essays that students wrote for the Novel Problem project may have been in the one format, however, they covered a wide range of specific studies under the umbrella of the presentation topics. In these essays, each student was able to show their individual understanding of the area of study and to consider the contribution made by the specific papers they discuss. For future offerings of the course, I might consider modifying this final individual assignment to allow students to demonstrate their understanding using other formats, such as a newspaper article or a nerdy letter to Grandma.

The MDSC 351 final project is a good example of how the UDL principle of multiple means of action and expression can work in a course. What started out as a low-stakes, fun addendum has become one of the most informative artifacts of student learning in my class. In developing the presentation, the students share what they have researched, what they think they know, and together they examine and evaluate their ideas, they challenge, and invariably, improve their understanding. The final presentation is their learning made visible. Shulman (1999, p. 11) describes learning as an interplay of “getting knowledge that is inside to move out and getting knowledge that is outside to move in.” The Novel Problem project is very much a product of that interplay.

Final Words

MDSC 351 has just gone through the 16th iteration of its development. I did not design MDSC 351 as a UDL course from the outset, but now that I know that UDL principles apply, I can be more purposeful about the further refinement/development of the course.

I hope that in this chapter, I have not told you, the reader, what to do, rather shown you by example

and narrative what can be done in your own teaching to apply UDL principles. As you saw in MDSC 351, I instituted changes over time, in small chunks. I didn't know then that what I was doing was in accordance with UDL principles. Only in peering through the UDL lens have I realized that it was so.

I did not design MDSC 351 as a UDL course from the outset, but now that I know that UDL principles apply, I can be more purposeful about the further refinement/development of the course.

In like manner, I'd encourage you to look back on your teaching. I would hazard to guess that upon reflection, you will already find examples of UDL in your teaching, that you've been doing little things for your student's learning that fit into this framework. Let that discovery be motivation to build upon that structure, with the awareness of how things connect and support one another.

Let me end with this quote from McCarthy and Butler (2019), who argue that what matters in higher education is:

“... to include all learners and to create curricula that value a variety of pathways to learning and the celebration by students of that learning.” (p. 216)

At bottom, this is what UDL is about, its reason for being.

