

Defining Active Learning in Online Courses Through Principles for Design

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This work also stands on the shoulder of a giant in the field of education research. The work of Dr. Thomas Reeves inspired this study and his kind and generous mentorship, for which I am deeply grateful, gave me the confidence to pursue a three-year design-based research investigation. Along the way, I found a passion for design-based research (DBR) as a means to conduct research that positively impacts the world. I also made a friend. I am deeply grateful to you Tom. Thank you for believing in me!

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## DEDICATION

I dedicate this dissertation to my daughters, Alia and Josie, who are the loves of my life and to my father from whom I have inherited my love for learning and who through mysterious ways has guided me towards the transdisciplinary framework of this study.

## ABSTRACT

This two-part design-based research (DBR) study sets as its goal to address a research-practice gap between what is known about learning through empirical evidence grounded in educational research and what is normally practiced in the online classroom. Its local goal was to increase active learning in the online courses at the College for Continuing and Professional Studies (CCAPS). Its larger goal was to define active learning for online courses in general, so that it might improve the learning experience for wider audiences. The first design intervention (DBR 1) incorporated the principles of authentic e-learning (Herrington, Reeves, & Oliver, 2010) into its online course review and evaluated the learning activities and assessments of 75 undergraduate online courses against these principles, resulting in an active learning (AL) score for each course. DBR 1 also surveyed the learners of these courses about what made learning meaningful and coded their feedback into design principles. The second design intervention (DBR 2) implemented a learning outcomes protocol that reviewed the learning activities that learners engaged in for opportunities to practice transdisciplinary skills, resulting in learning analytics on these higher-order skills. Its local goal was to advance undergraduate learning outcomes assessment for the CCAPS; its larger goal was to make t-skills more visible as research had connected them to active learning methods. DBR 2 also prompted learners to complete a reflection activity on what had helped them foster the t-skill they selected. The learner feedback from both design interventions was coded into design principles resulting in the theoretical findings of this study, namely that the authentic task principles (Herrington, et al., 2010) as well as newly identified learner-centered principles together serve as evidence-based principles to define active learning in online courses. The practical outcomes of this DBR study are two methods: a course review that quantifies active learning in online courses and a learning outcomes protocol that tracks t-skills through the learning management system. Together they can assist higher education in the design of online courses for multiple simultaneous goals: active learning online, personalizing the curriculum, t-skill development, learning analytics, and evidence-based course design.

## PERSONAL STATEMENT

**The Go-between**

As a resident alien in the United States,  
I am comfortable as the go-between  
navigating,  
bridging,  
translating  
between seemingly separate worlds.  
So it does not surprise me that my dissertation  
aims to make connections between multiple viewpoints.  
This study  
aims to reconnect what has been torn apart.  
To integrate the learning sciences into the instructional design process,  
and by doing so reconnect a knowledge domain split in two.  
It explores  
constructivism within direct instruction not as binaries,  
but as complementary elements of instruction.  
And finally, this study navigates  
between disciplinarity and transdisciplinarity in full acknowledgement  
that both enhance a more complete understanding.  
I have made peace  
not belonging here nor there  
but belonging in-between.  
I have made my home in the middle,  
the hidden third.  
Through the arduous journey of this dissertation  
I have also found my place as a researcher  
pursuing the world of knowledge through transdisciplinary eyes  
and through the lens of complexity.  
I find that space most whole, most creative and most open to possibilities,  
a good home for a go-between.

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## CHAPTER 1: INTRODUCTION AND BACKGROUND OF THE STUDY

The lack of active learning (social-constructivist approaches that include inquiry-based, problem-based, project-based, and authentic learning experiences) in online courses is an important problem in higher education (Beetham & Sharpe, 2007; Bellanca, 2010; Bereiter & Scardamalia, 2008; Guerriero, 2017; Herrington, Reeves, & Oliver, 2010; Laurillard, 2012). Although a large body of literature supports active learning as an effective evidence-based practice (Darling-Hammond et al., 2008; Bonwell & Eison, 1991; Bransford & Brown, 2000; National Research Council, 2000; National Academies of Sciences, Engineering, and Medicine, 2018; Prince, 2004), active learning is frequently misunderstood (Frydenberg, 2002) or an entirely missing concept in the context of online learning. Arguably, there is a disconnect between what is known about the science of learning and what is practiced in online course design (Berliner, 2008). Active learning is even more important today because educational research have connected active learning methods with the development of the transdisciplinary skills that are among the most essential outcomes of higher education in the 21<sup>st</sup> Century (Beetham & Sharpe, 2007; Bereiter & Scardamalia, 2008; Hearn & Bridgestock, 2010; Laurillard, 2002, 2012, 2013; Reeves, 2010; Scardamalia & Bereiter, 2006).

The lack of clarity of how to define active learning through design principles for the purpose of online course development and the importance of active learning for the development of t-skills present two significant challenges. First, active learning in online courses needs to be defined through principles for design so that instructors, designers, and administrators develop a shared understanding of active learning course design. A definition through principles for design would allow courses to be reviewed for active learning and facilitate design conversations about how to operationalize active learning in the design of online courses. Second, transdisciplinary skills, which by their very nature are elusive, multidimensional, and as such difficult to track need to be mapped in relationship to the learning activities that foster them. If active learning methods indeed foster the development of these important skills as the literature suggests, then both a definition of active learning and the tracking of t-skills are required to advance our understanding of design principles that enable both.

While useful frameworks such as the Interactive, Constructive, Active, and Passive (ICAP) framework exist that separate learning activities by modes of engagement (Chi & Wylie, 2014), Chi and Wylie's definition of *active* learning is not used in this study as this study posits that learning activities can not only involve multiple modes of engagement (interactive, constructive, active, and passive) but also span multiple dimensions, i.e. cognitive, affective, and conative simultaneously. When a team of students works together over the length of a semester to research a topic of their interest related to the subject matter being taught, and self-directs their efforts to collaboratively produce a digital story that demonstrates their knowledge gains, all modes: interactive, constructive, active, and passive active modes of learning have been practiced. The length of the time that learners explore a topic is a characteristic excluded from Chi and Wylie's framework, yet student-led sustained investigations enable learner agency so important for the development of self-regulation skills. The ICAP framework distinguishes modes of learning based on overt behaviors demonstrated by the learner and focuses primarily on cognitive outcomes, whereas this study includes affective and conative dimensions so important to online learning and for the development of t-skills.

This study applies the principles of authentic e-learning (Herrington, et al., 2006, 2010) as a viable heuristic to define active learning course design, and in the literature review connects each authentic task principle with its theoretical foundation for learning. In chapter 2, this study further examines the nature of learning through a transdisciplinary perspective and defines learning as the process of relationship-building between the learner and the subject matter, a process that that is not directly observable. Like Chi and Wylie, this study examines the learning activities and assessments that learners engage in, but rather than classifying the activities based on observable learner behavior as the ICAP framework suggests, this study examines the learning activities based on design principles. This suggests an ecological perspective, namely regarding the design principles as creating the environmental conditions under which learning thrives.

As such, this three-year design-based research (DBR) study reported in this dissertation addresses the problem of the paucity of active learning found in online courses as the local problem. It addresses this problem by developing a course review that reviews the learning activities and assessments that online

learners engage in against evidence-based design principles to arrive at an active learning score. But as it is customary for design-based research studies, this study also hopes to expand our understanding of active learning and hopes to refine the principles that define active learning for the purpose of knowledge development and for the purpose of wider application.

### **The Impetus for the Study**

The impetus for this DBR study arose from my personal realization about the disconnect that exists between what is known about active learning and what is practiced at higher education institutions. This realization was prompted by the following experiences. First, in my role as creative director guiding the design and development of a large portfolio of online courses, I discovered through the process of conducting internal course reviews, that the majority of online courses in the portfolio practiced what Chi and Wylie (2014) would define as passive or expository learning. “The instructional model of the teacher and the textbook as the primary source of knowledge, conveyed through lecturing, discussion, and reading” (Darling-Hammond, 2008, p.v) comprised the predominant course design. Existing courses also paid a heavy emphasis on proctored exams rather than engaging learners in learning experiences that would promote far learning transfer. Second, the University of Minnesota made a deliberate attempt to tackle this very problem, namely the lack of active, student-centered teaching practices with technology through a formal community of practice.

#### **Increasing and improving exemplary use.**

In November 2015, the University of Minnesota formed a formal community of practice (fCoP) with the goal of Increasing and Improving Exemplary Use of academic technology. I was fortunate to chair this formal community of practice (fCoP) effort along with two members of the Online and Educational Services (OES) design team. The charge of this formal community of practice was to 1) identify common barriers that prevent faculty and instructors from using academic technologies effectively and creatively, 2) identify incentives, reward structures, and engagement opportunities that promote effective and creative use of academic technologies, 3) research themes and conditions of effective and creative use of academic technology. In other words, the University was exploring how to counteract the disconnect between evidence-based practices in teaching and learning with technology and existing teaching practices by

exploring what peer institutions were doing, by surveying the literature, and by closely examining the barriers and opportunities at the University of Minnesota.

The resulting report in April 2016 provided both an in-depth analysis of the problem - the lack of learner-centered teaching practices in higher education - as well as recommendations to the Provost's office on how to advance active learning through the use of academic technology at the University of Minnesota. The barriers to adopting more learner-centered teaching practices the report summarized were complex, but could be organized into three main areas:

1. Systemic barriers in the form of lack of time, lack of financial support, teaching not valued as highly as research; tenure and promotion process, faculty autonomy and dispersed academic perspectives and priorities;
2. Faculty perception in the form of reliability of technology, technology-driven approach acts as barrier to adoption, concern that technology may not be critical for learning;
3. Support issues in the form of lack of institutional support, or support is underutilized, student lack of computer skills.

My dual position as PhD student in the learning technologies program and my position as director guiding a design-team in the development of online courses for the College of Continuing and Professional Studies (CCAPS) presented me with the unique opportunity to support the larger goals of the University of Minnesota to advance active learning mediated by technology by attempting to contribute knowledge and usable artifacts in the area of active learning online course design through the many online courses the Online and Educational Services (OES) design team serviced.

### **Background for the Study**

Online and Educational Services, the 10-15 person design team implementing this DBR study consisted of a professional team of instructional designers, media specialists, course developers, and administrators many of whom possessed advanced degrees in learning technologies, theatre arts, biology, mathematics / statistics, multimedia development, etc. and who brought their respective expertise to bear on the courses they designed. OES served the many applied undergraduate and graduate degrees of the College for Continuing and Professional Studies in online course design, course development and online



faculty support for roughly 117 fully online courses, 25 blended delivery, and 62 technology-enriched companion sites.

What made CCAPS unique as a college was the fact that the vast majority of instructors were experts in their field and possessed little to no background in teaching and learning. Consequently, content experts heavily relied on the pedagogical and technological expertise of the OES team to design and develop an engaging online course and to support their online teaching efforts. Additionally, OES designed, developed, and maintained fully online courses for departments across the University of Minnesota under the Online and Distance Learning (ODL) Memorandum of Agreement, pairing faculty from various disciplines ranging from the natural sciences to the social sciences to the humanities with an OES designer to design and develop an online course. ODL online courses routinely changed instructors from one semester to another, resulting in courses originally created by one content expert to be taught by another, thus relying on the online course design to deliver on the educational outcomes originally conceived by the department and approved by the academic council.

#### **Online and Educational Services (OES).**

In addition to online course design and development, OES regularly provided educational services to CCAPS and ODL faculty in the form of faculty development workshops, just-in-time teaching tips, and one-on-one consultations to support the successful adoption of new technologies and to support faculty's online teaching efforts. One of the many strengths of the services that OES provided was that the design team was equally versed in pedagogy as it was expert in instructional design and consequently, the learning design of OES-designed courses were well supported both pedagogically and technologically.

#### **Researcher Background and Positionality**

Research does not happen in a vacuum. It is conceived and executed by individuals and teams and implemented in the real world. Design-based research, in particular, which takes place in the messiness of the real world, is informed by the lived experience of the researcher who, working closely with practitioners and other stakeholders, frames the research problem and guides the design study. Design-based research, moreover, is situated within the organizational culture of the institution in which the research takes place. Because I conceived this design-based intervention as a PhD student in the Learning

Technologies program while simultaneously holding a staff position guiding a design team through this intervention, it is important that I disclose my own research philosophy as it has without a doubt informed this study.

My research philosophy was informed by my academic pursuit as a PhD student in the Learning Technologies program which educated me on the historic evolution of the use of educational technology from instructional technology as media (1900-1940), to technology as process (1950-1960), to the development of the Learning Sciences (1970) which began to consider learning from perspectives beyond the tool (*technology as media*) and beyond the cognitive-behavioral paradigm (*technology as process*). Hoadley (2011) ascribed the departure in the field of psychology away from a purely behaviorist model as one of the influxes responsible for the development of the learning sciences. “The emergence of the interdisciplinary field of cognitive science legitimized mixing and matching approaches from disciplines as varied as computer science, anthropology, linguistics, and philosophy with traditional psychological theories and research methods, which helped bring to the forefront context and culture as key factors in learning” (Hoadley, 2011, p.1). Validating context meant that research findings from educational psychology, curriculum and instruction, culture and teaching, sociology, and other social sciences became considerations in understanding how learners constructed meaning.

Research about learning from the field of *Educational Psychology*, for example, contributed empirical findings regarding memory and cognitive load with clear implications for learning design. It contributed research findings about “perception, language acquisition, and how people acquire and automatize skills’ (Hoadley, 2011, p. x). It contributed findings about self-efficacy, motivation, and emotion as drivers of learning that needed to be considered in the learning design to optimize the learning experience.

*Curriculum and Instruction* stressed the importance of pedagogical findings to assure that instruction builds on the prior knowledge of learners, that it uses metacognitive strategies, that it provides formative evaluations, and more. Moreover, this general pedagogical knowledge expanded into pedagogical content knowledge (Gudmundsdottir & Shulman, 1987) to assure that the pedagogical learning design “bridges students’ prior knowledge with the core disciplinary ideas that a student is expected to

learn. Unlike general pedagogical knowledge, pedagogical content knowledge is discipline-specific”

(Pallas, Neumann, & Corbin, 2017).

Pedagogical content knowledge “makes clear that students’ prior knowledge is a central part of the learning process, and that effective teaching makes use of that prior knowledge, whether academic, cultural, or both. But there are few protocols for eliciting such prior knowledge at the college level, and individual faculty are left to their own devices. Further, many college faculty think of teaching as the dissemination of subject-matter knowledge, rather than as the purposeful linking of disciplinary ideas to what students already know and believe.” (Baum & Mc Pherson, 2017, p. ?).

When mediated through technology, it further requires faculty to develop the technological, pedagogical content knowledge, also known as TPACK (Koehler & Mishra, 2009; Mishra, 2012) in order to be effective in designing pedagogically-sound disciplinary instruction mediated by technology.

Research about learning from the field of *Culture and Teaching* further contributed a significant body of empirical findings that *culture* and *identity* are core factors in learning and that students’ distinctive culture and identity required culturally-relevant pedagogies (Ladson-Billings, 1995 ) as a means to make academic knowledge accessible to them. These findings are particularly important for academically vulnerable students and would improve online courses by making the learning design more learner-centered and consequently more accessible to marginalized audiences.

The recognition of learning as a socio-cultural endeavor meant considering Vygotsky’s theoretical contributions which expanded learning beyond “what a student was able to do individually, but what he or she can accomplish with the help of a more able other” (Hoadley, 2011, p. 4). Broadening the study of learning to include context gave further rise to theories such as situated cognition (Lave & Wenger, 1991), anchored instruction (The Cognition and Technology Group at Vanderbilt, 1990), and the importance of cultivating the social interactions between learners by developing a community of practice (Barab & Duffy, 2000; Brown & Campione, 1994; Garrison & Arbaugh, 2007) as influential to learning outcomes. For the design of learning in online courses this had direct implications to purposefully design online courses as social spaces in which both learners and instructors developed social presence and online identity, and in which social interactions were purposefully designed into the learning activities and assessments that learners engaged in to optimize learning.

Broadening the study of learning to include the socio-cultural context under which learning took place further demanded the development of new research methods to examine learning in context. Brown and Collins (1992) approached these situated research methods through design experiments which later evolved into design-based research (DBR) in its many forms. “The basic method involved documenting what was going on in an applied setting and examining the impact of complex instructional implementations as they went through different phases of design and development” (Hoadley, 2011, p.8). The learning sciences as a distinct branch in the field of learning technologies thus focused on a wide variety of disciplines to address the complex phenomenon called learning with the aim to advance learning mediated by technology through theory-building via design principles, frameworks and design-based research. As a budding learning scientist, I thus viewed the world through the lenses of multiple disciplines: anthropology, educational psychology, critical theory, sociology, and so forth, and thus considered as many theories as a particular learning ecology demanded.

My research philosophy was additionally informed by my own lived experience. As a non-traditional student, I pursued my PhD late in life after having raised my two daughters as a single mother and as an immigrant to the United States. Having been the online student who advanced her own education while raising her daughters, I had come to see online learning not only as a unique mode of education but as the potential it held for others to advance themselves. My wish remained for others to be able to reach their own educational, career, and life potential by making online learning accessible and successful for all.

Finally, my research philosophy was influenced by my previous professional experience as an educator in K-12 and in higher education. Having been a teacher for many years, I deeply understood that designing for the weakest learner improved the learning for all. My teaching experience had further taught me that learning was experience and that experience was influenced by multiple complex interactions between the learner and her environment.

As a life-long educator, my deep appreciation for teaching and learning was informed by Donald Winnicott’s stance towards learning who proposed that “the happiness and future satisfaction of the human race depended ultimately not so much on external political issues, but on something far closer to home: the way parents bring up their children. All the ills of humanity were, in his view, in essence consequences of a

failure of parental provision. Fascism, delinquency, rage, misogyny, alcoholism, these were only the symptoms of poor childhoods that the collective would have to pay for. The road to a better society begins in the nursery” (The School of Life, 2016, p. 320). According to Winnicott, we might never have to solve the big problems of the world, if we attended to raising our children in nurturing environments. As an educator, I extend Winnicott’s care towards the way we raised children - the earliest forms of learning - to the larger goals of education, where educators we are given the precious opportunity to foster the development of the minds and hearts of learners, and with it the opportunity to eradicate ignorance, to empower learners’ voices, to foster tolerance towards others and to develop reflection and understanding of self. Like Ernest Boyer (1990) I view “teaching as the highest form of understanding” (p.8) and through this DBR study hoped to advocate for a learning design that was not only grounded in the science of our times but that would live up to the promise that education holds to improve upon the human condition.

#### **Researcher philosophy.**

Director-General of UNESCO, Fredrico Mayor best frames my perspective towards a more transdisciplinary approach to education.

When we look at the future, we confront many uncertainties about the world our children, grandchildren, and great grandchildren will live in. But we can be certain of at least one thing: if we want this earth to provide for the needs of inhabitants, human society must undergo a transformation. The world of tomorrow must be fundamentally different from the world we know as we step into the 21st century and the new millennium. We must strive to build a “sustainable future.” Democracy, equity, social justice, peace and harmony with our natural environment should be the notion of “durability” at the base of our way of living, of governing our nations and communities, of interacting on a global scale.

Education, in the broadest sense of the term, plays a preponderant role in this development aimed at fundamental changes in our ways of living and behaving. Education is the “force of the future” because it is the most powerful instrument of change. One of the greatest problems we face is how to adjust our way of thinking to meet the challenge of an increasingly complex, rapidly changing, unpredictable world. We must rethink our way of organizing knowledge. This means breaking down the traditional barriers between disciplines and conceiving new ways to reconnect that which has been torn apart. We have to redesign our educational policies and programs. And as we put these reforms into effect, we have to keep our sights on the long term and honor our tremendous responsibility to future generations. (Morin, 2002, p. 1)

I am deeply influenced by the tenets of transdisciplinarity which aim to re-engage knowledge with the world and are above all “a new way of thinking about, and engaging in, creative inquiry” (Niculescu,

2008, p. ix). As such, transdisciplinarity not only became the conceptual framework for this dissertation, but a mindset that guided me through the many iterations of this design intervention. Over the course of nearly three years I frequently had to trust that “the method (or path) emerges from the research” (Morin, 2008, p. xxv.). Drawing on Morin’s (2008) work, a transdisciplinary mindset can be summarized as requiring:

1. *A focus that is inquiry-driven* rather than discipline driven. This does not involve a rejection of disciplinary knowledge, but the development of *pertinent* knowledge for the purposes of action in the world.
2. A stress on *the construction of knowledge* through an appreciation of the meta-paradigmatic dimension - in other words, the underlying assumptions that form the paradigm through which disciplines and perspectives construct knowledge. Disciplinary knowledge generally does not question its paradigmatic assumptions.
3. An understanding of *the organization of knowledge*, isomorphic at the cognitive and the institutional level, the history of reduction and disjunction (what Morin calls “simple thought”) and the importance of contextualization and connection (or “complex thought”).
4. *The integration of the knower in the process of inquiry*, which means that the effort becomes one of acknowledging and making transparent the knower’s assumptions and the process through which s/he constructs knowledge (p.xxvii)

### **Choice of Methodology**

In my role as educator-researcher, I thus hoped to positively impact learning “and that meant taking on the real world and its complexities” (Hoadley, 2011, p.7). A design-based intervention was therefore my preferred approach to research as it allowed me to attempt to affect positive change while simultaneously aiming to advance theoretical understanding through reflection.

The first guiding principle of design-based research (DBR) is its “focus on a persistent problem of practice from multiple stakeholders’ perspectives” (Russell, Jackson, Krumm, & Frank, 2013). The problem that this DBR addressed is the paucity of active learning opportunities in online courses despite

empirical evidence that a learner-centered design using inquiry-based, problem-based, and authentic learning experiences fosters engagement and deepens learning (Darling-Hamond, 2008; Dumont, Istance, & Benavides, 2010; Jonassen, 2012; Pallas et al., 2017; Prince, 2004; National Research Council, 2000; National Academy of Sciences, Engineering, and Medicine, 2019). This DBR study encompasses one design team's investigation into the learning design of online courses by systematically reviewing the learning activities and assessments that learners engaged in against the principles of authentic e-learning as articulated by Herrington et al., (2006; 2010). The principles of authentic e-learning were chosen to review online courses for active learning because a large body of literature on situated pedagogies had affirmed these principles as evidence-based to deepen understanding and learner engagement. The literature review of this dissertation will connect each of the principles to its theoretical origin. The study further hoped to refine the principles of authentic e-learning to include the socio-affective dimensions of learning. Over a three-year period (Fall 2016 - Fall 2019), the design team implemented, revised, and refined its internal course review method and reviewed over 100 unique online courses (of which 75 are represented in this data set) by applying the principles of authentic e-learning as indicators of active learning resulting in an active learning (AL) score for each course. The study further surveyed learners on the question of what made learning meaningful to them in the hope to be able to refine these principles. The goal of this design intervention was to make active learning visible in the design of online courses and to explore the extent to which the intervention outcome - an active learning (AL) score - was able to quantify active learning in the design of online courses.

### **Layout of the Study**

Because of the length and complexity of this design-based research (DBR) study (each design intervention could have served as a stand-alone dissertation per se) the write-up of this study will primarily focus on the theoretical outcomes and knowledge-building value as it is customary for dissertations. Specifically, the write-up of this DBR study is organized into distinct chapters: Chapter 2 explores the nature of learning through a transdisciplinary lens and sets the ontological and epistemological foundation for the study. Chapter 3 details the first design intervention namely to define active learning in online courses through design principles, Chapter 4 details the second design intervention to track

transdisciplinary skills related to the learning activities and assessments that fostered them. Both chapters 3 and 4 include their own literature review, methodology, results and discussion chapters rather than a single literature review, methodology, results and discussion chapter as it is customary for dissertations. And finally, Chapter 5 summarizes the findings across both design interventions.

### **Chapter 2.**

Chapter 2 provides a discussion of the ontological and epistemological origins of transdisciplinarity so relevant to the complex nature of learning, for the development of transdisciplinary skills, for the development of a transdisciplinary mindset as the ultimate outcome of a higher education, and as a conceptual framework for the interventionist nature of design research which encounters complexity when interacting with the world.

### **Chapter 3.**

Chapter 3 addresses the need to better define active learning through design principles, and more specifically answers the following research questions:

Q1: Can the intervention - a new course review method - indicate the extent to which active learning is present in the design of an online course?

Q2: How can the principles of authentic e-learning incorporated into the new course review method be refined to foster more active learning?

To answer these questions, an instructional design team over the duration of five semesters (Fall 2017- Spring 2019) applied the authentic task principles as articulated by Herrington et al., (2006; 2010) during the course review process to 75 unique online courses resulting in an active learning (AL) score for each course that communicated the extent to which the learning design offers active learning opportunities. To arrive at an active learning course review that evaluates online courses against a set of design principles reliably, the course review process underwent three iterations. It further required the development of a rubric that would help define whether or not a design principle was absent, underemphasized, emphasized, or maximized. Additionally, learners in these online courses were asked about the extent to which the course they just completed provided them with the opportunity to create a meaningful project, presentation, or authentic task, and if yes, to describe what made it meaningful and how. The first level of data analysis reviewed the active learning scores of the courses in the sample for insights into what a low / medium /



high active learning (AL) score is able to communicate. The second level of data analysis compared the learner survey ratings from 75 unique online courses (267 course sections) against the active learning scores assigned by the design team. The third level of analysis coded nearly 900 qualitative survey statements made by learners using an open coding protocol about what made learning meaningful resulting in the theoretical outcome of Part 1 of the study, namely design principles that define active learning in online course design.

#### **Chapter 4.**

Chapter 4 addressed the need to track the development of transdisciplinary skills (t-skills) in online courses and more specifically answers the following research questions:

Q1: To what extent does the intervention - a new outcomes table - aid in tracking transdisciplinary skills in the design of online courses?

Q2: What principles guide the design of learning activities and assessments that foster higher-order skills?

To answer these questions, the instructional design team over the duration of five semesters (Fall 2017-Spring 2019) systematically mapped transdisciplinary skills, as articulated by the Partnership for 21st Century Skills [P21] (2006) and as aligned to the University of Minnesota Student Learning and Development outcomes (SLO / SDO), to the learning activities and assessments that learners engaged in while completing an online course. To implement the mapping of t-skills in online courses, the design team developed a custom outcomes table and revised the outcomes table in three iterations until the final iteration was able to capture multiple levels of outcomes that truly focused on the activities and assessments that learners engaged in. To automate the tracking of t-skills via the learning management system, the design team created digital rubrics so that assignments to which these skills had been mapped could be evaluated by instructors while grading. The graded rubrics deployed the learning outcomes reporting capacity of the learning management system resulting in learning analytics on higher order skills. Additionally, learners were prompted in the final module of their online course to complete a voluntary, ungraded reflection activity. As a part of this reflection, learners were prompted to select a higher-order

skill and reflect upon how the learning activities and assessments of the online course they just completed had helped them foster the skill that they selected.

The first level of data analysis of the reflection activity reviewed the learner-selected skills for 75 unique online courses and compared them with the skills mapped in the outcomes table and tracked in the learning management system. The second level of data analysis sorted the reflection activities from a subset of courses (27 unique CLA courses) across multiple semesters and across multiple sections according to the skill selected by learners. The third and final analysis of the reflection activity coded nearly 1000 of the CLA learner reflections about what helped them foster the skills that they selected using an open coding protocol, thus providing the theoretical outcome of Part 2 of the study, namely design principles that foster the development of t-skills in online courses.

### **Chapter 5.**

Chapter 5 summarizes the findings of the two design-based interventions, articulates the practical and theoretical contributions of this study, addresses the implications these findings hold for the field of instructional design, and articulates the importance of design research as a means for a more socially responsive and science that contributes positive outcomes to society.

While Chapter 3: *Defining Active Learning in Online Courses Through Principles for Design* and Chapter 4: *Tracking Transdisciplinary Skills in the Design of Online Courses* guide the reader step by step through two separate design interventions, it is important to remember that both design interventions were implemented by the same design team, with the same set of courses, and during the same three-year time span. Consequently, both design interventions examine the learning activities and assessments that learners engage in. Design intervention 1 reviews the learning activities and assessments against a set of evidence-based principles and asks learners for feedback about what made learning meaningful. Design intervention 2 maps t-skills to the same learning activities and assessments and asks learners to articulate what helped them develop the t-skill they selected.

For both design interventions, the learner feedback is coded using an open coding protocol. In both cases, the results confirm the evidence-based principles used in the course review. Moreover, in both cases, the learner responses reveal additional design principles as responsible for making learning

meaningful and for helping learners foster higher-order skills. Since the literature on active learning ties the development of t-skills to active learning methods (Beetham & Sharpe, 2007; Bereiter & Scardamalia, 2008; Hearn & Bridgestock, 2010; Laurillard, 2002, 20013; Reeves, 2010; Scardamalia & Bereiter, 2006). The findings of this study not only unequivocally confirm the relationship between active learning methods and t-skill development; the findings reveal additional design principles that refine our understanding of active learning course design.

### **Significance of the Study**

While the results of the two design interventions are remarkable in that they were able to connect two complex topics via the same design principles; it is Chapter 2 *The Nature of Learning*, that makes an intellectual contribution to the learning sciences field by reconnecting what has been torn apart through disciplinary fragmentation. It makes the argument for viewing learning from a transdisciplinary perspective. It acknowledges the existence of knowledge paradigms as pertinent to knowledge development and aims to develop an understanding of learning through multiple perspectives as the learning sciences have. It acknowledges the *systems and complexity perspective* so important to understanding the situated nature of learning and the situated nature of education research (Berliner, 2002). Finally, it acknowledges the subjective experience by including the knower in the pursuit of knowledge. It argues that transdisciplinarity is core to understanding the nature of learning, to knowledge development, as a learning framework for higher education, to the scholarship of teaching and learning, and consequently to the learning design of online courses.

The intellectual contribution of this study is in its *integrative* thinking and in its appeal to reconnect knowledge across the disciplines to arrive at a conception of learning that honors learning in its complexity. Through its two design interventions, this study attempted to integrate learning sciences research about active learning into instructional design practice and by doing so reconnect knowledge that has been fragmented by disciplinary knowledge development.

This study further grappled with the role that active learning methods hold within disciplinary instruction as two complementary elements of the learning design of online courses, offering an end to a long either-or debate (Kirschner, 2019) and a new understanding that *both* have their respective place in

instruction. “Complex thought does not reduce and polarize” (Morin, 2008, p. ix). Finally, this study grappled with the research-practice gap between what is known about the science of learning and what is practiced in the world. The bottom line is that the development of knowledge in theory, while a valuable goal in its own right, should further serve to positively impact practice in the world.

### **Limitations of the Study**

Because this study focuses exclusively on the design of authentic learning activities and how these foster skills while delivering disciplinary outcomes, this study does not address multiple additional factors that can impact the adoption of authentic learning activities and assessments.

#### **Out of scope: Instructor role.**

The role instructors play in supporting authentic learning activities and assessments is significant but it is not the focus of the study. Because instructors of online courses are frequently not the authors of the original course design, and because this study wanted to emphasize the importance of upfront pedagogical consideration when designing the learning environment, this study purposefully did not make the instructor role a main focus of the study. This is by no means intended to undermine the critical role of the instructor in moderating and supporting the online learning community.

#### **Out of scope: Other limitations.**

In order for active learning to be adopted in the design of online courses, many other factors come into play that are beyond the scope of this study. Institutional support for the Scholarship of Teaching and Learning, instructor workload, instructor comfort with active learning approaches, technology support for instructors, technology support for learners, pedagogical expertise of designers, and other factors can affect the adoption of active learning approaches. The discussion of these barriers while documented in the educational literature is outside of the discussion of this study.

#### **Out of scope: Technology support needs.**

Authentic and innovative learning activities and assessments that require student use of technologies (e.g. producing a digital story) will require significant technology support to assure success. The case studies of highly authentic courses will highlight the need for technology support, but the need of technology support will otherwise only be addressed in general terms.

## CHAPTER 2: THE NATURE OF LEARNING

*“When we try to pick out anything by itself, we find it hitched to everything else in the universe.”*  
*John Muir*

There is no single definition of learning though some have tried (De Houwer, Barnes-Holmes & Moors, 2013; Lachman, 1997; Harel & Koichu, 2010). Nor is there a scientific field exclusively dedicated to its study. Learning, rather, is examined through multiple disciplines ranging from anthropology, biology, cognitive science, culture and teaching, curriculum and instruction, educational psychology, linguistics, neuroscience, sociology to artificial intelligence, computer science, cybernetics, and learning technologies to name a few. Given the complexity of learning as a “dynamic and ongoing process that is simultaneously biological and cultural” (National Academies of Sciences, Engineering, and Medicine, 2018), attempting to arrive at a single objective and accurate definition is not only futile but fails to understand its transdisciplinary nature. The following is suggested as an alternative. Examine the transdisciplinary nature of learning and define it in principles so that these can serve as heuristics to inform the design of effective learning experiences, learning environments, and instruction.

**The Complex Nature of Learning**

To say that learning is complex is an understatement. To begin with, learning happens without instruction throughout a person’s lived experience from the implicit learning of language during the developmental years of childhood (Pinker, 2003) to the informal learning of social norms in response to observations and interactions with the environment to which a person is exposed (Marsick & Watkins, 2001). Learning is ongoing, dynamic, and affected by all that a person experiences in multiple dimensions: physically, mentally, emotionally, spiritually, socially, etc. (National Academies of Sciences, Engineering, and Medicine, 2018). Not only has learning biological, cognitive, emotional, spiritual, and developmental dimensions that are shaped by social and environmental factors, but these multiple dimensions are interdependent and their relationships non-linear and hidden from view.

To consider learning exclusively from a cognitive perspective, for example, to the exclusion of the emotional, psychological, spiritual, social, and cultural dimensions let alone the physical, economic, or political environment in which learning takes place, is a separation that is not only artificial, it is not

grounded in the science of our times. As such, education research must consider a complexity perspective that considers both the situated nature of the learning environment in which the learning takes place, as well as what the learner brings to the learning scenario in order to optimize learning. Perhaps the closest theoretical framework able to represent the complex, dynamic, and situated nature of learning is to arrive at a transdisciplinary conception of learning. This conception includes the cognitive perspective, the crucial role of motivation and emotion, the developmental and biological perspective, as well as the social and cultural dimensions under which learning takes place (Dumont, et al., 2010). But “transdisciplinarity is not merely the additive use of knowledge from several disciplines to confront a problem...transdisciplinarity is an attitude towards inquiry, informed by certain epistemological presuppositions, and an effort to frame inquiry as a creative process that recognizes as central the subjectivity of the inquirer and that challenges the underlying organization of knowledge” (Montuori, 2005, p.2). Transdisciplinarity holds profound importance for education.

### **Formal Learning**

The learning that is the focus of this study is the design of *intentional or formal* learning that corresponds with learning in educational settings as a goal of instruction (Bereiter & Scardamalia, 1989), in this case the design of undergraduate online courses delivered in asynchronous delivery. Formal instructional delivery differs dramatically from informal learning that students experience in every-day life in which they self-direct their efforts and interact with others through a wide array of activities, information sources, and stimuli. Formal instructional delivery further differs from informal learning in that cultural and contextual inputs from the natural environment are often removed. While the intent of formal instruction is to eliminate distraction so that the learner can focus on the object of instruction with all of her cognitive function and conative intention, it has the consequence of removing the context, social interaction, and learner agency so pertinent to learning. This ignores the transdisciplinary nature of learning and thus creates conditions that fail to develop what is known as “adaptive expertise or adaptive competence, i.e. the ability to apply meaningfully learned knowledge and skills flexibly and creatively in different situations” (De Corte, 2010, p.45). Consequently, formal learning too frequently results in inert knowledge (Whitehead, 1959; Herrington et al., 2010; Renkl, Mandl, & Gruber, 199) only to be remembered until the

next exam and then forgotten (Royal, Hedgpeth, Bynum, & Colford, 2016). The goal for incorporating authentic tasks into the instructional process of formal instruction is thus an attempt to reconnect academic knowledge with real-world context through learner-centered experiences, and thus to enhance cross-fertilization between formal academic learning and the complexity of life.

### **The Ontological Underpinnings of Transdisciplinarity**

Ontology is the branch of metaphysics dealing with the nature of being. As such it addresses a set of concepts within a subject area or domain that helps explain the domain's properties and the relations between them. The ontological underpinnings of transdisciplinarity are informed by advances in the field of physics. A layperson might think of physics as the forces of motion or the laws of gravity that govern our natural world. That was the world of 17th and 18th century physics, the world of Newton and Descartes, the period of modernity. Since then, the science of physics has changed. "Two new theories of physics, relativity theory and quantum theory, shatter all the principal concepts of the Cartesian worldview and Newtonian Mechanics" (Capra, 2014, p. 34). The empirical findings of what governs our world according to 21st century physics have not only debunked the Cartesian worldview; they invite researchers across the disciplines to undertake a paradigm shift (Kuhn, 1962, 2012) and to adopt the quantum perspective. The quantum perspective "challenges so many of our most basic assumptions, including our understanding of relationships, connectedness, prediction, and control" (Wheatley, 2011, p.33). In the quantum perspective, there are no *things* to observe, there are only patterns and relationships to be observed. "We live in a universe where relationships are primary. Nothing happens in the quantum world without something encountering something else. Nothing exists independent of its relationships. We are constantly creating the world - evoking it from many potentials - as we participate in all its many interactions" (Wheatley, 2011, p.69).

That relationships are primary is not only *ontologically or epistemologically* true; in regard to learning, building relationships is *structurally and biologically* true in that "the phenomenon of learning cannot be taken as though there were facts or objects out there that we grasp and store in our head" (Maturana & Valera, 1987, p. 25). Learning is the act of building relationships between what a person already knows based on prior experience and the new knowledge or experience presented. On a

neuroscience level, learning is quite literally the building of neural networks connecting information in patterns of neural activation.” There is for example, no one-to-one relationship that codes information in single molecules, single synapses, or single neurons. That would create a significant packing problem” (Saplosky, 2011, 30:00-33:00). Information is coded in patterns of neural activation through the *relationships* that a learner builds to the information to be stored. The more plentiful the relationships or connections in the neural network to the information to be learned, the easier the retrieval. The encoding of information is in its most literal sense an active process in that the learner has to “decode (translate) the outer language (disciplinary content) into an inner language of the self and construct (create) meaning. These are *active* processes of interpreting and assigning values in accordance to a set of internal beliefs, self-values and truths” (Aylward, 2012, p.32). In other words, knowing is an act done by someone. To understand these words, for example, you the reader have to lend your imagination, activate your prior knowledge and construct meaning. Without this act, the words remain only ink scribbles on paper.

#### **From objective knowledge to contextual knowledge.**

Across the sciences, anthropologists, biologists, computer scientists, linguists, neuroscientists, psychologists, sociologists, and others continue to explore the relationships between the varied dimensions of learning; the biological and the cognitive, the cognitive and the behavioral, the behavioral and the environmental, etc. with the growing recognition that each affects the other. Learning is experience, interaction, and encounter that includes the environment in which the learner interacts, the learners’ lived experience, as well as numerous context-dependent variables. The departure from purely behaviorist models in psychology to the growing recognition and eventual acceptance of the importance of context suggested that “the unit of analysis for understanding learning had to be larger than the individual person. People learned things with other people and generally learned with culturally developed tools and artifacts. Hence studying these interactions, tools, and artifacts meant considering ideas from fields like sociology and anthropology, semiotics and linguistics as part of the research and theory-building process” (Hoadley, 2011, p. 4).



### **From parts to whole.**

The analysis of any one aspect among the many that make up learning, while valid in its own right, remains an analysis of a single part without taking into consideration the complexity of the system in which learning takes place. What is required, however, is a shift in perception to complexity and systems thinking, that does not aim to analyze the individual parts but instead acknowledges the complex web of relationships between the various parts and the whole. “Systems thinking is contextual, which is the opposite of analytical thinking. Analysis means taking something apart in order to understand it; systems thinking means putting something into the context of a larger whole” (Capra, 2014, p. 66). Systems thinking is a form of parallel processing that enables pattern recognition across domains, the recognition of resemblances between related ideas, the development of schema or themes to unify metaphorical or physical similarities, the development of similes, frameworks, or other abstract patterns. As such, systems thinking, a core tenet of transdisciplinarity, exemplifies a hallmark of human cognition with significant importance for learning in higher education settings. Systems thinking enables learners to recognize patterns and to understand the structures that enable a system to maintain its existence. Hence systems thinking helps to develop the critical consciousness (Freire, 1973) of the learner.

### **From objects to relationships.**

The further scientists advance to the forefront of their discipline whether in quantum physics, molecular biology, and cognitive neuroscience, the more they acknowledge the importance of relationships. “As we penetrate into matter, we do not perceive any isolated building blocks, but rather a complex web of relations between the various parts of a unified whole. An elementary particle is not an independently existing analyzable entity. It is, in essence, a set of relationships that reach outward to other things. The universe is thus an interconnected web of relationships where parts can be defined only through their connections to the whole” (Capra, 2014, pp. 72-73). Moreover, “mind, brain, and relationships are not separate elements of life - they are irreducible aspects of one interconnected triangle” (Van der Kolk, 1994). The phenomenological nature of life is thus no longer a philosophy of science argument as proposed by Husserl (1970), Heidegger, Macquarrie, & Robinson (1962), Gadamer (1975), Piaget (1972), Nicolescu (2008), Kuhn (2012), and others; it is now validated through empirical

experiments in quantum physics (Heisenberg, 1958), molecular biology (Maturana & Valera, 1987), and neuroscience (Blumenfeld-Katzir, Pasternak, Dagan, & Assaf, 2011; Siegel, 1999; Van der Kolk, 1994), the sciences that investigate the secrets that govern natural phenomena. The complexity of elements at play in any given learning scenario are therefore both context dependent and temporary in nature. As such, “learning is best considered as the process of change for the individual. Learning is individual experience” (Itin, 1999, p.91). Imagine, for example, that the statistical concept of sampling is introduced to young children through a hands-on activity in which learners are able to engage in sampling using bags of M&M candies that have a known number of different color candies (e.g., 50% red, 30% green, and 20% yellow) and will only be able to eat the M&Ms once their sample equals the predetermined proportions. One group of students may be able to draw out just 10 candies and get a representative sample while another group may draw 100 and still not get a representative sample. The first group can munch away while the second group remains frustrated! This will surely be a memorable way of grasping the otherwise abstract concept of sampling. Because information is coded in patterns of neural activation, the more relationships that a learner has built to a given concept, the more emotionally salient the information is, the more applicable the information is to real-world practice, the more culturally relevant, the more novel and thus memorable, the easier the retrieval.

### **The Problem of Disciplinary Fragmentation**

To be able to acknowledge the advances in quantum physics as relevant for subject areas beyond physics requires researchers to acknowledge the problem of disciplinary fragmentation.

As human beings have developed more and more knowledge, there has been a concomitant division of labor. Disciplinary fragmentation is the result of increasing specialization. This is fundamentally an issue of organization. Industrial organization used division of labor and specialization, to increase, articulate, and facilitate production, and the production of knowledge has, for all intents and purposes, followed the same organizational model” (Montouri, 2005, p 5).

Despite this fragmentation, researchers at the forefront of their respective disciplines are pointing with empirical evidence across disciplinary boundaries to acknowledge the interdependent nature of the knowledge branches and to move towards a more comprehensive and complex science. The embodied cognition concept in cognitive science (Shapiro, 2010; Valera, 2016), for example, no longer rests

primarily on a philosophy-of-mind argument of the mind-body union (Bateson, 1979; Gadamer, 1975; Heidegger et al., 1962), instead neuroscience is providing evidence of learning as structural change (Maturana & Valera, 1987; Kühn, Gleich, Lorenz, Lindenberger & Gallinat, 2014) to acknowledge that “cognitive processes are deeply rooted in the body’s interactions with the world” (Wilson, 2002, p.625). The cognitive and physical domains - our mind and body - are interdependent to the point that separating them maintains a false dichotomy, a remnant of the Cartesian mind-body split. Neuroscience today further gives evidence that cognition and emotion are not only inextricably entwined, but that they are two components of one and the same perception (LeDoux, 2000; Pessoa, 2008). Moreover, “modern neuroscience has shown that emotions do infuse not only the mind but also the body. Feeling anxious raises your blood pressure and makes your pulse race, and feeling content can strengthen your immune system, with the result that you do not succumb to infections and other contagious illnesses as often as someone who is chronically down in the dumps” (Davidson, 2013, p.113). The recognition of emotion as an integral part of cognition and thus an integral part of learning has profound ramifications for the design of learning experiences as personally relevant to the learner. Moreover, the social environment under which learning takes place shapes learning as do cultural values, practices, and expectations (National Research Council, 2000; National Academies of Sciences, Engineering, and Medicine, 2018). One only has to be reminded of the fact that life is transdisciplinary in order to appreciate the limitations of examining a complex natural phenomenon such as learning from a single disciplinary perspective.

### **The Epistemology of Transdisciplinarity**

Transdisciplinarity already shares many of the epistemological approaches of social science research with regards to methods, validity, and scope. Both acknowledge the situated nature of their research domain. The importance of local or contextual knowledge has long been recognized as a core reason why education research is “the hardest science of all” (Berliner, 2002 p.18) and why “doing science and implementing scientific findings are so difficult in education, because humans in schools are embedded in complex and changing networks of social interactions” (Berliner, 2002, p.19). So, given the high variability of education settings as the norm, the transdisciplinary orientation towards contextual knowledge makes this perspective so essential to education research.

As it pertains to knowledge seeking and to the conceptual frameworks under which research is conducted, however, the transdisciplinary worldview expands existing social science research paradigms. Rather than looking for *truth* as merely situated in context, transdisciplinary research looks for the *patterns and relationships* that emerge as a result of interacting with context. Transdisciplinary research therefore employs methodologies that are action oriented, that are participatory, that are inquiry-based and explore the situated context of interest. Action research, design-based research, and other participatory research methodologies therefore align well to transdisciplinary inquiry. Transdisciplinarity at first seems a bit radical as it proposes a new organization of knowledge, one that questions “what we know, how we know, and how we organize our knowledge” (Morin, 2008, p. xxvi).

**What we know: The integration of the knower in the process of inquiry.**

Transdisciplinarity acknowledges that *what we know* is shaped by perception and therefore encourages the knower to become self-aware of his or her lens, the lenses of others, as well as the organization of knowledge itself. This departure from objectivity was a direct result of advances by quantum physicists who evidenced that,

we can no longer speak of the behavior of the particle independently of the process of observation. As a final consequence, the natural laws formulated mathematically in quantum theory no longer deal with the elementary particles themselves but with our knowledge of them. Nor is it any longer possible to ask whether or not these particles exist in space and time objectively ... When we speak of the picture of nature in the exact science of our age, we do not mean a picture of nature so much as a *picture of our relationships with nature*. ...Science no longer confronts nature as an objective observer, but sees itself as an actor in this interplay between man and nature. The scientific method of analyzing, explaining and classifying has become conscious of its limitations, which arise out of the fact that by its intervention science alters and refashions the object of investigation. In other words, method and object can no longer be separated (Heisenberg, 1958, p. 28-29).

This new approach to physics has profound implications in understanding our role as participants in these relationships. “The crucial feature of quantum theory is that the observer is not only necessary to observe the properties of an atomic phenomenon but is also necessary to bring about their properties. What we observe is not nature itself but nature exposed to our method of questioning” (Capra, 2014, p.74). Transdisciplinary research therefore includes the researcher in the pursuit of knowledge since objectivity is known not to be achievable. It acknowledges that any knowledge comes with lenses and perspectives (Kuhn, 1962; 2012) and makes the exposure of these multiple perspectives an important element in its

pursuit of findings. The process of becoming reflective of one's own thinking (Ghanizadeh, 2017) is of course a main goal of higher education which consequently requires that learners are given opportunities for reflection and articulation of their thoughts and feelings and the opportunity to listen to the ideas and feelings of others to cultivate this growing awareness.

**How we know: Construction of knowledge through multiple lenses.**

Transdisciplinarity constitutes a paradigmatic shift in *how we know* suggesting a departure from our Western approach to knowledge which evolved from a Cartesian model of mechanistic, dualistic thinking, separating objective and subjective reality and to move towards a more inclusive science that views the world as a complex, living, interconnected system; a Goethean science (Wahl, 2005) that acknowledges the complexity and interconnectedness of things, a complexity science that focuses on the construction of knowledge through multiple dimensions: mind, feelings, and body. “The transdisciplinary viewpoint allows one to see the various disciplines as an ecologist would see the living beings in an ecosystem (Nicolescu, 2008, p. 39). This ecological perspective is not a new one and has been advocated by scientists across the natural sciences (Capra, 2014; Dabrowski & Bailis, 1995; Heisenberg, 1958; Maturana & Valera, 1987), the social sciences (Bateson, 1979; Valera, et al., 2016; Wheatley, 1994) as well as in the humanities (Jung, 1978; Kauffman, 2016; Suzuki, 1996; Wahl (2005) for some time. The construction of knowledge through multiple lenses is shared by the learning sciences “which have long been open to multiple perspectives on learning. That openness is necessary because it takes multiple perspectives to understand the complex ecologies in which learning is situated” (Hoadley, 2011, p.19). Specific to learning, the epistemological view of situated cognition and the socio-cultural lens has long been shared by education researchers across the decades (Bandura, 1989; Brown, Collins, & Duguid, 1989; Bruner, 1966; Cognition and Technology Group at Vanderbilt, 1990; Dewey, 1938; Duffy and Jonassen, 2013; Fink, 2003; Herrington, Oliver, and Reeves, 2006; Hoadley, 2011; Ladson-Billings, 1995; Itin, 1999; Kolb, 1984; Lachman, 1997; Lave & Wenger, 1991; Vygotsky, 1980).

The transdisciplinary perspective, however, neither devalues nor displaces disciplinary expertise or disciplinary thinking; but rather compliments and builds upon it. The evolution of the disciplinary knowledge branches with their tremendous expertise and ways of thinking are indeed a hallmark of

mankind's achievement (Gardner, 2006). A historian, for example, applies a historical way of thinking by not using today's standards to evaluate a past event in history but rather encourages thinking historically by reconstructing the historical context as fully as possible in order to interpret the historical event in the light of the science, social structures, politics, etc. in which the event occurred. "We have acquired extraordinary knowledge about the physical, biological, psychological, and sociological world. Science is increasingly expanding the domain of empirical and logical methods of verification" (Morin, 2008, p.2). This said, the disciplinary knowledge branches are begging to be reconnected as the true structure of knowledge is not the disciplinary tree but that of a rhizomatic network (Lima, 2013, 2014, 2017). Nicolescu (2008) compares the disciplinary perspective to monochromatic lamps illuminating a scene and argues that "a comprehensive scientific view of the world should then be compared to the light of the sun, showing things with all their colors at one time (p.39)."

The transdisciplinary perspective is not only aware of different knowledge paradigms, it is able to distinguish when to rely on a disciplinary way of thinking and when to apply a wider lens to gain a more transdisciplinary and complexity perspective. When going into a hospital for diagnosis and intervention in a health condition, for example, it is crucial to be able to rely on disciplinary expertise which has been achieved through empirically verified protocols that will provide the patient with interventions that provide the statistically best possible outcomes. This hard-earned disciplinary expertise of a unique medical knowledge domain may determine the difference between life and death. Nowhere in recent memory has the importance of disciplinary expertise been more evident than in the recent accomplishments of scientists to successfully map the COVID-19 genome, identify how the virus infects humans by binding to specific proteins known as receptors, and develop a reliable serology test that can indicate if an individual has had any history of infection from the novel coronavirus. This expertise will save lives and provide guidance on vaccine and antiviral drug designs. This is disciplinarity at its best.

On the other hand, to examine what may have contributed to causing an illness in the first place requires a systems and complexity perspective to explore the many interrelated factors that may have contributed to this outcome. Societies' social practices, such as the practice of greeting each other with a kiss on each cheek as it is customary in Italy, may have contributed to advancing the outbreak in that

country. So, becoming aware of knowledge paradigms (disciplinarity and reductionism or transdisciplinary and the complexity perspective) and being able to critically evaluate which paradigm or combination of paradigms provide the best perspectives given a specific use-case should be a goal of higher education. Transdisciplinarity encourages this intellectual shape shifting in order to apply the best mode of thinking for the situation at hand.

**How we organize our knowledge: A focus on inquiry.**

Transdisciplinarity proposes a shift in *how we organize our knowledge*. The new organization of knowledge is inquiry-driven rather than disciplinary driven as inquiry-driven approaches are able to include all knowledge pertinent to examining a phenomenon in the world, whereas a disciplinary approach examines a phenomenon solely through its singular lens. Societies' most complex problems such as human health, poverty, racism, violence, the persistent achievement gap, environmental sustainability, etc. require a systems approach to thinking rather than a purely disciplinary one. They require that we acknowledge the interrelatedness of elements in the system rather than treating them as a solely biological, economic, sociological phenomenon. At its core, transdisciplinarity aims to re-engage knowledge with the world and is above all a new way of thinking about, and engaging in, creative inquiry (Nicolescu, 2002).

The goal to re-engage knowledge with the world through creative inquiry not only crosses disciplinary boundaries but wishes to explore what can be learned through these interactions. Because it is precisely when acting upon the world and causing a reaction that we might learn more about its hidden relationships. "In the quantum world, relationships are not just interesting; to many physicists, they are all there is to reality" (Wheatley, 2006, p.34). As researchers, "if we are to continue to draw from science to create and manage organizations, to design research, and to formulate ideas about organizational design, planning, economics, human motivation, and change processes (the list can be longer), then we need to at least ground our work in the science of our times" (Wheatley, 2011, p.8). The emerging understanding that hard-earned theory sometimes fails to achieve implementation in the real world has many social scientists acknowledge the need for an implementation science approach that is situated, participatory, and iterative in order to achieve the desired results. Because the moment that attempts are made to implement theory in practice, it is confronted with the complexity perspective and the messiness of the real world.

Imagine for example, the complexity of suddenly having to move courses online at universities around the world in the wholesale manner that is being done in the wake of the coronavirus spread. There are many strong theories and design principles for online learning that could inform this transition, but it is likely that expediency is pushing many to rush to provide online instruction without consultation or even awareness of these theories. The context of the COVID-19 emergency that disrupted higher education to move its courses online in this case is contextual and temporary, yet significantly affecting the implementation and outcome of the learning design. As schools close their physical doors to students and move towards online provisions, the challenge will become how to keep learners engaged. In time, the recognition will be that if you want learners to engage, then you will have to be supporting them in activities that follow the evidence-based learning principles of design. So, this particular tenet of transdisciplinarity, namely its focus on inquiry that aims for knowledge acquisition for the purpose of action in the world such as was implemented in this design-based research study may prove particularly useful whenever working on the implementation of theory in real world practice.

### **The Importance of Transdisciplinarity for Design-based Research**

The need to incorporate research findings from multiple disciplines as relevant to learning is foundational to acknowledging the complexity under which learning takes place. “Doing science and implementing scientific findings are so difficult in education because humans in schools are embedded in complex and changing networks of social interactions” (Berliner, 2002, p. 19). Learning sciences research can be attributed with attempting to provide these multiple lenses to better understand the situated nature of learning and the importance of local knowledge and the socio-cultural lens. Design-based research (McKenney & Reeves, 2019) with a transdisciplinary conceptual framework such as the one applied in this study can therefore be very effective for promoting a socially-responsive science that works with local constituents to improve the education settings through design interventions that consider the local context and that are guided by the vast body of existing research that is begging to be implemented in the world.

Over the past century, researchers have grappled increasingly with these social, cultural, economic, and educational struggles with increasingly sophisticated research. At the same time that we celebrate these accomplishments, we must also acknowledge that research has proved insufficient to shift patterns of cultural exclusion and inequity that pose serious threats to democracy.



As we enter our second century of education research, we can't rely on traditional research approaches to combat our toughest social and educational problems. We need to augment traditional "scientific" scholarship that is focused primarily on technical questions with public scholarship that spans the technical, normative, and political concerns necessary to address these persistent threats. As we negotiate a culture that increasingly exhibits anti-intellectual, anti-scholarship tendencies, public scholarship can help us *with* and *for* an engaged informed citizenry (Oakes, 2018, p.101).

### **A Theoretical Framework for the 21st Century**

Transdisciplinarity has been termed a theoretical framework for the 21st Century because its inquiry into complexity, plurality, and systems thinking allow us to better understand the complex, dynamic, and interdependent nature of wicked problems that do not abide by disciplinary boundaries (Nicolescu, 2002; Morin 2002). As a theoretical framework, transdisciplinarity is currently being explored in the environmental sciences, in organizational leadership, in the field of engineering, and more recently in design, education, economics, sociology, and other social sciences. The need for integrative thinking, not *one* theory explaining any *one* phenomenon by itself, but realizing the complex and dynamic relationships that impact any phenomena is just one goal of transdisciplinarity. Another is to realize the natural relationships between the theories themselves, how they inform, expand, refine, and confirm each other's scientific assertions and how by integrating disciplinary knowledge, scientists will have a better chance to approximate the complexity of a phenomenon under study. The wicked problems of today are better served when addressed in their complexity and exasperated when reduced to simple solutions (Buchanan, 1992). A natural phenomenon is better approximated when examined through multiple lenses. The complex phenomenon of learning is no exception. To achieve this level of complex thinking, the learning design would have to foster *interdisciplinary perspectives, multiple interpretations and outcomes*, and use *multiple sources and perspectives* in order to foster this type of critical lens.

#### **The learner is central to the inquiry.**

For designers of learning this means that the learner in all of her complexity (her prior knowledge, her culture, her lived experience), the content (how it is presented, the lenses it communicates), and the environment (the tools, experiences, and interactions it provides) become design considerations or design constraints to consider. For designers of learning this means reconnecting academic or conceptual

knowledge with the situated perspective by providing opportunities for learners to explore what they are learning within the context of the world, in relationship to the learners' interests and prior experience, and in relationship to the perspectives of others. This requires an expansion from the purely disciplinary perspective to one of open inquiry, not to distract, or devalue the importance of disciplinary content but rather to allow the learner to discover the many hidden relationships that only context and authentic experience can provide. As a design principle for learning this requires ongoing *reflection* in order to foster the growing awareness of one's own knowledge paradigm. It further requires *articulation* of learner perspectives to build the vital relationships between outer knowledge (disciplinary content) and inner (personal) knowledge.

**The learning design focuses on the construction of knowledge through multiple lenses.**

A transdisciplinary learning design encourages educators to teach beyond facts - the "things" of knowledge - and encourages learners to take *multiple perspectives* into consideration including the *reflection* of her own perspective as she is inextricably a participant in the inquiry. A transdisciplinary learning design supports the complexity perspective by developing learning activities and assessments that promote meaningful *collaboration* among learners as a means to explore the disciplinary curriculum through multiple lenses. It means drawing on resources beyond a textbook to let learners develop the information literacy required to not only understand multiple positions on a subject but to grapple with knowledge paradigms, knowledge claims, authorship, and relevancy to the subject.

**The learning design includes open inquiry and knowledge building.**

A transdisciplinary learning design encourages educators to include open inquiry into the disciplinary perspective for learners to be able to explore and discover for themselves the complex relationships relevant to the disciplinary subject. A transdisciplinary learning design aims to reconnect abstract disciplinary curricula that has been broken into parts back with the context of the world by providing learning experiences that allow the learner to explore what they are learning through learning tasks that have *real-world relevance* and that provide *ill-structured* problems. It is in the messiness of ill-structured problems and open inquiry that the systemic nature and complexity of higher forms of learning such as mental models become apparent (Engstrom, 2014). Moreover, authentic tasks rebuild the

relationships that academic content has to the world and thus become a vehicle for the learner to anchor disciplinary knowledge via experience into memory.

**The learning environment is an open system.**

A learning environment that operates under the tenets of transdisciplinarity thus operates as an open system that encourages knowledge building (Bereiter, 2002; Bereiter & Scardamalia, 2006) in addition to the development of disciplinary expertise. It expands disciplinary knowledge beyond the classroom into the larger, distributed knowledge production network (Gibbons, 1998; Siemens, 2006) where learners can take advantage of the unprecedented interconnectivity of today. It presents learners with *multiple resources and perspectives* to widen their horizons so that they can become aware of the underlying knowledge paradigms, and where they can collaborate with others to become aware of the diversity of perspectives and how these *diverse perspectives* frame a problem or inform a solution. A transdisciplinary learning environment places the learner at the center of the learning scenario, engaged in meaningful inquiry to explore a complex problem that allows for a *sustained investigation* in order to explore the complexity of a phenomenon and draw on interdisciplinary connections.

How can practitioners begin to develop their own approaches to establishing transdisciplinary learning environments? A traditional instructional design (ID) approach such as ADDIE (Branch, 2009) is not up to the task because typical ID models oversimplify the development of learning environments through a step-by-step mechanistic process. Design-based research (DBR) on the other hand is better suited to the complexity of building transdisciplinary learning environments because of its systems perspective and iterative, organic process. DBR is particularly well-suited to the application of the principles of authentic e-learning (Herrington et al, 2010) which provide the threads that reconnect abstract academic knowledge with real-world situations to deepen meaning. Table 2.1 summarizes these principles.

**Table 2.1***The Principles of Authentic eLearning* (Herrington, Reeves, & Oliver 2010)

Principle	Definition	Applied in Learning Design
Real-world Relevance	Learning rises to the level of authenticity when it asks students to work actively with abstract concepts, facts, and formulas inside a realistic and highly social context mirroring the practices of the disciplinary culture.	In a Construction Management course, learners are asked to visit a job site and identify the concept of <i>lean construction waste</i> and make recommendations for improvements that would reduce this type of construction waste.
Ill-defined Problems	Challenges cannot be solved easily by the application of an existing algorithm; instead, authentic activities are relatively undefined and open to multiple interpretations, requiring students to identify for themselves the tasks and subtasks needed to complete the major task.	In a Business Communications course, learners research and analyze a real-world problem in an organization of their choosing and produce an <i>analytical report</i> that communicates the problem, the analysis of findings, as well as recommendations for solving the client's problem.
Sustained Investigations	Problems cannot be solved in a matter of minutes or even hours. Instead, authentic activities comprise complex tasks to be investigated by students over a sustained period of time, requiring significant investment of time and intellectual resources.	In a Sociology course, learners apply sociology concepts and methods by conducting a semester-long ethnographic study of their own neighborhood. To complete the project, learners identify a sociological theme to research (education, health, crime, etc.), identify data sources, conduct interviews, write ethnographic field notes, use mapping and statistical software, and finally produce a digital story about their neighborhood supported by data.
Interdisciplinary Perspectives	Relevance is not confined to a single domain or subject matter specialization. Instead, authentic activities have consequences that extend beyond a particular discipline, encouraging students to adopt diverse roles and think in interdisciplinary terms.	In an introductory Sociology course, learners explore the strengths and weaknesses of particular methodological approaches (interview, survey, ethnography) to explore complex societal problems and debate the promises and perils of engaging in <i>Public Sociology</i> .
Collaboration	Success is not achievable by an individual learner working alone. Authentic activities make collaboration integral to the task, both within the course and in the real world.	In a Mathematics for Design course, groups explore weekly applications of mathematics to design problems that require learners to discuss the assigned problem, collaboratively come to a consensus of how to approach and solve the problem mathematically, and present

Reflection	Authentic activities enable learners to make choices and reflect on their learning, both individually and as a team or community.	the solution. Some of the problems will have more than one method that is valid, so the group discussion should include why different approaches achieve the same result.
		In a Management course, learners are asked to make meaningful, personal connections with the ideas and resources presented in the course by reflecting on the learned materials from the perspective of a manager or organization. The YouConnects activity encourages learners to reflect creatively through formats such as blog, digital story, e-portfolio, travel log, poetry, film script, musical lyrics, presentation, YouTube Live event, etc. The importance of the assignment is that the reflection makes a <i>personal</i> and meaningful connection to the course concepts.
Articulation	Learning activities enable presentation and defense of arguments.	In a Physics course, learners are given physics problems to solve on their own, then collaborate within a group forum to articulate how they arrived at their solution. By the end of the week the group has to come to consensus and submit their agreed upon solutions for a single shared grade.
Integrated Assessments	Assessment is not merely summative in authentic activities but is woven seamlessly into the major task in a manner that reflects real-world evaluation processes.	In a Digital Marketing course groups of students collaboratively develop a digital marketing campaign that integrates customer research, brand value proposition, content strategy and content development, UX design, and social media strategy, and campaign pitch into a cumulative project that synthesizes the learning from this course.
Polished Products	Conclusions are not merely exercises or sub-steps in preparation for something else. Authentic activities culminate in the creation of a whole product, valuable in its own right.	In a music course about the historical origins of Rock Music, learners are tasked in their final project of the course to explore the history of this era through a music compilation they themselves curate. They are prompted to compile a Spotify “best of” compilation that creates and communicates a distinct media message through 20th century rock music.

Multiple Interpretations and Outcomes	Rather than yielding a single correct answer obtained by the application of rules and procedures, authentic activities allow for diverse interpretations and competing solutions.	In a sociology course on the topic of Law, Crime, and Punishment learners are asked to create a polished audio podcast (think <i>RadioLab</i> or <i>This American Life</i> ) that integrates the theory of “legal consciousness” about the role and effects of law in everyday life by interviewing someone.
Multiple Sources and Perspectives	Learners are not given a list of resources. Authentic activities provide the opportunity for students to examine the task from a variety of theoretical and practical perspectives, using a variety of resources, and requires students to distinguish relevant from irrelevant information in the process.	In a History course, learners collaboratively create an interactive digital timeline to bring a chosen time period to life. To construct the timeline, groups of learners select a theme, research relevant historical events, movements, and cultural artifacts to contribute to the collective timeline.

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### Windows of Transdisciplinarity within Disciplinary Instruction

Student learning outcomes in higher education are traditionally defined in relationship to three learning domains: cognitive, affective, and conative, with the majority of emphasis given to the cognitive domain. University student learning (SLO) and development (SDO) outcomes articulate goals at all three levels, but both instruction and assessment in higher education largely focus on the cognitive domain. Moreover, within the cognitive domain, learning goals too frequently focus on the lower level of the domain (remembering, understanding, and applying). “This problem stems largely from the relative ease with which the skills encompassed in the realm of *remembering, understanding, and application* can be taught and tested within most disciplines” (Herrington, et al, 2010, p. 99). It further stems from the nature of publisher-developed curriculum which is traditionally organized around convergent, disciplinary-specific outcomes that can be assessed in standardized ways. The affective domain which addresses emotions and feelings, especially in relationship to a set of values is rarely incorporated into instruction. Neither is the conative domain which encompasses action and self-regulation. “The conative domain focuses on conation or the act of striving to perform at the highest level” (Herrington, et al, 2010, p.100). “It is closely associated with the concepts of intrinsic motivation, volition, agency, self-direction, and self-regulation” (Huitt, 2005, p. 1), and is essential for online learners to succeed.

For learning activities to enact a learner's full capability in all of her dimensions: cognitive, affective, and conative will require learning tasks that tap into the learners' emotions and values and that require the learner to take charge of a project and bring it to completion. Incorporating learning experiences that follow the principles of authentic eLearning as articulated by Herrington et al., (2006; 2010) into disciplinary instruction thus not only fosters learning along multiple dimensions for the learner: cognitive, affective, conative; authentic learning experiences inform the learner of the complexity that surrounds conceptual knowledge when it reconnects with the situated perspective. Authentic learning experiences are windows into complexity.

### **The Importance of a Transdisciplinary Mindset**

Arguably, a core critical higher-order skill for learners to develop in higher education is a transdisciplinary mindset that enables learners to connect concepts and knowledge across disciplines in order to better understand the interconnectedness and interdependence of variables that make up the complexity of modern life. A transdisciplinary mindset is also required for individuals to work effectively in cross-disciplinary teams to address real-world problems that do not respect disciplinary boundaries in order to *see* that multiple perspective are required if a viable solution is to be the outcome. A transdisciplinary mindset acknowledges that knowledge is not concrete, but rather is perceived through multiple lenses that neither learners nor teachers adequately appreciate. This mindset recognizes that identity and lived experience shape the lenses through which we interpret the world. It develops awareness of one's own culture through reflection and develops respect and listening skills toward the perspective of others. A transdisciplinary mindset remains open to inquiry and is willing to explore new conceptual locations. It develops the capacity to change one's mind on matters; is willing to break down old ideas to allow new and better ideas to grow in their place. A transdisciplinary mindset is able to leverage today's distributed knowledge production system and to synthesize information from a variety of sources beyond the academic enterprise. It assumes a growth mindset that is dedicated to learning, the pursuit of inquiry, and knowledge building (Scardamalia & Bereiter, 2014). A transdisciplinary mindset adopts a systems view. It accepts complexity as core to understanding a phenomenon under study and thus seeks

multifaceted perspectives. F. Scott Fitzgerald said that “the test of a first-rate intelligence is the ability to hold opposing ideas in mind at the same time, and still retain the ability to function” (Fitzgerald et al., 2007). Developing a mindset “that always looks for and finds root perspectives is foundational to critical and independent analysis” (Wheatley, p.101).

Finally, a transdisciplinary mindset values disciplinary expertise but is driven to follow inquiry across disciplinary boundaries in order to better understand the complexity of the phenomenon under study. A transdisciplinary mindset aims to reconnect the existing relationships that disciplinary lenses leave unexplored and takes advantage of the tremendous distributed knowledge production systems available today. Because in a world in which disciplinary content, even curated content such as an open online course, is becoming increasingly widely available, the value of an online course cannot exclusively be tied to the delivery of disciplinary content, but instead must reach for higher levels of learning and foster the life and career skills needed for the future. To take learning to higher levels and to promote the meta-outcomes also known as transdisciplinary skills in the design of online courses therefore requires learning tasks that provide interactions in which the learner is able to construct her own knowledge, increasingly self-direct her learning efforts, reflect critically on learning experiences and processes, and learn from and work collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue. As such, a transdisciplinary mindset can be seen as the ultimate meta-outcome of fostering higher-order skills and dispositions. Transdisciplinarity emerges as a mindset required to understand the complexity of modern life.

### **Transdisciplinary Skills**

Transdisciplinary skills are what separate us from the machine: creativity, empathy, applied problem solving, cross-cultural skills, pattern-recognition, leadership, etc. Each of these skills is highly complex. Take leadership, for example. Leadership encompasses self-awareness, namely the ability to understand your own strengths and weaknesses and the ability to identify gaps in your skills. It requires communication skills that go beyond articulating thoughts and ideas using oral, written, and non-verbal communication; it requires listening skills to decipher meaning, including knowledge, values, attitudes, and intentions. It requires social and cross-cultural skills in order to interact effectively with others. It requires



respecting cultural differences and the ability to work with people from a range of social and cultural backgrounds. It requires the ability to inspire others to reach their best by setting examples. It requires demonstrating integrity and ethical behavior in using influence. It requires working effectively in a climate of ambiguity. It requires flexibility and adaptability to deal with different roles, demands, and contexts. Leadership is a deeply human and deeply complex transdisciplinary skill that spans the cognitive, affective, and conative domain.

To help learners develop their own leadership can therefore not be accomplished through the study of leadership theory alone as this only addresses the cognitive domain. To foster leadership in learners would require learning experiences that help the learner develop the emotional intelligence and other dispositional skills that make up leadership.

To help learners develop the affective and conative dimensions of leadership would require that learners are given the opportunity to work on something that they care about and that allows them to test their own strengths and weaknesses by tackling a challenging problem. It would require them to experience a situation that presents ambiguity and that requires them to take charge and coordinate with others to bring a project to completion. In short, to develop a complex skill such as leadership that is composed of cognitive, affective, and conative dimensions requires learning experiences that allow the learner to tap into these dimensions within themselves.

Education literature links active (problem-based, project-based, inquiry-driven, cooperative, and authentic) learning opportunities to the development of these complex transdisciplinary skills. The authentic task principles as articulated in Table 2.1 not only define these active learning methods in design principles, they articulate important qualities of design (ill-structured, interdisciplinary perspective, real-world relevance) that expand the definition of active learning as learners have the opportunity to build additional relationships based on these principles. The definition of *active learning* in this dissertation uses the principles of authentic e-learning as evidence-based principles for active learning, but also seeks to expand this definition by asking learners about what makes learning meaningful to them and what helps them develop complex t-skills. Due to their growing importance in the creative economy (Beetham &

Sharpe, 2007; Bellanca, 2010; Bereiter & Scardamalia, 2008; Guerriero, 2017), the relationship between active learning and the development of t-skills became the impetus for this study.

### CHAPTER 3: DEFINING ACTIVE LEARNING IN ONLINE COURSES THROUGH DESIGN PRINCIPLES

Active learning is widely accepted in the education literature for creating learning experiences that engage and deepen learning. It is associated with the broad family of social-constructivist approaches that challenge educators to move from a direct instruction model towards more inquiry-based approaches, such as problem-based, project-based, and authentic learning opportunities (Barron & Darling-Hammond, 2008; Bonwell & Eison, 1991; Bransford & Brown, 2000; Herrington et al., 2010; National Research Council, 2000; National Academies of Sciences, Engineering, and Medicine, 2018; Prince, 2004; Sawyer, 2008). Active learning as a quality standard of online course design (Frydenberg, 2002; Lowenthal & Hodges, 2015), however, remains largely undefined. With online courses having become a widely accepted mode of instruction, it is imperative to better define what active learning in online courses looks like and to provide evidence-based design principles for designers and teachers.

Despite the well-documented need for more active and learner-centered pedagogies in higher education (Beetham & Sharpe, 2007; Bellanca, 2010; Bereiter & Scardamalia, 2008; Darling-Hammond, 2010; Fogarty & Pete, 2010; Guerriero, 2017; Herrington et al., 2010; Laurillard, 2012; Reeves, 2010; Vockley, 2012), few online courses incorporate active learning pedagogies in the design of learning tasks. Too many online courses still place the learner in the role of passive consumer of disciplinary content rather than in the central role of tackling authentic tasks that foster active knowledge construction. Recorded lectures, preselected chapter readings and automated assessments too often make up the exclusive discourse of online courses instead of taking advantage of the pedagogical innovations made possible through authentic learning tasks mediated by technology (Herrington et al., 2010). With over 30% of all students in US higher education taking at least one online course in 2017 (Poulin & Straut, 2016), the learning design of these courses, whether static content is delivered or active learning is promoted, thus becomes not only a question of quality for online education but a question central to the mission of higher education to educate knowledge workers for the 21st century (Laurillard, 2002, 2013).

When translating the concept of active learning to online delivery, however, it is important to understand that what are active *teaching practices* in face-to-face delivery become active *design practices*

for online delivery, thus necessitating the *upfront* consideration of design principles when developing the activities and assessments that will eventually guide the learners' active participation. The ability of online courses to *design* a particular pedagogical approach into the learning environment and automate this approach for ongoing use, and re-use only stresses this importance. Without *upfront* design considerations for active learning, online courses - which hold the promise of being a creative tool of the 21st century - will not only not fulfill this promise but perpetuate the persistent gap between what is known about the science of learning and what is practiced in the online classroom. Defining active learning in the design of online courses thus becomes a matter of quality for online delivery, a matter of relevance for the creative economy, and a requirement for a more learner-centered education model that increases the probability of success for a wider majority of learners. Because without clear principles of design, vague definitions regarding active learning in online courses will continue to be the only guiding standards of quality.

While some quality standards for online courses have found their way into university practice via the voluntary peer review process of Quality Matters (Shattuck, 2010), what exactly is meant by active learning in online courses remains a vague concept, and frequently a misunderstood goal. In the fifth edition of the Quality Matters rubric, Standard 5.2 recommends that *Learning activities provide opportunities for interaction that support active learning*. "The definition of this interactivity, however, is generally left undefined, and, in many cases, interaction with a computer in a complex branching program that guides the learner in a step-and-remediation process will qualify as interactive" (Frydenberg, 2002, p. 4). With contributions over decades to advance active learning from educators, researchers, and thought leaders (Bruner, 1966; Dewey, 1938; Piaget, 1972; Vygotsky, 1978;) and more recently (Bandura, 1989; Brown, Collins & Duguid, 1989; Darling Hammond, 2010; Fink, 2003; Herrington et al., 2010; Jonassen, 2006; Laurillard, 2013; Swan, 2002, 2003, 2004, 2012), it is time to define active learning in online courses through design principles. This three-year design-based research (DBR) study documents one design team's intervention to address this research-practice gap. In particular, this study addressed the lack of a definition of QM Standard 5.2 as its primary problem and provides a systematic inquiry into what active learning in online courses looks like and how active learning indicators can quantify the extent to which active learning is present in the design of an online course.

## Literature Review

### Pedagogy in Support of Active Learning

Active learning is grounded within the broad family of social-constructivist approaches that challenge educators to move from a direct instruction model towards more inquiry-based approaches, such as problem-based, project-based, and authentic learning opportunities (Darling-Hammond, 2010; Dumont, et al, 2010; Herrington et al., 2010; Laurillard, 2002; Hung & Khine, 2006; Mishra, 2012; Bereiter & Scardamalia, 2008; Guerriero, 2017, Sawyer, 2008). What defines active approaches to learning is that they require the learner to exhibit a degree of agency and self-regulation that is not fostered when learners remain passive recipients of content knowledge. It is when learners engage in an authentic activity, reflecting on their newly constructed knowledge, and share their findings in a polished product or performance, that knowledge is actively constructed.

Active learning course design begins with an understanding that “learning is an activity carried out by the learner” (Schneider & Stern, 2010, p. 82) and that knowledge is built based on previous learning (Schwartz & Fischer, 2003). As such, the laws of classical mechanics, the Cartesian coordinate system, or the mechanisms of photosynthesis remain inert until the learner constructs this knowledge in order to create meaning. “The more connections a learner sees between the educational world of learning environments and the outside world, the easier the knowledge transfer will be” (Schneider & Stern, 2010, p. 83). Active learning is precisely the attempt of reconnecting inert academic knowledge so that it becomes alive and owned by the learner with the goal of “enabling students to *transfer* their learning to new kinds of situations and problems and to use knowledge more proficiently in performance situations” (Barron and Darling-Hammond, p.3). An active learning course design provides thoughtfully scaffolded and designed learning experiences that carefully guide the learners’ knowledge construction through action, reflection, abstraction, and application (Swan, 2004).

To design these types of active learning experiences requires the understanding of learning as a *constructive, self-regulated, situated, collaborative* (CSSC) process (Dumont, et al., 2010). It requires an understanding that the learner is central to the inquiry which means that the learning design, while

considering the important course-level outcomes, is truly focused on the learner with the goal of integrating the learner into the process of inquiry through learning experiences that involve as many of the learners' cognitive, affective, and conative dimensions as possible. An active learning course design furthermore focuses on the construction of knowledge through multiple lenses. This is to encourage the development of cognitive structures that connect academic knowledge with real-world contexts and with the learners' lived experience. Finally, an active learning design includes open inquiry and knowledge building to connect academic knowledge for the purpose of action in the world. This implies connecting academic knowledge beyond the disciplinary focus to consider how this knowledge will impact real-world contexts in which social systems, culture, and complexity apply. The constructive, situated, self-regulated, and collaborative nature of learning is well represented by the principles for authentic e-learning (Herrington et al., 2010) (see Table 3.1).

**Table 3.1**

*The Principles of Authentic eLearning* (Herrington, et al., 2010)

Principle	Definition	Applied in Learning Design
Real-world Relevance	Learning rises to the level of authenticity when it asks students to work actively with abstract concepts, facts, and formulas inside a realistic and highly social context mirroring the practices of the disciplinary culture.	In a Construction Management course, learners are asked to visit a job site and identify the concept of <i>lean construction waste</i> and make recommendations for improvements that would reduce this type of construction waste.
Ill-defined Problems	Challenges cannot be solved easily by the application of an existing algorithm; instead, authentic activities are relatively undefined and open to multiple interpretations, requiring students to identify for themselves the tasks and subtasks needed to complete the major task.	In a Business Communications course, learners research and analyze a real-world problem in an organization of their choosing and produce an <i>analytical report</i> that communicates the problem, the analysis of findings, as well as recommendations for solving the client's problem.
Sustained Investigations	Problems cannot be solved in a matter of minutes or even hours. Instead, authentic activities comprise complex tasks to be investigated by students over a	In a Sociology course, learners apply sociology concepts and methods by conducting a semester-long ethnographic study of their own neighborhood. To complete the project, learners

	sustained period of time, requiring significant investment of time and intellectual resources.	identify a sociological theme to research (education, health, crime, etc.), identify data sources, conduct interviews, write ethnographic field notes, use mapping and statistical software, and finally produce a digital story about their neighborhood supported by data.
Interdisciplinary Perspectives	Relevance is not confined to a single domain or subject matter specialization. Instead, authentic activities have consequences that extend beyond a particular discipline, encouraging students to adopt diverse roles and think in interdisciplinary terms.	In an introductory Sociology course, learners explore the strengths and weaknesses of particular methodological approaches (interview, survey, ethnography) to explore complex societal problems and debate the promises and perils of engaging in <i>Public Sociology</i> .
Collaboration	Success is not achievable by an individual learner working alone. Authentic activities make collaboration integral to the task, both within the course and in the real world.	In a Mathematics for Design course, groups explore weekly applications of mathematics to design problems that require learners to discuss the assigned problem, collaboratively come to a consensus of how to approach and solve the problem mathematically, and present the solution. Some of the problems will have more than one method that is valid, so the group discussion should include why different approaches achieve the same result.
Reflection	Authentic activities enable learners to make choices and reflect on their learning, both individually and as a team or community.	In a Management course, learners are asked to make meaningful, personal connections with the ideas and resources presented in the course by reflecting on the learned materials from the perspective of a manager or organization. The YouConnects activity encourages learners to reflect creatively through formats such as blog, digital story, e-portfolio, travel log, poetry, film script, musical lyrics, presentation, YouTube Live event, etc. The importance of the assignment is that the reflection makes a <i>personal</i> and meaningful connection to the course concepts.
Articulation	Learning activities enable presentation and defense of arguments.	In a Physics course, learners are given physics problems to solve on their own, then collaborate within a group forum to articulate how they arrived at their solution. By the end of the week the group has to come to consensus and

Integrated Assessments	Assessment is not merely summative in authentic activities but is woven seamlessly into the major task in a manner that reflects real-world evaluation processes.	submit their agreed upon solutions for a single shared grade.
Polished Products	Conclusions are not merely exercises or sub-steps in preparation for something else. Authentic activities culminate in the creation of a whole product, valuable in its own right.	In a music course about the historical origins of Rock Music, learners are tasked in their final project of the course to explore the history of this era through a music compilation they themselves curate. They are prompted to compile a Spotify “best of” compilation that creates and communicates a distinct media message through 20th century rock music.
Multiple Interpretations and Outcomes	Rather than yielding a single correct answer obtained by the application of rules and procedures, authentic activities allow for diverse interpretations and competing solutions.	In a sociology course on the topic of Law, Crime, and Punishment learners are asked to create a polished audio podcast (think <i>RadioLab</i> or <i>This American Life</i> ) that integrates the theory of “legal consciousness” about the role and effects of law in everyday life by interviewing someone.
Multiple Sources and Perspectives	Learners are not given a list of resources. Authentic activities provide the opportunity for students to examine the task from a variety of theoretical and practical perspectives, using a variety of resources, and requires students to distinguish relevant from irrelevant information in the process.	In a History course, learners collaboratively create an interactive digital timeline to bring a chosen time period to life. To construct the timeline, groups of learners select a theme, research relevant historical events, movements, and cultural artifacts to contribute to the collective timeline.

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### **Authentic Task Principles: A Heuristic Representing Active Learning**

The authentic task principles are furthermore grounded in multiple educational theories, as detailed in the following section.

#### **Active learning is constructive.**

The theoretical foundation for the premise that learning environments need to encourage the learner's active engagement is grounded in multiple theories ranging from Dewey's Social Activism Theory (1938) which aimed to foster learning through hands-on activities connected to real-world issues and problems, to Bandura's Social Learning Theory (1989) which emphasized the reciprocal nature of the learner and the environment's influence on one another, to Lave and Wenger's Situated Learning Theory (1991) which aimed to reconnect academic learning within social and cultural contexts. Common to these theories is the idea that knowledge is constructed by the learner in the process of integrating new experiences with existing knowledge. Active, experiential, inquiry-based methods such as design-based, project-based, problem-based, or other authentic learning opportunities provide the learner with opportunities to foster agency as the learner grapples with a proposed problem, engages in inquiry, designs a solution, or articulates her findings in a polished product. The authentic task principles *Ill-defined Problems, Sustained Investigations, Polished Products* (Herrington et al, 2010) support opportunities for learners to construct their own knowledge through active learning experiences.

#### **Active Learning is self-regulated.**

The theoretical foundation for the premise that active learning environments need to provide learners with agency through scaffolded, self-regulated learning opportunities that include reflection and articulation is grounded in the understanding that "individuals are metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman, 1994, p.3). Additionally, developing self-regulation, namely learning how to manage your own study time, set learning goals, monitor your own progress and understanding, and persist despite obstacles, is highly correlated with academic success (Zimmerman and Risemberg, 1997), thus requiring that learners are given ample and careful practice of these important skills. Active learning approaches provide the opportunities to practice self-regulation and to develop metacognition (Garrison, 2003) as they require learners to exhibit a degree of

agency and self-regulation that is simply not fostered when learners remain passive recipients of content knowledge. It is when learners engage in inquiry by undertaking an authentic activity that requires their sustained attention and intellectual resources, when they reflect on their newly constructed knowledge, and articulate their findings in a polished product or performance, that self-regulation and metacognition are exercised. Therefore, in order for learners to develop the metacognitive structures so important for self-regulated learning, learners must be given opportunities to self-direct their learning efforts, reflect on their understanding, articulate their thinking, and produce polished products as integrated assessments in which they share their newly acquired knowledge, either individually or in collaboration with others. Thus, an active learning course design requires *Reflection, Articulation, and Integrated Assessment* (Herrington et al., 2010) as principles for design.

#### **Active learning is situated.**

The importance of context is well documented in the learning sciences literature and suggests that “the unit for analysis for understanding learning had to be larger than the individual person. People learn things with other people and generally learn with culturally developed tools and artifacts” (Hoadley, 2011, p. 4). This theoretical expansion from individual cognition to cognition in context of culture and environment was paved through advances in the field of psychology from its early understanding of learning as a function of change in overt behavior in response to a set of stimuli (Skinner, 1966) to the expansion of the cognitive sciences as an interdisciplinary discipline which helped bring to the forefront context and culture as key factors in learning. “In this expanded view of context-based learning, researchers began to consider ideas from fields like anthropology, culture and teaching, sociology, semiotics, and linguistics as part of the research and theory-building process” (Hoadley, 2011, p. 5), leading to the eventual understanding that learning is constructed by the learner through interactions with others and with the world (Bandura, 1989; Bruner, 1966, 2009; Piaget, 1972; Vygotsky & Cole, 1978).

The expanded understanding of situated cognition (Lave & Wenger, 1991) and anchored instruction (Cognition and Technology Group at Vanderbilt, 1990), namely that “without anchoring knowledge to situations where the purpose of the knowledge is clear, it would likely become inert” (Hoadley, 2011, p.7) had significant implications for the design of learning. It implied that academic

content required to be reconnected to real-world contexts in order to create meaning. For active learning course design, this means that pedagogical considerations draw on apprenticeship models common in real life and include contextual narratives that situate concepts in practice (Brown et al., 1989). The authentic task principles *Real-world Relevance, Interdisciplinary Perspective, Multiple Interpretations and Outcomes* (Herrington et al., 2010) are thus inherent principles of active learning as they offer opportunities to deepen learning by providing context to otherwise decontextualized academic knowledge and by allowing learners to bridge academic knowledge with personal experience and with the world.

#### **Active Learning is collaborative.**

The theoretical foundation for the premise that learning environments should both accommodate the social nature of learning is grounded in the social learning theory of Russian developmental psychologist, Lev Vygotsky. His Theory of the *Development of Higher Cognitive Function* (Vygotsky et al., 1978) asserted that knowledge development in the area of language, thought, and reasoning originates as actual relationships between individuals, and that knowledge is socially constructed through our interactions with others (p. 57). Vygotsky argued that “cognition applied equally to voluntary attention in interaction with others as it did to logical memory”, which implied that social interactions are pertinent to instruction (p. 57). For educational settings, Vygotsky’s theory of cognitive development implies that ideas, which at first originate outside a person, are learned through exchanges with others and eventually become internalized through the development of schema: words, concepts, models, etc. This, of course, has significant implications for online learning as it implies that collaboration and rich exchanges of thoughts and ideas amongst online community members are key to supporting academic goals.

Research in the learning sciences supports this collaborative construction of knowledge through the development of a learning community (Brown, et l., 1989). This was in part to acknowledge the social nature of learning (Bandura, 1989; Dewey, 1938; Johnson & Johnson, 1991; Piaget, 1972; Salmon, 1997; Vygotsky et al., 1978) but also to foster the social and cross-cultural skills among learners, two central transdisciplinary skills that benefit from multiple perspectives and diversity of opinions. Collaboration, “the ability to work effectively and respectfully with diverse teams and to make the necessary compromises to accomplish a common goal” is a key competency for the future (P21, 2010). The authentic task principles

*Collaboration, Articulation, Multiple Sources and Perspectives* (Herrington et al., 2010) emphasize the social nature of learning in the design of online courses by providing meaningful opportunities for learners to collaborate with others on academic goals. These principles not only to deepen the learning of disciplinary goals but expose learners to diverse opinions and this facilitate the cross-pollination and examination of complex ideas.

If active learning is indeed indicated via these principles, then these have to be taken into consideration in the learning design of online courses. With a significant body of existing research to draw upon how to create active learning experiences, this study's focus goes beyond validating situated pedagogy but focuses on whether a course review is able to indicate the extent to which active learning is present in the design of an online course.

### **Theoretical framework**

There is no *single theory* upon which this design intervention is based. Rather, the study's overarching theoretical framework is guided by the common threads that situated pedagogies hold in creating learner-centered experiences. These common threads are grounded in the core tenets of the learning sciences, namely that the nature of learning is constructive, self-regulated, situated, and collaborative (Dumont, et al., 2010), an interplay of multiple dynamic factors. The theoretical foundation of this DBR is grounded in and supported by multiple theories advocating for the situated perspective.

Dewey's Social Activism Theory (1916) asserted that "knowledge arises through the acting and interacting of self-reflected beings" (Corbin & Strauss, 2008, p. 5) which implied that learning experiences are meant to engage learners in authentic tasks with the world and with others. Lave and Wenger (1991) expanded on the idea of action situated in context in their Theory of Situated Cognition by stating that "the common element here is the premise that meaning, understanding, and learning are all defined relative to actionable contexts, not to self-contained structures" (p.15). Situated cognition further viewed learning as being social in nature in which the learner at first learns from a stance of "peripheral participation" (Lave & Wenger, 1991), and then increases her participation and autonomy as expertise is gained. These theories have implications for the design of online courses as social environments in which participants learn from interactions with each other, through collaborative inquiry and through the fostering of a learning

community. It has further implications for the careful scaffolding of inquiry-based activities to meet the needs and readiness of learners to work independently or collaboratively in self-regulated projects.

The common threads that situated pedagogies emphasize are that they acknowledge the constructive nature of learning through experience (Dewey, 1938), the self-regulated nature of learning through inquiry (Bruner, 1966), the importance of context in addition to content (Lave & Wenger, 1991), as well as the social and collaborative nature of learning (Bandura, 1989; Vygotsky, 1980). Their common intent is to build relationships between the academic content, the learner, and the world to create meaning. Their common goal is to engage learners in scholarly curiosity, to provide learning experiences that deepen engagement and understanding and to create opportunities for reflection and articulation. These learner-centered pedagogies honor learners in their diversity, with the understanding that learners themselves are not empty vessels but can meaningfully contribute to a more complex understanding of a subject matter. Their shared understanding is that learning requires interaction for the learner to construct meaning, and that pedagogical considerations for the design of learning spans multiple considerations ranging across multiple dimensions. The common threads that connect the theoretical foundation of this DBR is the shared understanding grounded in learning sciences research that learning is highly complex with multiple influences hidden from view, and that validating multiple theories together better approximates the complex phenomenon called learning.

## Methodology

The first guiding principle of design-based research (DBR) is its “focus on a persistent problem of practice from multiple stakeholders’ perspectives” (Russell, Jackson, Krumm, & Frank, 2013). The problem that this DBR addressed is the paucity of active learning in online courses despite extensive research in the learning sciences providing empirical evidence that a learner-centered design using active learning methods fosters engagement and deepens learning (Darling-Hamond, 2008; Dumont et al., 2010; Jonassen, 2012; Pallas et al., 2017; Prince, 2004; National Research Council, 2000; National Academy of Sciences, Engineering, and Medicine, 2019). This DBR study encompasses one design team’s investigation into the learning design of online courses by systematically reviewing the learning activities and assessments that learners engaged in against the principles of authentic e-learning as articulated by Herrington et al., (2010). Over a three-year period (Fall 2016 - Fall 2019), the design team implemented, revised, and refined its course review method and reviewed over 100 unique online courses (of which 75 are represented in this data set) by applying the principles of authentic e-learning as indicators of active learning resulting in an active learning score for each course. The goal of this design intervention was to make active learning visible in the design of online courses and to explore the extent to which the intervention outcome - an active learning score - was able to quantify active learning in the design of online courses.

### Design-based Research

A DBR must be substantiated by existing theories and frameworks in order to articulate a close relationship between the high-level conjecture, the mediating processes, and the design interventions, so that these stand in direct relationship to the intervention outcomes. The high-level conjecture of this design intervention speculated that online courses that score high in the principles of authentic e-learning provide more active learning opportunities than online courses that score low. The mediating processes are social - constructivist pedagogies: problem-based, project-based and student-led inquiry in support of curricular goals. The tangible intervention designed and refined during this DBR study was a course review method by which to evaluate the level of active learning in online courses for the purpose of guiding educators

towards a course design that maximizes active learning. Specifically, this DBR study addressed the following two questions:

Q1: Can the intervention -a new course review method- indicate the extent to which active learning is present in the design of an online course?

Q2: How do the principles of authentic e-learning incorporated in the new course review method need to be refined?

The collaborative, exploratory, iterative nature of design-based research (DBR) is particularly well suited to this research because it afforded a design approach “with the intent of producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings” (Barab & Squire, 2004, p.2). Answering these research questions, for example, would not be possible without the intervention-based nature of DBR.

One strength of this study is that the principles of authentic e-learning were applied across a wide variety of disciplines. The online courses that were reviewed as a part of this study ranged in disciplines from the natural sciences, to the social sciences, humanities, and the applied professions. As such, active learning was examined in direct relationship to diverse disciplinary outcomes, diverse disciplinary ways of thinking, and diverse disciplinary content, yet with the consistent goal to deepen the learning of the varied disciplinary curriculum through active engagement. If active learning tasks could successfully work through such a diverse set of disciplinary goals, then the resulting principles would be generalizable and as such suitable to define active learning in online courses.

### **Context**

During my tenure as director, Online and Educational Services (OES) developed a rigorous course review process as well as the practice of reviewing each online course it designed against a set of standards. In addition to the internal course review practiced by OES designers after designing a new course, or after redesigning or revising an existing course, OES also offered course reviews as a service to the College of Continuing Education and Professional Studies (CCAPS) Applied and Professional Degree (APS) programs as part of their ongoing review of APS course offerings. Over time, the OES course review became an integrated aspect of the CCAPS Applied and Professional Studies’ three-year review practice

with great reliance placed on OES designers to report back to APS faculty and program directors on design standards that a course needed to address in its upcoming course revision or redesign.

OES initially based its course review on the Quality Matters 4th edition rubric (Matters, 2014), a widely accepted standard of online course quality in higher education. This review included eight general standards of online course design: 1) Course Overview Introduction, 2) Learning Objectives, 3) Assessment and Measurement, 4) Instructional Materials, 5) Course Activities and Learner Interaction, 6) Course Technology, 7) Learner Support, and 8) Accessibility and Usability. While the QM rubric covered many important organizational and usability standards that improved the learning experience, the rubric lacked pedagogical guidance on what was meant by *active* learning in online courses. General Standard 5 of the QM rubric, *Course Activities and Learner Interaction*, suggests that “meaningful interactions (instructor to student, among students, and student to course materials) are to be employed to motivate students and foster active learning, intellectual commitment, and personal development” (Matters, 2014), but *how* active learning was defined, and consequently *how* active learning would be recognized in the learning design of online courses remained a vague concept.

In the spring 2016, OES conducted a semester-long professional learning initiative on the topic of authentic e-learning, guided by *A Guide to Authentic e-Learning* (Herrington et al., 2010). This in-depth exploration of evidence-based design principles focused the team’s discussion on both how to design for active learning using these principles but also how to review existing courses against these principles so that there would be a feedback loop that would communicate whether or not active learning was indeed taking place. As such, the principles of authentic e-learning presented the perfect opportunity to grapple with the core question of how to make active learning more tangible and recognizable for all stakeholders.

### **Design Intervention I: Revising the Online Course Review**

#### **Phase 1: Incorporating the principles of authentic e-learning into the OES course review.**

Phase 1 of the study incorporated the principles authentic e-learning (Table 3.1) into the OES course review form and adopted them as OES design standards (see [Appendix 3a](#)). The revised course review allowed OES to evaluate the learning activities and assessments against each of the authentic task principles (on a scale of 0=absent, 1=underemphasized, 2=emphasized, 3=maximized) resulting in an



active learning (AL) score in the course review summary. In this iteration of the course review, the principles of authentic eLearning were integrated into the organizational structure of the existing course review which followed the eight general standards of the Quality Matters (QM) rubric. This had the effect of distributing the eleven authentic task principles among the QM general standard categories. While this first phase successfully integrated the principles of authentic e-learning into the OES online course review, the active learning (AL) score which resulted from the aggregate of all eleven principles remained difficult to interpret since the principles were spread across the QM categories.

**Phase 2. The need for a rubric.**

Phase 2 consisted of OES examining the first set of active learning (AL) course reviews and realizing the challenge of evaluating the principles consistently among members of the design team. For example, some designers took into consideration not only the task design but also the weight in grade that a learning activity or assessment was assigned to in a given course. This prompted the collaborative development of an Authentic Task Rubric (see [Appendix 3b](#)) by the instructional designers in which multiple courses were used to arrive at the articulation of the rubric criteria in which both the time dedicated to a learning activity and the percent of the grade assigned to the activity were taken into consideration when scoring a particular learning activity (see Table 3.2 as an example of the rubric for one of the authentic e-learning principles).

**Table 3.2***Example Rubric Criteria*

	Rubric level descriptions			
	<b>Absent (0)</b>	<b>Underemphasized (1)</b>	<b>Emphasized (2)</b>	<b>Maximized (3)</b>
General level description	Learning activities and assessments do not evidence the principle	Learning activities and assessments do evidence the principle but without emphasis in quantity: little time is allocated to the task and little to no grade points are allocated to the task	Learning activities and assessments evidence the principle in a noticeable amount of time and the grade points allocated to the task reflect the time allocated to the task.	Learning activities and assessments evidence the principle in a significant amount of time and the majority of the grade is determined by authentic tasks.
Real-world relevance	Learning activities and assessments are purely academic and are presented/assessed without any real-world context.	Learning activities and assessments are largely presented without a real-world context (i.e. exercises, tests, and quizzes) or context is provided but activities are underemphasized in the grade scheme.	Learning activities and assessments match or simulate the real-world tasks for several of the activities and an appropriate amount of time and grade points are allocated to the tasks.	Learning activities and assessments mirror real world tasks of a professional or make clear how the knowledge is useful in the world for the majority of the activities and account for a significant portion of the final grade.

Note. Rubric criteria consider time and grade point dedicated to learning activities.

Once the rubric had been created, the designers shared a more consistent understanding of the design principles in practice and hence developed a more reliable interpretation of the principles during their course review.

### **Phase 3. One additional principle.**

As additional courses were scored, it became apparent that while the 11 principles of authentic e-learning were capturing the majority of attributes of the learning activities and assessments that learners

engaged in, there was a core component supported by research that they were not able to capture. This component was tied to the research on the dynamic interplay of emotion, motivation, and cognition.

At the beginning of cognitive science research, many researchers imagined human cognition to be similar to information processing by a computer. As a consequence, little attention was paid to the emotional and motivational aspects of human cognition. Since the 1960s, however, things have changed considerably. Motivation and emotion are now recognized as important determinants of thinking and learning (Dumont, et al., p. 81).

In other words, students' interests, hobbies, and passions, their values, and their goals in life contributed to the complex interplay of cognition and motivation. While what motivates individual students can be as varied as their learning needs, courses with a high active learning (AL) score often accommodated these individual differences by allowing learners some degree of choice in the execution of their assignments. Recognizing this gap, the design team added an additional principle to the course review, namely the principle of *Personal Relevance*. The final course review included 12 principles, with a total possible score of 36.

#### **Phase 4. A focus on learning design.**

Phase 4 of the study consisted of OES restructuring the layout of the course review general standards to reunite the principles of authentic e-learning under a single new general standard called *Learning Design*, (see [Appendix 3c](#)). The term *Learning Design*, previously called *Instructional Design*, denotes the switch in focus from teaching to learning and the orientation towards a more learner-centered paradigm. This reorganization of the standards not only elevated active learning from its place of sub-standard in the Quality Matters organization; it placed *Learning Design* as the first and central element of the course review. This standard was given such a central position due to the fact that in online courses, the *learning design* of the activities and assessments that learners engaged in required *upfront* pedagogical considerations in order to create the right environmental conditions for learning. The active learning (AL) scores resulting from the course review consequently also became easier to review since they were no longer spread across the QM categories.

#### **Design Intervention II: Asking Learners About their Online Learning Experience**

For this study, we also asked learners in these online courses to respond to a survey. The learners' feedback was compared with the active learning (AL) scores from the course review to

gauge whether or not a course with a high active learning (AL) score was also viewed as authentic by learners. The survey data spanned across 75 unique online courses (some with multiple sections) taught over six semesters resulting in survey responses from 275 online course sections.

The learners' qualitative statements as to what made learning meaningful and authentic to them were coded into themes using an open coding protocol. Established by Glaser and Strauss (1967), the open coding protocol is mostly associated with grounded theory. The main feature of this approach is that theory - in this case design principles - are generated inductively from data through concurrent data collection and analysis, and constant comparison between the two. The themes resulting from nearly 900 student survey statements about what made learning meaningful to them were compared against the design principles used to quantify active learning.

Universities traditionally ask learners to evaluate their learning experiences by asking them to complete a student rating of teaching (SRT) form at the end of the semester. For online courses, however, the questions of a traditional SRT simply are not adequate to address the learning design (whether the online activities in the course supported the students' learning), the learning environment (whether or not the course site was easy to use), or the online instruction (whether the online interactions with the instructor helped students learn). To address this gap, OES designed a voluntary and ungraded learner feedback survey into weeks 3, 7, and 14 of its online courses to provide learners with the opportunity to provide faculty with feedback about their students' online learning experience. The week 14 course feedback survey was comprehensive and asked learners about why they chose to select an online over a face-to-face course, questions about their readiness and access to learn online, questions about the course design, and questions about instructor interaction and what specific advice they would give the instructor to improve the learning in the online course (see [Appendix 3d](#)). Specific to active learning, question 15 asked learners to rate the question: "*The course provides the opportunity for me to complete a meaningful project, presentation, or authentic task*" on a scale of strongly disagree, disagree, neutral, agree, or strongly agree and question 16 asked learners "*If the course provided the opportunity for you to create a meaningful project, presentation, or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful*".

The first level of analysis reviewed the learners' feedback of question 15 and compared the learners' ratings with the active learning (AL) scores resulting from the course review completed by the design team. The second level of analysis focused on the open-ended statements in response to question 16 and coded these statements into themes using an open coding protocol. This was accomplished by exporting the course feedback surveys of 237 individual course sections from the learning management system gathered over five semesters (Fall 2017, Spring 2018, Summer 2018, Fall 2018, Spring 2019), uploading these surveys into Google drive from where responses to question 16 could be extracted and gathered into a separate spreadsheet for open coding. Once nearly 1000 statements had been coded, the filter option of Google sheets was used to gather all statements related to a theme (design principles) into its own spreadsheet to provide a frequency count.

## Results

### Active Learning Scores Resulting from the Course Reviews

The first level of data analysis reviewed the active learning scores of 75 online courses across a wide range of disciplines. In order to discuss the findings, the courses were grouped into three categories: *low, medium, and high* according to their active learning scores (See Table 3.3).

**Table 3.3**

*Courses by Low, Medium High Active Learning Ranges*

AL Level	AL Score	Courses
Low	0	LAMP 41xx
	1	-
	2	-
	3	-
	4	-
	5	MM 300xxW
	6	
	7	-
	8	-
	9	-
	10	CMGT 30xxW, CMGT 40xx
	11	ABUS 41xx, CMGT 40xx
	12	ABUS 41xx, ABUS 41xx, CMGT 40xx
	13	CSCL 33xx, HORT 10xx
14	ABUS 33xx, MATH 12xx, MATH 12xx	
Medium	15	ENGW 31xx, CMGT 43xx, ABUS 42xx, ECON 11xx
	16	MKTG 30xx, MATH 10xx, ABUS 42xx
	17	ABUS 45xx, ABUS 40xxW, ABUS 40xx, SOC 11xx, HIST 37xx, PUBH 30xx

	18	CMGT 40xx, HORT 10xx, CMGT 4073, HSM 45xx
	19	ABUS 35xx, ABUS 40xx, CMGT 43xx, ABUS 40xxW, MM 40xx, ENGL 30xxW, MUS 10xx, MUS 10xx
	20	AFRO 31xx, HSM 35xx, CMGT 44xx, ABUS 40xx, MATH 11xx
	21	SOC 37xx, ABUS 45xx, SOC 10xx, TRIN 31xx, ENGL 30xxW, COMM 34xx, MATH 10xx
High	22	ABUS 30xx, ABUS 47xx, ABUS 47xx, ENGL 30xx, ECON 11xx
	23	-
	24	INET 10xx, MATH 22xx, ENGL 30xx
	25	CMGT 40xx, ABUS 45xx, MGMT 30xx, SOC 42xx
	26	ABUS 41xx, SOC 30xx, MATH 10xx, HIST 38xx
	27	INET 40xx
	28	-
	29	ABUS 47xx
	30	SPAN 10xx, MDS 30xxW, COMM 54xx
	31	ABUS 45xxW, HSM 30xx, SPAN 10xx
	32	ABUS 40xxW
	33	-
	34	-
	35	HSM 45xx
	36	-

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An active learning (AL) score range between 0-14 was classified as *low*, meaning that a revision or redesign of the learning activities and assessments could increase active learning opportunities. An active learning (AL) score of 15-21 was classified as *medium*, which meant that active learning opportunities were emphasized in the course. Finally, an active learning (AL) score of greater than >

21 was classified as *high*, which meant that active learning was realized to the fullest extent within the design constraints of the curriculum, and that learning activities and assessments provided significant active learning opportunities. The ranges that classified courses into low (0-14), medium (15-21), and high (22-36) were chosen with the middle range smaller than the other two ranges because there was as much variety in the 15-21 range as there was on the low and high end. The majority of courses (37 out of 75) fell into the medium active learning range. Only a single online course scored zero on the active learning scale and none of the courses reached the total score of 36/36 which would require for each of the 12 authentic task principles to be maximized. The highest active learning score (35/36) was received by an online course on the topic of innovation.

#### **Undergraduate levels.**

Organizing the distribution of low, medium, and high courses according to undergraduate level (1000, 2000, 3000, and 4000 respectively) further gave evidence that it is possible to realize active learning at each level of the undergraduate journey (see Table 3.4).

**Table 3.4**

*All Undergraduate Levels Show Low, Medium and High Active Learning Courses*

AL Range		1000/2000	3000	4000/5000
AL	Low	HORT 10xx	ABUS 33xx	ABUS 41xx
		MATH 12xx	CSCL 33xx	ABUS 41xx
		MATH 12xx	CMGT 31xxW	ABUS 41xx
			MM 30xxW	CMGT 40xx
				CMGT 40xx
				CMGT 40xx
				LAMP 41xx
AL	Medium	ECON 11xx	ABUS 31xx	ABUS 40xx
		HORT 10xx	ABUS 35xx	ABUS 40xx
		MATH 10xx	AFRO 31xx	ABUS 40xx
		MATH 11xx	COMM 34xx	ABUS 40xx
		MATH 10xx	ENGL 30xxW	ABUS 40xx
		MUS 10xx	ENGL 30xxW	ABUS 40xxW
		MUS 10xxW	ENGW 31xx	ABUS 42xx
		SOC 10xx	HIST 37xx	ABUS 42xx
		SOC 11xx	HSM 35xx	ABUS 45xx
			MKTG 30xx	CMGT 40xx
			SOC 37xx	CMGT 40xx
			TRIN 31xx	CMGT 43xx
			PUBH 30xx	CMGT 44xx



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				HSM 45xx
				MATH 40xx
				MM 40xx
AL	High	ECON 11xx	ABUS 30xx	ABUS 40xxW
		INET 10xx	ENGL 30xx	ABUS 41xxx
		MATH 22xx	ENGL 30xx	ABUS 45xx
		MATH 22xx	HIST 38xx	ABUS 45xxW
		SPAN 10xx	HSM 30xx	ABUS 47xx
		SPAN 10xx	MDS 30xx	ABUS 47xx
			MGMT 30xx	ABUS 47xx
			SOC 30xx	CMGT 40xx
				COMM 54xx
				HSM 45xx
				INET 40xx
				SOC 42xx

---

**1000-level courses can be high active learning courses.**

In this section, details are provided on three freshman 1000-level math courses, one at the *low* level, a second at the *medium* level, and a third at the *high* level (see Table 3.5).

**Table 3.5**

*Comparison of a Low, Medium, and High Active Learning Math Course*

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Authentic Task Principles	Course		
	Math 12xx	Math 11xx	Math 1xx
Personal Relevance	0	1	2
Real-world Relevance	2	2	2
Ill-defined Problem	1	1	2
Sustained Investigation	1	2	3
Interdisciplinary Perspectives	1	0	1
Collaboration	3	3	1
Reflection	0	2	3
Coaching and Scaffolding	3	3	1
Integrated Assessment	1	2	3
Polished Product	2	3	2

Multiple Interpretations & Outcomes	0	1	3
Multiple Sources & Perspectives	0	1	3
Total AL Score	14	21	26

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*Note.* Three 1000-level math courses each at a different active learning range

MATH 12xx with an AL score of 14 scored in the low active learning range. This course used a publisher textbook with an associated publisher course pack to introduce calculus theorems through textbook exercises and homework problems. It assessed learners' comprehension through weekly quizzes, one midterm, and a final exam. Learners worked individually on all activities except for the weekly homework problems which required them to collaborate, reflect on their own solutions in relation to classmates' solutions, and revise their work before submitting the final solution. Through the collaborative homework problems, the course maximized the principles of *Collaborative Construction of Knowledge and Coaching and Scaffolding*, but scored low on the remaining principles as learners continued to work individually on math problems and were assessed exclusively through summative quizzes, midterms, and final exams.