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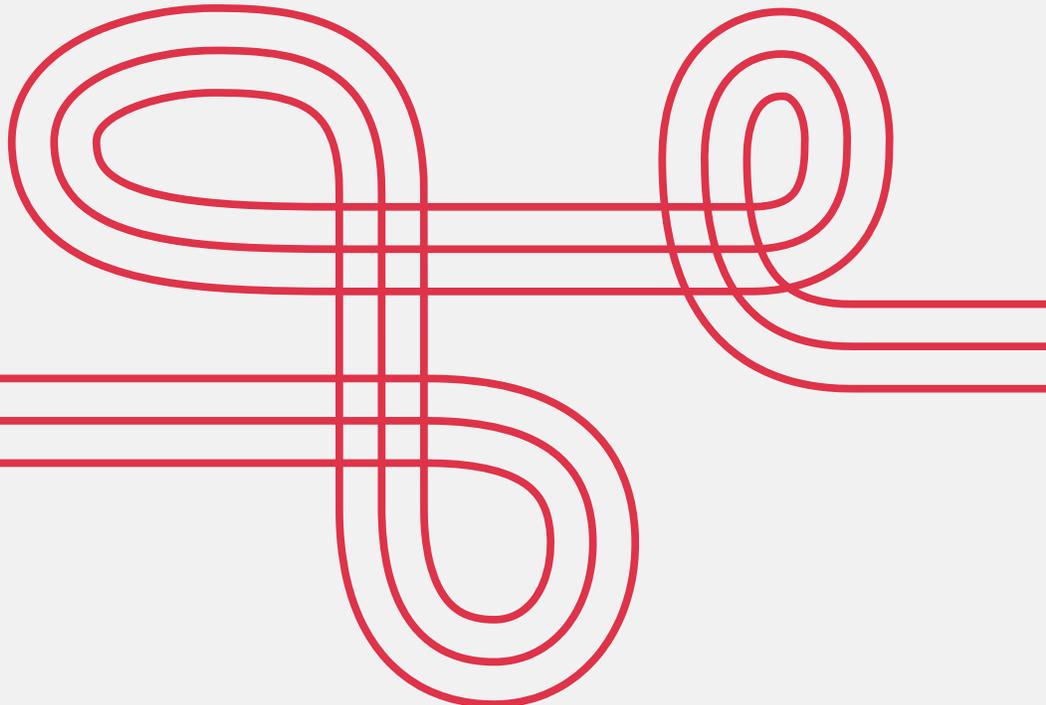
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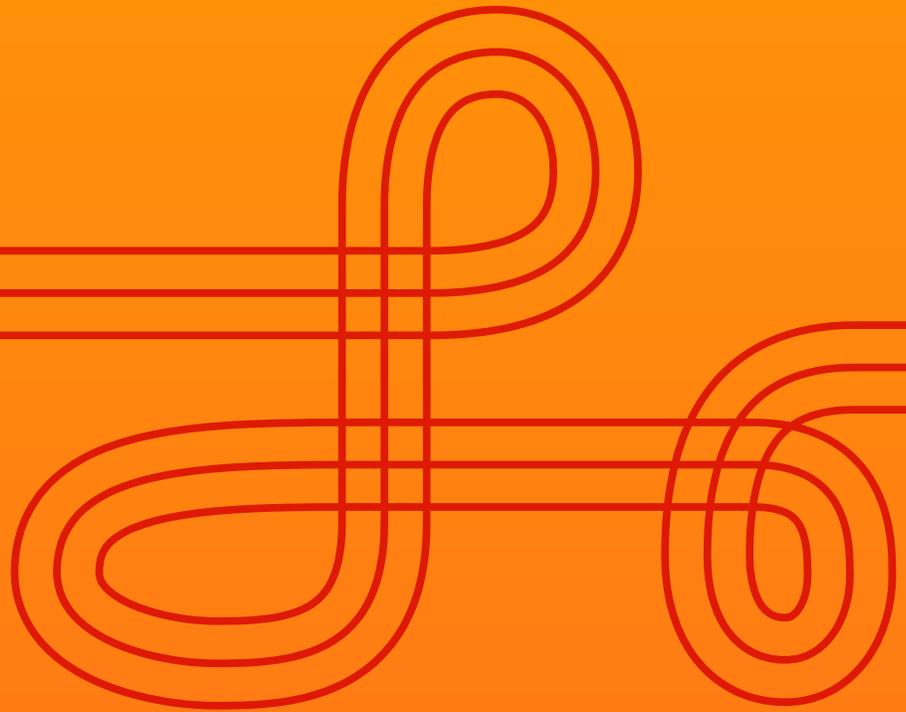
Final Thoughts

The chapters in this guide broaden our understanding of how different disciplines intentionally incorporate UDL principles into course design, and the impact on student learning. Expanding on them, we offer the following questions for instructors who want to incorporate UDL into their own courses.

- What are you already doing in your courses to incorporate UDL principles?
- How might you use UDL principles to create a community of learners that is collaborative, self-directed, and motivated to learn in an online course?
- How can you leverage the diversity of learners to challenge implicit assumptions and bring in multiple perspectives?
- How might you foster student agency in the course?
- How could the course be more accessible to students who live in different time zones, have poor internet access, or limited financial means? How could it be more accessible for students with sensory impairment?
- How might you incorporate UDL principles for students who have had a learning disruption due to COVID-19, either in high school or previous university courses?
- How could the course be more inclusive in terms of incorporating demographic diversity?
- How might you apply multiple means of representation through incorporating different disciplines into a course?
- How can you incorporate UDL strategies in partnership with students?

We encourage you to think about the ways in which you already incorporate UDL principles into your course and how you can take your next steps towards an inclusive, accessible learning environment for your students.





The **Incorporating Universal Design for Learning in Disciplinary Contexts in Higher Education Guide** is available on the Taylor Institute for Teaching and Learning website.

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