MATH 10xx with an AL score of 21 scored in the medium AL range. This course required a traditional midterm and final exam (a math department requirement), but also provided extensive knowledge building exercises, collaborative activities, and a reciprocal teaching project for students to demonstrate their mathematical understanding. Learners completed online problems individually that they could resubmit until they got the correct answer. Learners were also prompted to use the discussion forum to discuss mathematical topics in application and to complete collaborative group homework problems. Additionally, learners were asked to choose a calculus problem with real-world application and to create a recorded video describing the mathematical concepts and techniques needed to solve the problem. After selecting the calculus to demonstrate, learners used the discussion forum to receive feedback from other students and the instructor on their solution method. Through the weekly collaborative homework problems, the course maximized the principles of *Collaborative Construction of Knowledge and Coaching and Scaffolding*. Additionally, as learners worked independently on preparing a math demonstration video

over several modules, the course further maximized the principles of *Sustained Investigation, Real-world Relevance, Integrated Assessment, Reflection, and Polished Products*.

MATH 10xx with an active learning score of 26 scored in the high AL range. In this course, students were assigned individual homework problems, as well as weekly real-world design problems for learners to solve in teams. Additionally, teams were tasked with creating a final project worth 30% of their grade in which they connected a real-world design problem with a mathematical concept introduced in the course. The team project which was to be completed over multiple modules required learners to select a design challenge that could be solved mathematically, create an elevator speech outlining the problem's importance, and as a team create a presentation to the class that demonstrated their mathematical approach and solutions. As part of solving the problem, learners were asked to consider the situation in which the math concept would be used, to investigate if there was a historical basis or story behind solving and applying the math principles, and which perspective they used to approach the problem.

Additionally, learners were asked individually to demonstrate their understanding of mathematical concepts through written reflections and exams. Through the weekly team-based design problems and the team project, the course maximized the principles of *Collaboration, Sustained Investigation, Integrated Assessment, Multiple Interpretations and Outcomes, and Multiple Sources and Perspectives, Interdisciplinary Perspectives* while also emphasizing the principles of *Real-world Relevance, Ill-defined Problems, Learner-Relevant, Learner-Choice, and Polished Product*. What is important to note about the Math 10xx course, is that the course was originally designed for face-to-face delivery but possessed a companion site complete with all the learning resources and learning activities required to complete the course. When the COVID-19 pandemic necessitated the fully online delivery of the Math 10xx, very little needed be changed in the learning management system to accommodate the change in delivery to online. The exact same pedagogical learning design worked for face-to-face, blended, and fully online delivery. The idea, that a well-designed active learning course site can accommodate multiple modes of delivery (face-to-face, blended, hyflex, and fully online) with minimal change will remain important beyond the pandemic in order to be able to flexibly adapt the delivery to the circumstance.

### Same AL score - Unique combinations of principles.

This study asked whether or not the design intervention can indicate the extent to which active learning is present in the design of an online course. The short answer to this question is yes in that the AL score can provide a general sense of the degree of active learning (low, medium, high) in the design of an online course. This said, courses with the same AL score are not necessarily all alike because individual courses may arrive at their AL score through a different combination of the principles (see Table 3.6). For example, eight courses from disciplines as varied as Applied Business, Construction Management, English Literature, Manufacturing Operations Management, Music, and Sociology all received an AL score of 19. While these eight courses all fell in the medium active learning range and received the same AL 19 score, each course enacted a different combination of the principles. Table 3.6 shows that not a single course with an AL 19 score applied the principles in the same manner.

**Table 3.6**

*Same AL Score - Unique Combinations of Principles*

	ABUS 35xx	ABUS 40xx	CMGT 43xx	ABUS 40xxW	MM 40xx	ENGL 30xxW	MUS 10xx	MUS 10xxW
Personal Relevance	1	2	1	2	2	1	2	2
Real-world Relevance	2	2	2	1	2	2	1	1
Ill-defined Problem	1	2	2	2	2	2	2	2
Sustained Investigation	2	2	2	2	2	2	1	0
Interdisciplinary Perspectives	1	1	0	0	1	1	2	1
Collaboration	2	2	1	1	2	1	0	0
Reflection	2	2	2	3	1	1	3	2
Coaching and Scaffolding	2	1	2	1	2	1	1	2

Integrated Assessment	1	1	2	2	1	2	1	2
Polished Product	1	1	1	1	3	2	2	2
Multiple Interpret. & Outcomes	2	2	2	2	1	2	3	3
Multiple Sources & Perspectives	2	1	2	2	0	2	1	2
Active Learning Score	19	19	19	19	19	19	19	19

*Note.* Eight courses with an AL 19 score apply the principles in unique ways

### Same Principle - Unique Applications

Not only can the same active learning (AL) score be composed of different combinations of the principles (see Table 3.6), but a single principle can express itself uniquely within courses. Table 3.7 shows 10 courses in the *high* active learning range (AL score >22) that maximized the principle *Sustained Investigations* but each in its own unique way.

**Table 3.7**

#### *Ten Sustained Investigations*

Course	Sustained Investigation
ABUS 40xxW	This Applied Business course engaged learners in a Sustained Investigation by preparing an analytical report for a client of their own choosing over the duration of 7 modules which involved conducting an audience analysis, preparing an idea proposal, developing a process outline, creating a visual design research report, conducting a writing self-assessment, drafts, and a peer review before presenting their uniquely crafted analytical report. Each learner had selected a different company, but all incorporated the aspects of professional communication which was the subject of this course.
ABUS 45xxW	This Applied Business course engaged learners in a Sustained Investigation into grant writing by forming teams to pursue a real grant. The project lasted the duration of the semester and tied together the various components of grant writing: from identifying a grant opportunity, to crafting a needs or problem statement, to developing a budget, to articulating a sustainability plan for the proposal. By contextualizing the academic work in a real-world task, learners were able to learn about grant writing by applying it themselves.

HSM 30xx	This Health Management course engaged learners in a sustained investigation about preparing for a professional internship by conducting a company research relevant to their interests, crafting an interest statement, drafting a cover letter, creating a professional resume, creating a LinkedIn profile, and practicing interviewing for a company. By personalizing these professional tasks learners were highly motivated to succeed.
COMM 54xx	This Communications course engaged learners in a <i>Sustained Investigation</i> into a research project on the topic of professional communication in which learners identified a real-world organizational communication problem, developed a research question, conducted primary research on the topic, selected academic vs. popular articles on their topic, submitted a bibliography, and wrote a research paper that incorporated theory into their proposed solution.
ABUS 47XX	This Marketing course engaged learners in a <i>Sustained Investigation</i> conducting a digital marketing campaign by forming a marketing team for their fictitious company for which they developed a brand value proposition, a content strategy, a white space analysis, a social media campaign, etc.
SOC 30xx	This Sociology course engaged learners in a <i>Sustained Investigation</i> by conducting an ethnographic study of their own neighborhood including interviews, data gathering, statistical analysis, and data visualization. Each project turned out differently but all learners applied sociological concepts and research methods which addressed the course outcomes of this sociology course.
HIST 38xx	This History course engaged learners in a <i>Sustained Investigation</i> as a class by creating a collaborative digital timeline of key events between 1945-present in which each learner selected a theme and researched and contributed historic events for their theme to be added to the collective timeline.
MGMT 30xx	This Management course engaged learners in a <i>Sustained Investigation</i> planning, organizing, leading, and controlling a fictitious Center for Creativity and Innovation. In teams, learners were charged with running the organization in all of its aspects: mission, goals, strategies, processes, problems, opportunities, resource management, organizational structure, etc.
SOC 42xx	This Sociology of Health and Illness course engaged learners in a <i>Sustained Investigation</i> into a health topic of their choosing in which learners developed a thesis statement, prepared a preliminary annotated bibliography, explored and declared their own positionality, analyzed and evaluated sources, and drafted a report that analyzed and evaluated the problem.
MATH 22xx	This Algebra course engaged learners in a <i>Sustained Investigation</i> into algebraic functions by creating discovery teams that investigated real-world problems such as tracking a pandemic, the loss of permafrost in the arctic, and the loss of habitat for a species using quantitative and qualitative measures. Discovery teams simulated the work of scientists grappling with these real-world problems by researching the problem and by applying algebraic functions to track the problems.

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While the course projects of these ten *Sustained Investigations* produced unique outputs (*Multiple Interpretations and Outcomes*), each of these projects addressed the disciplinary outcomes of their respective course, while also allowing for creative input by learners. What courses in the high AL range

had in common is that learners were engaged in learning tasks that lasted over multiple modules (weeks) in which they were able to apply the course concepts in ways that made them real-world and personally relevant.

### **Application of Principles in Low, Medium, and High AL Courses**

Given that the active learning (AL) score is an aggregate of all principles operationalized in a course, it is further helpful to provide an overview of how the application of the individual principles (0=absent, 1=underemphasized, 2=emphasized, 3=maximized) differed in low, medium, and high AL courses. Table 3.8 provides an overview of averages taken of each of the principles across 75 courses in the low, medium, and high active learning range.

**Table 3.8**

*Averages for Principles in Low, Medium, High Active Learning Courses*

	AL Score Range				
	Low AL (0-14)	Gains	Medium AL (15-21)	Gains	High AL (22-36)
Personal Relevance	0.66	<b>(0.92)</b>	1.58		2.22
Real-world Relevance	1.07		1.72		2.32
Ill-defined Problem	1.14		1.72		2.48
Sustained Investigation	0.71	<b>(1.01)</b>	1.72	<b>(0.84)</b>	2.56
Interdisciplinary Perspectives	0.78		0.81		1.2
Collaboration	1.07		1.5		1.92
Reflection	0.5	<b>(1.07)</b>	1.57		2.04
Coaching and Scaffolding	1.17		1.48		1.9
Integrated Assessment	0.57		1.24	<b>(0.88)</b>	2.12
Polished Product	1.28		1.78		2.48
Multiple Interpretations & Outcomes	1.21		1.51		2.48
Multiple Sources & Perspectives	0.92		1.51		2.04

### **Low active-learning courses.**

Courses in the low active learning range (AL=0-14) scored lower on *all* of the active learning principles when compared with courses in the medium and high ranges, but particularly low in the principles of *Personal Relevance* (0.66), *Reflection* (0.5), and *Integrated Assessment* (0.57).

### **Medium active-learning courses.**

Courses in the medium active learning range (AL=15-21) scored higher in each of the principles compared to low active courses but showed a particular gain in the principle of *Reflection* (1.57) when compared to courses in the low range for that principle (0.5). Another significant increase was seen in the principle of *Sustained Investigation* (1.72) for courses in the medium range when compared to courses in the low range for that principle (0.71). The principle with the highest average for courses in the medium active learning range was *Multiple Interpretations and Outcomes* (1.86) leading to the conclusion that learners in the medium active learning range were engaged in learning activities and assessments that allowed for more personalization (*Multiple Interpretations and Outcomes*) and that involved learners in more project-based learning (*Sustained Investigation*).

### **High active-learning courses.**

Courses in the high active learning range (AL=21-36) scored higher averages for *every* principle compared to the courses in the medium range, and saw particular gains in the principles of *Sustained Investigation* (2.56), *Real-world Relevance* (2.32) and *Integrated Assessment* (2.12). Additionally, high-active learning courses scored high averages in the principles of *Ill-defined problems* (2.48), *Polished Products* (2.48), and *Multiple Interpretations and Outcomes* (2.48).

## **Learning Experience Design**

In order to provide learners with more ill-structured, sustained investigations into the curriculum that would result in polished products, courses in the high active learning range frequently created a narrative structure or use case scenarios for the learner to experience the curriculum. These narrative structures (the grant-writing process, the neighborhood investigation, etc.) became the organizing element of the course rather than the traditional course structure organized around textbook chapters, curricular units, etc.



For example, in an Applied Business course, students learned about grant writing by actually writing one which organized the course content around the learner's step-by-step process of writing a grant. An Information Technology Infrastructure course was structured as one semester-long project around a fictitious IT company in which learners were introduced to IT challenges to solve. In a Sociology course, learners took on the role of sociologists to conduct a semester-long research about their neighborhoods. These carefully scaffolded authentic tasks cannot be found at the end of a textbook chapter or as a part of a publisher's course pack. These assignments were creatively designed so that learners could *experience* the curriculum firsthand in as close an approximation to real-world scenarios as possible. Even if some of the scenarios were fictitious (a made-up IT company, for example) and required a certain amount of *suspension of disbelief* of the learners; the simulations assisted in providing the context for the application of the concepts. While the goal is to help learners connect academic concepts with the world, powerful simulations can often be used as effective proxies.

Another prevalent way that assignments were made meaningful to learners in these high active learning courses was by giving learners some degree of *choice*. Being able to choose some aspect of their academic work (which topic to write about, who to interview, what delivery format to present in, etc.) was an important means to motivate learners to persist through their sustained investigations independently and successfully.

### **Learner Surveys**

The second research question asked how the principles of authentic e-learning incorporated into the new course review method needed to be refined to foster more active learning? To answer this question, the learner survey data was used.

#### **Learner survey ratings of tasks.**

The first level of survey data analysis compared the learner survey ratings from over 75 unique online courses (267 course sections) against the active learning scores assigned to courses by the design team. Of 5,836 students in these courses, 1,586 learners responded to the survey (27% on average). Table 3.9 shows learner survey ratings in low, medium, and high active learning courses.

**Table 3.9***Learner Survey Ratings in Low, Medium, and High Active Learning Courses*

AL Range	Total responses	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
High	537	3%	3%	16%	37%	41%
Medium	722	2%	4%	14%	45%	35%
Low	327	3%	3%	15%	40%	38%

Interestingly, the percentage of students agreeing or strongly agreeing that they had the opportunity to create a meaningful project, presentation, or authentic task did not significantly differ between courses in the low, mid, or high AL range. It is likely that students were thinking about a *single* activity in their response, whereas the AL score looked at the entire course and was an aggregate of all the learning activities and assessments. Thus, it was important to use the qualitative data provided by students to better understand their experiences.

#### **Qualitative Analysis of Learner Survey Statements.**

The next level of analysis of the learner surveys coded nearly 1000 qualitative survey statements on the question: “*If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.*”

#### **Authentic task principles.**

The first round of coding used the authentic task principles as articulated by Herrington, et al., (2010), see (Table 3.10). Over one third (38%) of all learner comments were coded for one or more of the authentic task principles. Table 3.10 shares the distribution of student responses and an illustrative comment for each authentic task principle.

**Table 3.10***Learner Survey Statements Coded into Authentic Task Principles*

<i>#Learners</i>	<i>Authentic Task Principle with a Sample Quote</i>
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- 
- 153     **Real-world Relevance.**  
    *“The final Applied Management Research Paper allowed students to analyze the activities of a real-world manager in the light of the management theory presented in our textbook. Rather than simply relying on some examples from a textbook, we were able to evaluate the decisions made by real world managers based on the theory that we learned. This gave us a chance to draw conclusions about how theory is applied when managing an actual organization”.*  
    *(see Appendix 3e for additional Real-world Relevance quotes)*
- 84     **Collaboration.**  
    *“The most meaningful aspect of the various projects assigned in class, such as the group project, was the ability to work with other students and share ideas and information on the texts that we read. I found this to be helpful when completing my assignments, such as the essays”.*  
    *(see Appendix 3f for additional Collaboration quotes)*
- 67     **Integrated Assessment.**  
    *“The final allowed me to create something that represented all we had learned and I really liked that”.*  
    *( see Appendix 3g additional Integrated Assessment quotes)*
- 47     **Reflection.**  
    *“Weekly reflections & the occasional mini papers forced me to utilize and apply my learnings. It made me reflect on the different leadership concepts we’ve learned and how they’re connected. Doing these assignments have helped me prepare for real life leadership experiences”.*  
    *(see Appendix 3h for additional Reflection quotes)*
- 20     **Articulation.**  
    *“It allowed us to create demonstration videos and for our classmates to view them which allowed us to learn the problems further in depth and be able to communicate them”.*  
    *(see Appendix 3i for additional Articulation quotes)*
- 15     **Polished Products.**  
    *“The Spotify assignment helped me think about the subject material cumulatively and made a tangible thing to show my knowledge to others”.*  
    *(see Appendix 3j for additional Polished Products quotes)*
- 12     **Multiple Sources and Perspectives.**  
    *“I think that Essay C was very meaningful because it allowed me to connect with a different generation and see how their opinions impacted their perception of the same music that I heard. It was meaningful because I can apply this knowledge outside of the course and remember that other’s different experiences will make their perception of an event different from mine”.*  
    *(see Appendix 3k for additional Multiple Sources and Perspectives quotes)*
- 11     **Multiple Interpretations and Outcomes.**  
    *“I thought that the playlist assignment was very meaningful. It allowed us to make a compilation of the most important songs and I thought it was really cool to see that everyone’s playlist was very different”.*  
    *(see Appendix 3l for additional Multiple Interpretations and Outcomes quotes)*

- 6        **Sustained Investigation.**  
 “It was meaningful to be able to create a project based on our course materials and work on it throughout the semester”.  
 (see Appendix 3m for additional Articulation quotes)
- 2        **Interdisciplinary Perspectives.**  
 “The timeline project gave us an opportunity to study the historical context of the literature for that week. In my opinion, knowing the history made the readings more interesting and engaging”.  
 (see Appendix 3n for additional Interdisciplinary Perspectives quotes)
- 1        **Ill-Defined.**  
 “I really liked how the projects were long and tough, which made it more appealing because we had to figure out on our own how to complete it”.

The authentic task principle with the highest frequency was *Real-world Relevance* (153). Learners over and over stated that being able to make the connection between what they were learning and how it applied in the real world helped them understand the course work, and made what they were learning memorable and meaningful. Many of them described that being able to apply what they were learning to the real world helped them see the *usefulness* of the information. Others explained being able to compare what they learned in class with the real world helped them gain further insights into the course material as well as allowed them to imagine what it would be like to work in that field.

The authentic task principle with the second highest frequency count was *Collaboration* (84). Learners stated that they enjoyed learning and working with their classmates which speaks to collaboration meeting some of the learners’ social needs, namely to meet new people, see what other students are involved in, and having the opportunity for learners to get to know each other and develop meaningful peer relationships. The majority of learners selecting *Collaboration* also spoke of the academic benefits of working with their classmates. They stated that working together on a project *pooled their best ideas* and produced a better result than working independently. They remarked that receiving feedback from classmates helped them understand the class material better and improved their own work. As this learner stated:

*The group homework discussions were integral to developing meaningful relationships with my peers along with helping to build a stronger foundation on topics that were difficult to understand.*

Others commented that discussions with classmates helped them see additional viewpoints and exposed diverse perspectives that enriched their thinking. This was particularly true when learners were asked to share their personal views on a subject matter and take position to the academic content presented. By sharing their own perspectives, learners added nuance and complexity to the disciplinary subject matter beyond the material that was presented. Learners further commented that listening to the perspectives of their classmates helped them understand that there often is no single right answer but rather a continuum of perspectives. This realization was new to some students whose main coursework came from disciplines in which right answers were routinely a part of their course assessment. When group work had been successful, learners made positive statements about having become a team and expressed pride about having accomplished something together. Students also commented that they valued collaboration as a skill in and of itself (in particular the skills derived from coordinating and collaborating fully online) because learners were aware that teamwork was going to be valued in their future workplace.

But not all collaboration comments were positive. Of the 84 learners who stated that collaboration with others helped them learn, thirteen learners commented that they struggled with one or the other aspect when learning in groups due to challenges having to coordinate with others, group members not doing their share, the make-up of the group, or the assignment not lending itself to collaborative work. The negative comments about collaboration provide an important insight into the need to purposefully design collaborative assignments for individual accountability and positive interdependence between the group members (Johnson & Johnson, 2004), and the need for online instructors to pay attention to group culture and to proactively set expectations on how to collaborate successfully.

The authentic task principle with the *third* highest frequency was *Integrated Assessment (67)* though learners did not use those exact words. Instead they described the activities as *synthesizing* assignments that helped them *bring together / culminate / apply / connect / make sense* of everything they learned that semester. Many of the learning activities that learners referred to as culminating or synthesizing fell into the category of inquiry and project-based learning and were mentioned in learner statements as final assignments, final presentations, final papers, final projects, etc.

The authentic task principle with the *fourth* highest frequency was *Reflection (47)* which learners stated helped them *look back at* what they were learning, build connections, and deepen their understanding. Learners especially spoke of reflections being a powerful tool for learning when it involved self-reflection. Being able to look back and articulate their understanding through self-reflection, namely being able to articulate how they *personally* related to or understood the materials helped them build the relationships to the course material, as seen in the following quotes:

*I thought that the most meaningful assignments were the reflections, because they engaged my learning and I could look back on what I learned.*

*I appreciated the opportunities to complete reflections every week. It made it more personal and easier to connect to the concepts.*

The remaining authentic task principles also received multiple comments but in lower counts. What was noteworthy about the learner comments coded for *Polished Product* (such as a digital timeline project, a YouTube or Spotify playlist, a digital story, a podcast, a research paper, or a recorded presentation), was that the statements were peppered with the following descriptors: *liked, enjoyed, meaningful, fun, and proud* leading to the conclusion that learners took satisfaction in producing a tangible product that demonstrated their learning. For example, one student stated:

*Through our final project, we got to put our whole semester's learning to use and create something we are proud of.*

What is important to mention regarding the coding of the authentic task principles is that while learner statements were coded for one or the other principle, learner statements frequently referred to more than one principle when describing the activities they found meaningful. The following learner survey statement, for example, was coded for *Collaboration* but could also have been coded for *Sustained Investigation*.

*This course was meaningful because I worked in a group the entire semester. We got to know each other over the course and we utilized our technology to tackle assignments.*

The fact that more than one principle applies to a single activity, of course, reminds of the interrelatedness of the principles. The principles of *Reflection* and *Articulation*, for example, have a hand-in-glove relationship, as reflection activities require learners to articulate their thinking. The same interrelatedness exists between the principles of *Sustained Investigations*, *Polished Product* and *Integrated Assessments*. When learners engage in project-based activities and are tasked with producing an artifact that demonstrates their learning, these projects require a sustained amount of time and are designed to be integrated and often cumulative assessments. Thus, the coding of the learner survey statements into categories was important insofar that they allowed these evidence-based design principles to be revealed. This said, the frequency counts of the individual principles were of course dependent on the learning activities and assessments that learners in these courses had the opportunity to experience. A different set of courses in the sample may easily alter the frequency count.

What the frequency count does seem to reveal, however, is that particular principles, such as interdisciplinary perspectives and ill-structured assignments (which were the least commented on principles) most likely received such low counts because higher education (except in interdisciplinary programs) strongly focus their instruction within their discipline, and because open-ended, ill-structured assignments and assessments remain few and far between in undergraduate higher education.

#### **Learner-centered principles.**

The second set of design principles that emerged from the coding of learner surveys were learner-centered principles. 28% of all learner comments coded for one of the following learner-centered principles: *learner-relevant*, *learner-choice*, *learner-self-expression*, *learner-creativity*, *learner socially-culturally connected*, *learner-values*. Table 3.11 shares the distribution of student responses and an illustrative comment for each learner-centered principle.

Table 3.11

*Learner Survey Statements Coded into Learner-centered Principles*


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#Learners	<i>Learner-centered Principles with a Sample Quote</i>
126	<p><b>Learner Relevant.</b>  <i>“I really believe that the fact that we got to create a brand of something that we were interested in was a great idea. I really got a personal connection to it and I wanted to see it succeed. Now at the end of my time with this class, I will actually quite miss working on my brand. I'm not just saying this to be nice. I actually quite liked the process of creating our brand and seeing it grow. That part of the class was different from anything else I've seen in school, and I can say I feel as though I learned many skills by doing so”.</i>  <i>(see Appendix 3o for additional Learner-Relevant quotes)</i></p>
59	<p><b>Learner Choice.</b>  <i>“This project was meaningful because I could choose any topic that I was passionate about. It made it easier to want to work on and research, and it makes me prouder to see it completed. Writing this report about something I am passionate about is also meaningful because I could actually use it/the information I discovered to make the change I suggested in my report”!</i>  <i>(see Appendix 3p for additional Learner -Choice quotes)</i></p>
32	<p><b>Learner Self-Expression.</b>  <i>“We were able to explain personally how we understood what we learned with our YouTube final project. Being able to select our own music, and describe it in our own words demonstrating our understanding of the material presented this semester was meaningful in the sense that it was a true reflection of ourselves and what we learned, not simply just an exam about facts.”</i>  <i>(see Appendix 3q for additional Learner Self-expression quotes)</i></p>
27	<p><b>Learner Creativity.</b>  <i>“What made the assignments meaningful was due to the interesting, thought provoking topics and open-ended approach that still had criteria and guided examples. These aspects of the tasks allowed me to play on my strengths and experiences and tested my creativity.”</i>  <i>(see Appendix 3r for additional Learner-Creativity quotes)</i></p>
20	<p><b>Learner Socially-Culturally Connected.</b>  <i>“I really enjoyed Critical Essay C. I had a great time interviewing my Great Uncle and just getting to connect with him on a musical level I had never before. It really brought the two of us closer which I am extremely thankful for. I sent back the finished essay to him and he was extremely impressed with how it ended. If I had to take away one meaningful project or assignment from this course it would most certainly be Critical Essay C.”</i>  <i>(see Appendix 3s for additional learner Socially-Culturally Connected quotes)</i></p>
5	<p><b>Learner Values and Caring.</b>  <i>“It was meaningful because we got to pick the topic and organization of this project which made it more personal. It gave me more motivation to do well on this project because I did it on an organization I was connected to and love a lot. “</i></p>

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(see Appendix 3t for additional Learner-Values and Caring quotes)

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Details on each of the learner-centered principles are included in the following section.

***Learner Relevant.***

The learner-centered principle most frequently coded for was *Learner-relevant* (127). Learners expressed that they enjoyed their academic work when it was related to their personal interests, and/or when academic work was perceived as *relevant / applicable / useful* to their personal lives or future careers.

For example, one student stated:

*The final project allowed me to take in all I have learned this semester and relate it back to myself. I got to reflect on my own interests while connecting it to the course.*

Learners also stated that being able to combine academic coursework with issues that they cared about and were passionate about made learning meaningful and used words like *phenomenal, cool* to describe their academic work. Some sample quotes included:

*The final paper was meaningful because I was able to write about a social issue that I actually cared about.*

*I think being able to use course concepts and create your own business was the most meaningful assignment. You can choose something that you are passionate about instead of just being told what to do.*

***Learner Choice.***

The learner-centered principle with the second-highest frequency count was the principle of *Learner-Choice* (59). The principle of *Learner-Choice*, of course, went hand-in-hand with making academic subject matter *Learner Relevant*, but the 59 statements were coded separately since *Choice* emerged as a powerful design strategy that allowed for the personalization of any curriculum. The choices that learners commented on in their survey statements were being able to choose a business for developing a marketing plan, being able to pick who to interview, being able to select a topic to research relevant to the subject, being able to choose the format / media on how to demonstrate their understanding of weekly topics (journal, blog, etc.). While these choices were small choices, learners really seemed to appreciate

being able to customize their academic work to something that was personally meaningful. For example, one student stated:

*It was meaningful because I was able to choose something that I was passionate about and try to create an effective solution.*

*This project was meaningful because I could choose any topic that I was passionate about. It made it easier to want to work on and research, and it makes me prouder to see it completed.*

Among the 59 learner statements coded for Learner Choice, the expressing *being able to choose something that I am passionate about* appeared exactly 9 times.

### ***Learner Self-Expression, Learner Creativity***

The next two learner-centered principles *Learner-Self Expression (32)* and *Learner-Creativity (27)* went hand-in-hand but were coded separately. Learners' comments on both principles were peppered with words like *fun* and *enjoyed*, and filled with amazement that they were not only allowed but encouraged to express themselves. One running thread that ran through many of the *Learner-Self Expression (32)* and *Learner-Creativity (27)* comments was that being asked to express themselves challenged learners to form their own opinions, thoughts, and feelings, gave them the opportunity to listen to those of others, and become more reflective of the diversity of opinions. Some sample quotes are:

*It allowed me to share my take on a piece of information about the things we were learning and allowed for my peers to provide feedback on the information I presented.*

*The course really pushed us to give our own opinions, thoughts, and feelings. This really helps us to feel invested in the projects which is a huge bonus.*

The thread running through the learner comments coded for self-expression and creativity was that learners appreciated being able to bring themselves to the academic work and make it their own. For example, one student stated:

*Being given the opportunity to make some assignments creative in approach is what made it meaningful because we were able to make the projects our own and many courses don't allow you to do this.*

### ***Learner Socially-Culturally Connected, Learner Values and Caring***

The last two learner-centered principles *Learner Socially-Culturally Connected* (20) and *Learner Values and Caring* (5) could also have been grouped together as both emphasized the importance of culture and lived experience. Learners stated that *getting more involved with my community, working closely with my relatives, interviewing my partner, mother, grandpa, great uncle, older members in their neighborhood, selecting a business that I had a relationship with* etc. were tasks that enriched their lives and that helped them build meaningful connections to the subject matter. For example, one student stated:

*For Critical Essay C we had to interview someone, and this gave me a chance to learn more about one of my family members. Additionally, it helped to put what we were learning about in class in a context relatable to me.*

### **Positive assignment and course-specific comments.**

The third set of codes related to positive comments about a specific assignment (51) or the course in general (45). Some sample quotes are:

#### ***Assignment Positive.***

The positive comments (96) addressed the usability of the course interface, the fact that every assignment provided a purpose outline, that projects directly related to the topics being learned, how the organization of the weekly modules were effective in helping learners prepare for their final project, how the required discussions supported their learning of concepts, and how the careful scaffolding of smaller activities (developing a process outline, conducting a peer review, receiving formative feedback ) supported their larger more complex projects. Some positive sample quotes are:

*I thought the course interface was very easy to understand and also easy to maneuver. Finding documents or links was extremely easy.*

*Again, I think the class was brilliantly constructed. The course materials and assignments required deep thought and connections between concepts that did not always reveal themselves at first glance.*

*Every single assignment seemed to have a purpose and drove home the concepts of each week's readings. I didn't feel like there were any "filler" assignments in this course.*

***Course Positive.***

*The final presentation requires the combination of the feedback given by the previous stages. It helps us to grow and learn from the mistake gradually.*

*The projects were meaningful because they directly related to the topic we were learning for the week in order for us to solidify the knowledge that we learned.*

***Technology-mediated Learning.***

Twenty-six students commented exclusively on the use of *technology* resulting in meaningful learning because learners considered being able to work, learn, and collaborate with others online as an important skill for the future. Many of the students who mentioned *Technology* in their comments referred to the experience of taking an online course that required them to use communication and collaboration software as meaningful.

*I feel what I got that was most beneficial to myself from this was the experience with working on a project with several people. This was beneficial because none of us got to meet, and we had to do all of our coordination online. This gave real world experience with completing projects that management sends out, for a person whose team may be split across the state or country.*

*The course included a group project. The successful completion of this project required us to meet as a group which provided several opportunities to learn new programs and applications for online meetings. Two applications I learned about were YouTube Live Events and Google Hangouts, neither of which I used prior to this.*

Of the 26 students who commented on technology-mediated learning, nine also mentioned struggling with technology. This is an important finding along with comments students made about struggling with online collaboration as it points to the need to carefully scaffold and support both online collaborative assignments and student technology use (see Appendix 3v for additional technology-mediated learning quotes).

***Negative or Improvement Comments.***

The negative comments (23) while fewer mostly addressed learners wanting more clarity about their assignments as evident in the following statements:

*Some of the directions were vague and it was hard to know what the assignment was.*

*I just needed some more description in the instructions because they weren't always worded so that the point of the assignment was easily understood.*

*Assignments were sometimes unclear and our group was confused about what exactly we were supposed to do. I had higher expectations for this course.*

*Some of the assignments were hard to understand and then you would get a bad grade.*

*Better instructions for the project and an example to give us an idea of what was expected.*

Other negative comments addressed the lack of feedback in order for learners to improve their performance. Some sample quotes are:

*The short stories provided the opportunity to combine elements from each module, but this opportunity was undermined by the lack of feedback on each module.*

*I felt it was difficult to find projects meaningful when commentary was limited to a few sentences with my final grade. I would prefer full feedback via something like GoogleDoc comments.*

***Improvement.***

23 additional comments made specific recommendations about how to address the perceived negative experiences in the online course. Requests were made for different or more meaningful assignments, better or more clearly-defined criteria by which to complete the assignments, better or additional resources such as study notes, TED Talks, or simulations, improved-course organization or navigation, and more feedback from the instructor (see Appendix 3x for specific comments).

***Project-based Learning***

The last set of comments were coded for project-based learning (14). Learners commented that completing a project felt *meaningful, interesting, even fun*. Others stated that working on a project *didn't seem like busy work and made me stretch myself* (see Appendix 3y for specific comments).

## Discussion

This DBR intervention addressed the lack of a definition of active learning as a quality standard for online course design, and through its literature review established the principles of authentic eLearning (Herrington, et al., 2010) as a well-suited heuristic for active learning. This DBR demonstrated through its design intervention that active learning in online courses can indeed be quantified by applying these evidence-based principles along with the added learner-centered principles. The high-level conjecture of this design intervention, namely that online courses that score high in the principles of authentic e-learning provide more active learning opportunities than courses that score low, proved to be valid.

Courses in the low active learning range (<15) offered minimal opportunities for learners to build relationships between the academic content and the real-world, offered fewer complex use cases that would clarify the purpose of the knowledge for the learner. They also provided minimal opportunities to connect the academic content to the learners' prior knowledge. This ignores the situated nature of learning (Lave & Wenger, 1991; Wenger 2010). Courses in the low active learning range further underemphasized the social nature of learning so core to human cognition (Vygotsky, 1978, Brown et al., 1989) and as such did not leverage the potential that collaboration has to offer to enhance learning. Finally, the learning activities and assessments in low active learning courses lacked opportunities for learners to self-regulate their learning which is important for learners to practice, so that they develop the meta-cognitive abilities that lead to learning independently and successfully.

Courses in the medium active learning range showed strong representation of *some* of the principles but the courses did not truly create authentic contexts. Learners, for example, may have been provided "suitable examples from real-world situations to illustrate the concept or issue being taught", such as a case study, "but they did not go as far as providing the purpose and motivation for learning, nor did they provide a sustained and complex learning environment that can be explored at length" (Herrington et al., 2010, p. 19).

Courses that fell in the high active learning range (>21) operationalized the empirical findings in learning sciences literature that learning is constructed by the learner through interactions with others and with the world (Bandura, 1989; Bruner, 1966; Piaget, 1972; Vygotsky & Cole, 1978). These online courses

were creatively designed to bring the curriculum alive by infusing the course with opportunities for learners to build connections to real-world contexts, their own interests, and through rich exchanges and collaboration with classmates. These courses provided opportunities for learners to construct their own learning by being tasked with sustained investigations into a subject matter that required them to research, collaborate, reflect, articulate, and produce a product that demonstrates their learning. These are generative processes (Benassi, Overson, & Hakala, 2014) as we can only express knowledge that what we have successfully internalized and made our own.

Courses in the high active learning range consistently exhibited a creative use of technology guided by the pedagogical understanding of learning as a constructive, self-directed, situated, and collaborative process (De Corte, 2010). The learning design was focused on the learning experience and the use of technology was determined by the alignment of technological affordances to pedagogical needs. Moreover, highly active learning courses had reordered the disciplinary content in support of the learning experience. These courses wove the entire course content into a narrative structure organized around the learning experience and effectively scripted the course material into a storyline organized around how the learner would experience the sequence. Courses that followed a narrative structure received the highest ratings of personal relevance which was frequently accomplished by allowing learners some degree of choice of how to execute their assignments. The products that learners created to demonstrate their learning were unique and evaluated via a rubric to assure that they nevertheless met all of the disciplinary goals articulated for the course. Not only did these high active learning courses meet all of the disciplinary outcomes articulated for a course, they frequently elevated the levels of learning because by their very nature, active learning tasks operate at an applied or higher cognitive level.

### **The Role of Active Learning in Instruction**

What is important to clarify here is the role that active learning experiences hold within instruction. The role of active learning opportunities is to engage learners and to build and deepen the relationships between the academic content and the learner. The more relationships that a learner has built to a given concept, the more emotionally salient the information is, the more applicable the information is to real-world practice, the more culturally relevant, the more novel and thus memorable, the easier the



retrieval. Unless these relationships are *constructed* by the learner, no learning or only shallow learning will take place.

This said, active learning opportunities work hand-in hand with the direct instruction of content; the difference is *how* the learner is positioned to interact with the content. In low active learning courses, the learner's role lacks agency and is positioned as a passive recipient of content knowledge. The role of the learner becomes an object (receiving action) in this learning scenario. In high active learning courses, on the other hand, learners are charged with complex tasks that require them "to make choices and reflect upon and self-regulate their own learning. These activities enable students to play diverse roles such as project manager, data collector, statistician, and report writer" (Herrington, et al., p.56). As such, learners in high active learning courses act as contributors and co-creators of the curriculum by reinventing the curriculum through their novel products. The role of the learner becomes an *agent* (initiating action) in this learning scenario. Learner agency, of course, is part and parcel to developing the conative skills so important for learners to develop in order to successfully self-direct their own learning.

### **A False Dichotomy**

Some education researchers position constructivism in opposition to direct instruction (Kirschner, 2019). Nothing could be further from the truth. Direct instruction and constructivist approaches complement one another. They each hold an important role in the design for learning. Learning as an active and constructive process does not at all imply that students' construction of their knowledge should not be guided and mediated through appropriate modeling, coaching, and scaffolding by teachers, peers, and educational media (Collins, Brown, and Newman, 1989). Nor does the importance of active learning diminish the value of carefully curated curriculum that scaffolds basic elements of disciplinary knowledge such as foundational terminology, concepts, and frameworks into the more complex knowledge structures of the discipline. "It took mankind several thousand years until it discovered some of the contents taught in middle school today, for example, the laws of classical mechanics, the Cartesian coordinate system, or the mechanisms of photosynthesis" (Schneider & Stern, 2010, p. 79). Engaging learners in active learning experiences does *not* imply that learners should start from scratch and rediscover knowledge structures that

took decades to develop independently and without guidance. These knowledge structures are provided through the major ideas and frameworks in the disciplinary content.

The point, however, is to design beyond the content (Hokanson, 2015) and to focus design considerations on learning experiences that allow learners to build the *real-world, personally-relevant, interdisciplinary*, relationships to the subject matter. Opportunities for *reflection, articulation, and collaboration with peers on projects for a sustained amount of time that require all of the learners' capabilities: cognitive, affective, and conative* will help the learner construct these relationships.

### **Designing Learning Experiences.**

Designing beyond content (Hokanson, 2015; Perrin, 2007) for active learning also means reorganizing the content layout to support the learning experience as it benefits learners to see the close relationship between the content presented and the activities and assessments they are being tasked to do. Truly designing the curriculum or the online course around the learning experience thus requires a 180-degree shift in focus in which the content presented supports the experience design, not the other way around. As the examples of high active learning courses ( $AL > 21$ ) in this study have shown, it is possible to design active learning experiences that bring the curriculum to life for the learner *and* that meet the disciplinary goals set fourth for the course. Highly active courses, naturally present content (short lectures, readings, case studies, etc.) that introduce the disciplinary concepts, frameworks, and terminology. They do assess for understanding along the way by way of quizzes, discussions, homework, labs and/or exercises to help the learner check her understanding of the newly presented material. The difference in highly active learning courses is that there is more. There is a purpose for learning, a context for learning, and a sizable task for individual learners or teams of learners to grapple with and to use their newly acquired knowledge for problem solving in real-world or personally relevant ways.

Therefore, when designing learning experiences, the design considerations become which materials best support the learner's experience of the curriculum and selecting those that are most salient and leaving the rest as additional / optional resources. This does most likely mean covering less of the content (Fogarty & Pete, 2010) and focusing on the big ideas, concepts, and frameworks to be communicated and aligning these to the learning experience design. With a new emphasis on learning

experience design, quizzes and exercises no longer carry the weight of summative assessments. Instead, they are given less weight in the overall course grade and treated as a check-for-understanding for the learner to monitor her own progress. Moreover, the learning design in high active learning courses weave the many smaller learning activities and assessments together in support of the larger project rather than present them as separate unrelated activities. The learner comments for the authentic task principle *Integrated Assessments* (see Appendix 3g) best speak to this feature of the course design. As this learner commented:

*The final project was meaningful in that it was an application and culmination of other smaller tasks throughout the semester.*

What was furthermore apparent in the high active learning courses was the required role change it involved for the instructor. These carefully scaffolded, professionally designed, learning experiences required the instructor to adopt a new role. The instructors' role in high active learning courses resembled more the role of a host, coach, or mentor than the traditional role of instructor as expert lecturer.

Admittedly, it requires creativity to design online courses that weave together the existing curriculum into something that the learner can experience. This is where the design principles become useful. The design principles implemented in the active learning (AL) course review serve as generators or cylinders that power-up the learning design of an online course to increase the likelihood for learners to engage and build connections. Active learning is not new, and neither are the principles of authentic e-learning, not even the learner-centered principles. What is new as a result of this DBR is that these evidence-based principles can now be applied during a course review.

### **Practical Outputs of this Design Intervention**

The active learning course reviews that reviewed the learning activities and assessments in online courses against the principles of authentic e-learning produced an active learning (AL) score that reliably quantified whether a course fell in the low, medium, or high active learning range. Thus, an AL score can provide guidance whether or not the learning design of an online course follows minimal requirements for active learning. Courses in the low active learning range truly do not follow the science of learning. They

are delivery systems for curated, digitized content followed by automated assessments which are becoming increasingly free on the Internet and more resemble digital books in that they deliver well curated curriculum, but they do not deliver active learning opportunities which in this study has been articulated as the building of relationships between the academic content and the learner. As such, the active learning course review could be used to identify low active learning courses so that these can be scheduled for a creative and professional redesign.

The size of this study, namely that the course review was performed across a wide variety of disciplines and across the full range (1000-4000) of undergraduate levels, further evidenced that an active learning course design is possible independent of the curricular level and independent of the disciplinary subject matter. The practical application of the course review could furthermore guide faculty development workshops to help illustrate the design principles in action and support teachers, designers, and administrators in the design, review, and approval of online courses to follow evidence-based design principles. Finally, a well-designed online course that initiates active learning can equally be used for a blended and flipped classroom delivery. In fact, Online and Educational Services (OES) after successful implementation of the AL course review for online courses expanded this practice for all undergraduate blended and face-to face courses at the College of Continuing and Professional Education. As such, the active learning course review and rubric which are the practical outputs of this study have application beyond online delivery. With that, this design-based research study met one of its goals, namely to produce educational products or processes that have the potential to narrow the research-practice gap and to advance active learning.

### **Implications for the Field of Instructional Design**

Designing or redesigning an online course for truly active learning will require a redesign of the curriculum. It will require a shift in focus beyond disciplinary course outcomes, important as they are, to the learning activities and assessments that learners engage in. Because “learning results from *what the student does and thinks* and only from what the student does and thinks. The teacher can advance learning only by influencing what the student does to learn” (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010). To design meaningful learning experiences,

It will require teachers and designers to think *out of the box* when it comes to developing e-learning courses. It will require moving away from traditional university course activities (such as lectures, demonstrations, discussions, textbook readings, and examinations) to a course design in which a *single* authentic task or project becomes the entire e-learning course (Herrington, et al. 2010, p. 13).

For active learning in online courses to become mainstream will require learning experience design to become a standard practice in the training of instructional designers. It will furthermore require that learning sciences research which supports these evidence-based design principles to be taught more widely. The active learning course review, however, is a practical step for identifying the extent to which an online course already operationalizes active learning and the expanded design principles can provide guidance for the re/design of exciting online learning experiences that are personally relevant. But this does not change the reality that a lot of work will be ahead to enable online courses to provide learning experiences that engage learners in meaningful ways. “We won’t meet the needs for more and better higher education until professors became designers of learning experiences and not teachers” (Spence, 2001, p.10). The reward, once a course has been redesigned for active learning, is that going forward, all copies of this course will automate active learning.

#### **The importance of creativity.**

There is no recipe for designing active learning experiences other than the guidance provided by these evidence-based design principles. Their application in courses is unique. The opportunities each curriculum holds to incorporate active learning opportunities is unique. All courses possess these opportunities but it will require *creativity* to imagine, design, and implement them. But even this is good news, because *creativity* is a muscle that can be exercised (Hokanson, 2017). What better way to prepare for the creative economy than to design learning experiences that require creativity of designers and learners alike.

#### **Theoretical Outputs of this Design Intervention**

This design intervention truly stands on the shoulders of multiple education scholars, but in particular on the shoulders of Herrington et al., (2010) whose principles of authentic e-learning inspired and guided this investigation. A DBR strives to produce new or refined theoretical understanding in the form of reusable design principles that can inform practice as well as further research. The learner survey

statements contributed these theoretical outputs. An important finding as a result of the coding of learner survey statements was that the two categories: The *Authentic Task Principles* (418) and the *Learner-centered Principles* (269) both received a high number of student comments. When comparing the two top-rated categories, namely *Real-world Relevant* (153) and *Learner-Relevant* (127)- *Learner Choice* (58) one can conclude that they held near equal weight in helping learners create meaning. This expands the definition of *authentic*. In addition to drawing on situated cognition, a perspective that multiple educational researchers have advanced (Brown et al., 1989; Cognition and Technology Group at Vanderbilt, 1990; Lave & Wenger, 1991), authentic can also relate to the *subjective* experience of learners, and the importance of tapping into the inner states: personal interests, passions, goals, and values of learners. Thus, the authentic principles need to be expanded to a bi-directional lens: situated as external to the learner (the socio-cultural context) and situated as internal (interests and the prior experience) of the learner. In the educational literature, situated cognition and situated pedagogies have guided the field towards a more learner-centered paradigm, as it has also guided this study. Rarely, if ever is the subjective experience brought to the forefront in education literature other than in the well-established importance of prior knowledge. The findings of this portion of the study, which was derived by asking the learners themselves about what made learning meaningful, clearly requires the acknowledgement that situated cognition is bi-directional; namely situated as *external* to the learner and situated as *internal* to the learner. These findings further point to the conclusion that learning is a subjective experience and that intentional academic learning can be enhanced when connecting academic content with learners' interests, lives, and lived experience.

These findings further remind that emotion and motivation have significant impact on learning which only becomes more important as learners work asynchronously and independently. As such, this study's theoretical output can inform future research on how to design for an increased personalization of the curriculum in order to engage learners' interests, passions, and values. The theoretical findings of this study further point to emotion as the undercurrent of cognition and as an untapped element for designing learning experiences that are emotionally salient for the learner by providing some element of choice by which the learner can connect their interests, values, and lived experience to the subject matter being taught. If active learning course design is the art of designing experiences that help learners build

relationships to the academic subject matter, then designers of learning now have additional design principles to help build these relationships and to make learning meaningful. The synaptic relationship-building process that we call learning now can tap into two sets of principles as active learning draws on connections from both.

## CHAPTER 4: TRACKING TRANSDISCIPLINARY SKILLS IN THE DESIGN OF ONLINE COURSES

“The aim of education is to develop the student.” (Kohlberg and Mayer, 1972)

Educators today are faced with the daunting task of preparing learners for an age in which technologies are transforming lives and society at a pace faster than previously experienced in history (Brynjolfsson & McAfee, 2014; Gray, 2016; Schwab, 2017). Economies are experiencing a rapid transformation from their traditional industrial base to knowledge-based societies. Industries are shifting from a focus on manufacturing and trade to a focus on knowledge and ideas in which creativity is becoming the main source of economic growth (Florida, 2014; Pink, 2006). This rate of change caused by the fourth industrial revolution (Gray, 2016, Schwab, 2017) is not only responsible for disrupting traditional market forces, but is predicted to accelerate as artificial intelligence increases its presence and renders existing professions obsolete (Susskind & Susskind, 2015). Society is said to be approaching “the second half of the chess board” (Brynjolfsson & McAfee, 2014, p. 40-56), meaning that we live in a time in which technologies will accelerate change at exponential rates. “By 2022, no less than 54% of all employees will require significant re- and upskilling. Proficiencies in new technologies is only one part in the 2022 skills equation. Human skills such as creativity, originality, and initiative, critical thinking, persuasion, and negotiation will likewise retain or increase their value, as will attention to detail, resilience, flexibility, and complex problem solving” (World Economic Forum, 2018, p. ix).

This level of change requires a constant retooling, as well as flexibility and adaptability, to adjust to change. It further requires the ability to learn independently, to develop entrepreneurial skills and creativity in order to take advantage of new opportunities. Employers and advisory boards are seeking t-shaped professionals (Robles, 2012), who in addition to disciplinary expertise, possess excellent communication and collaboration skills, emotional intelligence, and intercultural competencies to work across cultural settings and within interdisciplinary teams. “As careers change over time, students need to be able to develop approaches in identifying content themselves in order to adapt to the continuously changing employment market” (Toetenel & Rienties 2016, p. 3). To



educate learners to succeed in times of disruptive change requires that learners not only gain disciplinary expertise, but develop precisely those transdisciplinary skills (t-skills) that separate humans from the machine: adaptability, creativity, empathy, pattern-recognition, systems thinking, complex problem solving, self-regulation, and of course the important intercultural skills that allow us to live and work peacefully and productively with others (Bellanca, 2010; Darling-Hammond, 2010; Fogarty, 2010; Mishra, 2012; Reeves, 2010; Robles, 2012; Vockley, 2007). These t-skills are not only deemed important for a successful economy and sought by employers from college graduates entering the workforce (Conley, 2012; Gray, 2016); they are required for “effective community and social engagement in a participatory democracy and for living fulfilling meaningful lives” (Bereiter & Scardamalia, 2008, p.5).

Thus, t-skills have been coined the new canon and higher education administrators and faculty have been questioned about their ability to deliver on them (Berret, 2016). What makes these skills elusive is that they are neither declared in course outcomes statements nor assessed via the learning activities and assessments that foster them. This chapter reports on a design-based research (DBR) study that addressed this problem. Specifically, the study reports on an instructional design team’s intervention to make t-skills visible by developing a new outcomes table that systematically mapped multiple levels of competencies (course, program, and t-skills) to the learning activities and assessments that fostered them. The new mapping process captured not only the intended disciplinary goals (what was taught) but also the competencies fostered by the learning design (how the curriculum was taught). The new mapping process further served as a roadmap to automate the tracking of program-level competencies and t-skills by deploying the learning outcomes capacity of the learning management system. The practical application of this method provides learning analytics on the type of skills fostered by a given curriculum that facilitates course and program-review on higher-order skills.

## Literature Review

### Transdisciplinary Skills and Dispositions

Transdisciplinary skills comprise a set of learning and development skills that have been identified as required for success in today's complex, competitive, changing, knowledge-based, technology-driven society. These skills have been articulated and organized into frameworks for over a decade by numerous national and international organizations such as the Association of American Colleges & Universities [AACU] (2007), Educational Testing Service [ETS] (2007), International Society for Technology in Education [ISTE] (2007), North Central Regional Educational Laboratory [NCREL] (2003), Organization for Economic Cooperation and Development [OECD] (2005), Partnership for 21st Century Skills [P21] (2006); State Educational Technology Directors Association [SETDA] (2001), in an effort to foster educational innovation in support of these skills. These individual frameworks, while organized in slightly different ways, are found to be "generally consistent with each other" (Dede, 2010, p.11) in their emphasis on learning and innovation skills, information and media skills, life and career skills, and their focus on 21st century themes such as civic, health, and environmental literacy, financial - economic -business- and entrepreneurial literacy and an awareness of the interdependent nature of systemic issues. Together, they make a compelling argument for their importance as well as an appeal for the inclusion of learning experiences that foster them (Beetham & Sharpe, 2007; Bellanca, 2010; Bereiter & Scardamalia, 2008; Guerriero, 2017).

As such, transdisciplinary skills are higher-level outcomes at a scale of university student learning and development outcomes (SLO/SDO) fostered through multiple learning experiences along the undergraduate education journey. These meta-outcomes are not to be confused with the more immediate disciplinary outcomes that are set to be achieved with the completion of a single course but instead must be fostered as an integral component of - and throughout the existing curriculum - without deterring from disciplinary goals. One simply does not have the luxury to replace disciplinary goals with transdisciplinary skills nor does one have the luxury to crowd the curriculum with twice as many goals. To achieve the development of these important skills, the curriculum has to deliver on both: the attainment of disciplinary expertise as well as the fostering of transdisciplinary skills and dispositions. Because of the interdependent

nature of the achievement of disciplinary outcomes and transdisciplinary skills, namely that t-skills are fostered *through* the same learning activities and assessments that are designed to deliver on what a course sets out to teach, this DBR study carefully examined learning activities and assessments that delivered on both.

**Transdisciplinary skills develop over time.**

Transdisciplinary skills are meta-outcomes that arguably are developed through multiple exposures along the educational journey. Given their nature, it is imperative that students are given ongoing opportunities to practice these meta-outcomes through appropriately crafted learning activities so that they can develop over time. The design of learning activities and assessments thus requires creating the environmental conditions that enable a t-skill to be practiced. Whether the subject matter is calculus, social theory, or economics, t-skills such as *Teamwork and Leadership* can be fostered by incorporating collaboration and ill-defined problems as design principles into the design of an online course to enable learners to develop *Teamwork and Leadership* skills. Developing t-skills such as *Innovation and Creativity* will not be achieved exclusively by reading about how creativity is fostered but requires learning tasks in which learners can take risks, that give learners the freedom to be creative, that encourage self-expression, that challenge assumptions, and that require learners to reframe problems and connect and combine ideas in new ways (Hulme & DeLaRosby, 2014; Hokanson, 2017).

In short, the development of transdisciplinary skills requires application, practice, and experience. Because t-skills require multiple exposures and scaffolds so that they can be introduced and practiced over the duration of a program, these skills require tracking across courses. Tracking t-skills via analytics therefore becomes not only essential as a feedback loop for program design to assure that these skills are being practiced in the first place, tracking t-skills across courses is necessary in order to design programs that meaningfully scaffold these opportunities to increase their potential of mastery.

**Transdisciplinary skills are elusive and difficult to track.**

While transdisciplinary skills apply across the disciplines and can be fostered with purposefully designed curriculum, t-skills are difficult to track because they are rarely directly taught but are rather a byproduct of learning activities and assessments designed to meet disciplinary outcomes. Not only are t-

skills difficult to track because they are rarely articulated in course outcomes statements or assessed via the learning activities and assessments that learners engage in, they are difficult to track because they reach beyond the cognitive into the affective and conative domain. For example, initiative and self-direction which includes managing goals and time, working independently, and becoming a self-directed learner are examples of t-skills in the conative domain that are rarely directly stated as course outcomes yet are a key skill tied to academic success and a required skill in the learning economy. Social and cross-cultural skills which includes working effectively on diverse teams, respecting cultural differences, responding open-mindedly to different ideas and values are examples of t-skills in the affective domain that are rarely directly stated in course outcomes yet are key skills for our diverse, interconnected, and interdependent global economy. Course designs that merely articulate and assess disciplinary goals therefore often fail to address these important t-skills as it renders them invisible. This issue is confounded by the complexity of the desired t-skills. Any given learning activity perhaps can only enable students to practice a sub-component of a complex skill, thus increasing the difficulty of tracking them.

**Tracking transdisciplinary skills faces technological barriers.**

Traditionally, a learning management system (LMS) can track learning activities and assessments designed to meet disciplinary outcomes at the course-level but their capacity to track outcomes at multiple levels, across time, or across programs is more limited. This level of curriculum mapping is usually left to Assessment Management Systems (AMS) which possess the functionality to build relationships between course-level outcomes, program-level outcomes, and higher-order competencies and allow users to drill down to where a particular competency is practiced. Unfortunately, the data integration between LMS and AMS systems is often not seamless to create the type of analytics that would allow an institution to track the development of t-skills by student, course, program, and across disciplines. The lack of widespread and consistent adoption of technology platforms (LMS and AMS systems) by stakeholders (both faculty and administrators) present additional barriers to creating meaningful analytics about t-skills. Finally, most LMS and AMS systems orient their assessment strategies towards disciplinary course and program-level outcomes, which means that t-skills that are developed as a result of learning design remain invisible.

### **Pedagogy in Support of Transdisciplinary Skills**

What the transdisciplinary nature of learning as articulated in Chapter 2 of this study implies for the pedagogical design of learning is that in order to foster multidimensional and complex transdisciplinary skills, learners must be engaged in learning activities and assessments that are equally multidimensional and complex (Beetham & Sharpe, 2007; Bereiter & Scardamalia, 2008; Fogarty & Pete, 2010; Hearn & Bridgestock, 2010; Laurillard, 2002, 20013; Mishra, Koehler, & Henriksen, 2010; Reeves, 2010; Scardamalia & Bereiter, 2006). Thus, learners must encounter learning tasks that present them with complexity while also learning the more convergent outcomes that develop disciplinary expertise. Incorporating learning experiences that foster t-skills into disciplinary instruction thus not only fosters learning along multiple dimensions for the learner, but exposes the learner to the complexity that surrounds conceptual knowledge when it reconnects with the situated perspective. The development of transdisciplinary skills thus requires a pedagogy for complexity (Gibbs, 2017).

To develop these transdisciplinary skills requires that educators consider *how* students learn and draw on what is known about the design of learning experiences that foster these meta-outcomes (Laurillard, 2002, 2013, 2013). To develop t-skills, learners require opportunities to explore, learn, and apply new knowledge and skills independently and practice synthesizing knowledge from an increasingly distributed knowledge production system (Gardner, 2006, Gibbons, 1998, Siemens, 2006). It requires working in collaboration with others, exploring cultural differences, developing self-reflective practices (Garrison, 2003), and grappling with the complexity inherent in our diverse, interconnected, and interdependent world (Lynch, Russell, Evans, & Sutterer, 2009). It requires that learners encounter more open-ended, ill-structured problems for which there are no single right answers but that challenge them to grapple with the complexity of a problem and follow their own path of inquiry to generate solutions, ideas, knowledge, and products.

To develop these transdisciplinary skills further requires educators to rethink *what* students are learning. With knowledge expanding at a breathtaking pace, “effective education can no longer be focused on the transmission of pieces of information that, once memorized, constitute a stable storehouse of knowledge” (Darling Hammond, 2015, p. 2). Effective education requires educators to

reevaluate what content is worth having students spend their time learning and aim for higher levels of learning that go beyond recognition and recall in favor of engaging with original ideas, complex knowledge structures, knowledge transfer, and application.

To develop these transdisciplinary skills further requires educators to draw on today's distributed knowledge production system. "The main change, as far as universities are concerned, is that knowledge production and dissemination – research and teaching – are no longer self-contained activities, carried out in relative institutional isolation. They now involve interaction with a variety of other knowledge producers" (Gibbons, 1998, p. 6).

Corporate structures and traditional education serve views of knowledge as static concepts or reservoirs. The pursuit of stability must give way to adaptability. Knowledge reservoirs have become rivers. This changes everything – from production and consumption of media to how we structure leadership to how we organize and run businesses. The centering elements of yesterday are yielding to the decentralized and networked structures of today. The flow of knowledge is the oil pipeline of our generation (Siemens, 2006).

To become effective knowledge workers, learners therefore need to be taught to critically evaluate learning resources from the distributed knowledge production system. This is to develop their critical ICT Literacy that allows them to discern authorship, expertise, point of view, knowledge paradigm, etc. and develop a synthesizing mind (Gardner, 2006) that is able to effectively synthesize information from multiple sources and perspectives. Thus, to become effective knowledge workers, learners need to learn how to access and "make use of the intellectual resources that they don't fully control" (Gibbons, 1998, p.7)

#### **Upfront pedagogical considerations.**

The challenge of designing learning activities and assessments that foster the development of transdisciplinary skills is further exacerbated when courses are online. Developing a fully asynchronous online course in which all learning activities and assessments are explicitly mediated via the learning management system requires a significant upfront investment of time and effort by multiple stakeholders (content expert, instructional designer, media specialist, course developer, etc.) and takes place long before learners engage with the learning environment. Pedagogical considerations must be clarified upfront because they drive the rest of the design and development

process (Jonassen 1991, 1999, 2000; Jonassen & Land, 2012; Jonassen & Strobel, 2006). After all, once an online course has been designed and developed, the pedagogical approach is essentially *woven* into the learning environment. An online course can be duplicated into additional sections and deployed to automate the learning experience for years to come. If the original course design does not foster the development of transdisciplinary skills and dispositions, the course requires a near complete redesign and a repeat investment of time and effort in order to change its pedagogical approach.

Without upfront pedagogical decisions regarding the learning design that fosters transdisciplinary skills, the online classroom poses the risk to not only continue the great disconnect between what is known about the nature of learning and what is practiced in the classroom (Berliner, 2008) but to automate, duplicate, and exaggerate its practice. With over 30% of all students in US higher education taking at least one online course in 2017 (Poulin & Straut, 2016), and with the likelihood that online courses will reach 100% adoption as a result of the Covid-19 pandemic, the pedagogical design of fully online courses, whether static content is delivered that places the learner into the role of passive consumer, or whether transdisciplinary skills are fostered through active knowledge construction, thus becomes not only a question of quality for online education, but a question central to the mission of higher education to prepare the knowledge workers of the 21st century (Laurillard, 2002). Thus, the consideration of a learning design automated through technology must consider how the learning design can foster higher order skills. Consequently, if the learning design adopted the principles of authentic e-learning (see Table 4.1), then it would follow that the learning activities and assessments would help foster the development of transdisciplinary skills.

**Table 4.1***The Principles of Authentic eLearning* (Herrington, et al., 2010)

Principle	Definition	Applied in Learning Design
Real-world Relevance	Learning rises to the level of authenticity when it asks students to work actively with abstract concepts, facts, and formulas inside a realistic and highly social context mirroring the practices of the disciplinary culture.	In a Construction Management course, learners are asked to visit a job site and identify the concept of <i>lean construction waste</i> and make recommendations for improvements that would reduce this type of construction waste.
Ill-defined Problems	Challenges cannot be solved easily by the application of an existing algorithm; instead, authentic activities are relatively undefined and open to multiple interpretations, requiring students to identify for themselves the tasks and subtasks needed to complete the major task.	In a Business Communications course, learners research and analyze a real-world problem in an organization of their choosing and produce an <i>analytical report</i> that communicates the problem, the analysis of findings, as well as recommendations for solving the client's problem.
Sustained Investigations	Problems cannot be solved in a matter of minutes or even hours. Instead, authentic activities comprise complex tasks to be investigated by students over a sustained period of time, requiring significant investment of time and intellectual resources.	In a Sociology course, learners apply sociology concepts and methods by conducting a semester-long ethnographic study of their own neighborhood. To complete the project, learners identify a sociological theme to research (education, health, crime, etc.), identify data sources, conduct interviews, write ethnographic field notes, use mapping and statistical software, and finally produce a digital story about their neighborhood supported by data.
Interdisciplinary Perspectives	Relevance is not confined to a single domain or subject matter specialization. Instead, authentic activities have consequences that extend beyond a particular discipline, encouraging students to adopt diverse roles and think in interdisciplinary terms.	In an introductory Sociology course, learners explore the strengths and weaknesses of particular methodological approaches (interview, survey, ethnography) to explore complex societal problems and debate the promises and perils of engaging in <i>Public Sociology</i> .
Collaboration	Success is not achievable by an individual learner working alone. Authentic activities make collaboration integral to the task, both within the course and in the real world.	In a Mathematics for Design course, groups explore weekly applications of mathematics to design problems that require learners to discuss the assigned problem, collaboratively come to a consensus of how to approach and solve



		<p>the problem mathematically, and present the solution. Some of the problems will have more than one method that is valid, so the group discussion should include why different approaches achieve the same result.</p>
Reflection	<p>Authentic activities enable learners to make choices and reflect on their learning, both individually and as a team or community.</p>	<p>In a Management course, learners are asked to make meaningful, personal connections with the ideas and resources presented in the course by reflecting on the learned materials from the perspective of a manager or organization. The YouConnects activity encourages learners to reflect creatively through formats such as blog, digital story, e-portfolio, travel log, poetry, film script, musical lyrics, presentation, YouTube Live event, etc. The importance of the assignment is that the reflection makes a <i>personal</i> and meaningful connection to the course concepts.</p>
Articulation	<p>Learning activities enable presentation and defense of arguments.</p>	<p>In a Physics course, learners are given physics problems to solve on their own, then collaborate within a group forum to articulate how they arrived at their solution. By the end of the week the group has to come to consensus and submit their agreed upon solutions for a single shared grade.</p>
Integrated Assessments	<p>Assessment is not merely summative in authentic activities but is woven seamlessly into the major task in a manner that reflects real-world evaluation processes.</p>	<p>In a Digital Marketing course groups of students collaboratively develop a digital marketing campaign that integrates customer research, brand value proposition, content strategy and content development, UX design, and social media strategy, and campaign pitch into a cumulative project that synthesizes the learning from this course.</p>
Polished Products	<p>Conclusions are not merely exercises or sub-steps in preparation for something else. Authentic activities culminate in the creation of a whole product, valuable in its own right.</p>	<p>In a music course about the historical origins of Rock Music, learners are tasked in their final project of the course to explore the history of this era through a music compilation they themselves curate. They are prompted to compile a Spotify “best of” compilation that creates and communicates a distinct media message through 20th century rock music.</p>

Multiple Interpretations and Outcomes

Rather than yielding a single correct answer obtained by the application of rules and procedures, authentic activities allow for diverse interpretations and competing solutions.

In a sociology course on the topic of Law, Crime, and Punishment learners are asked to create a polished audio podcast (think *RadioLab* or *This American Life*) that integrates the theory of “legal consciousness” about the role and effects of law in everyday life by interviewing someone.

Multiple Sources and Perspectives

Learners are not given a list of resources. Authentic activities provide the opportunity for students to examine the task from a variety of theoretical and practical perspectives, using a variety of resources, and requires students to distinguish relevant from irrelevant information in the process.

In a History course, learners collaboratively create an interactive digital timeline to bring a chosen time period to life. To construct the timeline, groups of learners select a theme, research relevant historical events, movements, and cultural artifacts to contribute to the collective timeline.

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## Methodology

Design-based research has two primary goals, first to address a significant problem in the real world (in this case enabling students to develop critically important t-skills) and second to advance theory (in this case identifying design principles that can be reused in the context of designing more effective online courses). Online courses are often designed to track learning activities and assessments through the learning management system. In such courses, detailed assignment descriptions are posted, the tools that mediate the activities are identified, and the extent to which learning activities require learners to reflect, share their thinking with others, are tasked with sustained investigations, are given opportunities for meaningful collaboration, etc. are all visible in the learning management system. Because of the nature of online courses to *structure* a particular pedagogical approach into the design of the learning environment, online courses can be viewed as an ideal research site to investigate the design of learning activities and assessments that support the development of transdisciplinary skills. Of course, the design principles used to guide the development of online courses do not produce learning analytics themselves, but the learning tasks in which the learners are engaged yield rich data. Identifying the learning activities and assessments that support the development of t-skills within existing disciplinary context and the design principles that guide the development of these activities and assessments are the central focus of this study.

This design-based research study (DBR) encompasses one design team's investigation into tracking transdisciplinary skills in the design of online courses by developing a new outcomes table that allowed for the systematic mapping of higher order skills to the e-learning activities and assessments that foster them and that provided the roadmap for tracking these skills using the learning outcomes feature of the learning management system Canvas. During a two-year migration from one learning management system to another, the design team implemented a new outcomes tracking method for multiple undergraduate degrees resulting in nearly 30,000 data points for program-level competencies and t-skills for these courses. Because t-skills are taught indirectly rather than directly, namely through the same learning activities and assessments that learners engage in to meet disciplinary outcomes, this study carefully tracked learning activities and assessments that enabled students to learn both disciplinary outcomes and t-skills.

## Design-based Research

Design-based research (DBR) is a genre of educational research in which the development of innovations (also called interventions or treatments) as practical solutions to complex educational problems is driven by iterative, empirical investigations (McKenney & Reeves, 2019). Concurrently with the development of effective interventions, DBR strives to produce new or refined theoretical understanding in the form of reusable design principles that can inform practice as well as further research. The innovative interventions that result from a DBR can be educational products, processes, programs, or policies. The collaborative, explanatory, iterative nature of design-based research (DBR) is particularly well suited because it allows for a design approach “with the intent of producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings” (Barab & Squire, 2004, p. 2). Specifically, this DBR study addressed the following two research questions:

Q1: To what extent does the intervention - a new outcomes table - aid in tracking transdisciplinary skills in the design of online courses?

Q2: What principles guide the design of learning activities and assessments that foster t-skills?

This DBR study required multiple iterations working with the design team to redesign the outcomes table in the course syllabus to clarify the complex relationship that these meta-outcomes have with learning activities that are primarily designed to achieve disciplinary goals. The intervention further required significant collaboration with faculty and program directors to review and approve outcomes tables for courses in their programs and the University Office of Undergraduate Assessment and the Office of Information Technology (OIT) to automate the tracking of program outcomes and t-skills through the LMS. In its final iteration, this DBR provided an opportunity to incorporate the College of Liberal Arts (CLA) developed software called RATE (Reflect, Articulate, Translate, and Evaluate) which allows students to self-reflect on their developing t-skills, articulate what helped them develop the skill they selected, translate how this skill may help them in a professional context, and self-evaluate on their development of the skill.

### **Practical Value of Design Intervention**

In my role as director of the design team it also became apparent that in order for the design intervention (in this case the outcomes mapping process) to be widely implemented, it needed to yield practical results for the faculty and program directors who were manually mapping curriculum for the purpose of program review and accreditation, and who had no easy way to review learning outcome results across multiple courses. Using the learning management system (LMS) to generate learning outcomes analytics that would track multiple levels of outcomes across entire programs would therefore not only serve to track transdisciplinary skills for the purpose of this study but simultaneously support the arduous work of program administrators in their efforts of curriculum mapping and program review. The usefulness of this outcomes mapping process cannot be underestimated because it allowed this design intervention to directly support the important work of multiple program administrators in mapping their curriculum, reviewing their courses, meeting accreditation efforts, and generating meaningful assessment data for their programs. As such the successful implementation of a design intervention, in particular a design intervention of a sizable scope such as this longitudinal outcomes and skills mapping initiative, is dependent upon the successful collaboration with stakeholders who needed to value the practical outputs that this design intervention yielded for their respective purposes.

### **Context for Design Intervention**

#### **Existing design practice: Declaring educational outcomes.**

As a design team, Online and Educational Services (OES) practiced the backward-design process inherent in instructional design (Wiggins & McTighe, 2005) of declaring the course-level outcomes to be achieved and then designing learning activities and assessments that addressed them. The alignment check between the declared disciplinary outcomes and the activities designed to foster and assess them was routinely conducted towards the end of the design process by completing a course review. To determine whether a course met its stated learning outcomes, two members of the design team reviewed all learning activities and assessments in relation to the declared course outcomes statements to assure their alignment. The alignment check was arguably the most complex and time-consuming task of the course review as learning activities and assessments never presented a simple linear relationship to course-level outcomes. In

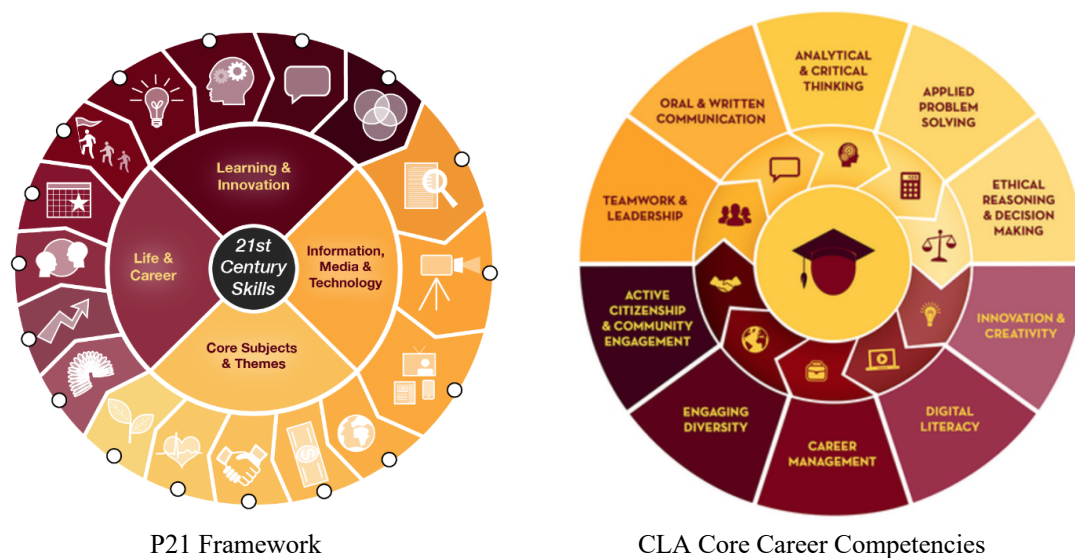
particular authentic tasks routinely met multiple course-level outcomes at once while simultaneously fostering t-skills.

### **Design Intervention I: Tracking Transdisciplinary Skills**

Because transdisciplinary skills are not taught directly but rather fostered through the learning activities and assessments that deliver on disciplinary outcomes, the design intervention required a close examination of both the declared course outcomes, the learning activities and assessments that delivered on them, and the higher order skills that these activities and assessments fostered. It further required differentiating between learning skills (those that can be measured in the cognitive domain) from development skills (those that fall in the affective and conative domain) so that the latter, while difficult to measure could nevertheless be tracked.

#### **Phase 1: Select a transdisciplinary skills framework.**

Phase 1 of the study involved a review of the literature and multiple 21st century skills frameworks, as presented earlier in the paper. Of the many available frameworks, the P-21 skills framework [P21] (2006) was adopted by the OES design team for College of Continuing and Professional Studies (CCAPS) undergraduate courses because it offered a near one-to-one relationship to the University of Minnesota undergraduate student learning outcomes (SLO), student development outcomes (SDO), and liberal education requirements (LE) (See [Appendix 4a](#) for more detail). For CLA-owned courses, OES tracked the CLA adopted Core Career Competencies to accommodate the CLA developed framework. In essence, both frameworks were composed of identical t-skills just organized differently (see Figure 4.1). The P21 framework which consisted of 17 t-skills provided more granularity when compared with the CLA Core Career Competencies which consisted of 10 t-skills.

**Figure 4.1***Two T-skill Frameworks*

P21 Framework

CLA Core Career Competencies

**Phase 2. Develop a new outcomes table.**

Phase two consisted of developing a new outcomes table that brought the learning activities and assessments that learners engaged in into closer proximity to the course-level learning outcomes. Traditional instructional design practices follow the backwards design process of first declaring the course-level outcomes (CO) and then designing learning activities and assessments that deliver on them (Wiggins & Mc Tighe, 2005). Rarely, if ever, do the outcomes statements declare *how* the course activities deliver on the stated goals. This renders the learning design responsible for mediating the higher order skills invisible. After three iterations of the outcomes table (see Appendices [4b](#), [4c](#), [4d](#)), the design team arrived at an organization that allowed multiple levels of outcomes to be mapped to the learning activities and assessment that learners engaged in. The new outcomes table removed the course-level outcomes statements from the table and made the learning activities and assessments that learners engaged in the organizing element (see Table 4.2). The organization of the new learning outcomes table was reorganized in the most literal sense around the learning experience. Finally, whereas the two previous outcomes tables had occupied a section in the course syllabus and had been student facing, the new outcomes table became a design document and which was housed in a section of the online courses dedicated to design documents.

**Table 4.2**

*Completed Course Outcomes Table for a Management Course*

Canvas Assignment	AL score 25/36			
Learning Activities and Assessments	Individual / Group	% Grade	CO	T- Skills
<b>Discussion Forums</b> 1, 2, 4, 6, 8, 9, 10, 11 @ 25 pts	Individual	20%	CO2 CO3 CO4	Oral and Written Communication
<b>YouConnect</b> YouConnect 3 @ 60 pts YouConnect 5 @ 60 pts YouConnect 7 @ 60 pts YouConnect 13 @ 60 pts <b>YouConnect Final @ 60 pts</b>	Individual	30%	CO1 CO2 CO4	<b>Innovation &amp; Creativity</b>
<b>Project</b> Project Part 1 @ 60 pts Project Part 2 @ 60 pts Project Part 3 @ 60 pts Project Part 4 @ 60 pts <b>Project Final @ 60 pts</b>	Individual/ Group	30%	CO1 CO2 CO4 CO5	<b>Innovation &amp; Creativity</b> <b>Oral &amp; Written</b> <b>Communication</b>
<b>Quizzes</b> 4,6,8,12,13 @ 40 points	Individual	20%	CO3	Analytical and Critical Thinking
<b>Total = 1,000 pts</b>		<b>100%</b>		

CO1: Assess then create a plan to implement fundamental skills for being an effective manager.

CO2: List then evaluate the strategies managers use to help organizations adapt to global environments while establishing and maintaining ethical and socially responsible policies and practices.

CO3: Discuss the fundamental functions of management (planning, organizing, leading, and controlling) and provide examples.

CO4: Examine ethical and social factors used for making management decisions.

CO5: Demonstrate theoretical application and imaginative inquiry reflection on the course concepts and resources (planning, organizing, leading, and controlling).

Table 4.2 shows the completed outcomes table for a management course. The bold-faced skills marked in burgundy color indicate t-skills that are attached to the digital rubric in the LMS so that these can be evaluated on a scale of *exemplary, proficient, developing, or not at standard* during the grading process. This seemingly innocuous reorganization of the table from a focus on disciplinary outcomes to a focus on the learning activities and assessments that learners engaged in had the profound effect of being able to



clearly identify the learning tasks that met multiple levels of outcomes: course-level, program-level, as well as t-skills (university-level).

The course-level outcomes (CO) column in the outcomes section of Table 4.2 further provided an instant alignment check for the content expert, the instructional designer, and program administrator to assure that the learning activities and assessments indeed addressed the intended disciplinary outcomes. A completed outcomes table further made evident that active (inquiry-based, problem-based, project-based) learning activities in which learners collaborated were the ones that met multiple disciplinary goals while simultaneously fostering t-skills. Finally, the revised outcomes table served as the roadmap for automating the tracking of program-level outcomes and t-skills via the learning management system to generate analytics on the learning activities and assessment in which these t-skills were practiced.

**Phase 3: Track t-skills via the learning management system.**

Phase 3 of the study automated the tracking of t-skills for CCAPS and Online and Distance Learning (ODL) as identified in the new outcomes table via the learning management system Canvas. This phase required program-level competencies and t-skills to be loaded into the learning management system at the college sub-account level so that individual outcomes could be imported into courses where they were assessed. The completed outcomes table thus only served as a design document for the purpose of *mapping* transdisciplinary skills to the learning activities and assessments. *Tracking* these skills via the learning management system further required digital rubrics to be built that would assess the learning activities and assessments that practiced these transdisciplinary skills (see Table 4.3). The digital rubrics served to automate the tracking of the skills identified in the outcomes table via the learning management system to generate analytics across courses and programs.

**Table 4.3***Digital Rubric for a Final Project*

## MGMT 30xx Project Rubric

Criteria	Ratings					Points
	10.0 pts Excellent	8.5 pts Above Average	7.0 pts Satisfactor y	6.0 pts Below Average	0.0 pts No Submissio n	
Inquiry and Reflection	Demonstrates a mindful and imaginative inquiry into and thoughtful reflection on the course concepts and resources.	Demonstrates a customary or conventional inquiry into and generalized reflection on the course concepts and resources.	Demonstrates an adequate or compliant inquiry into and simplified reflection on the course concepts and resources.	Demonstrates a biased or prejudiced inquiry into and judgmental reflection on the course concepts and resources.	No submission	10.0
Exploration and Analysis	Explores alternatives openly and imaginatively, without prejudgment.	Explores alternatives conventionally or with moderate resourcefulness.	Explores alternatives passively and without originality.	Shows no exploration of alternatives and relies primarily on opinions.	No submission	10.0
Evidence and Illustration	Makes clear and substantive connections with course concepts and resources.	Makes generalized or sporadic connections with course ideas and resources.	Makes hasty or cursory connections with course ideas and resources.	Fails to make connections with course ideas and resources.	No submission	10.0
Synthesis and Application	Fuses, summarizes, and comprehensively explains findings and applications.	Makes meaningful connections and commendable explanations.	Makes reasonable connections and sweeping explanations.	Makes questionable connections and sweeping generalizations.	No submission	10.0

Structure	Explains and expresses concepts and practices clearly and convincingly.	Explains and expresses concepts and practices plausibly and credibly.	Explains and expresses concepts and practices commonly and acceptably.	Explains and expresses concepts and practices clumsily or ineptly.	No submission	10.0
Timeliness	Deliverables are handed in on time according to course due dates.		Deliverables are not handed in on time according to course due dates.		No submission	10.0
Creativity & Innovation	3.0	2.0	1.0	0.0		--
Threshold: 2.0	Exemplary	Proficient	Developing	Not at Standard		
Oral & Written Communication	3.0	2.0	1.0	0.0		--
Threshold: 2.0	Exemplary	Proficient	Developing	Not at Standard		

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*Note.* Digital rubric for the final project in a Management Course to which two t-skills have been attached.

The digital rubric served the dual purpose of evaluating an assignment for the purpose of grade calculation in the LMS gradebook and for evaluating a higher-order skill for the purpose of generating learning outcomes proficiency data in the LMS mastery gradebook. The graded rubric further associated the t-skills with the learning activity or assessment that had fostered it in the LMS learning outcomes result report thus allowing for visualizations of which type of skill had been fostered by which type of learning activities and assessments in the data set.

**Phase 4: Visualize learning analytics on t-skills.**

The learning outcomes feature of the LMS generated a learning outcomes results report at the sub-account level for the college for any learning activities and assessments that had been assessed with digital rubrics to which outcomes had been attached. The resulting raw data file required cleaning in preparation for visualization in Tableau. Data cleaning in this case consisted of deleting student protected information as required by FERPA, deleting data fields superfluous to the analysis, splitting one course column into three data fields to separate course identifier from term and section, renaming column headers to simplify

filters in Tableau, deleting nulls, and otherwise reviewing the data file for consistency of data structure. Once the learning outcomes results report .csv file had been cleaned, it was uploaded into Tableau for visualization. The powerful Tableau visualization capabilities provided flexible reporting options to visualize skills for a single course, for multiple courses; with proficiency ratings, by frequency count, and over time by selecting data fields from the learning management outcomes results report into its visualization window and by creating filters (see Figure 4.2) that would allow for further customization of the reports by selecting courses and skills to be visualized via the Tableau filter options.

**Figure 4.2**

*Tableau Filters*

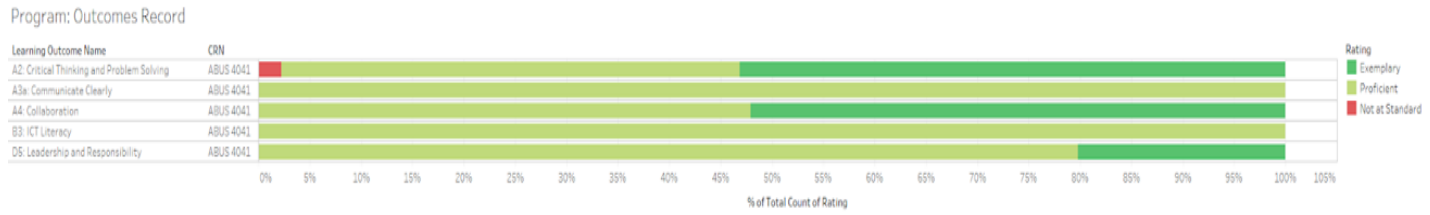
Course Name	Learning Outcome Name
<input type="checkbox"/> (All)	<input checked="" type="checkbox"/> (All)
<input type="checkbox"/> ABUS 4022W (301) ...	<input checked="" type="checkbox"/> A2: Critical Thinkin...
<input type="checkbox"/> ABUS 4023W (301) ...	<input checked="" type="checkbox"/> A3: Communication
<input type="checkbox"/> ABUS 4041 (301) Dy...	<input checked="" type="checkbox"/> A3a: Communicate ...
<input type="checkbox"/> ABUS 4101 (301) Ac...	<input checked="" type="checkbox"/> A4: Collaboration
<input checked="" type="checkbox"/> CSCL 3334 (301) Mo...	<input checked="" type="checkbox"/> Analytical & Critica...
<input checked="" type="checkbox"/> MUS 1013 (302) Roc...	<input checked="" type="checkbox"/> B1: Information Lit...
<input checked="" type="checkbox"/> SOC 4246 (301) Soci...	<input checked="" type="checkbox"/> B3: ICT Literacy

*Note.* Tableau filters customize the visualizations

The resulting Tableau visualizations allowed administrators to create customized views on competencies they were tracking for the purpose of course and program review, and to meet accreditation goals. These visualizations can be performed for single courses or across multiple courses. At the single course level, Figure 4.3 visualizes t-skills tracked for a single course with proficiency ratings resulting from graded assignments to which skills had been attached.

**Figure 4.3**

*T-skills for a Single Course*



*Note.* Proficiency ratings for t-skills fostered by a single course.

Visualizations across multiple courses have utility for program review to track the development of t-skills across a degree program. Figure 4.4 shows t-skills tracked for multiple courses. The number of the courses in the Tableau visualization was easily altered by simply selecting the courses for which reporting was desired through the Tableau filter options.

**Figure 4.4**

*T-skills for Multiple Courses*



*Note.* Proficiency ratings for t-skills fostered in multiple courses.

Figure 4.5 visualized t-skills across multiple courses with frequency count into a curriculum map. This type of perspective over the curriculum allowed administrators to gauge whether or not a skill was practiced in the first place, where (in which course/s) the skill was practiced, and the frequency count by which a particular t-skill was practiced. These visualizations made curriculum redesign actionable as administrators were able to see where a t-skill displayed low proficiency ratings, or whether a t-skill that was deemed an important program outcome was practiced on a regular basis.

**Figure 4.5**  
*Curriculum Map of T-skills*

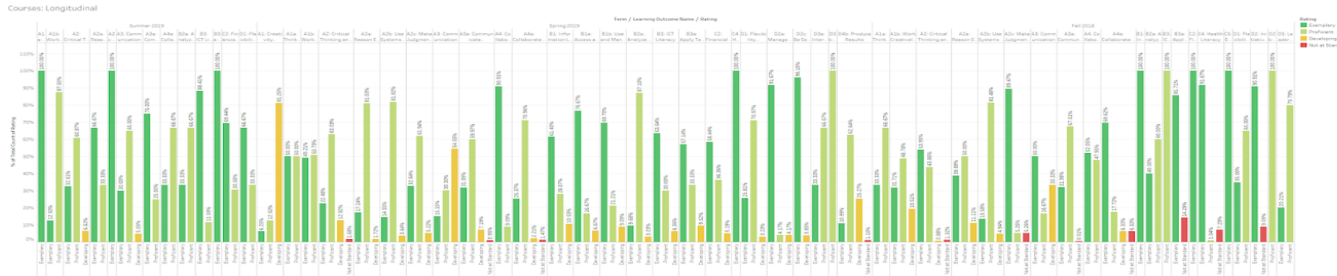


Note. T-skills mapped across multiple courses with frequency count.

The ability to compare skill proficiencies over time is important for gauging whether or not learners are improving in a selected skill because complex skills require multiple exposures and cannot not be expected to be mastered by practicing them once. So, if learners at the beginning of a program were evaluated at a developing level for a skill and by the end of the program in their capstone course were rated at a proficient or exemplary level, then progress had been made on that particular skill development. Figure 4.6 shows t-skills tracked across multiple courses over time.

Figure 4.6

*T-skills Tracked Over Time*



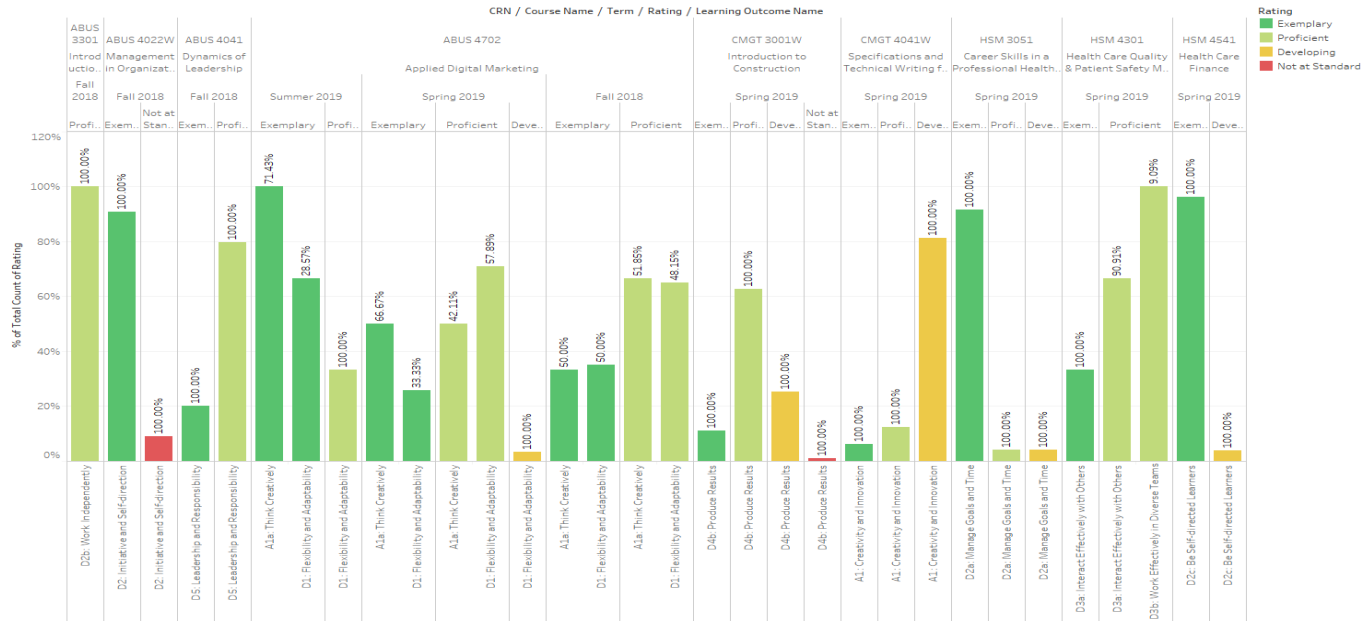
If a program wanted to see where (in which courses) and which assignments a particular skill was fostered, by simply selecting that particular skill and all the programmatic courses in the Tableau filter, the visualization would be able to report on that particular skill, where it was practiced, and what the proficiency ratings are. So if, for example, learners had three opportunities to practice *Initiative and Self-direction* (a sub-skill for leadership) and they were doing poorly, then perhaps they required more practice in that particular skill and this could initiate a redesign to incorporate *Initiative and Self-direction* in other courses or to redesign the activity in which they were doing poorly. In short, these visualizations provided insights into the curriculum that made them actionable. Figure 4.7 isolated a single t-skill: D2: *Initiative and self-direction* which consisted of the subskills: D2a) *Manage goals and time*, D2b) *Work independently*, and D2c) *Be a self-directed learner* as practiced in courses between Fall 2018 and Spring 2019.



Figure 4.7

D2: Initiative and Self-direction

Courses: Longitudinal



Note. D2: Initiative and Self-direction tracked between Fall 2018 and Spring 2019.

Because of the full integration between the LMS and the university's Student Information System (SIS), the learning outcomes data analysis could theoretically even be taken down to the individual student level across any courses a student was taking as long as these were tracking learning outcomes data via digital rubrics. In essence, this portion of the design intervention served as a proof of concept that the tracking of higher-order competencies such as t-skills is indeed possible within the existing university course and semester structure which offers significant advances over traditional competency-based models which dismantle the course and semester structure entirely and thus cause significant disruption to the higher education system. Deploying the learning outcomes feature of the LMS further resolved long-standing LMS / AMS integration issues which had been a hurdle for wider implementation of learning analytics on program-level competencies and t-skills for the college in the past. The ability to track multiple t-skills using the analytics capacity of the learning management system proved effective not only for easing program review but to finally be able to track t-skills across courses and over time.

#### **Design Intervention II: Learners Reflect on Their Developing T-skills**

Because t-skills are complex skills that go beyond the cognitive and reach into the affective and conative domain, and because affective and conative skills are dispositions that can only be inferred from the learning activities and assessments that learners produce and cannot be directly observed by the instructor, we asked learners in all 75 online courses in the sample to complete an ungraded reflection activity called RATE. The RATE implementation spanned five semesters: Summer 2018, Fall 2018, Spring 2019, Summer 2019, Fall 2019 resulting in 3,786 learner reflections across 75 online courses spanning multiple disciplines in the applied and professional studies programs (Applied Business, Construction Management, Health Service Management, Information Technology Infrastructure, Manufacturing Operations Management) and diverse departments across the university (Afro-American and African Studies, Communication Studies, Cultural Studies & Comparative Literature, Economics, English Literature, English Writing, History, Horticulture, Laboratory Pathology, Mathematics, Management, Music, Public Health, Physics, Sociology, and Spanish).

For high-enrolling courses taught in multiple sections each semester, the learner reflections quickly provided large data sets for review. For low-enrolling courses taught in a single section once a year, the learner reflections provided data more slowly. The number of reflections among the courses thus varied with high enrolling courses submitting a correspondingly larger number of reflections.

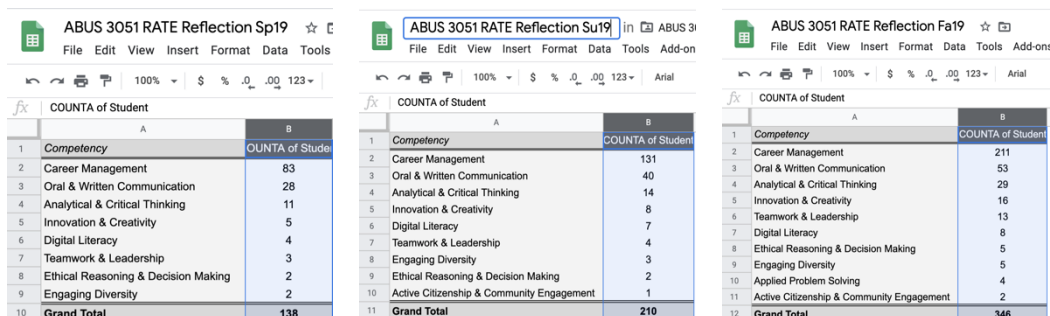
**Learner skill selection.**

As a part of the reflection activity, learners were asked to select one of the following skills as the top skill resulting from the online course they had just completed: *Oral & Written Communication, Analytical & Critical Thinking, Applied Problem Solving, Ethical Reasoning & Decision Making, Innovation & Creativity, Teamwork & Leadership, Engaging Diversity, and Active Citizenship & Community Engagement*. Upon selecting a t-skill, learners were prompted, through an open-ended item, to reflect upon how the learning activities or assessments in the online course they just completed had helped them foster the t-skill they selected.

The first level of analysis of the reflection activity reviewed the learner-selected skills to identify the top skills selected by learners for each of the 75 online courses. These learner-selected skills were then compared against the skills identified in the learning outcomes tables to gauge alignment between the t-skills mapped to a course against those selected by learners. This was accomplished by examining the individual course-level RATE raw data file as pivot tables in Google sheets organized by competency in descending order by student count, see Figure 4.8.

**Figure 4.8**

*Increased Reliability*



*Note.* Learner-selected skills remain the same over three consecutive semesters

Each course learner reflection raw data file was reviewed for accuracy to assure that learners had selected the course they just completed. When learners accidentally had commented on a learning experience other than the course they just completed, the reflection entry was removed before visualizing the data as a pivot table. For courses that were taught across multiple semesters by the same or by different instructors, multiple data sets (pivot tables) were available for the same course. It is important to note that the *same* RATE reflection survey gathered learners' skill selections across all sections of a course. This allowed for comparisons of skill selection for courses taught across multiple semesters by downloading the RATE data file after the semester ended and visualizing the data before it would gather more learner reflections. Figure 5.8 shows three pivot tables for an Applied Business course taught in multiple sections over three semesters in which learners consistently selected Career Management as the top skill fostered as a result of completing the course.

#### **Open-ended learner reflection statements.**

The second analysis focused on the open-ended learner statements from the RATE reflection activity. This analysis used a subset of the 75 courses, namely 27 CLA courses across a large variety of disciplines: African American and African Studies (1), Economics (2), English Literature (6), English Writing (1), History (1), Horticulture (5), Management (1), Marketing (1), Music (2), Physics (2), Sociology (3), and Spanish (2). The 27 CLA courses were selected because CLA used the same skills framework as the CLA generated RATE reflection activity, whereas the CCAPS courses used the P21 t-skills framework. Learner reflections were first sorted by skill selected. This gathered all learner statements for a particular skill, for example creativity and innovation, into a single file for analysis of what helped learners develop that particular skill. The qualitative statements of the 1000 learners in these 27 CLA courses were coded using an open coding protocol. This was accomplished by uploading individually cleaned CLA RATE data files into Dedoose, a qualitative analysis tool, where learner selections were filtered by individual skill, resulting in data outputs that organized learner reflections across all 27 courses in the sample according to skill selection. The learner statements were coded into themes resulting in design principles responsible for fostering t-skills.






## Results










### T-skills Mapped in Outcomes Tables

The mapping of t-skills in outcomes tables for all 75 online courses resulted in *Critical Thinking and Problem Solving* (58/75), and *Communication, and Collaboration* (55/75) as the top two skills mapped across all the courses in the sample (see Table 4.4).

**Table 4.4**

*T-skills Mapped to 75 Undergraduate Online Courses.*

P21 Skill Categories	Skill Badge Image	Skill	# times that skill was mapped in Outcomes Table
A: Learning and Innovation Skill: The 4Cs		A1: Creativity and Innovation	12
		A2: Critical Thinking and Problem Solving	58
		A3: Communication	55
		A4: Collaboration	36
B: Information, Media, and Technology Skills		B1: Information Literacy	13

		B2: Media Literacy	7
		B3: ICT Literacy	23
C: Core Subjects and 21st Century Themes		C1: Global Awareness	5
		C2: Financial, Economic, Business, Entrepreneurial (FEBE) Literacy	5
		C3: Civic Literacy	3
		C4: Health Literacy	6
		C5: Environmental Literacy	6
D: Life and Career Skills		D1: Flexibility and Adaptability	3
		D2: Initiative and self-direction	15



D3: Social and Cross-cultural Skills 10



D4: Productivity and Accountability 7



D5: Leadership and Responsibility 5

That *Critical Thinking and Problem Solving* and *Communications* were the most frequently mapped higher-order skills in undergraduate online courses comes as no surprise given that most courses require learners to demonstrate their understanding through oral and written communication. *Collaboration*, namely the ability to work effectively with others to accomplish a common goal, was mapped to approximately 50 % of the courses (36/75) and rated as the third highest skill. This gives evidence that the collaborative construction of knowledge is something that can be implemented across a wide variety of disciplines though it was not practiced in all courses. *Digital Literacy*, namely *B1: Information* (13/75), *B2: Media* (7/75), and *B3: ICT Literacy* (23/75) when combined rated higher 43/75 than collaboration (36/75) which likely can be attributed to the OES design team's deliberate effort and success to design learning activities and assessments that supported learners in practicing *B1: Information*, *B2: Media*, and *B3 ICT Literacy* when completing course projects. The combined 21st Century Literacies (C1-C5), namely *C1: Global Awareness*, *C2: Financial, Economic, Business, Entrepreneurial (FEBE) Literacy*, *C3: Civic Literacy*, *C4: Health Literacy*, *C5: Environmental Literacy* were mapped to learning activities and assessments in significantly lower numbers (<10/75 for each skill). These literacies were largely fostered through the course content in their respective courses such as *C5: Environmental Literacy* developing as a result of completing a Construction Management course on the topic of Environmental Health Principles, or *C4: Health Literacy* developing as a result of completing a Health Care Delivery Systems course. The important *Life and Career Skills* (D1-D5) namely *D1: Flexibility and Adaptability*

(3/75), D2: *Initiative and Self-direction* (15/75), D3: *Social and Cross-cultural Skills* (10/75), D4: *Productivity and Accountability* (7/75), D5: *Leadership and Responsibility* (5/75) were also mapped to learning activities and assessments in significantly lower numbers (<10/75 for each skill) with the exception of D2: *Initiative and Self-Direction* (15/17) which was a key requirement for successfully bringing self-directed learning activities to completion. *Creativity and Innovation*, a key skill for the creative economy was mapped to courses 12/75 times. Unfortunately, online courses designed by a professional design team trained in designing for active e-learning such as OES with online courses developed without professional design support is not available for comparison in these results. Given that OES worked deliberately to design for active learning, it is plausible that online courses designed without attention to the learning design and without the required media support would result in significantly lower numbers of these skills tracked.

#### **Learner-selected Skills Match Skills Mapped in Outcomes Table**

The first level of analysis of the RATE reflection activity compared the learner-selected skills with those mapped in the outcomes table. This served as a measure to either confirm or disconfirm the skills identified in the outcomes table and formally tracked via the learning management system. Across the 75 online courses in the sample, learners consistently selected the exact t-skills that had been mapped to the learning activities and assessments in the outcomes tables (see Table 4.5) as the top skills gained as a result of completing a course. For example, Figure 4.8 shows that learners selected *Career Management*, *Oral & Written Communication*, *Analytical & Critical Thinking*, and *Innovation & Creativity* as the top four skills for three consecutive semesters as a result of completing an applied business course. The consistency of learner-selected skills across semesters was evident for all courses for which multiple RATE data sets were available adding reliability to the learner-selected skills as those fostered by a given course. This reliability additionally increased whenever a larger number of learner reflections ( $n > 50$ ) were available for a given course. Table 4.5 shows a strong level of consistency between learner-selected skills (in yellow) with those mapped in the outcomes table (black letters). This consistency between learner-selected skills and those mapped in the outcomes table by the design team held true for courses with a frequency count  $n > 50$  learner



reflections as well as for courses with a frequency count  $n < 50$  learner reflections. (see Appendix 4f for more detail).

**Table 4.5**

*Mapped Skills vs. Learner-selected Skills*

Course	# Learner responses	A1	A2	A3	A4	B1	B2	B3	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5
ABUS 35xx	346			A3				B3		C2					D2			
ABUS 40xxW	97	A1	A2	A3			B2				C3					D3		
ECON 11xx	85		A2	A3														
ECON 11xx	132		A2	A3				B3										
ENGL 30xxW	124		A2	A3														
ENGL 30xx	101		A2	A3	A4													
MGMT 30xx	339	A1	A2	A3														
MKTG 30xx	256	A1			A4													
MUS 10xx	618		A2	A3														
SOC 10xx	89		A2	A3					C1									
SOC 37xx	119		A2	A3														

*Note.* Learner selected skills (in yellow), formally tracked t-skills (in black)

### **Learner-selected Skills Remain Consistent across Semesters and Sections**

After reviewing pivot tables of learner-selected skills for all 75 online courses, it became clear that the top skills selected for a given course remained consistent. Not only did the learner-selected skills remain consistent with those mapped in the outcomes table, the top choices of learner-selected skills for a given course remained consistent across multiple semesters, course sections, and instructors. This is a significant finding as it leads one to conclude that *how* a learning activity is taught (the learning design) matters as learners state that they gained skills based on the given learning design. The consistent results between learner-selected skills and those mapped in the outcomes table further point to the value of using indirect measures such as learner reflections with high frequency counts as complementary measures for reporting on t-skills, in particular for skills that remain difficult to evaluate directly via assignment rubrics.

### **Learners Select Additional Skills**

Learners occasionally selected *additional* skills not identified in the outcomes table though at significantly lower numbers. This variability in the selection of *additional* skills could be attributed to the fact that learning activities and assessments, in particular active learning tasks, foster multiple t-skills simultaneously, and that individual learners viewed certain skills as more salient to them than others. In other words, what is deemed important to learners remains to some extent a subjective judgment. As illustrated by this learner who selected digital literacy as the top skill developed as a result of completing his online economics course in which digital literacy was neither mapped in the outcomes table nor received a high frequency count by other learners:

*Before this summer, I had never taken an online class before. At first, it was overwhelming trying to figure out all of the online features and programs including google sheets.*

*By taking this class I developed digital literacy in Google sheets and Canvas. This was not my first class to use these websites, but it was the first where I was required to use them in everyday assignments. Previously I would only use basic features to simply get by, but now I'm more comfortable than ever utilizing them to not only complete assignments but to save time by using more complex features such as formulas and data analysis on google sheets.*

*As the course went on, I became more and more comfortable with the online setting and was less worried about keeping up and not missing deadlines. After taking this class I would say my digital literacy increased and I would be more comfortable learning on different digital platforms. This will give me an edge in a competitive work environment where many online resources are used.*

This learner's choice reminds of the fact that learning, while it can be directed through well-curated disciplinary content and well-designed learning experiences, the relationship building process between what a person already knows based on prior experience (which is unique to each learner) and the new knowledge presented will maintain a level of subjectivity and unpredictability so central to the creative process called learning. Occasionally, however, a large number of learners selected a top skill fostered by a course as evidenced by the top frequency count of a skill that had not been mapped in the outcomes table. This seemed to evidence more than the subjective interpretation of a few learners but points to the course fostering that particular skill through its learning design (see Figure 4.9).

**Figure 4.9**

*Additional Skills Selected by Learners*

	A	B
1	Competency	COUNTA of Student
2	Teamwork & Leadership	64
3	Analytical & Critical Thinking	55
4	Innovation & Creativity	50
5	Oral & Written Communication	20
6	Career Management	17
7	Ethical Reasoning & Decision Making	11
8	Applied Problem Solving	10
9	Digital Literacy	4
10	Engaging Diversity	2
11	<b>Grand Total</b>	<b>233</b>

	A	B
1	Competency	COUNTA of Student
2	Teamwork & Leadership	90
3	Analytical & Critical Thinking	82
4	Innovation & Creativity	67
5	Oral & Written Communication	33
6	Career Management	23
7	Ethical Reasoning & Decision Making	22
8	Applied Problem Solving	11
9	Digital Literacy	7
10	Engaging Diversity	3
11	<b>Grand Total</b>	<b>338</b>

*Note.* Learners selected skills as top skills not mapped in the outcomes table.

For example, 338 learners in a management course over multiple semesters taught by the same instructor selected 1) *Teamwork and Leadership*, 2) *Analytical and Critical Thinking*, 3) *Innovation and Creativity*, and *Oral and Written Communication* as the four predominant t-skills fostered as a result of completing the course. Ninety of 338 learners rated *Teamwork and Leadership* as the top skill fostered by the course (first row of Figure 4.9).. *Teamwork and Leadership*, however, was neither a skill that was articulated as a course-level learning outcome nor was it formally evaluated in an assessment or mapped in

the outcomes table. The consistent selection of *Teamwork and Leadership* by 90 students as the top skill for this course across multiple semesters (see Figure 4.9) could thus most likely be attributed to the learning design of the collaborative course project in which learners collaborated for a sustained amount of time.

Discovering a top learner-selected skill that had not been identified in the outcomes table could thus lead to a discussion whether or not to add this particular skill to the outcomes table and formally track it via the learning management system. (see Table 4.6). The learner input was particularly important for skills that fell in the affective and conative domain because these were not directly observed but rather were practiced as a component of the learning design.

**Table 4.6***RATE Reflection Results Added to Course Outcomes Table*

Canvas Assignments	AL score: 25/36.		Outcomes	RATE	
<b>Learning Activities and Assessments</b>	<b>Individual / Group</b>	<b>% Grade</b>	<b>CO</b>	<b>T- Skills</b>	<b>338 Learner Reflections</b>
<b>Discussion Forums</b> 1, 2, 4, 6, 8, 9, 10, 11 @ 25 pts	Individual	20%	CO2 CO3 CO4	Oral & Written Communication	Teamwork & Leadership (90) Analytical & Critical Thinking (82) Innovation & Creativity (67) Oral & Written Communication (33) Career Management (23) Ethical Reasoning & Decision making (22) Applied Problem Solving (11) Digital Literacy (7) Engaging Diversity (3)
<b>YouConnect</b> YouConnect 3 @ 60 pts YouConnect 5 @ 60 pts YouConnect 7 @ 60 pts YouConnect 13 @ 60 pts <b>YouConnect Final @ 60 pts</b>	Individual	30%	CO1 CO2 CO4	<b>Innovation &amp; Creativity</b>	
<b>Project</b> Project Part 1 @ 60 pts Project Part 2 @ 60 pts Project Part 3 @ 60 pts Project Part 4 @ 60 pts <b>Project Final @ 60 pts</b>	Individual/ Group	30%	CO1 CO2 CO4 CO5	<b>Innovation &amp; Creativity</b>  <b>Oral &amp; Written Communication</b>	

<b>Quizzes</b> 4,6,8,12,13 @ 40 points	Individual	20%	CO3	Analytical & Critical Thinking
<b>Total = 1,000 pts</b>		<b>100%</b>		

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*Note.* Teamwork & Leadership (90) and Analytical & Critical Thinking (82) are the two highest rated skills selected by learners across multiple semesters.

CO1: Assess then create a plan to implement fundamental skills for being an effective manager.

CO2: List then evaluate the strategies managers use to help organizations adapt to global environments while establishing and maintaining ethical and socially responsible policies and practices.

CO3: Discuss the fundamental functions of management (planning, organizing, leading, and controlling) and provide examples.

CO4: Examine ethical and social factors used for making management decisions.

CO5: Demonstrate theoretical application and imaginative inquiry reflection on the course concepts and resources (planning, organizing, leading, and controlling).

### **CLA Learner Reflections by Skill Selection**

The second level of analysis of the RATE reflection sorted learner reflections from a subset of the courses (27 unique CLA courses) across multiple semesters and across multiple sections according to the skills selected by learners (see Table 4.7). What is important to consider in the analysis of learner reflections is the following. *Oral and Written Communication* and *Analytical and Critical Thinking* were once again the two skills that received the highest frequency count by learners which echoes the findings in the course outcomes tables that also mapped these two skills with the highest frequency count. The relatively high count of the skill *Engaging Diversity* by 129 learners, however, requires explanation as it was influenced by a single high enrolling Music course taught in five sections over multiple semesters in which learners discussed the contributions of African-American artists to Rock-n-Roll. Similarly, the relatively high count of the skill *Innovation and Creativity* by 120 learners was influenced by a high enrolling Management course taught in multiple sections over multiple semesters that gave learners creative freedom on how to communicate their understanding. Without these two courses, the skills of *Engaging Diversity* and *Creativity and Innovation* would not have received the high frequency count they enjoyed.



**Table 4.7**

*Frequency Distribution of T-skills Selected by Learners in CLA Courses*

<b>CLA Core Career Competency</b>	<b># Learner Selection</b>
Oral and Written Communication	247
Analytical and Critical Thinking	214
Engaging Diversity	129
Innovation and Creativity	120
Teamwork and Leadership	99
Digital Literacy	62
Ethical Reasoning and Decision Making	48
Applied Problem Solving	47
Career Management	16
Active Citizenship and Community Engagement	15

*Note.* Oral and Written Communication (247) and Analytical and Critical Thinking (214) are skills most frequently selected by learners.

### **Qualitative Analysis of CLA Learner Reflections**

The third and final analysis of the RATE reflection activity coded 1000 of the CLA learner reflections about what had helped them foster the skill that they selected using an open coding protocol thus contributing to the theoretical outcome for this study, namely the design principles responsible for the development of these t-skills in online courses.

#### **Authentic task principles.**

The first set of design principles derived from the coding of learner statements directly reflected the authentic task principles as articulated by Herrington, Reeves, and Oliver, (2010): *real-world relevance, ill-defined problems, sustained investigations, interdisciplinary perspectives, collaboration, reflection, articulation, integrated assessments, multiple interpretations and outcomes, and multiple sources and perspectives* that were first introduced in the chapter 3 design intervention and findings. In their own words, learners stated that learning activities and assessments that followed the principles of: *real-world*

relevance, *ill-defined problems*, *interdisciplinary perspectives*, *collaboration*, *reflection*, *articulation*, *integrated assessments*, *polished products*, *multiple interpretations and outcomes*, and *multiple sources and perspectives* had helped them develop the higher-order skill they selected. Learners further described the learning activities and assessments as *synthesizing activities* integral to helping them engage and grow more interested in the subject matter while also deepening their learning of the disciplinary content. Excerpts of learner reflections below (see Table 4.8) illustrate how reflection statements referenced one or more of the design principles.

Table 4.8

*Learner Reflections Coded for Authentic Task Principles*

<b><i>Principle</i></b>	<b><i>Sample response</i></b>
<b><i>Real-world Relevance.</i></b>	<i>This course had a weekly journal where we had to answer open ended questions. These questions made us connect what we learned with real world situations and how we would solve them. It allowed us to think and fully understand the course concepts while getting a better understanding of how the real world operates with these concepts.</i>
<b><i>Ill-defined Problems.</i></b>	<i>I had to use applied problem solving while coming up with both the topic and the direction of research for my final project. I started with a problem for this final project, which was "what should I choose as my topic?" for every idea that I came across, I had to think about how I could solve my own questions and how I would design my project to fit the guidelines. I needed a strategy that would lay out all of my different alternatives and would create a solid path for me to follow throughout this project.</i>
<b><i>Collaboration.</i></b>	<i>The experience of teamwork and leadership within [Name of Course] was very enjoyable, but also very instructive. With critical thinking assignments, relationships with classmates were strengthened, and the overall understanding of the course material was strengthened.</i>
<b><i>Reflection.</i></b>	<i>The reflection journal exercises helped me to develop oral and written communication skills by expressing what I was learning through writing. These exercises got me thinking more deeply about the class material and it allowed me to communicate my reactions to the material. The written part of communication skills was obviously shown through the learning journal while the oral communication skills were more strongly developed through expressing to friends and family members around me what I have been learning. I think that these prompts and reflection exercises helped me to understand exactly what I should be thinking about to further my learning past the material.</i>
<b><i>Articulation.</i></b>	<i>I was able to develop my own ethical reasoning on many topics, and if I didn't agree I was able to form my own well rounded and supported opinion on why I thought ethically different. Many of the topics were challenging in the sense that there is no exact right answer and there are many sides to the story such as when discussing a health care system for the United States, it's not wrong to not want universal health care to be a right, just the same as it's not wrong to believe that it should be. Everyone is entitled to an opinion, and it was interesting to read something that was opposite to mine. I learned about myself throughout this course, because I was able to form opinions that I didn't know that I felt strongly about such as medicalization, health care reform and other topics we discussed throughout the semester. I cared about those things but I didn't have the facts or knowledge to fully form my own opinion and now I do.</i>
<b><i>Integrated Assessments</i></b>	<i>The project in this course was all essentially applying the concepts learned via the book and additional resources in a real-world application. Using the concepts learned about in the course, we were required to plan out the</i>

ideologies of an organization named "Center for Creativity and Innovation (CCI)" which we were to plan out using the various concepts we've learned about. Using these concepts allowed us to understand what it would be like to apply the concepts of planning, leading, motivating, and controlling in a real-life organization. The CCI had various real-life sponsors who had a wide range of expertise and experience, and whose ideologies we would have to take into account before articulating our plan.

**Polished Products**

This experience of learning new technologies of screen recording, audio recording, and iMovie editing has allowed me to develop new skills in digital literacy. These new skills are an asset to me because it means that I now have more expansive knowledge on various aspects of technology that will benefit the future projects that I will encounter. I now have the skills necessary to produce a digital media project/video without having to develop these abilities on the spot. Also, I now have more patience with technology through this experience, because it was a long process of learning and adapting to new applications and methods of producing a media project. I now know how to use several different tools on my computer for multiple purposes.

**Multiple Interpretations and Outcomes**

Through the discussion board, I was able to understand others' point of views. They would give their opinion as to why they thought a topic was just and fair. Other times I would only look at my perspective and think that was the morally just answer to the question. In this course, however, I was able to engage with other students to respectfully dispute our own reasoning to the beliefs on different topics. This challenged me to always look at both sides to an argument even when I think my answer or belief is correct. I have learned that I can be very open-minded and want others around me to be more open-minded. I feel like those that I am close to have my old way of thinking still in their minds and I want to open their eyes to see that we need to respect one another by looking at all points of view.

**Multiple Sources and Perspectives**

The teamwork activities that were provided by [Name of Course] has allowed me to better understand how important teamwork is when it comes to the workplace. As it has taught me that a better answer is usually devised from multiple perspectives, this course has provided me with an understanding that constructive criticism from your peers is crucial in developing responses. In the future, this will be an incredibly valuable trait to have, as working in an office with a team will always be met with an issue that has to be resolved through including multiple perspectives.

What is important to note regarding the coding of learner reflections into design principles is that learner reflection routinely indicated two, occasionally even three of the design principles as working together to help foster a particular skill. Because reflection statements indicated one, two, or even three design principles in varying combinations, no frequency count for the principles was attempted while coding. Rather, a principle was noted as relevant whenever it was repeatedly mentioned across the 1000 learner reflection statements. For example, the following reflection statement of a learner who selected

*Engaging Diversity* fostered as a result of completing a music course illustrates that multiple design principles: *Collaboration, Reflection, and/or Articulation* contributed to the development of the skill *Engaging Diversity*.

*“During this summer online course in 2019, I practiced "Engaging Diversity" when completing the weekly discussion posts and each of the critical essays. Each piece of writing required me to be culturally aware when reflecting on certain prompts and commenting on people's posts with their own opinions and having appropriate discussions about them.*

*Occasionally, it was difficult at times to respond to a classmate's opinions or thoughts when they contradicted my own opinions or personal beliefs. I had to learn how to share my own perspective without being overbearing or harsh while also making sure that I could explain as to why I didn't agree with their cultural/social thoughts with concrete evidence or examples. I learned that it isn't always the easiest to have a discussion online about serious topics when vocal inflection and body/facial gestures are left out. I also learned that I have more strong values that I had realized in the past when I was reflecting and writing each week about things that I didn't use to think about on a daily basis.*

*Each week, I was required to complete assignments that made me think critically about my own values and cultural and societal opinions within the context of the historical influence of this era of music; this led to self-inquiry and reflection that forced me to become aware of my own uninformed opinions and perpetuated biases. Because of this, I was able to increase my self-awareness and therefore consciously work on my educated opinions and perspectives. Responding to my peers each week provided an opportunity for growth where I could take in new perspectives, respectfully respond to them, and accompany such with my own knowledge and views”.*

Of the authentic task principles, *Interdisciplinary Perspectives* was rarely mentioned other than indirectly in learner reflections about a music course in which learners discussed how race relations, historical contexts, and social climate contextualized the development of Rock-N-Roll. These interdisciplinary perspectives helped learners understand how historical and political issues and events made it into the songs themselves and as such, that these songs were records of history. Or alternatively, how learning and discussing history and social structures in a sociology course helped contextualize the development of theories. The scarcity of interdisciplinary perspectives, however, points to the fact that higher education follows a tight disciplinary knowledge structure and consequently encourages fewer relationships to interdisciplinary perspectives.

It is further necessary to clarify that the authentic task principles *Sustained Investigations and Integrated Assessment* were rarely directly mentioned in the learner reflections about their skill development. Both design principles nevertheless applied. Instead of being mentioned in learner reflection

statements, the authentic task principles *Sustained Investigations and Integrated Assessment* were consistently evident in the course outcomes tables which mapped the learning activities and assessments as integral to the learning outcomes of the course and which displayed the purposefully designed scaffolds that guided learners through course projects for a sustained amount of time, usually over multiple modules / weeks (see Figure 4.10).

That a learning design that aims to maximize learner agency, creativity, and open inquiry requires careful scaffolds is an important clarification required for critics of constructivist learning methods who assume that constructivist inquiry is entirely open-ended and non-directed. Learning as an active and constructive process does not at all imply that students' construction of their knowledge should not be guided and mediated through appropriate modeling, coaching, and scaffolding by teachers, peers, and educational media (Collins, Brown, and Newman, 1989). Figure 4.10 provides an example of a sustained investigation that maximized learner agency and creativity through carefully designed scaffolds. The learners in the case of the film project were working independently, collaborative, and creatively. The scaffolds were to structure the learners' independent, break a semester-long task into smaller deliverables, serve as a check-in with the instructor, and provide opportunities to receive formative feedback. The degree to which a project is scaffolded depends upon the maturity of the learners to work independently. A PhD student can be tasked with driving her own inquiry with little guidance from an advisor. A freshman student on the other hand would require a more structured and carefully guided inquiry to successfully execute a research project independently.

Figure 4.10

*A 12-week Sustained Investigation*

Film Project		24% of Total	+	⋮
⋮	<b>Choose Your Film/TV Project Group</b> Module 1: Introduction to the Course Module   Due Jan 27 at 11:55pm   5 pts	✓	⋮	
⋮	<b>Film Project Group Charter</b> Module 2: The Damsel in the Castle; Mad Scientists in the Lab Module   Due Feb 3 at 11:55pm   10 pts	✓	⋮	
⋮	<b>Film Project YouTube Greeting</b> Module 2: The Damsel in the Castle; Mad Scientists in the Lab Module   Due Feb 3 at 11:55pm   5 pts	✓	⋮	
⋮	<b>Film Analysis Worksheet</b> Module 3: Monsters from the Workshop Module   Due Feb 10 at 11:55pm   20 pts	✓	⋮	
⋮	<b>Film Project Academic Source Analysis</b> Module 4: Faeries & Other Forest Dwellers Module   Due Feb 17 at 11:55pm   20 pts	✓	⋮	
⋮	<b>Film Project Progress Report</b> Module 8: The Rebel & The System Module   Due Mar 17 at 11:55pm   10 pts	✓	⋮	
⋮	<b>Film Project Practice Presentation</b> Module 8: The Rebel & The System Module   Due Mar 17 at 11:55pm   10 pts	✓	⋮	
⋮	<b>Film Project Presentation Outline</b> Module 10: Outlaws in Kingdom & Countryside Module   Due Apr 7 at 11:55pm   20 pts	✓	⋮	
⋮	<b>Film Project Presentation</b> Module 11: Wizarding School: Lessons from the Dragon's Lair Module   Due Apr 14 at 11:55pm   115 pts	✓	⋮	
⋮	<b>Film Project Critical Feedback</b> Module 12: Souls in the (Media) Machine; Cowboys and Casters in Cyberspace Module   Due Apr 21 at 11:55pm   25 pts	✓	⋮	
⋮	<b>Film Project Group Evaluation</b> Module 12: Souls in the (Media) Machine; Cowboys and Casters in Cyberspace Module   Due Apr 21 at 11:55pm   10 pts	✓	⋮	

*Note.* Scaffolds in an English Literature course for a film project spanning 12 modules.

### **Learner-centered principles.**

The second set of principles that emerged from the coding of learner reflections were learner-centered principles. In their reflections about what had helped them foster the t-skill they selected, learners described being given the freedom to make decisions over the execution of their assignments (*learner choice*), being able to relate the course content to their own lives (*learner-relevant*) and to their lived experience (*learner socially-culturally connected*), being invited to take position on a subject matter and express their personal views (*learner self-expression*), being given the freedom to experiment and be creative in the way that the assignment was to be completed (*learner creativity*), *an finally being able to work on something that they personally cared or were passionate about (learner values)* as helping them develop the t-skill they selected and deepen their understanding of the subject matter to be learned.

Learners further expressed that they gained enjoyment from completing academic work that followed these learner-centered principles (see Table 4.9).

**Table 4.9**

*Learner Reflections Coded for Learner-centered Principles*

<b><i>Principle</i></b>	<b><i>Sample response</i></b>
<b><i>Learner Relevant.</i></b>	<i>I was able to generate new, varied, and unique ideas through the coursework. I was able to be original and personal when completing the coursework as it was personal to me. I learned more about the coursework because I could connect it to my life.</i>
<b><i>Learner Choice.</i></b>	<i>Through open ended projects I was able to express my creativity and innovation skills in relation to managing a business.</i>
<b><i>Learner Self-expression.</i></b>	<i>We were given the freedom to create something on our own and were encouraged to not only be ourselves but present it creativity. For me this was exciting and made doing the work more interesting. Instead of writing a paper or creating a boring PowerPoint, we were encouraged to be innovative, something a lot of other teachers don't allow for. I loved how I can show my personality through these projects. For my most recent one I wanted to be even more outside the box and myself so I included relevant pictures and made it more fun. I appreciated how he taught us about creativity in the workplace and how our generation feels disconnected to their work because they aren't able to be themselves and did more with it. Instead of just saying these facts he implemented what managers should do to create more engagement.</i>
<b><i>Learner Creativity.</i></b>	<i>Throughout the entire semester we were really pushed to come up with unique perspectives and ideas. Specifically, on the YouConnect assignments and the ongoing project. We had to adapt the ideas that we learned from the textbook and the resources and apply them to a creative assignment. It really made you think, especially the semester long project. We had to imagine that we were the directors of an organization and we had to apply what we learned to this organization. It was quite fun and engaging.</i>
<b><i>Learner Socially-culturally Connected.</i></b>	<i>This class has helped me understand that the best way to learn or engage with diversity is to hear about experiences of people first hand, rather than from a textbook or website. Listening to the community and their needs first will be a top priority for me going forward in the public service industry. In my future work, I hope that I am able to engage with the public and develop my listening skills so that I can better serve my community.</i>

### **Design Principles that Foster T-skills**

Both sets of principles, the learner-centered principles as well as the authentic task principles *together* contributed to helping learners develop higher-order skills. The synergies between the principles, is worth pointing out. When learners are given some degree of choice over the execution of their



assignments (*Learner-Choice*), this increases the likelihood that they will select something that is relevant to them (Learner-Relevant) or they care about (Learner-Values) and thus will produce something uniquely theirs (Multiple Interpretations and Outcomes). The learner-centered principles, however, added more than choice. Learners expressed receiving enjoyment from learning activities and assessments that followed these learner-centered principles. Learners stated that they had *fun* completing these tasks and that they enjoyed being able to contribute to the knowledge building process, that they enjoyed expressing themselves. As such, the learner-centered principles are important for engaging online learners which is arguable one of the biggest challenges in asynchronous delivery.

In regard to the types of activities and assessments that yielded t-skills, the vast majority of activity and assessments to which t-skills were mapped fell into the category of collaborative inquiry and project-based learning activities as evidenced in the outcomes result report assessment title: *Final Project, Final Presentation, Final Report, Final Case Study, Research Paper, Research Report, Group Presentation, Team Project, Course Project, etc.* requiring sustained investigations into the subject matter of the course as integrated assessments. These authentic assignments routinely spanned multiple modules (weeks) of the semester and required careful scaffolding to support their development.

What is important to note in the analysis of the relationships between design principles and skill development is the fact that design principles did not present a linear one-to-one relationship to skill development but rather multiple design principles in different combinations contributed to fostering a particular higher-order skill. Learners reflected that the design principle of *Collaboration* supported their development of *Teamwork & Leadership* skills, but learners also reflected that the combined principles of *Collaboration, Reflection and Articulation* supported their development of *Analytical and Critical Thinking* skills or their understanding of diverse opinions and their *Engaging Diversity* skills.

Table 4.10 and Table 4.11 indicate all the principles that contributed to the development of a particular skill (marked by X) per learner reflection statements. Note for example, that multiple learner-centered principles: *Learner-agency, Learner-choice, Learner-relevant, Learner self-expression, and Learner creativity* were mentioned as relevant to helping learners develop their *Innovation and Creativity*

skills, see Table 4.11. Moreover, nearly all authentic tasks and learner-centered principles were mentioned as contributing to learners *Analytical and Critical Thinking* skills, see Table 4.10 and Table 4.11. Thus, the design principles can be understood as generators of engagement and meaning making that when combined can support the development of multiple higher-order skills.

**Table 4.10***Authentic Task Principles Contribute to T-skill Development*

	Real-world Relevance	Ill- Defined	Sustained Investigations	Inter- Disciplinary Perspectives	Collaboration	Reflection	Articulation	Integrated Assessments	Polished Product	Multiple Interpretations & Outcomes	Multiple Sources and Perspectives
Oral & Written communication	x			x	x	x	x		x		x
Analytical and Critical Thinking	x			x	x	x	x			x	x
Engaging Diversity	x			x	x	x	x				x
Innovation & Creativity		x	x		x			x	x	x	x
Teamwork & Leadership		x	x		x		x		x		x
Digital Literacy					x	x	x		x		x

Ethical Reasoning & Decision Making	x	x	x	x	x	x
Applied Problem Solving	x		x			x
Career Management	x					
Active Citizenship & Community Engagement		x	x	x	x	

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*Note.* Collaboration contributed to the development of nearly all skills

**Table 4.11***Learner-centered Principles Contribute to T-skill Development*

	Learner Relevant	Learner Choice	Learner Self-expression	Learner Creativity	Learner Socially-Culturally Connected	Learner Values	Technology-mediated Learning
Oral & Written Communication			x	x			x
Analytical and Critical Thinking	x		x	x	x		
Engaging Diversity	x		x		x		
Innovation & Creativity	x	x	x	x			
Teamwork & Leadership							
Digital Literacy		x	x				x

Ethical Reasoning &  
Decision Making

x

Applied Problem  
Solving

Career Management

x

Active Citizenship &  
Community Engagement

x

x

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*Note.* Multiple learner-centered principles contributed to the development of Innovation and Creativity.

## Discussion

### Practical Findings

The first research question asked, to what extent the intervention - a new outcomes table - could aid in tracking transdisciplinary skills in the design of online courses? While it was not an easy task to make these elusive skills visible, the design intervention - a new outcomes table - helped map t-skills to learning activities and assessments that fostered them. This mapping, however, was only made possible by expanding the focus beyond the disciplinary course outcomes and onto the learning design. Only by placing the design focus directly onto the learning activities and assessments that learners would engage in, was it possible to map multiple levels of outcomes, including the elusive t-skills. By focusing on the learning activities and assessments namely *how* learners were taught in addition to *what* was being taught, these elusive skills could be tracked. This yields significant practical applications for the field of instructional design which traditionally educates designers to apply the backwards design method to primarily design towards declared course-level outcomes (the disciplinary content). It encourages designers to expand their focus to consider the learning experience, namely *how* learners are to build the relationships to what is being learned. By applying evidence-based principles (the principles of authentic e-learning as well as the learner-centered design principles), not only were relationships to the disciplinary content deepened but additional higher-order skills fostered along the way.

The resulting design principles also yield important practical applications for educators tasked with the assessment of educational outcomes such as curriculum mapping and program review which are arduous tasks for assessment professionals. As a practical tool, the outcomes table can be used as a design document when designing online courses in preparation and for automating the data gathering process through the learning management system. But even if learning analytics through the learning management system were not the goal, having faculty complete such an outcomes table could reveal to them the hidden treasures that their curriculum yields in regard to program-level competencies and t-skills fostered by the learning design. The outcomes table also proves helpful during a course review to assure the alignment between the stated learning goals and the learning

activities and assessments that deliver on them. The mapping of skills to learning tasks would further help validate active learning methods as those that meet multiple levels of course outcomes while simultaneously fostering higher-order skills.

An immediate practical finding of this design intervention was that transdisciplinary skills can reliably be mapped to learning activities and assessments; they can even be tracked via the LMS to yield meaningful analytics about the type of learning activities and assessments that foster them (see Figures 4.3-4.7). After multiple iterations refining the course outcomes table, mapping t-skills to learning activities and assessments, and building digital rubrics that would assess them, the learning management system yielded results. The first learning analytics resulting from the Canvas outcomes results reports spanned four semesters. As courses continue to be taught and assignments continue to be graded using the digital rubrics to which outcomes have been attached, entire programs could potentially be reviewed for program-level competencies, as well as t-skills. Two programs at the College of Continuing and Professional Studies (CCAPS) used the outcomes tables to map their program-level competencies which helped the Construction Management (CMGT) program achieve its ABET accreditation and helped the Health Service Management (HSM) degree identify programmatic gaps which then could be remediated through redesign. As such, the design intervention resulted in a highly practical output, namely, to use the course outcomes tables to assist in program mapping, program review, as well as for tracking t-skills.

This design intervention further showed that indirect measures (learner reflections) and direct measures (learning activities and assessments graded by instructors) complement each other when reporting on complex skills that reach beyond what can be directly observed or assessed. The importance of complementing direct measures of learning (learning outcomes results reports resulting in learning analytics) with indirect measures (learner reflections) is particularly important for programs that have as their focus the achievement of human-centered skills such D3: Social and Cross-cultural Skills or D5: Leadership and Responsibility as these skills remain impossible to directly observe.



### **Theoretical Findings**

The second research question asked what principles guide the learning activities and assessments that foster t-skills. The theoretical findings of this design intervention validated the authentic task principles as articulated by Herrington, Reeves, and Oliver (2010) as responsible for deepening learners' understanding of disciplinary outcomes while also fostering t-skills. The theoretical findings further identified learner-centered design principles as relevant for motivating learners, for creating engagement, and for creating enjoyment in the academic tasks. Learner reflections further highlighted that learning activities and assessments that followed these design principles benefitted their learning in a variety of ways. It deepened their understanding by allowing learners to build relationships between the subject matter to be learned and the real-world. It allowed them insights into a complexity perspective where there is not right answer but rather a continuum of perspectives by exploring a subject matter collaboratively with their peers. While each principle had its own merit or value for learning, more often than not, the principles appeared in varying combinations and revealed their synergistic relationship. In particular, sophisticated cognitive skills such as critical thinking, applied problem solving, and sophisticated affective and conative skills such as leadership, cultural literacy, and initiative and self-direction were the result of multiple skills working together to affect the learning gains of these skills.

The authentic task principles clearly affirmed the constructive, situated, self-regulated, and collaborative nature of learning tasks as valid for fostering these higher order skills. The learner-centered design principles, however, extend situated cognition to the subjective realm of the learner's interests, passions, emotions, values, and lived experience by encouraging self-examination, self-expression, choice, and knowledge building (Scardamalia, 2006). As such, the learner-centered design principles expanded the definition of authentic as bi-directional: connecting academic knowledge to the real-world context external to the learner on the one hand, and connecting academic knowledge to the internal, personal, and subjective context that each learner brings to the learning scenario.

To build the maximum number of relationships between academic content and these dual contexts, both, the authentic task principles and the learner-centered principles, are relevant to building these relationships. Together, both sets of principles support the active engagement of learners. Both sets of

principles further serve as a heuristic for the active (constructive, self-regulated, situated, and collaborative) process called learning. Both guided the design of active learning experiences that fostered higher order skills. The consistency of findings between skills mapped to learning tasks in the outcomes tables and skills selected by learners in the reflection activity combined with the design principles resulting from the learner reflections supports the conclusion that learning tasks that followed the design principles of active learning (authentic task principles plus learner-centered principles) delivered on these skills. The combined takeaways propose a paradigm shift in instructional design practice that places the learner at the center of design considerations. The shift proposed is one that moves from instruction to learning. Perhaps in time, the field of *instructional design* will rename itself to *learning design* or to *learning experience design*. Many former Centers for Teaching and Learning have already undergone a name change to Center for Learning and Teaching to emphasize that the science of learning is pointing to the importance of designing experiences.

The shift in focus to learning experience design as the findings of this study suggest can not only increase learner engagement and deepen learning, it can also help foster the important higher-order t-skills beyond disciplinary expertise. The design intervention - an outcomes table organized around the learning activities and assessments that learners engage in - made complex skills which were previously hidden not only visible but trackable via the learning management system. Moreover, this design intervention leveraged learning outcomes analytics as a tool to track these higher order skills in online courses. When combined with a qualitative analysis as was attempted through the learner reflections, these outcome analytics can provide further insights into the pedagogical principles that guide the learning design. Last, this study applied design-based research as a powerful method for integrating theory into practice by revealing the principles underlying the learning design and by developing a process by which these principles could become operationalized in the daily work of practitioners. The resulting outcomes mapping process organized around what the learner does combined with the analytics capability of the learning management system finally allowed these elusive t-skills to become visible in the design of online courses.

## CHAPTER 5: SUMMARY AND CONCLUSIONS

*“Experiential learning is life’s most sophisticated engine for personalized education”*  
Aoun, 2017

This design-based research (DBR) study was designed to address a research-practice gap between what is known about learning grounded in educational research and what is normally practiced in the online classroom. Its local goal was to increase active learning in the online courses at the College for Continuing and Professional Studies. Its larger goal was to define active learning for online courses in general so that it might improve the learner experience for online audiences in general. To examine the research-practice gap required conceptualizing learning from multiple perspectives as the learning sciences have and arriving at a transdisciplinary definition to describe the complex nature of learning. It required recognizing that learning in its complexity cannot be discussed without integrating scientific findings from multiple research fields leading to the transdisciplinary conceptual framework for this study. Thus, active learning, while not a new topic, is critical in online learning through its connection to the development of transdisciplinary-skills (t-skills) necessary for students’ future success. Developing these t-skills for UMN undergraduates, but more largely for the increasing number of learners taking online courses, provided the rationale to make defining active learning in online courses through design principles an important goal.

**Summary of the Project**

This DBR set as its first goal to define active learning in online courses through evidence-based principles. By incorporating the principles of authentic e-learning (Herrington et al., 2010) in its online course review and by evaluating the learning activities and assessments that learners engaged in against these principles, 75 undergraduate online courses were reviewed for active learning resulting in an active learning AL score for each course. Asking the learners of these 75 online courses what made learning meaningful and authentic served as a feedback loop for the course review. In other words, the research methods of reviewing courses against evidence-based principles needed additional input. The learners’ feedback provided further insights if indeed these evidence-based principles had helped learners engage and deepen their understanding. With overwhelming consistency, learners affirmed in their qualitative

statements that the principles that were used to review online courses for active learning were the principles that created engagement for them and that deepened their learning by helping them build relationships to the academic content.

This design-based research study set as its second goal to track transdisciplinary skills (t-skills), because the literature had connected the development of t-skills with active learning methods. This proved challenging as these skills were not derived exclusively by *what* was being taught (the subject matter) but by *how* the subject matter was taught. It further proved challenging because t-skills by their very nature are complex and span the cognitive, affective, and conative domains which meant that important components of these skills in the affective and conative domains were difficult to measure directly. Tracking these skills started with reviewing the literature of available t-skill frameworks and identifying a framework that was suitably aligned to the University of Minnesota Student Learning and Student Development outcomes. Its local goal was to advance undergraduate learning outcomes assessment for the CCAPS; its larger goal was to grapple with the challenge of making these elusive skills more tangible and visible. By revising the learning outcomes table so that its organization focused on the learning activities and assessments that learners engaged in (not on the course outcomes as it was customary), multiple levels of outcomes could be mapped simultaneously. The final iteration of the outcomes table additionally served as a road map to automate the tracking of t-skills via the learning management system.

Similar to the course review needing a feedback loop, so did the outcomes mapping process. Asking learners to reflect on their developing t-skills served as a feedback loop to the mapping that had been completed by the design team. The learners' feedback was particularly important for those skills that fell in the affective and conative domain and provided further insights into what helped learners develop these skills.

### **Connecting the Two Design Interventions**

A new course review aided in reviewing learning activities and assessments in online courses against the principles of authentic e-learning. When learners of these courses were surveyed, their statements validated these principles as helping them learn. A new outcomes mapping process furthermore mapped t-skills to these same learning activities and assessments. When learners in these courses engaged

in a reflection activity about what helped them develop the skill they selected, their statements again validated the principles of authentic e-learning (Herrington et al, 2010) as helping them develop the skill they selected and as making learning engaging and meaningful to them. The mediating processes of both design interventions were learning tasks that followed the principles of authentic e-learning. The principles of authentic e-learning were validated not once but twice; once as responsible for deepening engagement and understanding, and a second time as responsible for helping learners develop these elusive but important t-skills. Active learning – as defined through evidence-based principles such as the principles of authentic e-learning helped learners engage, helped learners build relationships to the content being learned and create meaning, and helped foster the important but elusive transdisciplinary skills. You might say that science validated itself because scientific literature had connected active learning precisely with engagement, with deepening understanding, and with the development of these important t-skills. So, when evidence-based principles were applied to review learning activities and assessments against these principles and learners were asked for their feedback on these learning activities, learners confirmed these evidence-based principles on both occasions.

In addition to the application of the authentic e-learning principles (Herrington, et al., 2010), another set of principles, the learner-centered principles, emerged from the coding of both the learner surveys in chapter 3 and the learner reflections in chapter 4. These learner-centered principles pointed to the learners' subjective experience: personal interests, passions, values, etc. as relevant to the subject matter. These additional learner-centered principles, which were identified by learners in two separate contexts (the learner survey and the learner reflection activity) are an important finding that adds to the theoretical output of this study.

### **Practical Outputs**

#### **Course review.**

A design study sets as its goal to solve a local problem. The practical output from the revised course review demonstrated that it was possible to quantify the level of active learning in a course. This is important as it implies that it is possible to raise the quality of online courses in regard to evidence-based principles and to identify courses that truly lack in engagement and interaction. CCAPS courses that fell in

the low active learning range (AL 0-14) were scheduled for a redesign with the course review providing guidance in upcoming design meetings on the need to increase active learning. The feedback from learner surveys offered further insights into what specifically helped learners engage and deepen their online learning experience. The learner feedback also informed if a particular problem needed to be addressed as some learner statements evidenced the need to better support online collaboration or technology use. Over the three-year duration of this study, the AL course review and design services were extended to the majority of undergraduate courses at the college including courses in blended and face-to-face delivery because the review of the learning design provided valuable, pedagogical guidance for these courses as well. As such this study reached its first goal, namely to advance active learning for one college.

The potential for wider application, however, is dependent on institutional readiness to create this type of a feedback loop for its online courses. With courses rushing to go online in response to the Covid-19 outbreak, now is not the time because of the time intensive nature of redesigning a curriculum for active learning. But perhaps in time, once the majority of courses have been moved online, the attention will turn to the need to professionally and creatively redesign the online learning experience. What is both positive and practical about the nature of online courses is that the pedagogical approach remains *structured and visible* in the learning environment and as such, an online course can be reviewed and revised at any time. Being able to conduct a course review that can quantify active learning via an active learning score will be useful when the time comes that active learning gets its overdue attention.

What the course examples in this design-based research study have shown is that a shift of focus from content coverage to learner interaction is possible without distracting from disciplinary goals. The important role that active learning holds within disciplinary instruction is to engage, to motivate, to allow the learner to bring herself. After all, little learning takes place without the learner's engagement. Just as online courses today need to demonstrate *regular and substantive interaction* between instructor and student in order to qualify for financial aid, perhaps a minimum degree of active learning will be required in the future as a standard of online quality.

**Outcomes tracking.**

A second practical output is the learning analytics generated by the outcomes tracking process through the learning management system. The mapping of t-skills to the learning activities and assessments in online courses provided rich data on the skills that a particular learning design fostered, in particular when the skills mapped to a course were validated by a growing number of learner reflections (see Table 4.6). The outcomes mapping process also met programmatic goals for the college. One CCAPS program used the outcomes / analytics process to reach accreditation; another program used the outcomes mapping process to conduct a program review, identified programmatic gaps, and scheduled courses to be redesigned to address these gaps.

Because of its practical value to be able to report on program-level outcomes for individual courses, groups of courses, and entire programs, the college adopted the outcomes tracking process via the learning management system beyond the length of this study for ongoing data visualization on programmatic skills. The tracking of t-skills, however, ended with the conclusion of this study since the university at large changed its assessment focus from trying to capture student learning and development outcomes to capturing program-level outcomes as these are more salient for academic programs to track while also directly aligning to university-level goals. In fact, tracking learning outcomes directly through the learning management system by attaching program-level outcomes to the digital assignment rubrics eliminates the need to also attach t-skills, as these can be inferred from the program-level outcomes. Focusing on assessing program-level outcomes furthermore eliminates the natural redundancies that exist between these two levels of outcomes. Despite the discontinuation of tracking t-skills, this study provided a proof-of-concept that a competency-based education model is possible, even within a traditional higher education semester organization. The process of tracking t-skills could of course be improved by creating a rubric that better defined the level of granularity (sub-skills) so that the mapping of t-skills to learning activities could become more consistent. The findings further point to additional research being needed into which design principles contribute to which t-skill so that particular skills could be designed for deliberately.

### **Structural Change**

Each of the design interventions required a structural change in order to shift the focus of the learning design beyond the disciplinary content and to make the learner central to the learning design. In the course review, this structural change was the redesign of design standards to incorporate evidence-based principles (see [Appendix 3c](#)). In the outcomes mapping effort, this structural change was the redesign of the outcomes table to focus the learning design on the learning activities and assessments that learners engaged in (see Appendix 4d). This points to an important insight into why practices often persist despite scientific knowledge providing empirical evidence of the value to change these practices. The world is full of these structural *roadblocks* to change in the form of products, processes, even policies. For practice to come into closer alignment with theory required a redesign of these process structures (course review and learning outcomes table)

### **Theoretical Outputs**

#### **The importance of learning experience design.**

When a course engaged learners in meaningful collaborative activities to accomplish academic goals (in physics, math, or English literature, etc.), learners stated that they learned their subject matter better *and* that they developed collaboration skills. This meant that the learning design of courses matters as well as the curricular subject matter. For example, learners selected *Creativity and Innovation* in courses not because creativity was the subject matter but because the learning activities and assessments encouraged learners to express themselves and because learners were given choices and some degree of creative freedom in how to complete their assignments. Of the 124 learners who selected *Creativity and Innovation* as a skill fostered by the online course they completed, the majority attributed the development of this skill based on *how* the activities were designed. *How* we teach has the opportunity to teach additional skills while also deepening the learning of *what* we teach. In other words, a course with multiple articles on the topic of creativity only covers the cognitive domain. Giving learners the freedom to follow their interests and passion (which taps into their affective domain) and charging them with creatively bringing a course project to completion (which taps into their conative domain) contributes to the development of these skills.



That the *learning design* was responsible for engaging learners, for deepening their understanding, and for fostering additional t-skills was evidenced by the *consistency* of learner responses across multiple sections of a course and over time (see. Figure 4.8). The best example of this important finding can be illustrated at the example of a popular music course taught in up to five sections by five different instructors every semester from Spring 2018 - Fall 2019 resulting in learner reflections selecting *the same skills* and commenting on the *same principles* of design. The consistency of learner responses adds reliability to the finding that the learning design, *how something is taught*, is responsible for deepening engagement and for the development of t-skills. This finding should become more widely known as it would make the redesign for active learning a worthwhile pursuit. Because once a well-designed course enacts active learning, it can continue to foster engagement and skills for the duration of its offering.

**Personalize the learning experience.**

The theoretical findings of each design interventions, namely that the learner-centered principles had near equal weight to the authentic-task principles, expand the definition of *authentic*. The implication of these findings for the field of instructional design are to *personalize* the learning experience for learners. Personalized learning up until now has meant personalizing the *learning path* and the *learning pace* for learners. This is traditionally accomplished through adaptive learning software which are highly process-oriented and are grounded in process-oriented pedagogies dating back to the 1970s. The findings of this study *redefine* personalizing the curriculum through a *learner-centered* approach that validates the subjective learning experience and stresses the importance of learning activities and assessments that integrate the learners' subjective experience. It further stresses the importance of designing learning experiences that address the affective and conative domain in order to foster complex skills. The study's findings point to the importance of learner's interests and emotions as a powerful means to engage learners and to deepen disciplinary knowledge. Finally, to elevate the important but elusive t-skills to more visibility, instructional design practices could articulate learning outcomes for these elusive skills to bring them to the awareness of instructors and learners alike.

### **The importance of creativity.**

In the coming years, the most important work that human beings perform will be creative work (Aoun, 2017). This has important implications for higher education and for instructional designers to design learning experiences that foster creativity. The principles that learners identified as promoting their own creativity were: *Ill-defined, Sustained Investigations, Collaboration, Integrated Assessments, Polished Products, Multiple Interpretations and Outcomes, Multiple Sources and Perspectives, Learner-Relevant, Learner-Choice, Learner-Self-Expression, and Learner-Creativity*. These principles sound like they apply to any project that needs to be viable in the real world as these principles acknowledge both the complexity of life and the subjectivity of the lived experience.

But creativity is not only required of learners. In order to design online courses that reorganize the curriculum into one significant learning experience for the learner will require creativity of instructors and designers alike. The high active learning examples in this study required the creative use of technology and required creative thinking to design narratives or use cases that would teach the disciplinary outcomes while also creating learner-centered experiences. Over the decades, the use of instructional technology has progressed through many stages, from instructional technology as media, to instructional technology as process, to the advancement of constructivist methods. The new era of technology will require the use of *technology as a creative tool* which is both daunting but also exciting.

### **The importance of transdisciplinarity and t-skills.**

This study synthesized what was known about the nature of learning from multiple theories into a transdisciplinary framework that included learning beyond the cognitive domain to incorporate the affective and conative domains. The attempted transdisciplinary definition of learning acknowledged the learning sciences perspective but also broadened situativity to include the learner's interests, views, values, socio-cultural connections, and lived experience. As such, this study expanded the meaning of situated cognition which until now focused exclusively on the contexts external to the learner to the personal and subjective domain internal to the learner.

This study tracked important t-skills through the learning management system. This allowed these elusive skills to become visibly connected to active learning methods which confirmed literature that active learning methods foster transdisciplinary skills. It further provided a proof-of-concept that tracking t-skills, while complex, is achievable and that if the university were challenged to answer the question *If Skills are the New Canon, Are College Teaching Them* (Berret, 2016), the answer now is that it is possible.

T-skills, which draw upon the affective and conative domain, further emphasized that t-skills are profoundly human skills: “What is at stake is not just employability skills and success in the knowledge economy. What is at stake is holding on to what makes us human” (McAfee & Brynjolfsson, 2014). Because as we have entered into the Second Machine Age of growing automation, digitization, and artificial intelligence, creativity, inquiry, agency, emotional intelligence, and self-regulation may remain the only attributes that distinguish us from the machine. As educators and designers of learning, we would do well to nurture these attributes every chance we can.

#### **An appeal to end binary arguments.**

A complexity perspective as this transdisciplinary conceptual framework assumed does not seek to advance binary arguments that reduce or polarize scientific findings. Instead, this study aimed to connect, bridge, and integrate opposing views. Through its design interventions, this study aimed to reconnect what in reality are interrelated and complementary perspectives, Learning Sciences (LS) and Instructional Systems Design (ISD) by integrating learning sciences research into the instructional design process. It further bridged an even longer standing dichotomy between constructivism and direct instruction (DI) perspectives on teaching and learning. To claim the value of one does not have to dismantle the value of the other (Tobias, & Duffy, 2009). “Learning as an active and constructive process does not at all imply that students’ construction of their knowledge should not be guided and mediated through appropriate modeling, coaching, and scaffolding by teachers, peers, and educational media” (Collins et al., 1989). Binary arguments in the education literature, namely that one method is superior over the other, miss the point, as the question is not whether or not constructivism is a valid method that enables learning, but where and how the situated perspective can be incorporated meaningfully within an instructional scenario to deepen learning. This study integrated constructivist methods into formal instruction declaring that it is

not *whether* or not the situated perspective is valid but *where and how* it benefits instruction. This adds to an ongoing conversation - or argument - between instructivist and constructivist pedagogical models, not to end the conversation but to oppose an artificial binary in exchange for one that considers both. The new approach carefully considers the disciplinary instructional goals a course sets out to teach - *what* is being taught - as the jumping board for design considerations but then designs beyond the content (Hokanson, 2014) to consider the learning experience - *how something* is taught - and *who* is being taught - so that the learning design can deliver on both: active learning methods that delivery on instructional outcomes, that create engagement, and that foster higher-order skills and dispositions for the learner. It is not a question of active learning versus instruction; both are necessary. It is a question of *where* in the curriculum active learning fits. Through the systematic review of learning activities and assessments in online courses for active learning and through the systematic mapping of t-skills to the same learning activities and assessments, this study concludes that design principles are well suited to define active e-learning or to guide the design of e-learning activities and assessments that meet higher-order skills.

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## Course Review Standards AY 16-17

## COLLEGE OF CONTINUING EDUCATION

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## UNIVERSITY OF MINNESOTA

### *Statement of Purpose*

To insure the best possible outcomes for College of Continuing Education students, online and hybrid courses are evaluated against a set of learning design standards, composed of

- the nationally recognized Quality Matters standards; 5th edition (**QM, qm**)
- College of Continuing Education standards grounded in research in the learning sciences (**CCE, cce**)
- Authentic Learning Principles (**AL, al**)

For an online or blended course to pass the **Final Review** for course development, it must meet all **Essential Standards** indicated in capital letters and with a value of 3. Standards marked with an “X” are automatically met when using the CCE course syllabus and Moodle course template.

#### Online and Blended Course Definitions

**Online:** A course where most or all of the content is delivered online; typically without face-to-face meetings.

**Blended:** A course that blends online and face-to-face delivery. A substantial proportion of the content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings.

white	a QM standard
yellow	a CCE standard
purple	a principle of authentic learning to promote active learning and transdisciplinary skills

1: Learning Environment	Points	N/A	1	2	3
<b>General Standard: The overall design of the course is made clear to the student at the beginning of the course and promotes the development of a learning community.</b>					

1.1 Instructions make clear how to get started and where to find various course components. (QM)	3				X
1.2 Learners are introduced to the purpose and structure of the course (in a course tour video). In the case of a blended course, the statement clarifies the relationship between the face-to-face and online components. (QM)	3				
1.3 Etiquette expectations (sometimes called “netiquette”) for online discussions, email, and other forms of communication are clearly stated. (qm)	2				
1.4 Course and/or institutional policies with which the learner is expected to comply are clearly stated, or a link to current policies is provided. (qm)	2			X	
1.5 Minimum technology requirements are clearly stated and instructions for use provided. (qm)	2			X	
1.6 Prerequisite knowledge in the discipline and/or any required competencies are clearly stated. (qm)	1		X		
1.7 Minimum technical skills expected of the learner are clearly stated. (qm)	1		X		
1.8 The self-introduction by the instructor is appropriate and is available online. (qm)	1				
1.9 Learners are asked to introduce themselves to the class. (qm)	1		X		
1.10 An ice-breaker activity is included to promote learner social presence and the development of a learning community (CCE)	1		X		
1.11 The course syllabus uses the current CCE syllabus template or includes all the components as listed in the CCE syllabus table of contents. (CCE)	3				X
1.12 The course uses the current CCE course template or includes all the components of the template. (CCE)	3				X
1.13 The pathway students take through the learning environment is flexible, and students are able to move freely in the learning environment and return to any element at will. (CCE)	3				X
1.14 The course meets university effort hours (45 effort hours per credit) and content/effort is distributed over 14 modules.	3				
<b>2: Learning Outcomes</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Learning Outcomes are clearly stated and measurable. They assist students in focusing their efforts in the course.</b>					
2.1 The course-level outcomes describe outcomes that are measurable. (QM)	3				
2.2 The module-level outcomes are measurable and consistent with the course-level outcomes (QM)	3				
2.3 All learning outcomes are stated clearly and written from the learner’s perspective. (QM)	3				
2.4 The relationship between outcomes and assessment measures is clearly stated in the syllabus. (QM)	3				
2.5 The learning outcomes are suited to the level of the course. (QM)	3				
<b>3: Assessment Measures</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Assessment strategies use established methods to measure effective learning, aligned to stated learning objectives, and are an integral part of the learning process.</b>					
3.1 Assessments and assignments selected measure the stated learning outcomes. (QM)	3				

3.2 The course grading policy is clearly stated and indicates the value of each graded activity. (QM)	3				
3.3 Specific and descriptive criteria, such as grading rubrics, are provided for the evaluation of students' work and participation. (QM)	3				
3.4 The assessment instruments selected are sequenced, varied, and appropriate for the work being assessed. (QM)	3				
3.5 The Grade Center in the Learning Management System is made available to students for prompt feedback. (qm)	2				
3.6 For high-stake assessments, every measure should be taken to assure the integrity of student work, such as verifying student identity, using proctored test centers, and setting time limits. (qm)	2				
3.7 <b>Integrated assessment:</b> Assessment is not merely summative but is woven seamlessly into the major learning tasks in a manner that reflects real-world evaluation processes. (al)	scale				
3.8 <b>Polished products:</b> Conclusions are not merely exercises or sub steps in preparation for something else but culminate in the creation of a whole product, valuable in its own right. (al)	scale				
3.9 <b>Multiple interpretations and outcomes:</b> Rather than yielding a single correct answer obtained by the application of rules and procedures, assessments allow for diverse interpretations and competing solutions. (al)	scale				
<b>4: Learning Resources</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Learning resources are sufficiently comprehensive to achieve stated course outcomes and are prepared by qualified persons competent in their fields.</b>					
4.1 The learning resources contribute to the achievement of the stated course and module-level learning outcomes. (QM)	3				
4.2 Both the purpose of learning resources and how these resources are to be used for learning activities are clearly explained. (QM)	3				
4.3 All resources and materials used in the course are appropriately cited and are free from copyright infringement. (qm)	2				
4.4 The learning resources are current. (qm)	2				
4.5 A variety of learning resources is used in the course. (qm)	2				
4.6 The distinction between required and optional materials is clearly explained. (qm)	1				
4.7 The course content is presented into web appropriate chunks and sequenced accordingly (weeks, topics, or modules). (CCE)	2				
4.8 The learning resources promote a seamless mobile learning experience. (cce)	2				
4.9 Course applies CCE Design Guideline #5: <u>Everything in the course has one best place to live.</u> (CCE)	3				
4.10 The learning resources are organized and "framed" around a limited number of core ideas, and transferrable processes around which knowledge is examined. (CCE)	3				
4.11 <b>Multiple sources and perspectives:</b> Learning resources provide the opportunity for students to examine the task from a variety of theoretical and practical perspectives, using a variety of sources and require students to distinguish relevant from irrelevant information in the process. (al)	scale				
<b>5: Learning Activities and Learner Interaction</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Learning activities are designed to motivate students and foster active learning, intellectual commitment, and personal development.</b>					

5.1 Learning activities promote the achievement of stated learning outcomes (QM)	3				
5.2 Learning activities foster instructor-student, content-student, and if appropriate to the course, student-student interaction. (QM)	3				
5.3 Learning activities provide opportunities for interaction that support active learning. (QM)	3				
5.4 The requirements for learner interaction are clearly stated. (qm)	2				
5.5 <b>Articulation:</b> Learning activities enable presentation and defense of arguments? (CCE)	3				
5.6 Learning activities provide opportunities for formative feedback. (CCE)	3				
5.7 <b>Real-world relevance:</b> Learning activities match the real-world tasks of professionals in practice as nearly as possible. Learning rises to the level of authenticity when it asks students to work actively with abstract concepts, facts, and formulae inside a realistic— and highly social— context mimicking “the ordinary practices of the [disciplinary] culture. (al)	scale				
5.8 <b>Ill-defined problem:</b> Learning activities cannot be solved easily by the application of an existing algorithm; instead, are relatively undefined and open to multiple interpretations, requiring students to identify for themselves the tasks and subtasks needed to complete the major task. (al)	scale				
5.9 <b>Sustained investigation:</b> Learning activities cannot be solved in a matter of minutes or even hours but comprise complex tasks to be investigated by students over a sustained period of time, requiring significant investment of time and intellectual resources. (al)	scale				
5.10 <b>Interdisciplinary perspective:</b> Relevance is not confined to a single domain or subject matter specialization. Instead, learning activities have consequences that extend beyond a particular discipline, encouraging students to adopt diverse roles and think in interdisciplinary terms. (al)	scale				
5.11 <b>Collaborative Construction of Knowledge:</b> Success is not achievable by an individual learner working alone. Learner interaction is promoted through the task design as well as reflected in grades given for group effort, rather than the individual effort. (al)	scale				
5.12 <b>Reflection</b> (metacognition): Learning activities enable learners to make choices and reflect on their learning, both individually and as a team or community. (al)	scale				
<b>6: Course Technology</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Course navigation and technology employed in the course foster student engagement, and ensure access to instructional materials and resources.</b>					
6.1 The tools and media support the achievement of learning outcomes and are appropriately chosen to deliver the course content. (QM)	3				
6.2 The tools and media support student engagement and guide the student to become an active learner. (QM)	3				
6.3 Technologies required in the course are readily obtainable. (qm)	2				
6.4 The course technologies are current. (qm)	1				
6.5 Links are provided to privacy policies for all external tools required in the course. (qm)	1				
6.6 All content pages are compatible with current technical and delivery standards and all links (internal and external) work properly. (qm)	1				

6.7 Instructions for how to access course technologies are complete and easy to follow. All required course specific software and plug-ins are noted in the course and links are provided. (qm)	1				
6.8 Virtual Office Hours are available by appointment using a synchronous video call platform (Google Video Call or WebEx) to promote social presence and the development of a learning community. (CCE)	3				
6.9 The Course YouTube channel is used to moderate the course through announcements, weekly videos, answering questions. (CCE)	3				
6.10 The tools and media support student collaboration skills and the development of a learning community. (CCE)	3				
6.11 The tools and media support the development of a personal learning network. (cce)	1				
6.12 The use of technology as a learning tool is pervasive and extensive. (cce)	2				
<b>7: Learner Support</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: The course facilitates student access to instructional services essential to student success.</b>					
7.1 The course instructions articulate or link to a clear description of the technical support offered and how to obtain it. (QM)	3				X
7.2 Course instructions articulate or link to the institution's accessibility policies and services. (QM)	3				X
7.3 Course instructions articulate or link to an explanation of how the institution's academic support services and resources (tutoring, library, Writing Center, etc.) can help learners succeed in the course and how learners can obtain them. (qm)	2			X	
7.4 Course instructions articulate or link to an explanation of how the institution's student services (advising, financial aid, etc.) and resources can help learners succeed and how learners can obtain them. (qm)	1		X		
7.5 <b>Coaching and Scaffolding:</b> More knowledgeable students able to assist with coaching when appropriate? (cce)	1				
<b>8. Accessibility and Usability</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: The course face-to-face and online components are accessible to all students.</b>					
8.1 Course navigation facilitates ease of use. (QM)	3				
8.2 Information is provided about the accessibility of all technologies required in the course. (QM)	3				X
8.3 The course provides alternative means of access to course materials in formats that meet the needs of diverse learners. (qm)	2				
8.4 The course design facilitates readability, findability, etc. (qm)	2				
8.5 Course multimedia facilitate ease of use (platform-agnostic, mobile-ready, plug-ins. (qm)	2				
8.6 The learning environment follows <u>Top 5 Universal Design Guidelines</u> . (CCE)	3				
<b>9: Instructor Role</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
9.1 Clear standards are set for instructor responsiveness and availability (turn-around time for email, grade postings, etc.). (QM)	3				X
9.2 Instructor social presence is evident throughout the course by actively moderating the course through announcements, weekly videos, answering questions.(CCE)	3				

<b>9.3</b> Instructor pedagogical ability is evident throughout the course: leading by example, coaching students, scaffolding instruction, and/or providing formative feedback. (CCE)	<b>3</b>				
<b>9.4</b> Instructor managerial ability is evident throughout the course: effectively managing individual and group communication and providing individual and group assignment feedback. (CCE)	<b>3</b>				
<b>9.5</b> Instructor technical ability is evident throughout the course through the effective use of course technologies. (CCE)	<b>3</b>				
<b>9.6</b> Instructor states Virtual Office Hours are available in the Meet Your Instructor page. (CCE)	<b>3</b>				
<b>9.7</b> Instructor supports and sustains academic discussion. (CCE)	<b>3</b>				
<b>9.8</b> Instructor provides Access to Expert Performance and the Modelling of Processes through sharing of expert skill, modeling examples, sharing opinions, stories about professional practices. (CCE)	<b>3</b>				

## Appendix 3b

## Authentic Task Rubric

<p>Learning researchers have distilled the essence of authentic learning tasks down to 10 design elements, providing educators with a useful checklist that can be adapted to any subject matter domain.</p>	<p><b>Absent (0)</b></p> <p>Learning activities and assessments do not evidence the principle</p>	<p><b>Under-emphasized (1)</b></p> <p>Learning activities and assessments do evidence the principle but without emphasis in quantity: little time is allocated to the task and little to no grade points are allocated to the task</p>	<p><b>Emphasized (2).</b></p> <p>Learning activities and assessments evidence the principle in a noticeable amount of time and the grade points allocated to the task reflect the time allocated to the task.</p>	<p><b>Maximized (3)</b></p> <p>Learning activities and assessments evidence the principle in a significant amount of time and the majority of the grade is determined by authentic tasks.</p>
<p><b>Real-world relevance</b> Academic - Real world Authentic activities match the real-world tasks of professionals in practice as nearly as possible. Learning rises to the level of authenticity when it asks students to work actively with abstract concepts, facts, and formulae inside a realistic— and highly social— context mimicking “the ordinary practices of the [disciplinary] culture.</p>	<p>Learning activities and assessments are purely academic and are presented / assessed without any real-world context.</p>	<p>Learning activities and assessments are largely presented without a real-world context (i.e. exercises, tests, and quizzes) or context is provided but activities are underemphasized in the grade scheme.</p>	<p>Learning activities and assessments match or simulate the real-world tasks for several of the activities and an appropriate amount of time and grade points are allocated to the tasks.</p>	<p>Learning activities and assessments match, mimic, or perform real world tasks of a professional or make clear how the knowledge is useful in the world for the MAJORITY of the activities and account for a significant portion of the final grade.</p>
<p><b>Ill-defined problem</b> Structured - Ill-defined</p>	<p>Learning activities and assessments are multiple small tasks and do</p>	<p>All major assignments and assessments are highly scaffolded and allow the</p>	<p>A major learning activity allows the learner to define the majority of steps toward a</p>	<p>A major learning activity or assessment requires learners to identify for themselves the</p>



<p>Challenges cannot be solved easily by the application of an existing algorithm; instead, authentic activities are relatively undefined and open to multiple interpretations, requiring students to identify for themselves the tasks and subtasks needed to complete the major task.</p>	<p>NOT require students to deconstruct a complex problem into subtasks or develop their own strategy for solving the task.</p>	<p>learner to only define a few steps towards a solution and may discourage independent decision-making.</p>	<p>solution. However, a model or example is provided that demonstrates a potential path.</p>	<p>tasks and subtasks needed to complete the major task.</p>
<p><b>Sustained investigation</b> Problems cannot be solved in a matter of minutes or even hours. Instead, authentic activities comprise complex tasks to be investigated by students over a sustained period of time, requiring significant investment of time and intellectual resources.</p>	<p>Learning activities and assessments are designed as step by step practice and do NOT require learners to work for an extended period of time.</p>	<p>Learning activities and assessments are designed as weekly activities; none extend over multiple weeks or connect different parts of the curriculum.</p>	<p>Learning activities and assessments span across multiple modules and connect different parts of the curriculum, but the weight of the graded assignments is given to exams.</p>	<p>Learning activities and assessments span across multiple modules and weave together multiple smaller assignments as scaffolds that synthesize the course into a larger assignment. The weight of the graded assignment is well matched to the size of the assignment.</p>
<p><b>Interdisciplinary perspective</b> Single discipline - &gt; Multidisciplinary  Relevance is not confined to a single domain or subject matter specialization. Instead, authentic activities have consequences that extend beyond a</p>	<p>Learning activities and assessments are NOT relevant to other disciplines and broader knowledge.</p>	<p>Learning activities and assessments suggest students consider knowledge outside of their discipline but do NOT require students to use interdisciplinary knowledge in their thinking.</p>	<p>Learning activities and assessments ask students to extend their thinking beyond the course discipline to examine consequences and contexts;</p>	<p>Learning activities and assessments extend beyond one discipline; Students explicitly adopt roles that emphasize interdisciplinary thinking;</p>

particular discipline, encouraging students to adopt diverse roles and think in interdisciplinary terms.				
<b>Collaboration</b> Success is not achievable by an individual learner working alone. Authentic activities make collaboration integral to the task, both within the course and in the real world.	Learning activities and assessments <i>do NOT</i> foster collaboration between learners.	Students do work together on one assignment but the majority of the assignments are individual and the collaborative assignment is a small part of the total points. Alternatively, students form discussion groups and discussion is an integral part of the course and grade scheme.	Students work together on a collaborative assignment with multiple opportunities to collaborate. Or students work on multiple collaborative assignments and/or that span across the course but the majority of the grade is given to individual assignments.	Students work together on collaborative assignments which are pervasive throughout the course and the weight of the assignment is reflected in the grading scheme. The design of the collaboration addresses roles, positive interdependence and peer evaluation.
<b>Reflection/Self-Assessment (metacognition)</b> No facility to compare -> able to compare Authentic activities enable learners to make choices and reflect on their learning, both individually and as a team or community.	Learning activities and assessments do NOT require learners to compare themselves against other learners or expert knowledge, nor do they require learners to reflect and articulate their growing understanding.	Learning activities and assessments include ungraded/informal discussion, which can provide some opportunity for reflection.	Graded learning activities and assessments are inherently reflective in nature. (i.e. journals, group work)	Graded learning activities and assessment explicitly ask students to reflect on their learning, articulate what they do/do not understand, and evaluate the quality of their own work. (i.e. reflections, self-evaluations)  or  Inherently reflective assessments determine the majority of the course grade.
<b>Integrated assessment</b>	All assessments are summative and do not	Assessments include some real-world evaluation	Assessments reflect real-world evaluation	Assessments reflect real-world evaluation

<p>Separate tests - Integrated with activities Assessment is not merely summative, but is woven seamlessly into the major task in a manner that reflects real-world evaluation processes.</p>	<p>reflect real-world evaluation processes.  (i.e. multiple-choice midterm and final)</p>	<p>processes and products, but there are few opportunities for formative feedback.</p>	<p>processes, with several formative assessments that build toward a final product.</p>	<p>processes and are woven throughout the course.</p>
<p><b>Polished products</b> Raw -&gt; polished Conclusions are not merely exercises or sub steps in preparation for something else. Authentic activities culminate in the creation of a whole product, valuable in its own right.</p>	<p>Learning activities and assessments are merely exercises which cannot stand as a product on their own.</p>	<p>Learning activities and assessments are homework or exercises that could result in a polished product, but are never pulled together.</p>	<p>Learning activities and assessments are pulled together into a whole product but are not necessarily “ready for the real world”.</p>	<p>Learning activities and assessments culminate in a polished product and the sub step assignments contribute to the finished, polished product.</p>
<p><b>Multiple interpretations and outcomes</b>  Rather than yielding a single correct answer obtained by the application of rules and procedures, authentic activities allow for diverse interpretations and competing solutions</p>	<p>All learning activities and assessments accept only a single answer for which a student would receive credit.</p>	<p>Learning activities and assessments allow for multiple interpretations, but measurement values a single best answer/method above others.</p>	<p>Learning activities and assessments encourage multiple interpretations,</p>	<p>Learning activities and assessments stress multiple interpretations and outcomes over a single answer.</p>
<p><b>Multiple sources and perspectives</b> Learners are not given a list of</p>	<p>Learning resources are limited to instructor</p>	<p>Multiple learning resources are provided in the course, but may</p>	<p>Multiple learning resources provide a variety of perspectives and</p>	<p>Learners are required to locate a variety of resources, evaluate their</p>

<p>resources. Authentic activities provide the opportunity for students to examine the task from a variety of theoretical and practical perspectives, using a variety of resources, and requires students to distinguish relevant from irrelevant information in the process.</p>	<p>created content and/or a single textbook (or other content resource).</p>	<p>not represent multiple perspectives on any given topic.  Learners are not asked to seek out additional resources.</p>	<p>learners are asked to evaluate their relevance.</p>	<p>relevance to an assignment, and synthesize/evaluate the different perspectives.</p>
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Note: Herrington, et al., (2010). *A practical guide to authentic e-learning*. Routledge.

## Appendix 3c

## Course Review Standards AY 17-18

*Statement of Purpose*

To insure the best possible outcomes for College of Continuing Education students, online and blended courses are evaluated against a set of instructional standards. CCE uses:

- the nationally recognized Quality Matters standards; 5th edition (**QM**)
- standards that integrate specific College of Continuing Education practices (**CCE**)
- Authentic Task Principles in support of active learning (**AL**)

For a course to pass the Course Review, it must meet 19 Quality Matters *Essential* Standards indicated with (**QM**), 6 CCE Standards indicated with (**CCE**), and a minimum (**AL**) score of 10. Standards marked with an “X” are automatically met when using the CCE course syllabus and CCE course template.

*Course Definitions*

- **Online:** A course where most or all of the content is delivered online; typically without face-to-face meetings.
- **Blended:** A course that blends online and face-to-face delivery. A substantial proportion of the content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings.
- **Classroom:** A course taught in the classroom using a fully developed companion site to support flipped classroom delivery.

<b>Learning Design: What will the learner do?</b>					
The learning design creates a student-centered learning experience in which outcomes, activities, and assessments are in alignment and promote active learning.					
<b>1: Learning Outcomes</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Learning Outcomes are clearly stated and measurable. They assist students in focusing their efforts in the course.</b>					
<b>1.1</b> The course-level outcomes describe outcomes that are measurable. ( <b>QM 2.1</b> )	<b>3</b>				
<b>1.2</b> The module-level outcomes are measurable and consistent with the course-level outcomes ( <b>QM 2.2</b> )	<b>3</b>				
<b>1.3</b> All learning outcomes are stated clearly and written from the learner’s perspective. ( <b>QM 2.3</b> )	<b>3</b>				
<b>1.4</b> The relationship between outcomes and assessment measures is clearly stated in the syllabus. ( <b>QM 2.4</b> )	<b>3</b>				

1.5 The learning outcomes are suited to the level of the course. (QM 2.5)	3				
<b>2: Learning Activities and Assessments</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Learning activities and assessments support, align, and measure the stated learning outcomes through activities that foster active learning, intellectual commitment, and personal development to the largest extent possible.</b>					
2.1 Learning activities and assessments promote and measure the achievement of stated learning outcomes (QM 3.1 , QM 5.1)	3				
2.2 Specific and descriptive criteria, such as grading rubrics, are provided for the evaluation of students' work and participation. (QM 3.3)	3				
2.3 The assessment instruments selected are sequenced, varied, and appropriate for the work being assessed. (QM 3.4)	3				
2.4 For high-stake assessments, every measure should be taken to assure the integrity of student work, such as verifying student identity, using proctored test centers, and setting time limits. (CCE)	3				
2.5 The requirements for learner interaction are clearly stated. (qm 5.4)	2				
2.6 <b>Articulation:</b> Learning activities enable presentation and defense of argument? (CCE)	3				
2.7 <b>Personal relevance:</b> Learning activities provide the learner with choice, foster contribution of their prior knowledge or experience, and personal connections to the curriculum. Learning rises to the level of authenticity when it creates a narrative between the curriculum and the student's life.(cce)	scale	absent	under-emphasized	emphasized	maximized
2.8 <b>Coaching and scaffolding:</b> More knowledgeable students are able to assist with coaching when appropriate. (al)	scale	0	1	2	3
2.9 <b>Real-world relevance:</b> Learning activities match the real-world tasks of professionals in practice as nearly as possible. Learning rises to the level of authenticity when it asks students to work actively with abstract concepts, facts, and formulae inside a realistic— and highly social—context mimicking the ordinary practices of the disciplinary culture. (al)	scale	0	1	2	3

<p><b>2.10 Ill-defined problem:</b> Learning activities cannot be solved easily by the application of an existing algorithm; instead, are relatively undefined and open to multiple interpretations, requiring students to identify for themselves the tasks and subtasks needed to complete the major task. <b>(al)</b></p>	<p><b>scale</b></p>	<p>0</p>	<p>1</p>	<p>2</p>	<p>3</p>
<p><b>2.11 Sustained investigation:</b> Learning activities cannot be solved in a matter of minutes or even hours but comprise complex tasks to be investigated by students over a sustained period of time, requiring significant investment of time and intellectual resources. <b>(al)</b></p>	<p><b>scale</b></p>	<p>0</p>	<p>1</p>	<p>2</p>	<p>3</p>
<p><b>2.12 Interdisciplinary perspective:</b> Relevance is not confined to a single domain or subject matter specialization. Instead, learning activities have consequences that extend beyond a particular discipline, encouraging students to adopt diverse roles and think in interdisciplinary terms. <b>(al)</b></p>	<p><b>scale</b></p>	<p>0</p>	<p>1</p>	<p>2</p>	<p>3</p>
<p><b>2.13 Collaborative construction of knowledge:</b> Success is not achievable by an individual learner working alone. Learner interaction is promoted through the task design as well as reflected in grades given for group effort, rather than the individual effort. <b>(al)</b></p>	<p><b>scale</b></p>	<p>0</p>	<p>1</p>	<p>2</p>	<p>3</p>
<p><b>2.14 Reflection / self-assessment</b> (metacognition): Learning activities enable learners to reflect on their learning, both individually and as a team or community. <b>(al)</b></p>	<p><b>scale</b></p>	<p>0</p>	<p>1</p>	<p>2</p>	<p>3</p>
<p><b>2.15 Integrated assessment:</b> Assessment is not merely summative but offers formative feedback and is woven seamlessly into the major learning tasks in a manner that reflects real-world evaluation processes. <b>(al)</b></p>	<p><b>scale</b></p>	<p>0</p>	<p>1</p>	<p>2</p>	<p>3</p>
<p><b>2.16 Polished products:</b> Conclusions are not merely exercises or sub steps in preparation for something else but culminate in the creation of a whole product, valuable in its own right. <b>(al)</b></p>	<p><b>scale</b></p>	<p>0</p>	<p>1</p>	<p>2</p>	<p>3</p>

<b>2.17 Multiple interpretations and outcomes:</b> Rather than yielding a single correct answer obtained by the application of rules and procedures, assessments allow for diverse interpretations and competing solutions. <b>(al)</b>	<b>scale</b>	0	1	2	3
<b>2.18 Multiple sources and perspectives:</b> Learning resources provide the opportunity for students to examine the task from a variety of theoretical and practical perspectives, using a variety of sources and require students to distinguish relevant from irrelevant information in the process. <b>(al)</b>	<b>scale</b>	0	1	2	3
<b>2.19</b> Learning activities provide opportunities for interaction that support active learning. <b>(QM 5.2, al 2.9-2.18)</b>	<b>3</b>				

### *Learning Environment*

In online delivery, instruction is in part delivered through the careful design of the learner's environment in order to facilitate student-centered learning experiences through appropriate resources and technologies.

<b>3: Orientation and Introduction to the Course</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: The overall design of the course environment is made clear to the student at the beginning of the course and promotes the development of a learning community.</b>					
<b>3.1</b> The course syllabus uses the current CCE <b>syllabus template</b> or includes all the components as listed in the CCE syllabus table of contents. <b>(CCE)</b>	<b>3</b>				<b>X</b>
<b>3.2 Syllabus:</b> Prerequisite knowledge in the discipline and/or any required competencies are clearly stated. <b>(qm 1.6)</b>	<b>1</b>		<b>X</b>		
<b>3.3 Syllabus:</b> The course grading policy is clearly stated and indicates the value of each graded activity. <b>(QM 3.2)</b>	<b>3</b>				<b>X</b>
<b>3.4 Syllabus:</b> Course and/or institutional policies with which the learner is expected to comply are clearly stated, or a link to current policies is provided. <b>(qm 1.4)</b>	<b>2</b>			<b>X</b>	
<b>3.5 Syllabus:</b> Minimum technology requirements are clearly stated and instructions for use provided. <b>(qm 1.5)</b>	<b>2</b>			<b>X</b>	



<b>3.6 Syllabus:</b> Minimum technical skills expected of the learner are clearly stated. ( <b>qm 1.7</b> )	1		X		
<b>3.7 Syllabus:</b> Clear standards are set for instructor responsiveness and availability (turn-around time for email, grade postings, etc.). ( <b>CCE</b> )	3				
<b>3.8 Syllabus:</b> Course instructions articulate or link to the institution's accessibility policies and services. ( <b>QM 7.2</b> )	3				X
<b>3.9 Syllabus:</b> The instructor's plan for classroom response time and feedback on assignments is clearly stated. ( <b>QM 5.3</b> )					
<b>3.9 Course Template:</b> The course uses the current CCE course template or includes all the components of the template. ( <b>CCE</b> )	3				X
<b>3.10 Course Template:</b> The learner has flexible and free control over course navigation. ( <b>CCE</b> )	3				X
<b>3.11 Course Template:</b> Instructions make clear how to get started and where to find various course components. ( <b>QM 1.1</b> )	3				X
<b>3.12 Course Template:</b> Learners are asked to introduce themselves to the class through a course-specific ice-breaker activity that promotes learner social presence and the development of a learning community ( <b>QM 1.9, CCE</b> )	3				X
<b>3.13 Course Template:</b> Expectations for behavior in online discussions, email, and other forms of communication are clearly stated. ( <b>qm 1.3</b> )	2		X		
<b>3.14 Course Template:</b> The Grade Center in the Learning Management System is made available to students for prompt feedback. ( <b>CCE</b> )	3				X
<b>3.15 Course Template:</b> Course instructions articulate or link to a clear description of the technical support offered and how to obtain it. ( <b>QM 7.1</b> )	3				X
<b>3.16 Course Template:</b> Course instructions articulate or link to an explanation of how the institution's academic support services and resources (tutoring, library, Writing Center, etc.) can help learners succeed in the course and how learners can obtain them. ( <b>qm 7.3</b> )	2			X	
<b>3.17 Course Template:</b> Course instructions articulate or link to an explanation of how the institution's student services (advising, financial aid, etc.) and	1		X		

resources can help learners succeed and how learners can obtain them. (qm 7.4)					
<b>3.18 Course Template:</b> Information is provided about the accessibility of all technologies required in the course. (QM 8.2)	3				X
<b>3.19 Course Template:</b> Virtual Office Hours are available by appointment using a synchronous video call platform (Google Video Call or WebEx) to promote social presence and the development of a learning community. (CCE)	3				X
<b>3.20</b> The course meets university effort hours (45 effort hours per credit) and content/effort is distributed over 14 modules. (CCE)	3				
<b>3.21</b> The learning environment facilitates ease of use, readability, and follows the <u>Top 5 Universal Design Guidelines</u> . (QM 8.1, QM 8.4, CCE)	3				
<b>4: Learning Resources</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>3</b>	<b>3</b>
<b>General Standard: Learning resources are sufficiently comprehensive to achieve stated course outcomes and are prepared by qualified persons competent in their fields.</b>					
<b>4.1</b> The learning resources contribute to the achievement of the stated course and module-level learning outcomes. (QM 4.1)	3				
<b>4.2</b> Both the purpose of learning resources and how these resources are to be used for learning activities are clearly explained. (QM 4.2)	3				
<b>4.3</b> All resources and materials used in the course are appropriately cited and are free from copyright infringement. (qm 4.3, CCE)	2				
<b>4.4</b> The learning resources are current. (qm 4.4)	2				
<b>4.5</b> A variety of learning resources is used in the course. (qm 4.5)	1				
<b>4.6</b> The distinction between required and optional learning resources is clearly explained. (qm 4.6)	1				
<b>4.7</b> All content pages are compatible with current technical and delivery standards and all links (internal and external) work properly. (qm)	1				
<b>4.8</b> The course provides alternative means of access to learning resources in formats that meet the needs of diverse learners. (qm 8.3)	2				
<b>4.9</b> The course content is presented into web appropriate chunks and sequenced	3				

accordingly (weeks, topics, or modules). (CCE)					
<b>4.10</b> The learning resources are organized and "framed" around a limited number of core ideas, and transferable processes around which knowledge is examined. (CCE)	<b>3</b>				
<b>5: Course Tools and Media</b>	<b>Points</b>	<b>N/A</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>General Standard: Course navigation and technology employed in the course foster student engagement, and ensure access to instructional materials and resources.</b>					
<b>5.1</b> Course tools and media support the achievement of the stated learning activities and assessments and are appropriately chosen to deliver the course content. (QM 6.1, CCE)	<b>3</b>				
<b>5.2</b> Course tools and media support student engagement and guide the student to become an active learner. (QM 6.2 )	<b>3</b>				
<b>5.3</b> Course tools and media required in the course are readily obtainable and provide instructions for how to access them, i.e. links to software and plug-ins.(qm 6.3)	<b>2</b>				
<b>5.4</b> The tools and media are current. (qm 6.4)	<b>1</b>				
<b>5.5</b> Links are provided to privacy policies for all external tools required in the course. (qm 6.5)	<b>1</b>				
<b>5.6</b> Course tools and media facilitate ease of use (platform-agnostic, mobile-ready, plug-ins. (qm 8.5, cce)	<b>2</b>				
<b>5.7</b> Course YouTube channel is used to deliver instructor video content. (CCE)	<b>3</b>				
<b>5.8</b> Course tools and media support student collaboration skills and the development of a learning community within the course. (CCE)	<b>3</b>				
<b>5.9</b> Course tools and media support the development of a personal learning network that extends beyond the course. (cce)	<b>1</b>				
<b>5.10</b> The use of technology as a learning tool is pervasive and extensive. (cce)	<b>2</b>				

<i>Instructor Role</i> The instructor facilitates learning through developing and maintaining a learning community and actively moderating the course.	Points	N/A	1	2	3
<b>6.1</b> The (Flipgrid / Voicethread) instructor self-introduction video is appropriate and is available online. <b>(QM 1.8, CE)</b>	3				
<b>6.2</b> Instructor states Virtual Office Hours are available in the Meet Your Instructor page and the Virtual Office Hours tool is active. <b>(CCE)</b>	3				
<b>6.3</b> Instructor introduces the purpose and structure of the course in a course tour video. In the case of a blended course, the video clarifies the relationship between the face-to-face and online components. <b>(QM 1.2 , CCE)</b>	3				
<b>6.4</b> Instructor establishes instructor social presence and develops community in the course by encouraging and modeling meaningful participation. <b>(CCE)</b>	3				
<b>6.5</b> Instructor provides feedback and moderates the course though announcements, weekly videos, responses to forums, and answering questions. <b>(CCE)</b>	3				

## Appendix 3d

## Online Course Evaluation Survey

This online course evaluation is intended to provide feedback for improving your online learning experience. Please note that this is a distinctly different evaluation from the Student Rating of Teaching (SRT) form, which you will be asked to complete separately.

There are 3 sections of questions within this online course evaluation:

1. Student Readiness and Access,
2. Course Design,
3. Instructor Interaction

The entire survey is 16 questions long and should take you no longer than 10 minutes to complete.

Thank you for providing us with your honest feedback!

Online and Educational Services (OES)  
College for Continuing Education

This evaluation is anonymous.

**Scale**

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

**Student Readiness and Access**

1. I came into this class with adequate computing skills to meet the demands of the course.

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

2. The technology used in this course was adequately supported.

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

3. I would like additional support using these technologies:

4. What was your primary device for accessing this course?
- Windows Desktop
  - Apple (OS X) Desktop
  - Windows Laptop
  - Apple (OS X ) Laptop
  - Windows Tablet
  - Android tablet
  - Apple (iOS) Tablet (iPad)
  - Windows Smartphone
  - Apple (iOS) iPhone
  - Other
5. If you selected "Other" in the question above, what was your primary device that you used in the course?

**Student Readiness and Access**

6. The instructor was engaged in online discussions and responsive to students' questions and needs.
- Strongly Disagree
  - Disagree
  - Neutral
  - Agree
  - Strongly Agree
7. The instructor provided timely feedback on assignments and exams.
- Strongly Disagree
  - Disagree
  - Neutral
  - Agree
  - Strongly Agree
8. The instructor provided useful feedback on assignments and exams.
- Strongly Disagree
  - Disagree
  - Neutral
  - Agree
  - Strongly Agree
9. The instructor provided individual assistance when needed.
- Strongly Disagree
  - Disagree
  - Neutral
  - Agree
  - Strongly Agree

10. What specific advice would you give to help the instructor improve your learning in this course?

11. The Canvas course site was well designed and easy to use.

Strongly Disagree  
Disagree  
Neutral  
Agree  
Strongly Agree

12. Clear instructions were provided to me on how to complete course activities.

Strongly Disagree  
Disagree  
Neutral  
Agree  
Strongly Agree

13. The course provides the opportunity for me to create a meaningful project, presentation, or authentic task.

Strongly Disagree  
Disagree  
Neutral  
Agree  
Strongly Agree

14. If the course provided the opportunity for you to create a meaningful project, presentation, or authentic task, what made it meaningful and how? If not describe a type of assignment that would have made it meaningful.

15. I understood how to participate in the course, including how to participate in group or team assignments.

Strongly Disagree  
Disagree  
Neutral  
Agree  
Strongly Agree

16. The technology employed in the course helped my learning of concepts and principles.

Strongly Disagree

Disagree  
Neutral  
Agree  
Strongly Agree



## Appendix 3e

## 153 Real-World Relevance Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *I think the final paper provided a nice task for synthesizing information we've learned and putting it to work. It is meaningful because it tackles a real-life issue and we are proposing real ways to create change based on the latest research and information.*
2. *The assignment that had me practice interviewing was one that made this course meaningful because it created such a real interview environment.*
3. *I thought going into the real world at real businesses was a good way to experience first-hand how the tools and techniques taught in the course look like when actually used.*
4. *The final Applied Management Research Paper allowed students to analyze the activities of a real-world manager in the light of the management theory presented in our textbook. Rather than simply relying on some examples from a textbook, we were able to evaluate the decisions made by real world managers based on the theory that we learned. This gave us a chance to draw conclusions about how theory is applied when managing an actual organization.*
5. *I was able to connect what we learned in class to the real working world by having the chance to talk with a real manager.*
6. *I think the manager research paper is super useful because it provides students with an opportunity to learn from people in real-world working positions within an organization.*
7. *The Analytical Report was meaningful because in my case, my findings benefited a real company. It is also an applicable project since it would be realistic to have to perform a similar task in the workplace.*
8. *I thought that the real world feeling of the projects helped it be meaningful. It kept our group interested and driven towards the end goal.*
9. *I thought that the team project was very unique in comparison to what I've done in past classes. I normally really dislike group projects in online classes, but the details provided and the project from start to finish was really interesting and seemed to have a very real world feel to it that I haven't seen in other classes.*
10. *I think this course certainly provided the opportunity for me to create a meaningful project even though myself and my group had many struggles with the technology/software. What made it meaningful was that it was "real-life-like" and allowed us to work through an actual project.*
11. *The case study assignments allowed me to take a specific event from the world and research it deeply. I was then able to analyze the data I procured and put it into an essay that clearly articulated what was found. This is good practice for analyzing and critical thinking.*
12. *The final paper allowed me to tie what I learned in this course to the real world.*

13. *The point of the class was to learn how to create proposals, and so the final project of putting together a full proposal was helpful and meaningful. It gave a clear picture of what is required to write a grant, and the use of real-world organization and funding opportunities made the project relevant.*
14. *I enjoyed the projects that included real life experiences, like the construction site observation and the PM phone interview. I felt like it helped me engage in the course content more and better understand the goings-on of a construction project.*
15. *I like the case studies since they were able to reflect on real life situations and we were able to make decisions as if we really were in the situation.*
16. *The case studies were very meaningful to me. I think they did an excellent job of applying the concepts discussed in the weekly lessons, to realistic situations that the students could one day be faced with in our future careers.*
17. *The executive book summary was meaningful for me because it allowed me to read about real life cases and relate it back to the concepts and information that I've learned throughout this course.*
18. *It made it feel like it could be a real-world project and allowed us to act in the way that we think would be the best which was a good learning experience.*
19. *I found that the final research project was very meaningful in that it provided grounds for which I could really go in depth with course concepts as well as apply them to the real world - really allowing for me to absorb and comprehend the course content. I think another project for the midterm may have been helpful as well - perhaps a visual presentation uploaded by other students to be viewed and commented on (maybe with a voiceover?)*
20. *Using the group presentation and the two papers in this course allowed a sense of applying what we were learning in an actual practical sense. Many times, courses push information on students but never give them a chance to actually apply the information into a project or a real-world application.*
21. *These assignments provided a great opportunity for me to create a meaningful project because I was able to take what I had learned in the course so far and apply it to the real world, as well as to my own personal life.*
22. *The YouConnect assignments and Project assignments helped me to really understand the fundamentals of management and how they apply in my own life, and to a greater extent the world around me.*
23. *The projects were applicable to the real world.*
24. *The final project of attending a job fair was meaningful because it made you go out into the real world and connect with people that can help you get a job in the future.*
25. *Two of the assignments in this course were meaningful in the interview and presentation assignment. I appreciate the true fieldwork nature of these two, in particular, as a bridge to the theory work of quality management.*
26. *What made it meaningful to me was being able to use it in the real world. The interview report was very helpful and I was grateful that I got to complete that assignment.*

27. *Two case studies provide me with chances to use accounting in real-life examples.*
28. *The course provided meaningful exposure to real world problems and risks that many businesses encounter. It allowed me to gain experience so that I am better suited to deal with the risks in my future.*
29. *The case study gave me the opportunity to research a real-world situation and understand it deeply. I could then create an essay displaying all of the information that I discovered. This gave me skills in analytical and critical thinking, writing, and presentation.*
30. *The final paper was meaningful and helped me gain a lot of knowledge about the roles of a manager and how it is applied to real scenarios.*
31. *I was really excited to do the final paper interviewing a business professional. It was helpful to compare what I learned in the textbook and real-life experiences with my interviewee. Being able to fully understand the techniques and skills presented in the textbooks is a great way to become a strong leader. Being able to adjust, as my interviewee has done, to real life experiences.*
32. *We had to do an interview with a manager, this gave insight to what real life could be like as a manager in the future.*
33. *The final presentation was meaningful. I got real-world experience.*
34. *I think having us actually engage and talk with real managers is very beneficial to our learning, and helps add some realism and depth to the proceedings.*
35. *The task of interviewing with a manager and writing a paper about it. It kinda gives us the experience of a real-life situation in the work field. Gives us their perspective on how the work field is.*
36. *All coursework related to the real world and was easy to understand and comprehend.*
37. *The manager interview was meaningful and a good way to synthesize what we learned in the course and see it in a real-world perspective.*
38. *I liked learning the real-world aspects of business and how to communicate.*
39. *I wrote an analytical report that gave me an opportunity to experience firsthand the use of analytical and critical thinking tools to help solve problems in the real world, i.e. help a friend on how to penetrate the market and expand his customer base.*
40. *The final paper was meaningful because it allowed me to explore a style of writing to which I had no previous exposure. The assignment had real-life applications, which I greatly appreciated and valued. Overall, a very unique assignment which taught me a lot of valuable skills.*
41. *The real-world scenarios and ideas made this class meaningful and realistic for my education.*
42. *It was a good real-life example of a project that I have never worked on before.*
43. *Two case studies provided me with chances to use accounting in real-life examples.*

44. *It was meaningful because it was realistic and something you may have to do in the future in an HR position.*
45. *It was great to critique a case study, and find real-world examples of how to resolve the issues.*
46. *This course helped me gain real-life skills and perspectives.*
47. *I had the opportunity to complete a project with clear practical utility. It gave a taste of real-world application.*
48. *It was meaningful because it allowed me to create a real grant proposal throughout the semester. It was authentic because we selected a real-world organization and funding agency. At the end of the semester, it was nice to see the whole proposal come together.*
49. *This was great for learning what it looks like to have an RFP in the real world. Very practical!*
50. *The project (drafting a proposal) was a real-life opportunity to put concepts learned into practice.*
51. *Practical and hands-on experience that provides useful and extremely beneficial experience on grant writing. We had to choose an organization and actually develop a realistic plan to complete a grant proposal the way we would need to if it were an actual application for a job.*
52. *I have never written a grant proposal before, so being able to create one is really cool. Also, I learned so much in this class than I did in any English class. The instructor's feedback was kind of harsh (because it was so detailed! It's a good thing, though!) but very clear-cut because it only made my proposal better. I really enjoyed this class! Being able to do something that is applicable to the real world and that will really impress employers is awesome!*
53. *I got the opportunities to fully work on a marketing project for a company. I gained more practical skills rather than just learning about the theories. I could apply my knowledge while working on different components of the marketing plan, and the instructor gave us constructive feedback.*
54. *The projects seem to be based around real world hypothetical situations.*
55. *Good to apply what we learned in the course to outside, real companies in the case study assignments.*
56. *It was meaningful to really critique theories and think about circumstances in which they apply, and how it is relevant within the given context or situation.*
57. *Topic work was relevant to us and how society is right now. Not old school stuff.*
58. *We had real questions and real-world answers throughout this course.*
59. *Several projects involved manipulating real data from the US and other countries and comparing it in interesting ways to understand economic phenomena.*
60. *The final essay was a good test to see if we understand economics in the real world.*
61. *Using excel a lot is meaningful because it is a skill we need for the workforce.*

62. *The weekly reflections were pretty meaningful because they helped you reflect what you learned that week and made you sort of apply it to the real world.*
63. *We made a presentation where we modeled the rate of melting in the northern permafrost region. This was meaningful because we applied the things we had been learning to the real world.*
64. *Course projects were interesting and allowed me to apply my course knowledge with real-world concepts.*
65. *I think that the YouConnects made the class most meaningful, as it asked students to draw a connection between what we were learning and real-world experience.*
66. *Projects and YouConnects allowed for connection with class concepts to real life.*
67. *It made us think outside the box in a worldly fashion.*
68. *Had a semester-long group project that involved developing a marketing plan for a company/brand, which helped apply course concepts to real-world problems.*
69. *I felt like I got to actually apply what I learned to the real world!*
70. *The projects were applicable to the real world.*
71. *The final project of attending a job fair was meaningful because it made you go out into the real world and connect with people that can help you get a job in the future.*
72. *It was meaningful because it well prepared me for the future.*
73. *It was meaningful because I gained skills that I will definitely use in the future.*
74. *The assignment that had me practice interviewing was one that made this course meaningful because it created such a real interview environment.*
75. *I liked being able to have an interview with a professional in my desired career field.*
76. *I was pushed out of my comfort zone because the course gave us opportunities to connect with professionals outside of class.*
77. *I thought that the informational interview assignment was extremely meaningful because it helped train me in various aspects of job hunting in particular. I learned a lot about networking and speaking to professionals which was extremely useful.*
78. *Instructions were clear, easy to follow, and well-organized. The final project aided me in preparation for my future in the employment field.*
79. *I really liked the interview project. I think it was very useful to talk to someone at a company you could see yourself working at. I also enjoyed the LinkedIn Profile assignment. I think some of the requirements are a little hard to reach if you did set up your profile for the first time for this assignment, and I know that some professions don't use LinkedIn as much. I don't know if that will change with the changing role of technology in the job search process or not. Overall, I thought the assignments were really useful!*

80. *The course provided important guidance to the students. The design of this coursework encouraged us to work on many assignments that may potentially increase the chances of getting a better job, by preparing us professionally in our careers. The use of social platforms is a useful tool to be exploited and this course provided us with enough direction to succeed in this tasks.*
81. *This class provided me with the tools to obtain and have a successful informational interview.*
82. *I think something that made the assignments throughout this course so meaningful is how useful they were. The projects and tasks we had to complete were things that I need for my future professional career preparation so it was nice to get graded and feedback on things that I will use in the future like a resume and cover letter.*
83. *I think requiring us to go to a job fair made it very meaningful. We were able to apply the things we learned in class in preparation for our career paths.*
84. *Creating a proper resume and cover letter in this course was very meaningful to me. I will give me the best chance of conveying my skills and experiences to a future employer.*
85. *A meaningful task was reading the textbook and learning about Six Sigma. Prior to this class, I knew nothing about it. Learning about Six Sigma was meaningful because I had a conversation with an employee who uses Six Sigma and I was able to relate to what she was talking about.*
86. *What made it meaningful was the work that needed to be done outside of the class.*
87. *It allowed us to reach out to new organizations and work with them to complete the project which was a new experience.*
88. *I thought it important to learn and research an event relevant to my industry*
89. *It directly relates to my current position at my company.*
90. *The whole design of the course assisted students learn the 4 main functions of a manager and then see them in practice- great course!*
91. *I thought it was a very interactive class. I always learn better by doing, so the fact that we had to conduct an interview and work from there, really allowed for me to create a meaningful project.*
92. *The final assignment prompted thought about the four functions of management. Interviewing a top-level manager that had years of experience shed some new light on management strategies and styles.*
93. *We did create a meaningful management research paper through the use of a managerial interview. This was very insightful.*
94. *I liked how I had to interview a manager and see how they utilized the concepts we learned in class in everyday performance.*
95. *The final Applied Management Research Paper allowed students to analyze the activities of a real-world manager in the light of the management theory presented in our textbook. Rather than simply relying on some examples from a textbook, we were able to evaluate the decisions made by real world managers based on the theory that we learned. This gave us a chance to draw conclusions about how theory is applied when managing an actual organization.*

96. *The assignments had real-world relevance.*
97. *The interview a manager paper was very meaningful. It was very cool asking a manager a variety of questions that will help me in my career.*
98. *Yes, management paper was fun. I enjoyed talking with a professional manager.*
99. *The final paper was a very useful experience. Not only did it give me the opportunity to interact with a manager in my desired field and create a connection, I also had the chance to learn more about what it means to be a manager.*
100. *I was really excited to do the final paper interviewing a business professional. It was helpful to compare what I learned in the textbook and real-life experiences with my interviewee. Being able to fully understand the techniques and skills presented in the textbooks is a great way to become a strong leader. Being able to adjust, as my interviewee has done, to real life experiences.*
101. *The final paper was meaningful, as I got to interview and learn about a manager I was interested in, or an organization I potentially see myself working in someday.*
102. *The task of interviewing with a manager and writing a paper about it. It kinda gives us the experience of a real-life situation in the work field. Gives us their perspective on how the work field is.*
103. *I really enjoyed being able to meet with a manager in a field that I am interested in. This way, I am able to have an opportunity to really understand what he or she says because I am writing a paper on it.*
104. *It was meaningful because I got the opportunity to conduct an interview with a professional in a management position.*
105. *I think the most meaningful project in the course was the final paper. It allowed me to interview my mom and get to know her as a leader and manager in her career, I thought it was so unique and unlike any other project I have ever done. I think it also meant a lot to her that I chose her to interview for my project.*
106. *The manager interview was meaningful and a good way to synthesize what we learned in the course and see it in a real-world perspective.*
107. *Selecting own topic and being able to use it in the work place.*
108. *I liked learning the real-world aspects of business and how to communicate.*
109. *The final analytical report was very helpful because it gave me an idea of how professional reports would be made.*
110. *I liked how the final project was geared towards being personal in a way. It wanted you to look at problems that were in your own work place and I think this allows the project to have meaning and be authentic.*
111. *I wrote an analytical report that gave me an opportunity to experience firsthand the use of analytical and critical thinking tools to help solve problems in the real world, i.e. help a friend on how to penetrate the market and expand his customers base.*

112. *I solved a problem for work and presented it to my boss in hopes that they take it in to consideration.*
113. *The cemetery development project felt applicable to real life.*
114. *This will help me set up Microsoft project. I am a project manager at my company, but I did not have the real experience and that was the purpose for this class.*
115. *The final case study was a fairly real-world use of accounting skills to solve a problem. After the midterm case study, I had enough understanding of the goals and objectives to complete the task.*
116. *The case studies allowed me to apply what I had learned to an actual real-world situation rather than just on their own.*
117. *The case study assignments allowed me to take a specific event from the world and research it deeply. I was then able to analyze the data I procured and put it into an essay that clearly articulated what was found. This is good practice for analyzing and critical thinking.*
118. *My current job allowed me to immediately apply things such as performance appraisal, interview skills and recruitment learned in this class.*
119. *Working with groups created connections and helped relate classwork to real experiences you might have in Human Resources.*
120. *Every assignment given was geared towards learning a better understanding of what it means to be in the business field.*
121. *It was a great opportunity to be able to write a grant proposal on behalf of a real non-profit organization. It increased my knowledge and respect for non-profit organizations that work hard to get grants and offer their services.*
122. *Grant writing is always meaningful, and is such an important skill to have in this world!*
123. *I have never written a grant proposal before, so being able to create one is really cool. Also, I learned so much in this class than I did in any English class. Ann's feedback was kind of harsh (because Ann gets so detailed! It's a good thing, though!) but very clear-cut because it only made my proposal better. I really enjoyed this class! Being able to do something that is applicable to the real world and that will really impress employers is awesome!*
124. *Will be able to use processes at a future job.*
125. *I got the opportunities to fully work on a marketing project for a company. I gained more practical skills rather than just learnt about the theories. I could apply my knowledge while working on different components of the marketing plan, and the instructor gave us constructive feedback.*
126. *It was meaningful because I can apply what I learned and did in this project to other courses and perhaps a job, too.*
127. *By creating our own business plan and do the financial analysis, I have a real-life experience to think about using the knowledge learned from this class to real-life examples.*



128. *By being able to go out and do field work and site visits. Which wasn't described in the class description as this is supposed to be a fully online course.*
129. *The projects we participated in directly correlated to subjects we would use in a work setting.*
130. *It always seemed meaningful in respect to what we would be applying into the health care field.*
131. *The case studies were meaningful because they allowed for a closer touchpoint to the work aspiring health service managers to the frontline work within a healthcare organization. The book review was meaningful, in my opinion, because the flip grid showed an in-person side to the digital faces we have as online students.*
132. *The executive book summary was meaningful for me because it allowed me to read about real-life cases and relate it back to the concepts and information that I've learned throughout this course.*
133. *It made it feel like it could be a real-world project and allowed us to act in the way that we think would be the best which was a good learning experience.*
134. *The course provided the opportunity for gaining knowledge that might be useful in future career.*
135. *Meaningful learning was achieved. Topics and activities covered in this class will be utilized in the future.*
136. *The different assignments including the Statement of Work, RFP allowed me to get a sense of how IT implementation and transition operates for businesses.*
137. *I just think that every assignment that we had I learned something that is important and relevant today.*
138. *I found that the final research project was very much so meaningful in that it provided grounds for which I could really go in depth with course concepts as well as apply them to the real world - really allowing for me to absorb and comprehend course content. I think another project for the midterm may have been helpful as well - perhaps a visual presentation uploaded by other students to be viewed and commented on (maybe with a voiceover?)*
139. *We had real questions and real-world answers throughout this course.*
140. *Since the movies I analyzed in this course were such popular movies, it was more meaningful to analyze them. I would have been not as happy to analyze some dumb old movie from ages ago. However, since these movies were from the recent years, I was happy to analyze them in depth. It is more useful to analyze the movies that are relevant to our society than just silly meaningless movies. This course gave me a chance to think about our society in depth.*
141. *I think the concepts in the word problems apply to real-life situations that you can take outside of the classroom.*
142. *These assignments provided a great opportunity for me to create a meaningful project because I was able to take what I had learned in the course so far and apply it to the real world, as well as to my own personal life.*
143. *I think that the YouConnects made the class most meaningful, as it asked students to draw a connection between what we were learning and real-world experience.*

144. *All of the sections that went into it and it was a real-life example and not a fictional one.*
145. *Had a semester-long group project that involved developing a marketing plan for a company/brand, which helped apply course concepts to real-world problems.*
146. *I think the final paper provided a nice task for synthesizing the information we learned and putting it to work. It was meaningful because it tackled a real-life issue and we were proposing real ways to create change based on the latest research and information.*
147. *If we could have taken theories and concepts and compared them to social movements today, that would've been meaningful. Or creating our own new social movement based on the theories if there wasn't one already.*
148. *I think creating documents we can go back and reference was meaningful. Example would be how we had to answer interview questions in a written format. I can go back and reference that before future interviews.*
149. *It was meaningful because I was able to reflect on myself as an interviewer and on my real-world career fair experience.*
150. *The projects were meaningful because they made you problem-solve and think deeply.*
151. *The project about my own emotional intelligence was eye opening and very meaningful to me.*

#### 1 Suggestion for more real-world relevance

152. *The project could have been more applicable to real life, instead of just imagining a hypothetical situation.*
153. *If we could have taken theories and concepts and compared them to social movements today, that would've been meaningful. Or create our own new social movement based on the theories if there wasn't one already.*

#### 1 Problem with real-world relevance as assignment criteria

154. *I think it would have been a much better experience had we not spent over half the time trying to find a viable grant (which was never found) and then once it was realized that we wouldn't it made the entire proposal wonky because we were trying our best to only use the real facts about the organization such as their budget and goals, but then we also needed to make up things and change things to fit this assignment. It would have been much better if we had simply stuck to the RFP without spending hours searching for others and to have not reached out to the organization because I simply did not feel comfortable asking for all this intimate information when we didn't have a viable RFP. Had the instructor not so strongly pushed for us to do something "real" I would have enjoyed and felt much more comfortable completing this task.*

## Appendix 3f

## 84 Collaboration Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *It was very cool to participate in discussions every week and see what other students are involved in and where their interests lay.*
2. *It was meaningful because it led me to meeting the people I met in the group as well as the people I met at the interview. That was a great experience and I learned a lot from that.*
3. *Having us work in groups is extremely helpful. My group created a text message thread that allowed me to ask questions each week and get a prompt response while working on assignments.*
4. *I think the opportunity for collaboration in this class created the capacity for more integrative and meaningful projects, but I felt a bit rushed to do so due to the challenges of virtual communication.*
5. *Teamwork. Because during the management, teamwork is important.*
6. *The peer review assignment gave us an opportunity to communicate and review each other's papers. This helped in strengthening and clarifying the points in the paper.*
7. *It allowed me to connect with all of my other classmates and give me the option to choose on who to comment on.*
8. *We are able to learn from other students based on the class discussion. They helped me understand the class material.*
9. *The only meaningful assignments for me was our group assignments and that was due to the depth discussions that took place to better understand the content.*
10. *The group collaboration aspect of projects made it meaningful, because it taught us how to work effectively as a group and helped contribute to our learning.*
11. *By having a group that really took this class to heart I was able to really get into both my individual project as well as my group project. By giving all the course materials and TED talks I was able to really look at these projects as ways to better myself as a person.*
12. *The final group presentation was very meaningful because we interacted together the whole semester.*
13. *The group project was a great way to wrap up the semester in a meaningful way.*
14. *The most meaningful aspect of the course was the ability to share our discussions with students on the texts that we read. I found this to be helpful when completing my assignments, such as the essays.*

15. *Throughout this class, I learned about working in a group and what makes it hard or stressful to do group work. There are always people working at different paces and just getting everyone on board to talk about assignments is difficult.*
16. *What made it meaningful for me was being able to work with my classmates and also getting feedback from them all. I really enjoyed learning and working with my classmates.*
17. *The team project was meaningful and allowed us to discuss what was going on in the class as well as what things were required of us as we went along.*
18. *Group projects were useful but the group video recording of presentation wasn't really useful.*
19. *I think what made it most memorable was because it was a group project. It took a lot of teamwork and practice to get everything sorted out. I also liked being able to hear what the others in my group learned from the readings and videos.*
20. *Our group project was fun to work on. A little tough relying on others for so much of your grade but it worked out.*
21. *The project that we did in the course was meaningful because it really gave me a good idea of how a project would work with a group of people who have differing views and ways of working.*
22. *MS Project working with a team.*
23. *I got the opportunity to work with a great team and create a successful project.*
24. *The project we worked on as a group was really helpful in applying the new skills we learned.*
25. *It allowed me to share my take on a piece of information about the things we were learning and allowed for my peers to provide feedback on the information I presented.*
26. *All of the group assignments did a nice job exposing me to what a project might look like and what the expectations are for project managers.*
27. *This course was meaningful because I worked in a group the entire semester. We got to know each other over the course and we utilized our technology to tackle assignments.*
28. *I think the whole thing with building a business was for sure meaningful. We were able to put many aspects of a business to gather and as a group look at it in many different views.*
29. *It was awesome to get a hands-on team experience in our NPD groups. I feel that it added an additional layer of learning beyond just the academic side of things.*
30. *The group assignment was well shared out which made the group project much easier.*
31. *Grant writing is very specific and unique. From this course, I was able to work in a team to understand the complexity of writing a grant.*
32. *Writing a grant proposal within a group is a type of assignment that would have made it meaningful. Throughout this project, I could connect what I learned in each week module and used the concepts into Collaboration Assignment. I also learned the importance of working on a team.*

33. *Developing teamwork skills.*
34. *Collaborating with others on a project.*
35. *Group work and working over distance without in person meetings.*
36. *I think the group assignment was meaningful.*
37. *I was able to have a job in a group and create slides that evaluated a process on a more advanced level.*
38. *I feel what I got that was most beneficial to myself from this was the experience with working on a project with several people. This was beneficial because none of us got to meet, and we had to do all of our coordination online. This gave real world experience with completing projects that management sends out, for a person whose team may be split across the state or country.*
39. *Ability to interact online in a group setting while still creating projects.*
40. *The research case studies with groups was a good opportunity to conduct group research on a company or methodology and discuss it.*
41. *I really enjoyed the collaborative group projects.*
42. *The most meaningful aspect of the course was the ability to share our discussions with students on the texts that we read. I found this to be helpful when completing my assignments, such as the essays.*
43. *I was able to work really well with my group-mates. I thought it would be hard over long distance, but we worked surprisingly well together and got everything done on time because the course had milestones that were far enough apart to allow adequate time to do a thorough job.*
44. *I think the group project was meaningful because it helped to understand how flexible Shakespeare's works can be.*
45. *I enjoyed the interlocutor papers because it enabled me to genuinely discuss the topics with someone I am comfortable with, and it allowed me to truly engage in the class more than I normally would.*
46. *I enjoyed getting to collaborate with other people about different topics we discussed throughout this course.*
47. *I understood how to participate in the course, including how to participate in group or team assignments.*
48. *I was able to take the concepts I learned in this class and apply them by writing a group paper that compares two companies.*
49. *The semester long group marketing plan was meaningful because it taught us the multiple different aspects of strategic marketing, as well as had us work remotely with a group (over online applications) in order to complete assignments.*
50. *Working and communicating with others completely through online channels.*

51. *The YouTube final project was meaningful because thorough instructions were given, it was broken up into two weeks so I could complete it to the best of my ability, and it was interactive in that I could view and comment on other students' projects.*
52. *Through discussion with others.*
53. *I liked how the discussions can be seen by everyone and it was a really good way to get a lot of ideas out in the open. I think that some reflective assignments could have also been shared and discussed.*
54. *The group homework discussions were integral to developing meaningful relationships with my peers along with helping to build a stronger foundation on topics that were difficult to understand.*
55. *It really helped to have the weekly moderator assignment because it allowed for discussion with other students in the class without giving extra work to the teacher. It helped to keep things going and understanding the topics of the class better.*
56. *I guess the meaningful project for this class would be our final paper. I got to write about something I understood well and somewhat have a relation to. In our peer review assignments, I like that I got to hear the opinions of others on something I cared about, as well as reading and reviewing other topics I didn't even think of but we're very interesting.*
57. *I think the class offered a lot of resources to help learn Spanish and succeed. I kind of regret taking it online because it is harder to learn when you're not actually hearing it every day in the classroom but there were other ways to get that by talking with others or watching videos.*
58. *Often online courses feel very distant. This course was different in that it required a variety of assignments and interactions with other students. The video conversations, video reactions, and the instructor's weekly update videos were great in making me feel more involved with the class.*
59. *I would have liked to do more individual projects instead of a team project. Additionally, discussions were not useful because it was hard to have meaningful discussions with such a large class. I would have liked to see more activities with the class content like practicing seeing other projects and activities like determining WBS and Agile methodology through worksheets and activities.*
60. *Throughout this class, I learned about working in a group and what makes it hard or stressful to do group work. There are always people working at different paces and just getting everyone on board to talk about assignments is difficult.*
61. *I think an assignment where we had to talk about leading teams in real life using our skills that we learned in class would have been very beneficial and interesting for me.*
62. *I felt that most of the time I struggled with the assignments and had to rely a lot on my group to get them done. For that case, I didn't feel that I was able to create meaningful projects, presentations, and authentic tasks.*
63. *MS Project with team.*
64. *The project that we did in the course was meaningful because it really gave me a good idea of how a project would work with a group of people who have differing views and ways of working.*

65. *I really enjoyed that we got to present what we had been working on the whole semester together. It made it more meaningful and enforced a sense of teamwork.*
66. *This course was meaningful because I worked in a group the entire semester. We got to know each other over the course and we utilized our technology to tackle assignments.*
67. *I can share my idea online, like I share my idea with my friends on Facebook. Therefore, if this course can provide the opportunity for me to create a meaningful project, it would help relieve my stress of having to do a normal presentation. I also can share presentation and my own work online with my classmates, so it is really meaningful.*
68. *The most meaningful aspect of the various project assigned in class were the group projects and the ability to work with other students and share ideas and information on the texts that we read.*
69. *The course included a group project. The successful completion of this project required us to meet as a group which provided several opportunities to learn new programs and applications for online meetings. Two applications I learned about were YouTube Live Events and Google Hangouts, neither of which I used prior to this.*
70. *I think the group project was meaningful because it helped to understand how flexible Shakespeare's works can be.*
71. *I guess the meaningful project for this class would be our final paper. I got to write about something I understood well and somewhat have relation too. In our peer review assignments, I like that I got to hear the opinions of others on something I cared about, as well as reading and reviewing other topics I didn't even think of but we're very interesting.*

#### *1 Suggestion to increase collaboration*

72. *I don't think there were any meaningful tasks in the class. It would have been nice to get in a group and have a project with the theories for more colleague interaction, analytical thinking w/peers, and I think you learn a lot from being in groups and teamwork.*

#### *12 Negative comments about collaboration*

73. *There was too much collaboration in a time crunch to coordinate so many schedules that many of them ended up being more stressful than meaningful.*
74. *Some of the descriptions were confusing and hard to follow. And it was difficult to work with so many group assignments and trying to communicate with people in an online class.*
75. *I would love less group work. The increased Collaboration made it very easy to skirt by and not put much effort in.*
76. *In an online class, I think making most of the project management assignments individual assignments would have been much more valuable. Had projects been individual, I would have focused more on how to apply the course learnings. As is, I had to spend way too much time dealing with frustrating group members and had to BS my way through or do the bare minimum. This is especially true of the assignment where we had to make a Project file. MS Project is NOT designed for group projects and collaboration.*
77. *Some of the descriptions were confusing and hard to follow. And it was difficult to work with so many group assignments and trying to communicate with people in an online class.*

78. *I preferred the individual assignments as I learned the most from them. In this class, I didn't get out of the group assignment as much as I would have liked to.*
79. *The film project didn't make sense as a group project. The work involved was too little for five people. The project should either be more intensive, or done in groups of 2-3.*
80. *No. A group project or more direct communication from the professor would have helped.*
81. *The only difficulty I had was communicating with my group members online since it is an online course.*
82. *I would have liked to do more individual projects instead of a team project. Additionally, discussions were not useful because it was hard to have meaningful discussions with such a large class. I would have liked to see more activities with the class content like practicing seeing other projects and activities like determining WBS and Agile methodology through worksheets and activities.*
83. *Also, group projects in an online class are not the best idea. From all the people I know taking this class, it is just a very stressful and not meaningful way of making kids do busy work.*
84. *Yes, it was hard to do the presentation video because we all have different schedules. it is not like in the real world when a remote team still has some of the same hours.*



## Appendix 3g

## 66 Integrated Assessment Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *It was meaningful because it was a culmination of the semester long learning.*
2. *Applying everything we learned to the final paper.*
3. *I thought the class has been meaningful and I like how you learn all sorts of terms and tricks and then we have written a paper to put it all together. To me writing a paper like this is much less stressful and more meaningful then taking a final at the end of the term on everything we have learned so far.*
4. *I think that the short papers throughout the course were meaningful projects. Specifically, the final applied management research paper was helpful. I think it was meaningful because it applied all of the concepts throughout the entire year.*
5. *The manager interview was meaningful and a good way to synthesize what we learned in the course and see it in a real-world perspective.*
6. *It was meaningful as I was able to incorporate all my learning into my group work and final paper.*
7. *It integrated everything we learned throughout the course.*
8. *I liked the YouTube playlist assignment as it let me puzzle together what I had learned over the semester. I think it could have been explained a little more clearly. I was confused on whether we were supposed to use songs from the modules or any song from those artists. I also wasn't entirely sure how to word my description. Did I need to talk about each song in depth?*
9. *I thought that the final assignment was the most meaningful task and allowed me to put the whole of my knowledge attained throughout the course to use.*
10. *The YouTube playlist was very meaningful It helped test what I have learned over the weeks of being in this class. And it also helped me spot some things that I may have missed before when learning about each chapter.*
11. *It was cool to go through and create a playlist at the end of the course. It allowed me to tie together the entire semester.*
12. *I think the YouTube project really synthesized together the whole purpose of the course!*
13. *The final project was meaningful because it wrapped up the course nicely.*
14. *The YouTube assignment really synthesized everything we learned in the course and all of the music we listened to. I found this to be very meaningful because I could look back and had something to represent my entire experience in the course.*

15. *Creating the YouTube playlist was meaningful in that it required me to utilize all the things I had learned in the course to complete a cumulative project.*
16. *We had been working all semester on how to draw conclusions from technical and creative aspects of film, and the final project was summative and wrapped it all together.*
17. *I thought the final presentation was a great opportunity to have a finale for all the work we'd done together as a group this semester.*
18. *The final paper. I enjoyed it because it encompassed everything from the course.*
19. *Applying everything we learned to the final paper.*
20. *The final paper was really cumulative and brought it all together for me.*
21. *I liked the overall perspectives that resulted from the course project. It was a good way to synthesize the material.*
22. *I would say that the most significant project is our final assignment, which really forces us to dig deeply into our case study and we really have to have an understanding and a grasp on what we've done in class so far to be successful in the final. It is a good use of truly seeing how effectively students can analyze a case study like the one we were given.*
23. *It was meaningful as I was able to incorporate all my learning into my group work and final paper.*
24. *Was very meaningful once I understood requirements. It let us use everything we learned and boost retention.*
25. *You really get to synthesize what you learn and put yourself in the driver's seat. By that, I mean picturing myself as a leader and manager someday and how I will work with others and lead effectively.*
26. *It integrated everything we learned throughout the course.*
27. *The final YouTube playlist we had to make was definitely meaningful, as it involved reflecting on everything we'd already learned and using it to generate a cohesive argument.*
28. *The final allowed me to create something that represented all we had learned and I really liked that.*
29. *The essays were meaningful because they required you to synthesize your thoughts and feels using music as supporting evidence.*
30. *The YouTube playlist was very meaningful. It helped test what I have learned over the few weeks of being in this class. And it also helped me spot some things that I may have missed before when learning about each chapter.*
31. *It was cool to go through and create a playlist at the end of the course. It allowed me to tie together the entire semester.*
32. *I think the YouTube project really synthesized together the whole purpose of the course!*

33. *The three critical essays really forced me to synthesize information.*
34. *The YouTube assignment really synthesized everything we learned in the course and all of the music we listened to. I found this to be very meaningful because I could look back and had something to represent my entire experience in the course.*
35. *I thought the final project was a good way to put all the things we learned through the semester and put it all together into a final project.*
36. *The final exam and the final paper both allowed me to pull together what I learned about filmic elements including music. I love both Oz and The Mission and it was fascinating to think about them in deeper and completely different ways than I had previously. The elements we learned about in this course have allowed me to appreciate all movies on a much deeper level. I am truly and profoundly grateful for this, as music and movies are two of my favorite things in life - I couldn't get along very well without either. Cheers for a great semester!*
37. *The final presentation helped me put everything I learned in this class into a great summary of information.*
38. *It took a lot of effort and brought together things I've learned throughout the course.*
39. *It was meaningful because it was a synthesis of my learning and gave me the opportunity to explore myself as a leader.*
40. *I would say that the most significant project is our final assignment, which really forces us to dig deeply into our case study and we really have to have an understanding and a grasp on what we've done in class so far to be successful in the final. It is a good use of truly seeing how effectively students can analyze a case study like the one we were given.*
41. *It was meaningful as I was able to incorporate all my learnings into my collaboration and final paper.*
42. *Creating a YouTube playlist because it showcases our critical thinking and what we learned from taking this course.*
43. *The case studies allowed for us to bring together all of the information we have learned in a really meaningful way.*
44. *The second essay interview made that assignment a meaningful project by making us interact with someone who has lived through the different musical eras and allow us to learn from a different perspective. Then the final project was meaningful because it incorporated everything we have learned and made me compile all of my thoughts into a short response and playlist.*
45. *This course's presentation was helpful for understanding the class holistically and reflecting on what we learned in the course.*
46. *The final allowed me to create something that represented all we had learned and I really liked that.*
47. *I like the concept of the final project being a playlist of songs from all the chapters. It's a nice way to get an overview of some of the key developments of rock and look back at the modules we've gone over. It gave me satisfaction to put my playlist together and write a description for it.*

48. *The final project was a great way to refresh and reflect on everything we learned.*
49. *Creating the final playlist helped me synthesize everything I learned in a creative way. I liked being able to compile the songs I liked the most and that were important in shaping rock music.*
50. *The YouTube project allowed us to compile things that we had learned throughout the whole semester.*
51. *The Spotify project was fun and engaging, and it provided an opportunity to combine all the elements/knowledge from the course.*
52. *The project caused me to go back through the course material again which allowed me to better appreciate the progression of rock over the years and connect artists to influential roles during each time period.*
53. *The Spotify project was pretty meaningful. It allowed me to synthesize what I learned from the course with my own personal preferences for music. I was able to reflect on music that I enjoy listening to. It was an enjoyable project.*
54. *The Spotify Project really got me to review all the things I have learned in this class.*
55. *The final Spotify assignment was meaningful as it brought all of the concepts of the course I learned about the progression of music of the course of history together.*
56. *I think the final project, creating a playlist of the music we listened to during the semester and based on some sort of theme, was really meaningful. It made me really think about what tied together all of this music from different times and genres.*
57. *We had been working all semester on how to draw conclusions from technical and creative aspects of film, and the final project was summative and wrapped it all together.*
58. *The Final review made me revisit all of the things I had learned from previous lessons and combine it into a full-blown professional review of a movie of my choosing.*
59. *Lab reports were somewhat meaningful in tying together information, but I'm not a huge physics lover so I'm okay with not having a meaningful project.*
60. *The research paper had the possibility to become meaningful, but was not given enough attention. Instead of only having two aspects to the paper, it could have been built upon through the entire time to really pull everything together in one meaningful final paper.*
61. *It was meaningful to take what we learned and synthesize it into a meaningful creative post (blog for me). It was meaningful because I was able to look back and see how much I learned and how this would influence me as a manager.*
62. *You really get to synthesize what you learn and put yourself in the driver's seat. By that, I mean picturing myself as a leader and manager someday and how I will work with others and lead effectively.*
63. *The content that we studied week to week was all leading up to one final paper. If you took the time each week you were really well prepared for the final paper.*
64. *All the projects leading to the final paper were helpful.*

65. *The final project was meaningful in that it was an application and culmination of other smaller tasks throughout the semester.*

*Suggestion for better integration of assessment*

66. *The research paper had the possibility to become meaningful, but was not given enough attention. Instead of only having two aspects to the paper, it could have been built upon through the entire time to really pull everything together in one meaningful final paper.*

## Appendix 3h

## 47 Reflection Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *I thought that the most meaningful assignments were the reflections, because they engaged my learning and I could look back on what I learned.*
2. *All of the assignments had meaning; the reflection helped the student give their impression of that week's material, then would receive feedback on your reflection to assist in areas you may not have fully researched. I thought every assignment help me get a better understanding of the subject material.*
3. *I think this course certainly provided the opportunity to create something meaningful. Both the final paper and the final group presentation are the opportunities I am referring to. The final paper really allowed me to think about my time in this course and reflect on what I have learned and how I can use it in the future, and the same goes for the presentation; it was a nice way to look over what we have discussed throughout the semester. Thank you!*
4. *I think there was one assignment that asked you to reflect on a time where you were a leader and to apply the concepts that you learned which was valuable. My favorite assignments were the ones that asked you to evaluate a situation and apply the concepts that we have learned in class. I think this allows a unique opportunity to put yourself in someone else's shoes and it also is interesting to see how other students react differently to each situation.*
5. *I think this course really allowed me to self-reflect while learning about concepts which helped me grow as a leader and as a person. I think this course helped me create meaningful assignments that I put a great amount of effort into.*
6. *The course projects and assignments were meaningful because it allowed students to do a lot of self-reflection with the material provided.*
7. *The individual paper gave enough flexibility in the guidelines so that I was able to write and reflect on a topic meaningful to my future career using course concepts.*
8. *I think that the makeup of the assignments and the feedback was very helpful. There was lots of self-reflection on concepts.*
9. *I appreciated the opportunities to complete reflections every week. It made it more personal and easier to connect to the concepts.*
10. *Reflection assignment was one type of assignment that made it meaningful. I had a chance to write what I learned from the articles or the videos and then connected the concept to my own leadership experiences.*
11. *Weekly reflections & the occasional mini papers forced me to utilize and apply my learnings. It made me reflect on the different leadership concepts we've learned and how they're connected. Doing these assignments have helped me prepare for real life leadership experiences.*

12. *I think some sort of reflection essay would've been a great memorable assignment.*
13. *Being allowed the opportunity to reflect on how the course personally impacted myself, my life, and my peers made an impact and will forever change how I interact with others.*
14. *I thought that the most meaningful assignments were the reflections, because they engaged my learning and I could look back on what I learned.*
15. *I think some sort of reflection essays were great memorable assignments.*
16. *The discussions were focused on engaging with classmates in a professional manner, discussing materials and reflecting on personal backgrounds in the academic context.*
17. *The HPMO (high-performance-manufacturing organization) model gave me an opportunity to reflect on how manufacturing is supported by these three aspects of leadership, product and innovation. It is these three dimensions that gave me an opportunity to reflect how to evaluate any report based on these dimensions.*
18. *It offered the ability for me to do in-depth self-reflection, both on myself as a communicator and as a student. As it turns out, I'm better at communicating than I am at being a student. :/*
19. *I think I got a lot out of this course. The film analysis project and textual analysis essay were great assignments that forced me to think deeper on some cultural issues that I otherwise wouldn't consider. It forced me to look at some of my own privilege in today's society. And, it helped me to know how I want to be as a student. It would have been fairly easy to coast by in this class and get a "C". But I don't want to waste my time and just be average. I want to learn and grow and this class helped me to fully realize that.*
20. *The weekly reflections were pretty meaningful because they helped reflect what you learned that week and made you sort of apply it to the real world.*
21. *The course is structured in a way where you take the reading and you apply it in a YouConnect project where you really reflect on what you learned and applied your understanding.*
22. *The final YouTube playlist we had to make was definitely meaningful, as it involved reflecting on everything we'd already learned and using it to generate a cohesive argument.*
23. *I think the essay prompts allowed it to be meaningful for me. I got to open up in reflection about the music and what it said about reality.*
24. *The reflection that we had to do was meaningful. This allowed me to reflect on the entirety of the course and everything that I have learned in this course. I enjoyed the assignment.*
25. *I think using reflections for the critical essays were a big takeaway for myself. Reflection is very key to making meaningful projects which I consistently used throughout the semester.*
26. *This course had me complete numerous projects and reflections that allowed for personal reflection. Specifically, the final project that allowed for freedom in song selection and analysis was extremely meaningful due to its autonomous nature.*
27. *It offered the ability for me to do in-depth self-reflection, both on myself as a communicator and as a student. As it turns out, I'm better at communicating than I am at being a student.*

28. *The weekly reflections were pretty meaningful because it helped reflect what you learned that week and made you sort of apply it to the real world.*
29. *The YouConnect assignments we completed required a thoughtful reflection of the fundamentals of management, and we were challenged to create something that was meaningful and memorable. Professor K. pushed us to think outside of the box.*
30. *Writing all the papers allowed me to build and grow my critical thinking skills.*
31. *The final YouTube playlist we had to make was definitely meaningful, as it involved reflecting on everything we'd already learned and using it to generate a cohesive argument.*
32. *The final YouTube project was meaningful because I was able to reflect on the music I listened to over the course of the semester and how rock and roll has evolved.*
33. *We were able to explain personally how we understood what we learned with our YouTube final project. Being able to select our own music, and describe it in our own words demonstrating our understanding of the material presented this semester was meaningful in the sense that it was a true reflection of ourselves and what we learned, not simply just an exam about facts.*
34. *The YouTube final assignment was meaningful because it allowed me to reflect on an entire semester of work that I had completed.*
35. *The Spotify playlist project was a great opportunity to reflect on the music we listened to through the semester and the common threads that tie disparate types of music together.*
36. *I liked that the final project wasn't a test and it was kind of fun to make a playlist. It was different and reflected what we learned. I liked it a lot.*
37. *The final project was a meaningful project for me, because I was able to reflect back on all the different variety of songs that I have learned about from this course.*
38. *It allowed me to reflect on my entire semester and what I had learned - an all- encompassing project.*
39. *It was meaningful because I was able to reflect on myself as an interviewer and on my career fair experience.*
40. *I really enjoyed that the writing assignments challenged me to think outside of the quantitative.*
41. *The final YouTube project was meaningful because I was able to reflect on the music I listened to over the course of the semester and how rock and roll has evolved.*
42. *It was meaningful to analyze and reflect on the social implications of different songs.*
43. *The YouTube final assignment was meaningful because it allowed me to reflect on an entire semester of work that I had completed.*
44. *The reflection that we had to do was meaningful. This allowed me to reflect on the entirety of the course and everything that I have learned in this course. I enjoyed the assignment.*
45. *The Spotify playlist project was a great opportunity to reflect on the music we listened to through the semester and the common threads that tie disparate types of music together.*



46. *I think the meaningful assignment was conducting an interview on the morality of rock, which gave fruition to a wonderful and meaningful conversation on morality and life.*
47. *The course is structured in a way where you take the reading and you apply it in a you connect and project where you really reflect on what you learned and applied your understanding.*

## Appendix 3i

## 20 Articulation Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *We got to write our own thoughts about what we were learning each week in the weekly discussions.*
2. *The discussion posts really helped us in understanding and preparing for the case study papers.*
3. *The discussions were focused on engagement with classmates in a professional manner, discussing materials and reflecting on personal backgrounds within the academic context.*
4. *We are able to learn from other students based on the class discussion. They helped me understand the class material.*
5. *The discussions were very meaningful to me and I really think that I learned a lot from reading everyone's perspective.*
6. *During discussion I had a chance to see my classmates' thoughts about the assigned topic. Each individual could express their opinions if they would agree or disagree on their classmates' posts.*
7. *I had to formulate my ideas for the essays. This allowed me to practice my logical thinking and my ability to formulate arguments.*
8. *I thought the class has been meaningful and I like how you learn all sorts of terms and tricks and then we have written a paper to put it all together. To me writing a paper like this is much less stressful and more meaningful than taking a final at the end of the term on everything we had learned so far.*
9. *The only meaningful assignments for me were our group assignments and that was due to the in-depth discussions that took place to better understand the content.*
10. *The most meaningful aspect of the course was the ability to share our discussions with students on the texts that we read. I found this to be helpful when completing my assignments, such as the essays.*
11. *I liked how the discussions can be seen by everyone and it was a really good way to get a lot of ideas out in the open. I think that some reflective assignments could have also been shared and discussed.*
12. *Creating a math video in which you explained your thinking helped me learn more about the method of solving the individual problems.*
13. *The course allowed us to create demonstration videos and for our classmates to view them which allowed us to learn the problems further in depth and be able to communicate them.*
14. *The Math Demos were a good project.*

15. *The math videos helped me learn more about the method of solving the individual problems.*
16. *It helped me learn to create math demonstration videos.*
17. *It allowed us to create demonstration videos and for our classmates to view them which allowed us to learn the problems further in depth and be able to communicate them*
18. *It was very cool to participate in discussions every week and see what other students are involved in and where their interests lay.*
19. *The weekly discussion for the final paper was good and helpful for me.*
20. *No. Something that could make a meaningful project is a presentation in Spanish in front of people.*

## Appendix 3j

## 15 Polished Products Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *Through our final project, we got to put our whole semester's learning to use and create something we are proud of.*
2. *The final project allowed me to create something that represented all we had learned and I really liked that.*
3. *I was able to apply the concept that I've learned during the entire semester to create a meaningful project.*
4. *The Spotify assignment helped me think about the subject material cumulatively and made a tangible thing to show my knowledge to others.*
5. *Since we have been able to develop this company from the very beginning it felt like a nice progression from having an idea to bringing it full circle from conception to handing off a project.*
6. *The Tiki Toki timeline became more meaningful with each additional entry. It grew into a neat project to think about.*
7. *The Tiki-Toki Timeline provided a solid platform to translate an in-class lecture into weekly online work. While there were periods that the timeline was put off for a few weeks, the overall objective of focusing on three different themes based on the subject of the week really helped capture the overall message of that subject for the week.*
8. *The timeline is something that I found to be helpful and meaningful with regards to the course. This assignment helped me visualize the events and organize them in a way that was easy to understand.*
9. *I enjoyed the Timeline assignments and how I could relate them to my research for the major projects. It helped progress my research throughout the course.*
10. *I suppose that I enjoyed doing the final video project the most, that was a fun way to discuss something that genuinely interested me.*
11. *The final YouTube playlist allowed me to synthesize all I had learned in the course in an interesting and unique way. Instead of just writing another paper, I was able to supplement written analysis with the support of the music we had studied.*
12. *The course provided me with the opportunity to make a YouTube playlist, which is a technology I already use daily. I was already familiar with the format of YouTube, but I had never made a playlist before and it helped me explore that option.*

13. *Having a resume, cover letter, and LinkedIn profile is a great first step in developing your career, which is why I am happy I have these done!*
14. *The resume and cover letter work were meaningful as they provided me with a tangible product I can take forward into the job search.*
15. *The research paper specifically turned out to be a very well-executed piece of academic work. I am very proud of the research paper as it felt like one of the best pieces of writings I have composed.*

## Appendix 3k

## 12 Multiple Sources and Perspectives Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *I was able to use a variety of different readings, videos, and sources to write a response and understand the topic well.*
2. *It allowed me to dive deeper into music and understand other points of views along with questioning my own opinions.*
3. *I really liked how we got to use outside websites and different sources of technology in order to further engage our learning.*
4. *It was really cool to interview someone who experienced music from the 1950-1970 period firsthand. It was very insightful and brought different perspectives towards the subject.*
5. *The YouTube project gave me a chance to see other's ideas.*
6. *I think that Essay C was very meaningful because it allowed me to connect with a different generation and see how their opinions impacted their perception of the same music that I heard. It was meaningful because I can apply this knowledge outside of the course and remember that other's different experiences will make their perception of an event different from mine.*
7. *I think the ability to interview someone about the music we learned about provided interesting insight into a time most of us didn't grow up in.*
8. *I think the assignment where we had to interview someone born in the 40s was meaningful because it allowed me to see and understand an older generation and be able to connect with them about something they actually experienced.*
9. *The second essay interview made that assignment a meaningful project by making us interact with someone who has lived through the different musical eras and allow us to learn from a different perspective. Then the final project was meaningful because it incorporated everything we have learned and made me compile all of my thoughts into a short response and playlist.*
10. *I think an assignment where an outside text could be used to draw a parallel to course materials would have been beneficial.*
11. *I have done many researches while doing all the assignments in this course and so I think it teaches me how to do a meaningful project with more facts supported in the future.*
12. *I really enjoyed the interview project. It gave me some good insight into what the older generation was like and how they viewed things.*

## Appendix 31

## 11 Multiple Interpretations and Outcomes Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *We were able to pick a business for the Final Project that was within the area we wanted to think about.*
2. *We had the freedom to select the organizations we wanted therefore facilitating our creativity when developing the project.*
3. *I especially appreciated having the opportunity to decide what was meaningful to me from each module.*
4. *I enjoyed the final project and how open it was.*
5. *I found the Tiki timeline to be meaningful, as it was very interesting to see the subjective opinions of my peers on the most pivotal American historical events.*
6. *The writing assignments allowed for this and it was nice to talk about topics in a more personal way through the short video recordings at the end of the week because they had a loose topic but was still personal.*
7. *I thought that the playlist assignment was very meaningful. It allowed us to make a compilation of the most important songs and I thought it was really cool to see that everyone's playlist was very different.*
8. *Projects and papers were very open-ended and left a lot of opportunities to make assignments original and my own.*
9. *The essay questions were open ended, allowing for students to take unique approaches to answering them.*
10. *All of the writing (essays, discussions, reflective assignments) were quite open ended. While the prompts offered guidance, it was nice to be able to take a direction that I found most interesting or important.*
11. *The project at the end of the class was great to express our own interpretations of the music we learned, and to explore more deeply some of the music we knew prior to the class.*

## Appendix 3m

## 6 Sustained Investigations Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *It was meaningful to be able to create a project based on our course materials and work on it throughout the semester.*
2. *The final group presentation was very meaningful because we interacted together the whole semester.*
3. *I really enjoyed that we got to present what we had been working on the whole semester together. It made it more meaningful and enforced a sense of teamwork.*
4. *This course was meaningful because I worked in a group the entire semester. We got to know each other over the course and we utilized our technology to tackle assignments.*
5. *Not many courses have a semester long project to work on, and the cemetery project I thought worked best as a semester long project. I liked how not every week focused on the project too; it was a healthy break and regrouping tactic.*
6. *The final project was split into a few parts spread over the entire semester. This helped me build upon it over many weeks as I received feedback every time that I submitted a portion of the final project.*



## Appendix 3n

## 2 Interdisciplinary Perspectives Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *The timeline project gave us an opportunity to study the historical context of the literature for that week. In my opinion, knowing the history made the readings more interesting and engaging.*
2. *It made it meaningful by including what was going on in the time of the music that would/could potentially impact the songs that were produced.*

## Appendix 3o

## 126 Learner-Relevant Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *It was made meaningful because we were able to personalize our final research paper by interviewing a manager of our choice which allowed us to interview people who are of importance towards our future career.*
2. *I liked how the final project was geared towards being personal in a way. It wanted you to look at problems that were in your own work place. and I think this allows the project to have meaning and be authentic.*
3. *I think that the assignments were meaningful as I was able to personalize them with the type of career that I am looking towards. They helped me figure out the type of company that I want to work for and gave me an opportunity to think about my professional development.*
4. *I felt like the personal brand activity was helpful, I thought the LinkedIn outline was helpful but potentially a little excessive given that companies only even look at your resume for 30 seconds so why would they be invested in how many friends you convince to back up your skills on LinkedIn. Apart from that, though, I really resonated with the weekly tasks!*
5. *I felt that the informational interview and final project was very helpful and meaningful. It helped me to manage my time and go through a full process of job searching, company research, networking, and project management. This is something that should probably be done for every job I apply for, though perhaps on a smaller scale.*
6. *There were a lot of personal applications to the assignments which made it more meaningful to my understanding of the concepts in general.*
7. *The informational interview project was a great way for me to look into an industry that inspired me.*
8. *The project was very open ended, which allowed us to create a project that was personally important.*
9. *It made my ability to job search meaningful because I now know steps to follow to find job positions that I would be interested in and to apply to them.*
10. *It made my ability to job search meaningful because I now know steps to follow to find job positions that I would be interested in and to apply to them.*
11. *The opportunity to improve my resume and attend a job fair was very meaningful to me for my future career search.*
12. *A meaningful project that we worked on was our resumes and cover letters.*

13. *I think the resume assignments were extremely helpful. I already had a resume made, but having someone look it over really helped. Also, the resume scanner gave me some additional feedback to think about.*
14. *This course helped me a lot in preparing to step into the job market. The pace and process each week were very organized!*
15. *This course gave me the opportunity to truly think about the career options and organizations I would want to pursue after graduation. In addition, the InterviewStream resource proved to be a future asset for me whenever I want to practice any upcoming interviews that I want to be prepared for.*
16. *Resumes- useful for future.*
17. *I found a meaningful opportunity to expand my professional network and get advice to tailor my resume and cover letter in order to please a potential employer.*
18. *I have more confidence moving into my career search for after graduation because of the work done in this course.*
19. *I was happy with my resume by the end of the course.*
20. *It was meaningful because it well prepared me for the future.*
21. *Resumes and cover letters will be useful to use in the future.*
22. *Re-doing my resume and cover letter was extremely meaningful because it helped me for future jobs.*
23. *This course really helped me prepare and calm my nerves for job interviews. I highly recommend this course to other peers!*
24. *It was meaningful when it showed me my own worth. I kind of wish, however, that one module was dedicated more towards finding out what I want to do.*
25. *The resume and cover letters were needed and helpful to us since we are college students and will need to strengthen those things to further our career. The career fair was also useful and meaningful.*
26. *The course motivated me to better my resume and present myself higher in my career!*
27. *It allowed me to create a powerfully built and well-organized resume.*
28. *Creating a proper resume and cover letter in this course was very meaningful to me. I will give me the best chance of conveying my skills and experiences to employer.*
29. *Made my own resume and my LinkedIn page.*
30. *My final paper for the course was a meaningful project to me. That is probably due to the topic chosen had effects on me personally. The final paper was meaningful because it forced me to look*

*deeper in the case, study details, and present arguments that were beyond personal feeling or belief.*

31. *The final paper because we get to explore a topic that we find interesting and go our own ways with it which while still all applying the same foundational knowledge.*
32. *The interview a manager paper was very meaningful. It was very cool asking a manager a variety of questions that will help me in my career.*
33. *The manager interview was very meaningful for me because it helped me interact with people in a field that I love. It's one more person that has connections if I were to need them. It's another relationship to help build on. Careers in the sport management field are tough, so it is crucial to make a lot and the right connections. It has even further propelled me to interview more people in the field and my current place of work.*
34. *I was able to design a project that mirrored what I would create in my career field. There was guidance along the way that helped me focus in on a meaningful project.*
35. *I am going to be able to use my project to present it to the audience it was intended for. It was meaningful because I was able to use a topic that interested me.*
36. *The project was useful for the business I work for.*
37. *I was able to do my project in my organization which was relevant to my work. This was great.*
38. *Everything was meaningful. The responses we had to create after all of our readings really made you think about the information we took in and evaluate it and compare it to our own lives.*
39. *Talking to different leaders that have made a difference in your life and getting their views on how they perceive a leader.*
40. *The final PowerPoint and paper are meaningful because they encourage us to think about our leadership traits and how they apply in our daily lives.*
41. *A project relating to one's individual profession of interest.*
42. *The course provided the opportunity for me to create a meaningful project because a lot of the assignments we did were relative to my major and what I plan to do in my future.*
43. *It's a business I actually want to start. It doesn't get more meaningful than that for a business plan.*
44. *I really believe that the fact that we got to create a brand of something that we were interested in was a great idea. I really got a personal connection to it and I wanted to see it succeed. Now at the end of my time with this class, I will actually quite miss working on my brand. I'm not just saying this to be nice. I actually quite liked the process of creating our brand and seeing it grow. That part of the class was different than anything else I've seen in school, and I can say I feel as though I learned many skills by doing so. Keep it up.*
45. *Unique skills that will keep with me moving forward in my life.*

46. *I like being able to do the client research since I will have to do a lot of that in the future.*
47. *The project allowed me to get more insight in the career and ITI track I want to be in because I came into the course unsure what I wanted to do specifically. I had an idea of what I want to do but was unsure which track would give me an experience close to what I wanted to actually do.*
48. *The interview was meaningful since I was able to first hand meet someone working in a position that interests me and learn how they got there.*
49. *It is something I care about.*
50. *Learning new aspects about manufacturing and relating to organization I had an interest in, and learning how organization work as a group and the process, and the leadership sections in lectures were very helpful for my understanding.*
51. *It forced me to reflect on my own life and apply what I was learning rather than just recite back facts and figures.*
52. *Being able to connect it to other experiences in my life.*
53. *It was meaningful to be able to relate the course material to my life.*
54. *The space to use personal examples allowed me to use the learned content and incorporate it into my day to day life.*
55. *The second essay allowed me to connect my own experience with one of the theories taught in the lecture.*
56. *Helped me research further a topic I have been wanting to explore more in depth.*
57. *The assignment allowed me to explore a topic that was relevant to the class, but intriguing to me.*
58. *An assignment that applied math to our areas of personal interest, such as architecture or student loan debt.*
59. *It gave me the ability to make personal connections with the material, which allowed me to have a deeper understanding of the material.*
60. *The YouConnects were a phenomenal and very interesting way of getting me to try and find a way to connect with each function of management. I was slightly confused by the ambiguity at first, but I believe it was this ambiguity that allowed me to really make meaningful connections later in the course.*
61. *It was meaningful to be able to apply the concepts of the course to my life in the YouConnect assignments.*
62. *Being able to relate the concepts to myself and repeating them over and over helped engrave the lessons taught.*

63. *The YouConnect's were a great idea!*
64. *Although tedious, the YouConnect project was a great assignment. It allowed for me to look at various realms of my life and how I can alter any faltering aspects to ensure that they become relevant and helpful to myself and those around me. It truly did open my eyes to current actions I take which now helps me to take a step back and think about the situation with my critical thinking skills I have learned. Most papers or projects are indeed busy work, but the YouConnect actually made a difference in my life (a positive one!).*
65. *The YouConnect projects made it extremely personal because we were to relate it, in some way, to ourselves and lives to make stronger impact.*
66. *These assignments provided a great opportunity for me to create a meaningful project because I was able to take what I had learned I the course so far and apply it to the real world, as well as to my own personal life.*
67. *The personal connection, applying the fundamentals of management to literally yourself.*
68. *The YouConnect's made the class material more personal, and helped me retain the information much more efficiently.*
69. *It was meaningful to do our projects because of how we had to use our own personal stories and correlate it to the course material made learning everything fun.*
70. *It was meaningful because it was about me. I can speak to it myself and was extremely applicable.*
71. *The YouConnect assignments, although time consuming, helped make a meaningful connection with Understanding Management and myself.*
72. *We got to make a lot of personal connections with our projects to deepen our understanding.*
73. *The Center for Creativity and Innovation assignment felt meaningful to me. Also, I liked the ability to style the YouConnect in the way that we wanted, that was a good idea and made the assignment more personal.*
74. *We were asked to relate ourselves in YouConnect projects and relate it to the course.*
75. *I really liked the YouConnect assignments because I felt like I was able to connect with what I was learning with what has happen or is happening in my life.*
76. *It helped me understand my business better.*
77. *I thought the YouTube project was cool to come up with our own playlists.*
78. *Having the critical essays with additional materials helped me to connect what we learned with other areas of my life and other resources. I enjoyed this portion of the course as it helped me to learn much more.*
79. *I was able to create a music playlist and use my own knowledge I learned throughout the course!*

80. *The YouTube project was a meaningful opportunity as we could create a playlist of our own of songs we learned. However, the instructions were not super clear on what was expected and how to construct it.*
81. *The final project allowed for me to take in all I have learned this semester and relate it back to myself. I got to reflect my own interests while connecting it to the course. Creating playlists is something I already thoroughly enjoy doing, so getting the opportunity to do it for class was exciting.*
82. *It was meaningful because I felt that we got to discuss aspects of music that was important and interesting to me, such as the race relations and how that went hand in hand with the music of the era, the history and evolution of rock music, and the various different styles of music of the time.*
83. *The final essay allowed us to interview someone close to us about their personal experiences with music, and that was very meaningful to me.*
84. *The final essay was meaningful to me because I got to interview my girlfriend's mother who loved rock music and grew up during the heart of rock music.*
85. *I was able to make my knowledge my own in the final playlist project.*
86. *The YouTube project was very meaningful because I was able to pick my favorite songs from the semester and compile them in a playlist to share with the community.*
87. *It was meaningful because I got to choose a theme for the project unique to what I found interesting in the course.*
88. *The YouTube Final Project was meaningful because I was able to create a playlist based off of songs that I liked.*
89. *I liked the YouTube project because you had a choice in the music that you put together and were therefore able to say more on the subject. It's easier to speak out on something that interests you.*
90. *My favorite topic is history, and this course allowed me to make many connections to history and how music influenced and was influenced by political, cultural, and social events. I really liked how it was meaningful to students that were not just interested in music.*
91. *It made it meaningful because these are songs I have listened to before, so I had a personal connection with many of the topics we discussed.*
92. *I really enjoyed how this course was set up. It allowed for further thinking on the influences of rock and roll. Then it brought in our personal opinions into discussion.*
93. *The final project I created was very meaningful, because it gave me the opportunity to put together a list of my personal favorite songs that we studied throughout the semester.*
94. *I was able to take what I learned and look for specific musical aspects that appealed to me.*

95. *Being able to analyze and discuss my favorite movie series, that being Harry Potter, the narrative, and the music within, has been a very educational experience. This was one area of study I never saw myself being able to dive into in college, and am glad that I have had the opportunity.*
96. *It made it meaningful because I truly love cinema and every aspect to film.*
97. *Being able to select your OWN choice of a film for the final project made it extremely special. You were able to discuss a movie that you love and try to show another person why this film was so great.*
98. *I really enjoyed how I was able to delve deeper into some of my favorite movies to see their further meaning.*
99. *I had a meaningful assignment that was based off a film that I have loved my whole life but saw in a completely different light because of the assignment I had to accomplish.*
100. *The research paper was meaningful because it allowed me to dive deeper into a topic that I was interested in.*
101. *I could pick whatever topic I wanted for a research paper, which was a fun way to take the sociological concepts I've learned from the course and apply them to something I am interested in.*
102. *The week I moderated the discussion, I felt like I got some nice feedback and could be more specific in how the theories applied to me and my life specifically.*
103. *I liked moderating because it gave me the opportunity to connect social theories to my own personal life.*
104. *I guess the meaningful project for this class would be our final paper. I got to write about something I understood well and somewhat have relation too. In our peer review assignments, I like that I got to hear the opinions of others on something I cared about, as well as reading and reviewing other topics I didn't even think of but we're very interesting.*
105. *This course allowed me to pick a research paper topic that I was interested and helped me further develop my ideas through different assignments such as annotated bibliography, analyzing a specific source, and peer reviews.*
106. *The final paper was meaningful because I was able to write about a social issue that I actually cared about.*
107. *Every assignment was applicable to something in my life. The exercises and discussions all helped me prepare for the internship that I am currently in the process of starting and many of the lessons in this course were very helpful to that.*
108. *This course was helpful in providing me guidance throughout my search for jobs for next year. I feel like I improved significantly, and now I have access to tools that I did not know were available to me.*
109. *This course helped me make my resume better!*



110. *As I mentioned in my evaluation, I particularly enjoyed the resume and cover letter project, it was meaningful because it gave me new perspective on how I see myself as an employee and the experiences I've had and skills I've earned.*
111. *I think something that made the assignments throughout this course so meaningful is how useful they were. The projects and tasks we had to complete were things that I need for my future professional career preparation so it was nice to get graded and feedback on things that I will use in the future like a resume and cover letter.*
112. *I found that writing a resume and cover letter was personally very helpful. Not only did I want to complete this assignment to get the grade but I also now will only have to make small tweaks to these when it comes time for me to look for employment.*
113. *I think this course really helped with my writing skills, especially from a more professional standpoint. Having to write so many papers in this class, and the expectations of these papers to be professional really benefitted me and is something that I will keep with me going into my career.*
114. *I was really interested in the subject and it is a proposal that I can actually hand to the company I currently work at.*
115. *Being allowed the opportunity to reflect on how the course personally impacted myself, my life, and my peers made an impact and will forever change how I interact with others.*
116. *The connections made to the YouConnect assignments were meaningful because it made us apply the concepts to our lives, which made them easier to grasp and remember.*
117. *The YouConnect assignments and Project assignments helped me to really understand the fundamentals of management and how they apply in my own life, and to a greater extent the world around me.*
118. *I enjoyed the intersectionality assignment. What made it meaningful was the fact that I was able to evaluate myself in a non-judgmental space. I also greatly enjoyed learning how to use the Google Draw tool.*
119. *The discussions were focused on engagement with classmates in a professional manner, discussing materials and reflecting on personal backgrounds in the academic context.*
120. *I was able to record myself doing an interview for this class. This was meaningful because it gave me more practice with interviewing, something I need more help doing and I was able to see how I could improve and what I already do well.*

#### 6 Suggestions to Increase Learner Relevance

121. *Instead of creating a playlist to summarize or capture the songs learned in the course, have instead a playlist that reflects some significant time period during each individual students' lifetime using the songs learned in the course. It will be far more authentic and meaningful to have a personal based project.*
122. *Lab reports could be created according to my own individual experiences with the weekly lab experiments.*

- 123. I think a project that is relevant to student coursework will be more meaningful. For instance, the cemetery development project was a topic that we have no idea about. We don't know who works on this project, how much a typical funeral home costs, and what is needed to operate a cemetery. Which is why by incorporating a project that is related to college would be so much easier for students to relate to and work on.*
- 124. The fact that we stuck with one project helped magnify the lessons of each week. I wish that we could create our own projects at the beginning of the semester and then vote on it.*
- 125. It gave me the chance to learn about something personally relevant and write about it.*
- 126. The cemetery assignment was extremely confusing. How are we supposed to know what goes into making a cemetery? We were completely in the dark and there is not a lot of resources online showing you how to develop a cemetery. Due to this, the majority of the group assignments were literally made up and not helpful. It was like shooting in the dark. A more helpful assignment would have been something that was simpler to develop so that we could be creative with our assignments and did not have to spend time thinking about how to even develop a cemetery.*

## Appendix 3p

## 59 Learner Choice Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *It was meaningful because I was able to choose something that I was passionate about and try to create an effective solution.*
2. *We were able to pick a business for the Final Project that was within the area we wanted to think about.*
3. *We had the freedom to select the organizations we wanted therefore facilitating our creativity when developing the project.*
4. *I enjoyed the fact that we were able to choose our own topics for the final report.*
5. *Having the ability to choose a topic that was interesting. The individuality made it meaningful.*
6. *Being able to choose the person to interview was a way to really personalize the project for something that I will use in the future.*
7. *It allowed me to connect with all of my other classmates and give me the option to choose on who to comment on.*
8. *The way the final paper was meaningful was that you got to choose who you wanted to interview, essentially being a networking opportunity, which was much more important than the opportunity itself.*
9. *Selecting own topic and being able to use it in the work place.*
10. *I got to pick my final paper, so that made it really meaningful for me.*
11. *This project was meaningful because I could choose any topic that I was passionate about. It made it easier to want to work on and research, and it makes me prouder to see it completed. Writing this report about something I am passionate about is also meaningful because I could actually use it/the information I discovered to make the change I suggested in my report!*
12. *It was meaningful because we were able to pick something that was important to us, and the guidelines were flexible, allowing us to choose from a wide range of topics.*
13. *It was nice to choose our own topic of interest to focus our final project on.*
14. *I thought it provided the opportunity to be meaningful, because we were able to choose the project. Essentially, we could choose anything, which allowed us to choose something important or relevant to us. What made the project meaningful was the topic I chose. My choice of topic was related to the gym that I have been a member of and coach of for over five years. I have developed a lot of relationships at this gym and being able to provide an analysis that will potentially bring forth a positive outcome that will affect the community is important to me.*

15. *I was able to choose something I am passionate about for the semester long report.*
16. *This was meaningful because we got to choose what we worked on and it was not just assigned to us.*
17. *The whole proposal process allows us to create a meaningful project. We're allowed to choose a topic that we feel passionate about and delve into potential ways to remedy that problem.*
18. *We were able to pick the organization we wrote the proposal for, and I was able to write the proposal on the organization I am currently interning for- Be the Match.*
19. *I had the opportunity to choose from a non-profit that I wanted and write a unique grant proposal for them that interested me. I would say that is pretty authentic and meaningful.*
20. *I especially appreciated having the opportunity to decide what was meaningful to me from each module.*
21. *The book summary allowed me as a student to pick a topic of interest and read a book that I found interesting rather than just having every student read the same book. This also allowed students to learn about other books that may be of interest.*
22. *The final project gave you a lot of freedom to write about what you please.*
23. *I was able to pick a monster that I was interested in for my research paper which made it more interesting and fun to write.*
24. *I think the project that was originally assigned would've been meaningful because we were able to choose any topic that we were interested in.*
25. *I enjoyed writing the final project. I am glad we had completely free reign to research whatever topic was interesting for us. I really appreciated the freedom and the chance to learn about something I chose for myself.*
26. *The final project was meaningful to me because I got to choose a topic that I was passionate about.*
27. *I liked the final project because I got to choose a topic that I am actually really interested in. That being said, since the Professor was nonexistent, I don't actually know whether or not my topic was acceptable for the project.*
28. *Having freedom of choice for our final paper topic was excellent and allowed students to pick topics that interested them.*
29. *I think that the final paper we got to write made the class meaningful and the TikiToki presentation. This is because both projects we were able to pick our own topic, therefore, that made sure it was something we were 100% interested in.*
30. *The final project was a good example of how this class provided a meaningful project, it allowed the student to pick an area of interest and expand on it.*
31. *It left room to choose the media for creating and submitting assignments.*

32. *The final project for us to create a YouTube playlist was something that we could all reflect on. We were able to choose the songs that we felt were most meaningful throughout the course. This project really gave me a personalized ownership of the assignments I completed during this course.*
33. *The YouTube playlist project was meaningful in that you were able to choose songs that you personally thought were "best of" songs and ones that you enjoyed.*
34. *The projects and assignments within this course were meaningful because it allowed the students to incorporate their own experiences in music. I thoroughly enjoyed completing the assignments for this class because I was able to apply the concepts we were learning to my favorite artists and music.*
35. *This course had me complete numerous projects and reflections that allowed for personal reflection. Specifically, the final project that allowed for freedom in song selection and analysis was extremely meaningful due to its autonomous nature.*
36. *Allowed us to pick our own songs and personalize our playlist which I liked. Gave us the freedom to choose our own theme.*
37. *I enjoyed being able to choose songs that were of significance to me from our course time and reflecting on them.*
38. *I compiled a playlist of music from the course that I enjoy - I will keep listening to this playlist even after the course ends and add more to it with other songs to which I was introduced in the course.*
39. *We had a lot of freedom in our projects and I believe that is what made it meaningful. I was also able to learn more about songs that I listened to prior to the course.*
40. *I liked the Spotify assignment and the ability to choose our theme for a playlist, but it was very easy to fake, could be done without a lot of effort.*
41. *The choice assignments and critical essays were helpful since it made us think more about the context of the songs we had to listen to.*
42. *For me this was the final review. What made it more meaningful was that I was able to pick the movie and slowly work on it over the course of the semester.*
43. *The final review was very meaningful. It helped me to be critical of one of my favorite films. I focused on the small details and how they connected to larger messages.*
44. *The final review was meaningful, as it allowed you to review a movie of your choice.*
45. *By letting us choose the film for the final review made it meaningful.*
46. *I was able to choose the film I reviewed for my final.*
47. *Being given the choice to write about a movie of my choice for my final project and in meta reviews made my experience very authentic.*

48. *I enjoyed the ability to choose the movie I wanted to do my report on and the whole thing allowed for self-pacing to an extent.*
49. *The course was one of the most organized courses I've taken in the three years I have been at the University of Minnesota. It was very helpful to have the specific week's assignment checklist appear on the homepage and to have more detailed instructions within each individual assignment. Overall, I think the organization, clear instruction, and the instructor's availability (quick response time to emails) made each assignment (review, discussion, draft, etc.) meaningful. I also thought it was meaningful to be able to apply the course content to films of our choice.*
50. *The ability to choose what film we were using for the film paper helped shape enjoyment.*
51. *The research paper is the meaningful project. It was meaningful because we got to pick a topic that we were passionate about.*
52. *All of the writing (essays, discussions, reflective assignments) were quite open ended. While the prompts offered guidance, it was nice to be able to take a direction that I found most interesting or important.*
53. *Getting to choose the topic for my research paper (within a few limits) was very meaningful to me. I think that choosing the topic myself was tough because there are so many good topics to write about, but I think writing about one that I am passionate about made it a lot easier for me to be engaged with the paper and enjoy myself when writing it.*
54. *I was able to select a project (choosing where to live) that is directly applicable to my future.*
55. *I had the opportunity to choose from a non-profit that I wanted and write a unique grant proposal for them that interested me. I would say that is pretty authentic and meaningful.*
56. *It allowed me to do a project I wanted to do and it was approved. I know other professors try to give students flexibility by letting them create their own project but is still very specific when it comes to their guidelines.*
57. *I think being able to use course concepts and create your own business was the most meaningful assignment. You can choose something that you are passionate about instead of just being told what to do.*

## 2 Suggestions to Increase Learner-Choice

58. *Making the Math Demonstration videos helped me in my understanding of certain problems. One thing that I didn't like as well about them is that we had to choose which kind of problem we would present before we had learned how to solve the listed problems. This took away the chance of picking a problem that I had had difficulty with and might have understood better if given the chance to work on that specific kind of problem in greater detail.*
59. *I felt like the final project wasn't meaningful because we only got to choose from the songs listed in class. It would have been more meaningful if we could choose from any rock song of any era and maybe we didn't learn about them in class. Because the way the project was set up, I felt like every peers' playlist that I listened to was the same.*

## Appendix 3q

## 32 Learner Self-Expression Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *The meaningful project for me was the paper. It was nice to write about a meeting I had and to think about everything and talk about what was meaningful to me.*
2. *This course allowed me to explore outside sources and formulate my own thoughtful presentations of the topics we addressed.*
3. *The course made this reachable because it allowed me to put my personality into my work and challenged us to do. The course challenged us to do our best work and to think outside of the box.*
4. *For example, during discussions and feedback to other students, it allowed us to have meaningful observations and interpretations, making the assignment more beneficial.*
5. *It allowed me to share my take on a piece of information about the things we were learning and allowed for my peers to provide feedback on the information I presented.*
6. *Discussion is a type of assignment that made it meaningful. During discussion, I had a chance to see my classmates' thoughts about the assigned topic. Each individual could express their opinions if they would agree or disagree on their classmates' posts.*
7. *The final project allowed for the imagination to drift a little which I enjoyed.*
8. *I really liked the group videos. It allowed me to express my thoughts and opinions in a very causal way.*
9. *The essays challenged me to form and express my own opinions and theories about the literature we read. I also found it meaningful to learn about the origins of many of the uniquely American ideas and values.*
10. *The essays were a good chance to add individuality and interpretations from the readings.*
11. *This course has provided me with the opportunity to create short stories I am proud of.*
12. *The final essay allowed us to elaborate on our own thoughts on what was left out in the course.*
13. *The YouTube project and essays allowed us to have freedom and speak our mind.*
14. *Playlist allowed me to present my thoughts on the music presented in the course and engaged in the material we experienced over the summer.*
15. *I loved the evolution of rock and roll final assignment, because it allowed me to form my own opinion from the entire course.*
16. *I learned how to use YouTube for something other than just accessing videos. I felt the playlist I made was unique and I enjoyed making it.*

17. *We were able to explain personally how we understood what we learned with our YouTube final project. Being able to select our own music, and describe it in our own words demonstrating our understanding of the material presented this semester was meaningful in the sense that it was a true reflection of ourselves and what we learned, not simply just an exam about facts.*
18. *The course really pushed us to give our own opinions, thoughts, and feelings. This really helps us to feel invested in the projects which is a huge bonus.*
19. *I was able to share songs that represent my own life in some way shape or form, which I think helps people to understand me better.*
20. *The project was meaningful because it allowed me to express what I got out of this class and which songs really made an impact on me.*
21. *All of the essays and the final project were meaningful, because they helped me learn how rock music specifically impacted groups of people. This was something I was hoping to learn coming into the class, so getting to write about my own opinions with respect to this topic was very meaningful.*
22. *The Spotify project was a nice way to end the class. It allowed me to put my knowledge of rock and roll into a positive assignment where I could share my ideas.*
23. *The final project was a way for me to put my opinion out there about what music I enjoyed from the course and why it is important.*
24. *The Spotify project allowed me to include songs in my playlist that I found meaningful and that I enjoyed sharing with my classmates.*
25. *I liked creating the final Spotify project to express some of my favorite songs from the course and relate them to a theme that mattered to me.*
26. *We got to write out our thoughts about what we were learning each week in the weekly discussions.*
27. *I feel like I really improved my writing throughout this course, which is meaningful for me as a journalism student. We were given basic prompts but also a lot of freedom to write what we please.*
28. *The course allowed for me to make my own assessments of films and utilize the knowledge that I learned to make an honest review.*
29. *I think the final essays questions, asking for our opinions is the most "meaningful" assignment we were given. I think this would be a hard course for an assignment like that.*
30. *The writing assignments allowed for this and it was nice to talk about topics in a more personal way through the short video recordings at the end of the week because they had a loose topic but was still personal*
31. *Love that we could each put our individuality into the presentation.*



32. *The final review allowed us to write about a movie of our choosing, meaning it was most likely a film we really enjoyed. And while writing essays isn't overly fun, writing about something you enjoy is at least easier if not fun, as your feelings about the subject are much stronger. However, we were not allowed to be overly positive about the movie, which takes away from the experience. This assignment was described to be as if we were reviewers giving a movie review. There are many positive reviews in the existence, and they all vary on subject as each reviewer feels differently about different movies. To not allow us to be positive about our own movie for the sake of "authentic" review feels unrealistic, as good movies exist and reviews write positive things about them all the time.*

## Appendix 3r

## 27 Learner Creativity Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *It really requires students to be creative and put in effort, that's why it's meaningful.*
2. *There's a bit of creativity and freedom allowed within each project/presentation/task, but there was one instance where a group project focus was a bit murky. The project really helped reiterate all of the things I was learning throughout the class and brought all the material together in a fun way.*
3. *The course readings gave me a general understanding of the course material, but the assignments allowed me to be creative and dive further into the topic.*
4. *What made the assignments meaningful was due to the interesting, thought provoking topics and open-ended approach that still had criteria and guided examples. These aspects of the tasks allowed me to play on my strengths and experiences and tested my creativity.*
5. *I liked the accountability to a consistent discussion post and the ability to be creative with that without having to be prim and proper with the response.*
6. *Creating short fiction pieces throughout the semester - each with a different challenge/task associated with them, yet the openness to fit that challenge with whatever topic/characters/situation desired - as well as two short stories was incredibly empowering and impactful, especially for someone who has not had much experience in creative writing. After doing these exercises for the past few months, I plan to continue writing and creating short fiction pieces, using the lessons I learned in this course to continue to improve as a creative writer.*
7. *I thought the Tiki-Toki timeline project was really meaningful because it was directly related to what we were learning about in the class, but we also were able to be a little bit more creative than on most projects in other classes.*
8. *Being given the opportunity to make some assignments creative in approach is what made it meaningful because we were able to make the projects our own and many courses don't allow you to do this.*
9. *The YouConnects and projects were meaningful in a sense because they taught me new skills and improved my creativity and innovation.*
10. *By allowing me to make my project assignments personal and imaginative. The format of project was open and very broad.*
11. *The course provided many opportunities to create meaningful projects as it allowed us to show our creativity. There was not a lot of rules to what we did things as Professor K. wanted us to shape how we showed our growth and knowledge of different tasks.*
12. *The opportunity for YouConnects, anything creative & meaningful.*

13. *Yes, we did three essays and one final project. All of these assignments allowed room for personal creativity.*
14. *I thought the YouTube project was a unique one where we had to use our creative side a little more than usual.*
15. *I think the YouTube assignment was a neat use of technology because it allowed us to be creative in demonstrating what we learned from the semester.*
16. *We got to be creative when writing essays and doing the final project.*
17. *The YouTube playlist project was meaningful because it allowed me to be creative and show what I had learned throughout the course. I had also never made a YouTube playlist so it was nice to learn how to do that. I enjoyed being able to show my own preferences through the playlist.*
18. *I liked the YouTube final project and that we got to make a playlist of certain songs that stood out to us over the semester!*
19. *I have never been a part of a class that gave me the opportunity to make such a meaningful project. It was meaningful because I was able to use my creativity during it, an aspect I don't see in any of my other course projects.*
20. *All of the assignments allowed for creativity when selecting music, but the time period limit of the course prevented some of the best/most recognizable songs from being usable.*
21. *We had the freedom to select the organizations we wanted, therefore facilitating our creativity when developing the project.*

#### 4 Suggestions to Increase Learner Creativity

22. *I wish I had been more creative in the completion of the group presentation, because I thought it was a generic presentation-style project; however, more could've been done with that like making a fun video!*
23. *The course was structured around discussion posts, essays, and a group timeline. I think doing a final project that is different than an essay might have pushed us creatively and to think a little outside the box.*
24. *I think the midterm papers were nice assignments. The YouTube project at the end felt very forced and gave little room for creativity. I would much prefer an assignment like "Do further research and write about a topic that interested you in the class".*
25. *Instead of so many written reviews, the course should include a creative project for students to learn the painstaking process of scoring a film. In another online course I completed, there was a required video that each student prepared in the WeVideo cloud. There was a great technical support system offered to the class members. For this course in music in films, the project would be a 5-10-minute-long video that allows the students to incorporate music and sound into a video. The requirement would be a minimum of 25 different sound selections scored into the video. The final review should be dropped and the musical scoring project substituted as a 100-point project. NOTE: At the present time, there already exists enough writing to meet the CLA requirement for*

*at least three writing-intensive courses. This course would be a much better course with a creative project included.*

- 26. Maybe a team art/creative activity since the class is surprisingly not writing intensive, it felt writing heavy. So, including a more creative outlet as an option would be ideal.*
- 27. The assignments were good applications of materials and often took some creative thinking.*

## Appendix 3s

## 20 Learner Socially-Culturally Connected Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *I got to get involved more with the community by interviewing people.*
2. *Working closely with my relative and learning more about her made the final paper meaningful to me.*
3. *The final project was meaningful because I got to speak about an organization that I have been a part of most of my life.*
4. *The interview with my partner has created a deeper relationship between the two of us and made us more effective partners. I am back in school to make me more effective at this business, so it is wonderful to see immediate results.*
5. *I think the most meaningful project in the course was the final paper. It allowed me to interview my mom and get to know her as a leader and manager in her career, I thought it was so unique and unlike any other project I have ever done. I think it also meant a lot to her that I chose her to interview for my project.*
6. *I thought it provided the opportunity to be meaningful, because we were able to choose the project. Essentially, we could choose anything, which allowed us to choose something important or relevant to us. What made the project meaningful was the topic that I chose. My choice of topic was related to the gym that I have been a member of and coach of for over five years. I have developed a lot of relationships at this gym and being able to provide an analysis that will potentially bring forth a positive outcome that will affect the community that is important to me.*
7. *The projects, especially the Critical Essay C and the Final YouTube project were meaningful to me. The essay was meaningful because we had to interview someone and it made the project way more personal. I got the chance to learn a lot personally from talking with my grandpa and I think he did too. It was a great way to learn and also make a stronger connection between the two of us. The final project was also meaningful because we had the opportunity to reflect on the course as a whole and what we learned from it and then apply that learning by creating a YouTube playlist that demonstrated our learning. I enjoyed the course a lot.*
8. *I always find meaning when I can show how things evolved over time and many of the projects had us do that. I also had a very interesting discussion with my uncle for the interview project that I may not have otherwise gotten to have which I value very much. Finally, the final project had us discuss the diversity in what we were learning which I found to be very valuable.*
9. *For Critical Essay C we had to interview someone, and this gave me a chance to learn more about one of my family members. Additionally, it helped to put what we were learning about in class in a context relatable to me.*
10. *I liked the project where we had to interview someone. I interviewed my grandmother and it was interesting to hear about how the music that we learn about in class impacted her.*

11. *The interview was meaningful because it gave me new perspective in regards to my grandfather's experience with music growing up. Created new areas of discussion.*
12. *I liked the essay where you had to interview someone about music from the era we were studying. It was interesting to talk to my grandparents about what music they listened to when they were my age and what they thought about it.*
13. *I really enjoyed Critical Essay C. I had a great time interviewing my Great Uncle and just getting to connect with him on a musical level I had never before. It really brought the two of us closer which I am extremely thankful for. I sent back the finished essay to him and he was extremely impressed with how it ended. If I had to take away one meaningful project or assignment from this course it would most certainly be Critical Essay C.*
14. *I really enjoyed the interview assignment. Initially, I was a little hesitant, but I actually learned a lot from my grandmother about her music opinions and it was nice to connect over.*
15. *The Critical Essay B interview was meaningful for me. This prompted me to interview my parent about a topic which we had not spoken on before and I learned quite a lot. I would suggest providing a couple of potential essay topics (morality as a topic seemed limiting to me), but otherwise I loved this opportunity to talk in depth about another time period and experience with someone who witnessed it firsthand!*
16. *The Critical Essay C created a meaningful connection to this music by understanding the relationship that older members of our social circle had with that music.*
17. *I enjoyed the interview essay because it allowed me to connect with my grandmother through music and I think that's something very unique.*
18. *The Interview project was very meaningful for that I got to have a knowledgeable conversation with my father.*
19. *For me, getting to conduct an interview with someone in my own life about music of a certain time period was meaningful. My dad happened to be the best person for me to interview based on the music he experienced growing up and how invested he is in rock and roll music. My dad originally had impacted my interest in this course because I grew up with him playing rock music all the time, and I wanted to learn more because of this as well. Interviewing him and giving him the opportunity to tell me about his passion for rock and roll was a valuable experience.*
20. *I loved the assignment where we interviewed an older relative / person. I was able to connect my classwork to my grandmother's childhood.*

*Appendix 3t**5 Learner Values and Caring Quotes*

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *It was meaningful because we got to pick the topic and organization of this project which made it more personal. It gave me more motivation to do well on this project because I did it on an organization I was connected too and love a lot.*
2. *I got to create a project that helped close friends!*
3. *It was meaningful because I was able to look into an issue that I care about, and really dive into the nitty-gritty of it.*
4. *I think this course was meaningful because for the most part, a large majority of us got to participate and create proposals for causes and organizations that mean a lot to us or make important changes in the community.*
5. *Community gardens are extremely important to families in low income areas. Being able to share the knowledge of community gardens with others hopefully raises awareness of these crucial elements of society.*

*Appendix 3u**96 Assignment or Course Positive Quotes*

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

*51 Assignment Positive Quotes*

- 1. Every assignment has a purpose outline in what it will help us learn.*
- 2. The resume assignment was meaningful.*
- 3. I enjoyed the task of looking into the source material and finding which aspects of the material is used and why.*
- 4. The fact that I was able to contribute to each project and the grades represent the overall learning from the course.*
- 5. My final paper for this class.*
- 6. All projects were meaningful.*
- 7. The course provided me with the opportunity to review a business plan for the final project. We learned about aspects of a business plan during the class, but when we made these plans, I felt very unprepared, which led me to feel unprepared to evaluate this new business plan for the final. However, I do think the opportunity to create a business plan and to critique one from the eyes of an investor was a good one.*
- 8. I really enjoyed the case studies. Looking at certain companies and what they were doing well is interesting.*
- 9. Learning about certain aspects of the assignments.*
- 10. I believe it made me think about areas of the business plan creation that I would not have thought of or pursued. It also had us read about other companies' business plans and get a feel for how our plan compared to these as it was created.*
- 11. The materials presented to me were new so it provided a lot of learning opportunities, which made it very meaningful. For example, I've never used LivePlan before and I've never really taken a look at samples of business plans before so I learned a lot of new things, especially in regards to developing a new business.*
- 12. The assignments we did allowed for a really helpful end project. I felt that I learned all the parts along the way.*
- 13. Writing a full grant proposal is an elaborate one, and I have an incredible amount of respect for the process. I learned a lot about the entire process.*
- 14. The proposal was meaningful because it was so engaging and I felt like I learned so much.*



15. *Hopefully from the experience of writing a grant proposal I will be able to write then in my future career. But, right now I am not feeling experienced enough to take on another grant proposal.*
16. *The marketing project was meaningful.*
17. *The final presentation required the combination of the feedbacks given by the previous stages. It helps us to grow and learn from the mistake gradually.*
18. *All of these assignments were meaningful. I came into this class with no background of construction and now I do.*
19. *The interview was a good project. It would be good to have reminder of the due date.*
20. *Nothing too meaningful. But at the very least, projects were interesting. I like doing the project on a local business.*
21. *The projects were meaningful because they directly related to the topics we were learning for the week in order for us to solidify the knowledge that we learned.*
22. *The project for this course was somewhat enlightening for me, because it provided me with a chance to see what I need to work on in terms of project management and the like.*
23. *The grammar log! It is so helpful and I can look it up when I encounter some grammar problems in the future.*
24. *I felt like I was developing my ability to analyze the source of fears when I was writing my final paper.*
25. *All of those papers made me think differently than I usually will. They, accompanied by the feedback given by the instructor, gave me a solid idea of what a literature perspective was.*
26. *The three writing assignments provided me with the opportunity to explore theatre in a new manner that I may not have otherwise done.*
27. *I enjoyed the close reading essay actually, because it made me see such an old book in a more critical way.*
28. *The individual writing assignment and group paper were both very meaningful in tying together all of the concepts.*
29. *In my opinion, all the assignments that we have covered so far were super and contributed to what we need in order to gain knowledge.*
30. *U Connect.*
31. *Loved the format of YouConnects.*
32. *Writing all the papers allowed be to build and grow my critical thinking skills.*
33. *I like the Idea of the YouConnects assignments, just was confused on what the instructor was exactly looking for from those.*

34. *Writing the 'you connect' and projects helped me think more like a writer since writing is not my strong suit.*
35. *I liked that we used the same company throughout the whole semester.*
36. *Directions were very clear for every assignment and feedback was given really quickly which was nice.*
37. *I feel that the YouTube project and the critical essays were all meaningful tasks and help greatly expand my knowledge on the content of the class.*
38. *Creating the playlist was meaningful because we were required to pick songs that influenced rock as it evolved.*
39. *I feel that assignments like the YouTube playlist would make for more meaningful assignments.*
40. *The assignments were very clear and direct, and so it made it clear to me what I was being challenged to think deeper into and so I was able to do so.*
41. *I really like the second essay because I wrote an essay after I watched three movies. Those three movies were well directed and very interesting. In my opinion, the music is not a simple art form that people can only appreciate by listening. Movie is also a good way to know the music. In fact, there are many music that I added to my favorite list comes from the several movies.*
42. *I really liked the different prompts to each assignment and how they each helped me to take a different perspective on music.*
43. *The weekly quizzes and homework help make this course meaningful since it tested my knowledge of each chapter.*
44. *This allowed me to use skills that I otherwise would not have been exposed to. We did things in this lab that we didn't do in a chemistry or biology lab for example, and that allows us to think differently.*
45. *Overall pretty meaningful. Mapping intersectionality was a good assignment.*
46. *The research paper was a good way to practice my critical thinking as well as my writing skills. I also learned a lot about social policy surrounding government assistance.*
47. *I'm not sure what this question is asking, but this course sparked my interest in everything sociology especially when navigating through everyday life.*
48. *I enjoyed the compositions, they helped me practice my Spanish!*
49. *The compositions were good.*
50. *Writing questions on My Spanish Lab.*
51. *It was meaningful because we could directly apply our learning.*

52. *I thought the course interface was very easy to understand and also easy to maneuver. Finding documents or links was extremely easy.*
53. *It was great, thanks for taking time to make it so organized!*
54. *The course was extremely well organized and professor G. had very specific instructions and rubrics on how we were expected to complete projects and assignments. This was very helpful and I appreciated all the resources.*
55. *How everything was planned and laid out made every week very well and organized.*
56. *Odd question. However, this Canvas site is set up the best that I've seen, especially for it being an online course. Everything was all in one place without being cluttered and it was easy to navigate.*
57. *I really appreciate most of the templates for all of the projects. This eliminated a lot of anxiety. The only exception is the last and final individual project.*
58. *I think the fact that this course gave helpful resources such as the resume grader and the interview site really helped me in developing the things I needed to be successful. Also, the comments supported my revision process a lot.*
59. *The presentations website was a great tool, which I thought was helpful.*
60. *The study notes were very helpful, as well as the assignment guidelines and descriptions. The readings applied to the module and were necessary to complete the module so we were able to get a full understanding of the concept.*
61. *The clear instructions available through Canvas made tasks easy to follow and understand.*
62. *This class more than any other required me to prepare for interviews in updating my CV, review up to date information on interview expectations and forced me to get outside my comfort zone.*
63. *It was meaningful because it put things in perspective and it made realize what I need to improve on.*
64. *I learned a lot of little things about interviews, resumes and getting a job that I never knew before.*
65. *It was good.*
66. *I learned a lot in this course and gained a lot of knowledge.*
67. *The course was developed to impart practical knowledge of "management" in bits. The four paradigms of management were evenly divided among the modules and it really helped me prepare my final report. Also writing a final report based on a face-to-face interview was an experience I really enjoyed.*
68. *This course gave me a chance to show my writing skills that I didn't know that I had.*
69. *Yes, I thought the work we did was great and each thing had a different teaching purpose so I feel like I learned a lot of new skills.*
70. *Made me evaluate my current writing skills.*
71. *It was meaningful in inciting change.*

72. *The course made it meaningful with all of the modules. However, the instructions were always vague. He wanted a story, yet he really wanted a lot of resources as well.*
73. *The course was very useful in understanding what is necessary in a grant proposal, it would have been easier were it not totally online.*
74. *This course made me think bigger than I have before when it comes to seeking funding. I've only ever had to look for small amounts of funding for clubs and activities so it was interesting to expand my knowledge.*
75. *It's an English grammar class but it does not just focus on grammar, we also practiced our spoken English.*
76. *It was a good chance to consider and study grammar.*
77. *It gave me the chance to learn about something relevant and write about it.*
78. *I learned a lot in a very effective manner.*
79. *It was more accessible when not on campus, while also providing reasonable due dates and access to submit assignment and short papers.*
80. *This class helped me grasp American history better and improved my American history knowledge.*
81. *Good.*
82. *It was fine as is.*
83. *Detail orientated, time management, organization skills, research skills.*
84. *Learned a lot of new information.*
85. *I understood all the projects and worked on learning more about the course and history through a musical perspective.*
86. *Learned a lot of new information.*
87. *The book gave us enough information where I probably could have made a fun presentation on an artist or musical style.*
88. *Learning about this history of music.*
89. *Yes, this class was very helpful in that way.*
90. *Course is just fine the way it is.*
91. *Nothing was "meaningful" so to speak, but the class was simple and easy to understand.*
92. *It taught me to write important documents and what to look for when I'm working as a PM.*
93. *Critical and analytical thinking; ability to ask questions.*

94. *It tell me something new and sometimes I search it up and learn more about it if I want to know more of it job career.*
95. *I got to do something that I would have not done by myself and the information I learned in this course.*
96. *Throughout this course I learned a lot more about my leadership skills and how I can use them to be successful in the work force.*

## Appendix 3v

## 26 Technology Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *Use tools that will be essential down the road.*
2. *The YouTube live assignment was helpful, because I was able to learn how that technology worked, as I have not used it before.*
3. *Microsoft Project was a great introduction as well as the project management project that we got to work on this semester.*
4. *The ability to work on a project, using the project management tools we learned.*
5. *MS Project with team.*
6. *This course provided me the skills to use a software that I was unfamiliar with using the notes provided online and through the reading. There was also a manual we worked through and had to download installments off of Canvas to perform the assignments. This is a meaningful skill to have learned this software as I can implement it in my current and future work. The long-term assignment of the course allowed me to function as a leader by coordinating a team and the difficulties of managing a team which are all good experiences to take into consideration next time.*
7. *I think I mainly understood how to use these technologies but maybe didn't use them to their full potential. I think the tutorial videos in the beginning helped quite a bit to help me navigate this course on an online platform.*
8. *Microsoft Project 2013/2016*
9. *Microsoft Project*
10. *It is my first time to take an online course. It gave me the chance to present in front of the screen but not face-to-face. I have learned a lot of things regarding YouTube and other technology. It is interesting to me.*
11. *The technology used, although new, was very helpful in helping students achieve success.*
12. *The course allowed me to experience other technology than my assignments required. Overall, the class was interesting.*
13. *It helped me to further my technology skills by introducing new ways to do projects, hence the voice over and presentation - like the weekly posts in YouTube.*
14. *The course included a group project. The successful completion of this project required us to meet as a group which provided several opportunities to learn new programs and applications for online meetings. Two applications I learned about were YouTube Live Events and Google Hangouts, neither of which I used prior to this.*

#### 4 Online Social Presence Quotes

15. *Ability to interact online in a group setting while still creating projects.*
16. *The book review was meaningful, in my opinion, because the Flipgrid showed an in-person side to the digital faces we have as online students.*
17. *We didn't have a project but I had the opportunity to do Voicethreads, which is very helpful for the students. I had the opportunity to introduce myself to the other students.*
18. *The meaningfulness derived from the ability to communicate and to share in real-time without worrying about any other plans, and so more work was able to be completed and finished.*

#### 8 Struggle with Technology Quotes

19. *Technology within the Interview Steam app was not working and I could not access it.*
20. *Working through the Canvas technical issues. Technology needs to work.*
21. *I thought it was interesting how students can connect to each other via Google Hangout and through Flipgrids.*
22. *OK... let's review your survey instrument... Sometimes this course did and did not allow easy and convenient responses and opportunities to interact.  
Ditch flip grid. Total frustration on interaction. Provide alternative options than flip grid.  
Consider requests for online presence / publication vs. need for personal privacy. Some people have good reasons to monitor online presence.*
23. *Microsoft Project! Terribly confusing to use and the instructor offered little direction. The manual was helpful but would have been helpful to have recorded lectures from the professor on this topic.*
24. *The timeline software was hard to use and understand, and the assignment directions were not clear.*
25. *The use of the forum posts to create the final group project was sufficient, though it was not an ideal form of communication. The various forum posts that were able to be started and the forum reply attribute made it difficult to find group member replies often times. This may have been something I noticed for this team in particular, but communication was slightly more difficult based on the forum attribute.*
26. *The instructions were nice, but I wish we didn't have to redirect to a google docs page. I had to have like 4 tabs open every time I did an assignment.*

## Appendix 3w

## 24 Assignment and Course Negative Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

## 7 Assignment Negative Quotes

1. *Instructions were not always clear. I had to email a few times to ask questions to make sure I was doing it right.*
2. *The interviews we did had a lot of potential but I personally did not find them too meaningful.*
3. *Case study requirements were very vague.*
4. *Assignments were sometimes unclear and our group was confused about what exactly we were supposed to do. I had higher expectations for this course.*
5. *Some of the assignments were hard to understand and then you would get a bad grade.*
6. *It was completely useless because half the assignments that made up the "meaningful project" were a reach from the chapter lesson of the week. Most of the time, I felt like I was making up nonsense and sending it in. Might have helped if the professor actually looked over what assignments they assigned this year and adjusted the instructions to make sense.*
7. *Creating a LinkedIn profile was a great assignment in theory, but the requirements were just too difficult to meet. I'm glad to now have a profile, but I'm disappointed that my lack of connections inhibited me from receiving a better grade.*

## 18 Course Negative Quotes

8. *Literally the most boring class of my life. At least make it interesting???*
9. *The final paper I thought was great. The rest of the course for the most part was material already learned in previous courses, and I thought all of us commenting on what we read in the textbook got extremely tedious as there was a huge lack of variety in responses.*
10. *I thought it was an okay project, I didn't feel like I learned that much from the course. It helped me think a little more deeply about business communications, but I don't feel like I got the value commensurate with what I paid for the class.*
11. *The course made it meaningful with all of the modules. However, the instructions were always vague. He wanted a story, yet he really wanted a lot of resources as well.*
12. *This course did not provide a place to make create meaningful projects and tasks because they were too worried about using all of (or at least 4) of the course resources in your writing rather than being able to dive deep with one or two of the readings that really struck you.*
13. *Working with groups created connections and helped relate classwork to real experiences you might have in Human Resources. I think something that was a challenge as this is an online*



*course was not meeting in person. It limited our communication to solely professional work and there was minimal personal conversation or relationships that would expand beyond the course.*

14. *Nothing to me was meaningful.*
15. *The grading system was standard 93-100% A, 90-93% A- etc. However, assignments were set up so it was not possible to earn 90-100%. They should have been curved. And when everyone gets a lousy score on a test, this teacher needs to ask whether the problem is the students or whether the test was faulty.*
16. *Instructions for this were available but I didn't feel it was encouraged.*
17. *I didn't like this course liberal education is a waste of my time.*
18. *I did not understand the projects. I wish he offered examples, so I would understand what I was supposed to do.*
19. *I found the material in this class to be completely and utterly devoid of meaning. I can genuinely and sadly say that I dreaded every time I had to engage with this course, not through any fault of the professor and not because the material was too difficult, but because the subject of management proved to be so vapid and dull. Succeeding in this course came to mean shoving as many buzzwords into my assignments as possible and I'm sad to say this worked. Something this course could have done to be more meaningful is to use a better text or, better yet, no text at all. The daft and maric text made strange generalizations and really droned on and on about the same things over and over again. Also, in one particular instance the book seemed to show a lack of understanding of the pseudoscience of personality tests which made me distrust further assertions the book made. Additionally, the course notes emphasized self-reflection, values, self-improvement, and most importantly, nuance. However, the fact that the book was constantly trying to categorize and sort management into different terms felt inherently at odds with the nuance and critical thinking the course was actually trying to teach. The one thing I actually liked about the book were the little anecdotes about real companies. I actually feel like I learned something from those at times. If you want to make this course meaningful, I would be more transparent about the nature of management to be much ado about nothing. Then give us some case studies about real companies and tie in the course with the news and current articles. Teach the course without a book. I apologize for my harsh critique of the course, but I don't really feel like I learned anything and that makes me frustrated.*
20. *I didn't learn anything about music.*
21. *I felt like some of the coursework was busy work.*
22. *I didn't think this was very meaningful, however, I think if you wanted to make it meaningful you could've. I would have liked a different genre of music.*
23. *For a lib ed course that is only 3 credits, there was much more work than anticipated, and some of the grading was reviewing work as if we were all music majors and had prior knowledge of composition.*
24. *It just didn't seem like this class really helped me towards my major or become a more diversified individual. Yes, it was an interesting class, but still seemed like it wasn't beneficial.*

25. *Most of the assignments felt like busy work and weren't super beneficial in learning.*

## Appendix 3x

## 23 Course Improvement Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *I feel like there could have been TedTalks that talked about job searches or something that was encouraging for students in this course so they could feel motivated on completing job applications instead of treating them as assignments.*
2. *Not really, the career fair could have been a unique task/opportunity, however, since I had already been attending some due to graduating in May, it wasn't something I wouldn't have done if I had not been enrolled in this course. I feel that a project surrounding our potential career field would have been very cool and more so forced us to delve into the opportunities.*
3. *I thought the final paper was a good idea, but could be better focused on introducing the project though.*
4. *I believe an individual presentation or project would have been more beneficial to me than a group project. I also believe that it is not necessary to have both a final paper and final project for the course.*
5. *The mini papers helped with the final papers. I really enjoyed writing the mini papers. An assignment that was not as meaningful was the group performance assessment. I did not find this assignment resourceful or helpful. It was nice to get feedback from the group. However, I did not feel like my group gained from this. At the end of this course it would be nice to have a point system for our group. Where we can evaluate our team members based on grading them and ourselves in "100 point" system. Similar to other HSM course. In other HSM course, we would rate our group members based on a point system, then that individual will get "points" for that part of the overall grade.*
6. *Some additional resources for questions could be helpful, but over all I did well and feel other students will be able to as well in the future.*
7. *It would be resourceful to make the PowerPoint slides more accessible to students. Since the slides were posted on the weekly module page. It was difficult to find them sometime. In addition, grading. The final reflection paper is due in module 14. However, the midterm reflection has not been graded yet. This makes it difficult for us to understand what is required from you and how you grade it. Since the midterm is similar to final reflection. I would be better if the grading was done quicker so that students are able to take in the feedback and improve from there.*
8. *The main issue was that the Moodle Page was not updated from last year, so there was lots of confusion of class meeting dates, assignment deadlines and expectations.*
9. *Writing a paper for this class would be a good way to improve myself*
10. *Clearly defined criteria and resources ultimately are what remote students need.*

11. *I did not like how you have to find the week that you're on. I would have preferred if each week disappeared after it was done, or if the site was simply divided into sections based on content rather than dates (so there would be a section for discussions, readings, and quizzes) because the way it was set up was very difficult to find assignments and keep track of where we were in the course.*
12. *I would have liked to have an assignment where we used a software like a stock exchange game.*
13. *Better instructions for the project and an example to give us an idea of what was expected.*
14. *Honestly, I don't think his directions on some assignments were clear at all. He didn't give us any examples and made us use websites and copy data that was hard and come up with some weird answers.*
15. *Have study guides and sample questions for the final and midterm.*
16. *I think more of a thoughtful stimulation that goes in depth more with the topics.*
17. *I felt it was difficult to find projects meaningful when commentary was limited to a few sentences with my final grade. I would prefer full feedback via something like GoogleDoc comments.*
18. *The little projects seemed more like busy work. Meaningful projects should have been instead of some of the less useful discussions rather than an addition. These projects could have tackled the issues that the texts we read over this course addressed.*
19. *The assignment of Tiki-Toki Timeline should be improved because we would like to know more about how the events impact the American literature in that period.*
20. *The short stories provided the opportunity to combine elements from each module, but this opportunity was undermined by the lack of feedback on each module.*
21. *Providing a little more structure to the project would've been helpful.*
22. *I just needed some more description in the instructions because they weren't always worded so that the point of the assignment was easily understood.*
23. *Homework is meaningful. Lab can be meaningful, but the supply for lab isn't easy to find. I wish there could be a kit in Coffman Union that can provide everything I need for all labs.*

## Appendix 3y

## 14 Project-based Learning Quotes

If the course provided the opportunity for you to create a meaningful project, presentation or authentic task, what made it meaningful and how? If not, describe a type of assignment that would have made it meaningful.

1. *The project itself made it meaningful.*
2. *I think the Capital Convergence project made what we were learning very meaningful. It was very confusing, yes, but it was that didn't just seem like childish busy-work and answering basic questions--aka something meaning, an authentic task.*
3. *The final research project was very helpful to me and one of the most useful things I did all year in school.*
4. *This was a phenomenal course! I loved how it was so organized. The basil seed project was easy and not overwhelming. I have been recommending this course to everyone!*
5. *We completed my first completely online group project which was an interesting experience. Learned a lot from it.*
6. *Intelligent design. The structure of the course, and assigned material, drove the application of managerial concepts relative to a chosen industry. Personally, the projects gave me the opportunity to investigate the consulting industry, where I learned the requirements of managing a small firm.*
7. *The subject of the projects and essays were important and I enjoyed thinking about and analyzing them.*
8. *The project caused me to go back through the course material again which allowed me to better appreciate the progression of rock over the years and connect artists to influential roles during each time period.*
9. *I thought making a playlist and developing a theme was meaningful to my understanding of musical expression.*
10. *I think the projects just really made me stretch myself because they were much different than projects for other classes which made them fun and interesting.*
11. *All the projects/presentations/essays in the course allowed me to apply course concepts which helped me learn and made it meaningful.*
12. *We developed our thesis and components of our individual research paper throughout the semester, gaining knowledge and resources to make an authentic project at the end of the semester.*

## Suggestion to Increase Project-based Learning

13. *The course should provide another meaningful projects or assignments to understand what the macroeconomics is.*

14. *Make a playlist for every week.*

## Appendix 4a

## T-skills and CLA Core Career Competencies Aligned to UMN SLO / SDOs / LEs


The P21 Transdisciplinary Skills Framework and the [CLA Core Career Competencies](#) directly align to the University of Minnesota's [7 Student Learning Outcomes \(SLO\)](#), [7 Student Development Outcomes \(SDO\)](#), and [5 Liberal Education themes \(LE\)](#). The table below maps their relationships. P21 additionally provides measurable outcomes criteria and ready-to-use rubrics so that these meta outcomes can be tracked via assessments that foster them.


Key:

**Red** = UMN Learning Skill (SLO),



**Blue** = UMN Developmental Skill (SDO)


**Green** = UMN Liberal Education (LE) Requirement



Transdisciplinary Skills (P21)	CLA Core Career Competencies	UMN SLOs / SDOs / LEs
<b>A: LEARNING AND INNOVATION SKILLS: THE 4Cs</b>		
<p><b>A1: Creativity and Innovation</b></p>  <p><b>A1a: Think Creatively</b></p> <ul style="list-style-type: none"> <li>• Use a wide range of idea creation techniques (such as brainstorming)</li> <li>• Create new and worthwhile ideas (both incremental and radical concepts)</li> <li>• Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts</li> </ul> <p><b>A1b: Work Creatively with Others</b></p> <ul style="list-style-type: none"> <li>• Develop, implement and communicate new ideas to others effectively</li> <li>• Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work</li> <li>• Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas</li> <li>• View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes</li> </ul>	<p><b>CLA: Innovation and Creativity</b></p>	<p><b>SLO #6 Understand the role of creativity, innovation, discovery, and expression across disciplines</b></p>

	<p><b>A1c: Implement Innovations</b></p> <ul style="list-style-type: none"> <li>Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur</li> </ul>		
<p><b>A2: Critical Thinking And Problem Solving</b></p> 	<p><b>A2a: Reason Effectively</b></p> <ul style="list-style-type: none"> <li>Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation</li> </ul> <p><b>A2b: Use Systems Thinking</b></p> <ul style="list-style-type: none"> <li>Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems</li> </ul> <p><b>A2c: Make Judgements and Decisions</b></p> <ul style="list-style-type: none"> <li>Effectively analyze and evaluate evidence, arguments, claims and beliefs</li> <li>Analyze and evaluate major alternative points of view</li> <li>Synthesize and make connections between information and arguments. Interpret information and draw conclusions based on the best analysis</li> <li>Reflect critically on learning experiences and processes</li> </ul> <p><b>A2d: Solve Problems</b></p> <ul style="list-style-type: none"> <li>Solve different kinds of non-familiar problems in both conventional and innovative ways</li> <li>Identify and ask significant questions that clarify various points of view and lead to better solutions</li> </ul>	<p><b>CLA: Analytical and Critical Thinking</b></p> <p><b>CLA: Applied Problem Solving</b></p>	<p><b>SLO #1</b> Can identify, define, and solve problems</p>
<p><b>A3: Communication</b></p>	<p><b>A3a: Communicate Clearly</b></p> <ul style="list-style-type: none"> <li>Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts</li> </ul>	<p><b>CLA: Oral and Written Communication</b></p>	<p><b>SLO #5</b> Can communicate effectively</p>








	<ul style="list-style-type: none"> <li>Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)</li> <li>Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact to communicate effectively in diverse environments (including multi-lingual)</li> </ul>		
<p><b>A4: Collaboration</b></p> 	<p><b>A4a: Collaborate with Others</b></p> <ul style="list-style-type: none"> <li>Demonstrate ability to work effectively and respectfully with diverse teams</li> <li>Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal</li> </ul>	<p><b>CLA: Teamwork and Leadership</b></p>	<p><b>SDO #2 Independence and Interdependence by knowing when to collaborate or seek help and when to act on their own</b></p>

<b>Transdisciplinary Skills (P21)</b>		<b>CLA Core Career Competencies</b>	<b>UMN SLOs / SDOs / LEs</b>
<p><b>B: INFORMATION, MEDIA, AND TECHNOLOGY SKILLS</b></p>			
<p><b>B1: Information Literacy</b></p> 	<p><b>B1a: Access and Evaluate Information</b></p> <ul style="list-style-type: none"> <li>Access information efficiently (time) and effectively (sources)</li> <li>Evaluate information critically and competently</li> </ul> <p><b>B1b: Use and Manage Information</b></p> <ul style="list-style-type: none"> <li>Use information accurately and creatively for the issue or problem at hand</li> <li>Manage the flow of information from a wide variety of sources</li> </ul>	<p><b>CLA: Digital Literacy</b></p>	<p><b>SLO #2 Can locate and critically evaluate information</b></p>



	<ul style="list-style-type: none"> <li>• Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information</li> </ul>		
<p><b>B2: Media Literacy</b></p> 	<p><b>B2a: Analyze Media</b></p> <ul style="list-style-type: none"> <li>• Understand both how and why media messages are constructed, and for what purposes</li> <li>• Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors</li> <li>• Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media</li> </ul> <p><b>B2b: Create Media Products</b></p> <ul style="list-style-type: none"> <li>• Understand and utilize the most appropriate media creation tools, characteristics and conventions</li> <li>• Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments</li> </ul>	<p><b>CLA: Digital Literacy</b></p>	<p><b>LE: Technology and Society</b></p>
<p><b>B3: ICT Literacy</b></p> 	<p><b>B3a: Apply Technology Effectively</b></p> <ul style="list-style-type: none"> <li>• Use technology as a tool to research, organize, evaluate and communicate information</li> <li>• Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy</li> </ul>	<p><b>CLA: Digital Literacy</b></p>	<p><b>LE: Technology and Society</b></p>


<ul style="list-style-type: none"> <li>Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies</li> </ul>		
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Transdisciplinary Skills (P21)	CLA Core Career Competencies	UMN SLOs / SDOs / LEs
<b>C: CORE SUBJECTS AND 21ST CENTURY THEMES</b>		<b>SLO #3</b> Have mastered a body of knowledge and a model of inquiry
<b>C1: Global Awareness</b>  <ul style="list-style-type: none"> <li>Using 21st century skills to understand and address global issues</li> <li>Learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts</li> <li>Understanding other nations and cultures, including the use of non-English languages</li> </ul>	<b>CLA: Engaging Diversity</b>	<b>SLO # 4</b> <b>Diverse Philosophies: Understand diverse philosophies and cultures within and across societies.</b>  <b>LE: Global Perspectives</b>  <b>LE: Diversity and Social Justice</b>
<b>C2: Financial, Economic, Business, Entrepreneurial Literacy (FEBE)</b>  <ul style="list-style-type: none"> <li>Knowing how to make appropriate personal economic choices</li> <li>Understanding the role of the economy in society</li> <li>Using entrepreneurial skills to enhance workplace productivity and career options</li> </ul>		<b>LE: N/A</b>
<b>C3: Civic Literacy</b> <ul style="list-style-type: none"> <li>Participating effectively in civic life through knowing how to stay</li> </ul>	<b>CLA: Active Citizenship and</b>	<b>LE: Civic Life and Ethics</b>

	<p>informed and understanding governmental processes</p> <ul style="list-style-type: none"> <li>• Exercising the rights and obligations of citizenship at local, state, national and global levels</li> <li>• Understanding the local and global implications of civic decisions</li> </ul>	<p><b>Community Engagement</b></p>	
<p><b>C4: Health Literacy</b></p> 	<ul style="list-style-type: none"> <li>• Obtaining, interpreting and understanding basic health information and services and using such information and services in ways that enhance health</li> <li>• Understanding preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance and stress reduction</li> <li>• Using available information to make appropriate health-related decisions</li> <li>• Establishing and monitoring personal and family health goals</li> <li>• Understanding national and international public health and safety issues</li> </ul>		<p><b>LE: N/A</b></p>
<p><b>C5: Environmental Literacy</b></p> 	<ul style="list-style-type: none"> <li>• Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems</li> <li>• Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.)</li> <li>• Investigate and analyze environmental issues, and make accurate conclusions about effective solutions</li> </ul>		<p><b>LE: The Environment</b></p>

<ul style="list-style-type: none"> <li>• Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues)</li> </ul>		
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Transdisciplinary Skills (P21)	CLA Core Career Competencies	UMN SLOs / SDOs / LEs
<b>D: LIFE AND CAREER SKILLS</b>	<b>CLA Career Management</b>	
<p><b>D1: Flexibility and Adaptability</b></p>  <p><b>D1a: Adapt to Change</b></p> <ul style="list-style-type: none"> <li>• Adapt to varied roles, jobs responsibilities, schedules and contexts</li> <li>• Work effectively in a climate of ambiguity and changing priorities</li> </ul> <p><b>D1b: Be Flexible</b></p> <ul style="list-style-type: none"> <li>• Incorporate feedback effectively</li> <li>• Deal positively with praise, setbacks and criticism</li> <li>• Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multicultural environments</li> </ul>		<p><b>SDO #7 Tolerance of Ambiguity</b> by demonstrating the ability to perform in complicated environments where clear cut answers or standard operating procedures are absent</p>
<p><b>D2: Initiative and Self-direction</b></p>  <p><b>D2a: Manage Goals and Time</b></p> <ul style="list-style-type: none"> <li>• Set goals with tangible and intangible success criteria</li> <li>• Balance tactical (short-term) and strategic (long-term) goals</li> <li>• Utilize time and manage workload efficiently</li> </ul> <p><b>D2b: Work Independently</b></p>		<p><b>SDO #2 Independence and Interdependence</b> by knowing when to collaborate or seek help and when to act on their own</p> <p><b>SDO #3 Goal Orientation</b> by managing their energy and attention to</p>

	<ul style="list-style-type: none"> <li>• Monitor, define, prioritize and complete tasks without direct oversight</li> </ul> <p><b>D2c: Be a Self-directed Learner</b></p> <ul style="list-style-type: none"> <li>• Go beyond basic mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise</li> <li>• Demonstrate initiative to advance skill levels towards a professional level</li> <li>• Demonstrate commitment to learning as a lifelong process</li> <li>• Reflect critically on past experiences in order to inform future progress</li> </ul>		achieve specific outcomes
<p><b>D3: Social and Cross-Cultural Skills</b></p> 	<p><b>D3a: Interact Effectively with Others</b></p> <ul style="list-style-type: none"> <li>• Know when it is appropriate to listen and when to speak</li> <li>• Conduct themselves in a respectful, professional manner</li> </ul> <p><b>D3b: Work Effectively in Diverse Teams</b></p> <ul style="list-style-type: none"> <li>• Respect cultural differences and work effectively with people from a range of social and cultural backgrounds</li> <li>• Respond open-mindedly to different ideas and values</li> <li>• Leverage social and cultural differences to create new ideas and increase both innovation and quality of work</li> </ul>	<b>CLA: Engaging Diversity</b>	<p><b>SDO # 6 Appreciation of Differences</b> by recognizing the value of interacting with individuals with backgrounds and / or perspectives different from their own</p> <p><b>LE: Diversity and Social Justice in the United States</b></p>
<p><b>D4: Productivity and Accountability</b></p>	<p><b>D4a: Manage Projects</b></p> <ul style="list-style-type: none"> <li>• Set and meet goals, even in the face of obstacles and competing pressures</li> </ul>		<p><b>UMN SDO #3 Goal Orientation</b> by managing their energy and attention to achieve specific outcomes</p>

	<ul style="list-style-type: none"> <li>• Prioritize, plan and manage work to achieve the intended result</li> </ul> <p><b>D4b: Produce Results</b></p> <ul style="list-style-type: none"> <li>• Demonstrate additional attributes associated with producing high quality products including the abilities to: - <ul style="list-style-type: none"> <li>○ Work positively and ethically</li> <li>○ Manage time and projects effectively -</li> <li>○ Multi-task</li> <li>○ Participate actively, as well as be reliable and punctual</li> <li>○ Present oneself professionally and with proper etiquette</li> <li>○ Collaborate and cooperate effectively with teams</li> <li>○ Respect and appreciate team diversity</li> <li>○ Be accountable for results</li> </ul> </li> </ul>		
<p><b>D5: Leadership and Responsibility</b></p> 	<p><b>D5a: Guide and Lead Others</b></p> <ul style="list-style-type: none"> <li>• Use interpersonal and problem-solving skills to influence and guide others toward a goal</li> <li>• Leverage strengths of others to accomplish a common goal Inspire others to reach their very best via example and selflessness</li> <li>• Demonstrate integrity and ethical behavior in using influence and power</li> </ul> <p><b>D5b: Be Responsible to Others</b></p> <ul style="list-style-type: none"> <li>• Act responsibly with the interests of the larger community in mind</li> </ul>	<p><b>CLA: Ethical Reasoning and Decision Making</b></p>	<p><b>SDO #1 Responsibility and Accountability</b> by making appropriate decisions on behavior and accepting the consequences of their actions.</p>

The only transdisciplinary skills that do NOT have a one-to-one relationship to the university student learning and development outcomes and Liberal Education requirements are:

A4: **Collaboration** - only PARTIALLY matched by SDO 2: Independence and Interdependence

- B2: **Media Literacy** - no exact UMN SLO/SDO counterpart; however, it exists as **LE: Technology and Society**
- B3: **ICT Literacy** - no exact UMN SLO/SDO counterpart; however, it exists as **LE: Technology and Society**
- C2: **Financial, Economic, Business, Entrepreneurial Literacy (FEBE)** - no exact UMN SLO/SDO counterpart - **could it become an LE theme?**
- C3: **Civic Literacy** - no exact UMN SLO/SDO counterpart; however, it does exist as **LE: Civic Life and Ethics**
- C4: **Health Literacy** - no exact UMN SLO/SDO counterpart - **could it become an LE theme?**
- C5: **Environmental Literacy** - no exact UMN SLO/SDO counterpart; however, it does exist as **LE: The Environment**



## Appendix 4b

## Syllabus Outcomes Table AY15-16

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## Learning Outcomes

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**Course-level Outcomes (CO)**

This course supports the following course-level outcomes:

<b>Course-level Outcomes (CO)</b>		<b>Check</b> ✓
CO1		
CO2		
CO3		
CO4		
CO5		
CO6		

**Program-level Outcomes (PO)**

This course supports the following program-level outcomes:

<b>Program-level Outcomes (PO)</b>		<b>Check</b> ✓
PO1	Use relevant technology, operational, and project management concepts at all levels of an organization.	
PO2	Apply value concepts such as ethics, diversity, social responsibility, sustainability, teamwork, effective leadership, and lifelong learning to all levels of an organization.	
PO3	Create sound marketing plans and describe how marketing relates to other functional areas of business.	
PO4	Employ accounting and financial principles to make strategic and day-to-day operational decisions.	

PO5	Communicate, access, and organize information effectively to influence and collaborate within organizations and across cultural boundaries.	
PO6	Develop innovation within organizations through the identification and application of appropriate leadership strategies.	
PO7	Describe the roles of quality, safety, and productivity in ensuring excellent organizational outcomes	

### U of MN Student Learning Outcomes (SLO)

This course supports the following university-wide student learning outcomes:

Student Learning Outcome (SLO)		Check ✓
SLO 1	Can identify, define, and solve problems	
SLO 2	Can locate and critically evaluate information	
SLO 3	Have mastered a body of knowledge and a mode of inquiry	
SLO 4	Understand diverse philosophies and cultures within and across societies	
SLO 5	Can communicate effectively	
SLO 6	Understand the role of creativity, innovation, discovery, and expression across disciplines	
SLO 7	Have acquired skills for effective citizenship and lifelong learning	

### U of MN Student Development Outcomes (SDO)

This course supports the following university-wide student development outcomes:

Student Learning Outcome (SLO)		Check ✓
SDO 1	Responsibility and Accountability	
SDO 2	Independence and Interdependence	
SDO 3	Goal Orientation	
SDO 4	Self-Awareness	
SDO 5	Resilience	

SDO 6	Appreciation of Differences	
SDO 7	Tolerance of ambiguity	

## Appendix 4c

## Syllabus Outcomes Table AY16-17

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**Learning Outcomes**


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**Course-level Outcomes (CO)**

This course supports the following [program-level outcomes](#) (PO) or competencies (PLC) along with the [UMN Learning and Development skills](#) essential for the 21<sup>st</sup> Century.

	<b>Course-level Outcomes (CO)</b>	<b>Activities &amp; Assessments</b>	<b>PO / PLC</b>	<b>21<sup>st</sup> Skills</b>
CO1				
CO2				
CO3				
CO4				
CO5				
CO6				
CO7				
CO8				



Appendix 4e

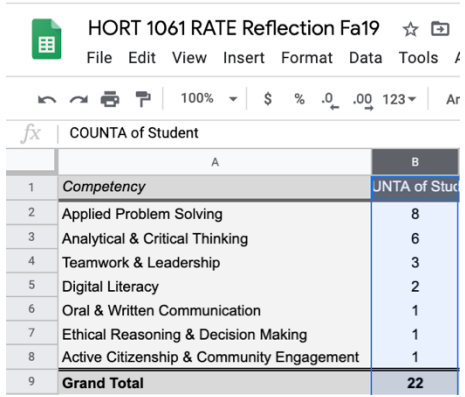
Learner-Selected Skills in ODL Online Courses

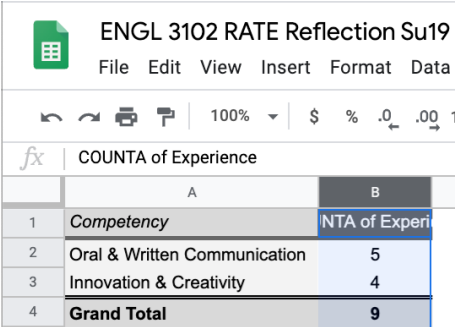
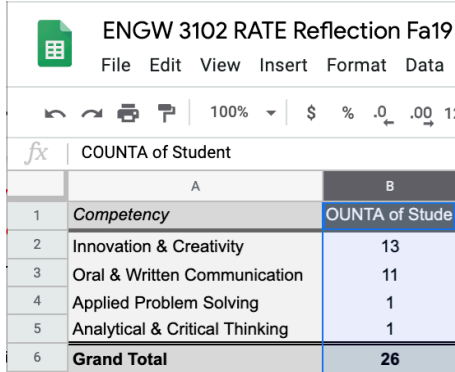
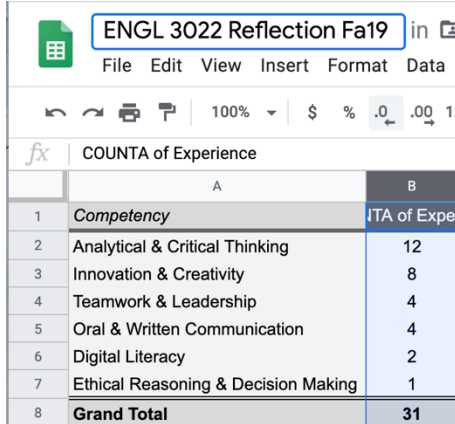
RATE prompt: Please select a competency and reflect on how a learning activity or assessment in (title of course) has helped you foster the competency you selected.

Key

Black: Mapped in Outcomes Table and Tracked in Canvas

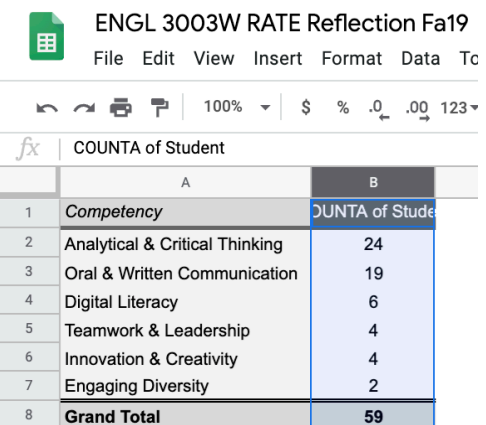
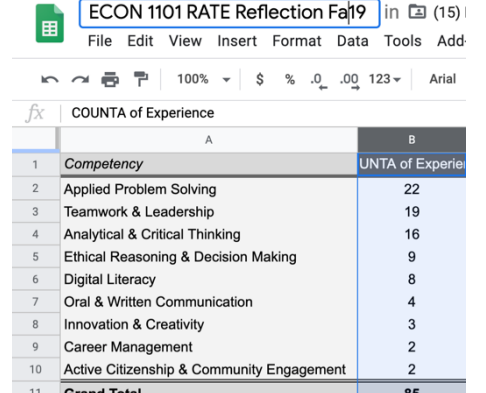
Red: NOT mapped or tracked but rated high by learners

Number of learners completing the RATE reflection	Learner-Selected Skills																								
n>20			Skills mapped in Outcomes Table																						
HORT 1061 The Sustainable Lawn		 <table border="1" data-bbox="1108 917 1570 1312"> <thead> <tr> <th colspan="2">COUNTA of Student</th> </tr> <tr> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>Competency</td> <td>JNTA of Stud</td> </tr> <tr> <td>Applied Problem Solving</td> <td>8</td> </tr> <tr> <td>Analytical &amp; Critical Thinking</td> <td>6</td> </tr> <tr> <td>Teamwork &amp; Leadership</td> <td>3</td> </tr> <tr> <td>Digital Literacy</td> <td>2</td> </tr> <tr> <td>Oral &amp; Written Communication</td> <td>1</td> </tr> <tr> <td>Ethical Reasoning &amp; Decision Making</td> <td>1</td> </tr> <tr> <td>Active Citizenship &amp; Community Engagement</td> <td>1</td> </tr> <tr> <td><b>Grand Total</b></td> <td><b>22</b></td> </tr> </tbody> </table>	COUNTA of Student		A	B	Competency	JNTA of Stud	Applied Problem Solving	8	Analytical & Critical Thinking	6	Teamwork & Leadership	3	Digital Literacy	2	Oral & Written Communication	1	Ethical Reasoning & Decision Making	1	Active Citizenship & Community Engagement	1	<b>Grand Total</b>	<b>22</b>	<p><i>Add Applied Problem Solving?</i></p> <p>Analytical &amp; Critical Thinking Teamwork and Leadership Digital Literacy Oral &amp; Written Communication</p>
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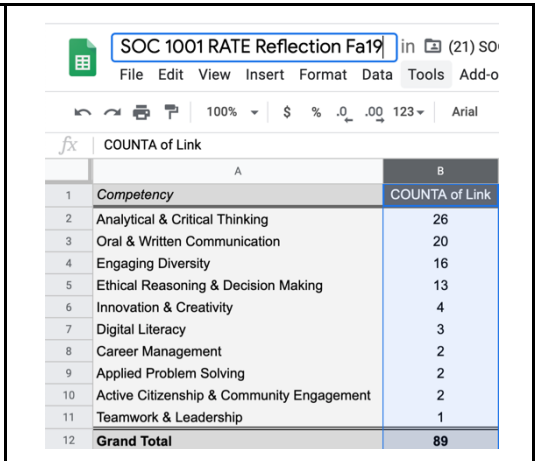
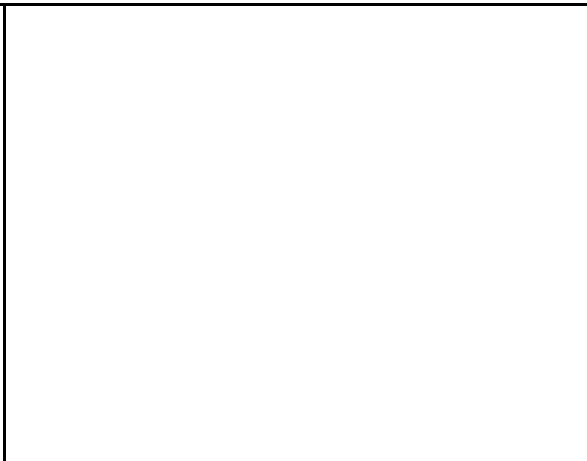
<p>ENGW 3102 Fiction Writing</p>	 <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Competency</td> <td>NTA of Experi</td> </tr> <tr> <td>2</td> <td>Oral &amp; Written Communication</td> <td>5</td> </tr> <tr> <td>3</td> <td>Innovation &amp; Creativity</td> <td>4</td> </tr> <tr> <td>4</td> <td><b>Grand Total</b></td> <td><b>9</b></td> </tr> </tbody> </table>		A	B	1	Competency	NTA of Experi	2	Oral & Written Communication	5	3	Innovation & Creativity	4	4	<b>Grand Total</b>	<b>9</b>	 <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Competency</td> <td>OUNTA of Stude</td> </tr> <tr> <td>2</td> <td>Innovation &amp; Creativity</td> <td>13</td> </tr> <tr> <td>3</td> <td>Oral &amp; Written Communication</td> <td>11</td> </tr> <tr> <td>4</td> <td>Applied Problem Solving</td> <td>1</td> </tr> <tr> <td>5</td> <td>Analytical &amp; Critical Thinking</td> <td>1</td> </tr> <tr> <td>6</td> <td><b>Grand Total</b></td> <td><b>26</b></td> </tr> </tbody> </table>		A	B	1	Competency	OUNTA of Stude	2	Innovation & Creativity	13	3	Oral & Written Communication	11	4	Applied Problem Solving	1	5	Analytical & Critical Thinking	1	6	<b>Grand Total</b>	<b>26</b>	<p>Innovation and Creativity Oral &amp; Written Communication Analytical and Critical Thinking</p>
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Sociology



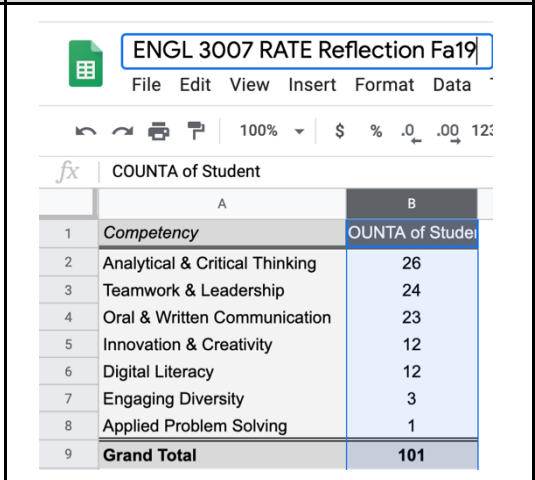
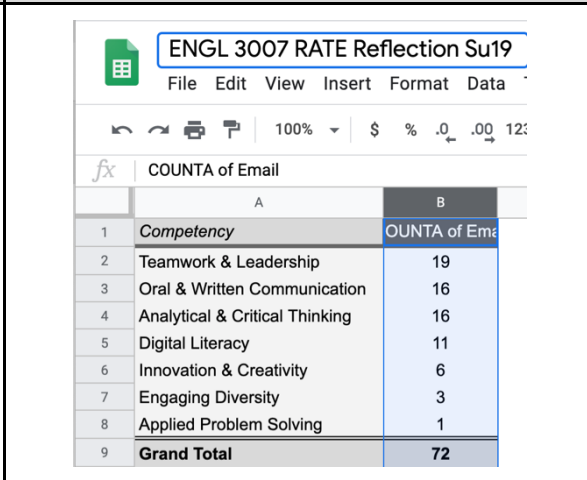
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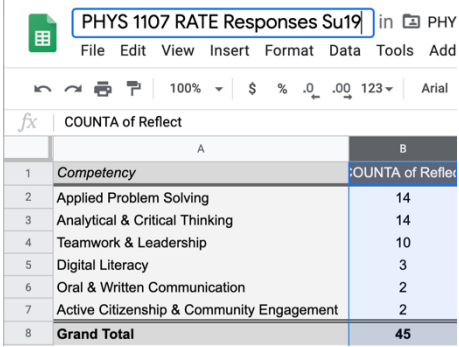
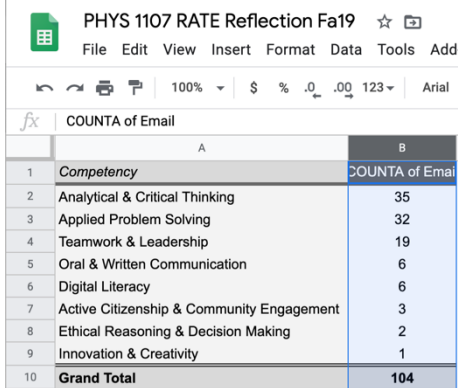
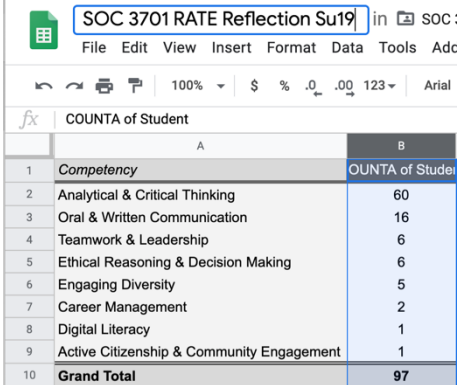
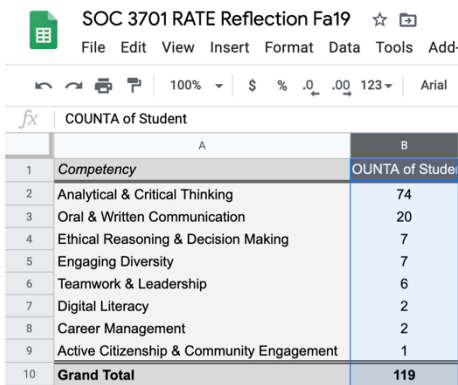


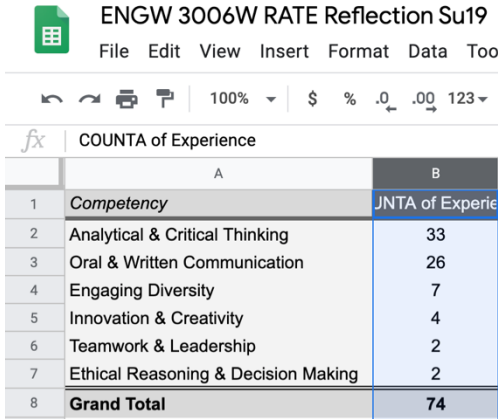
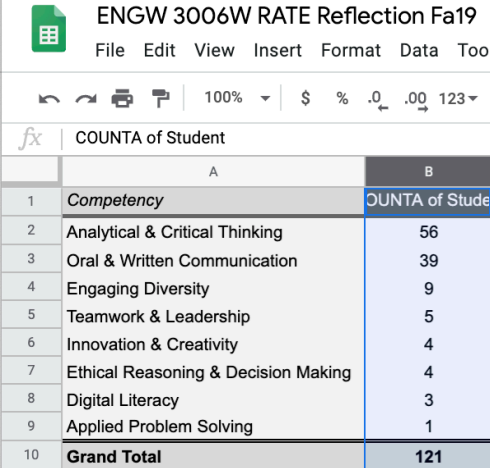
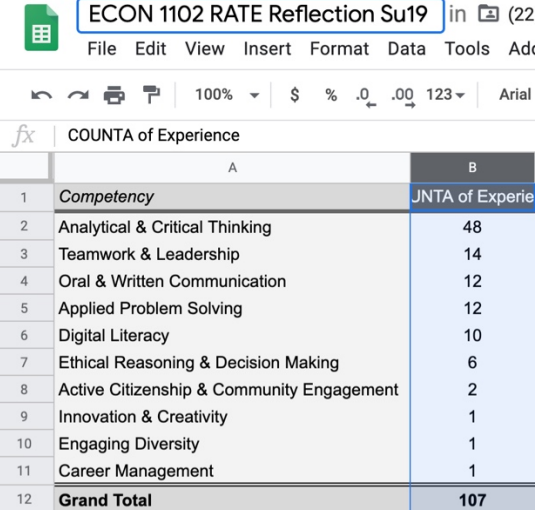
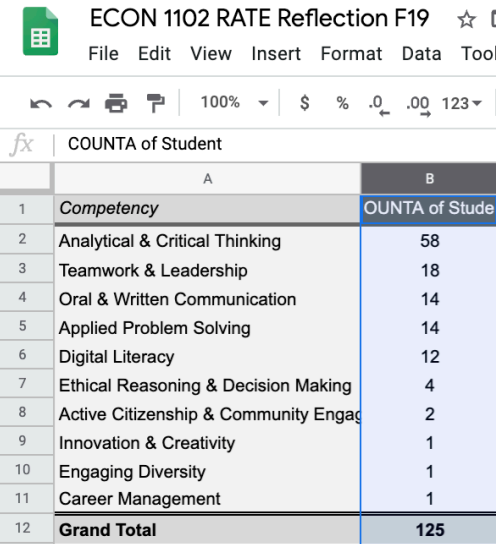
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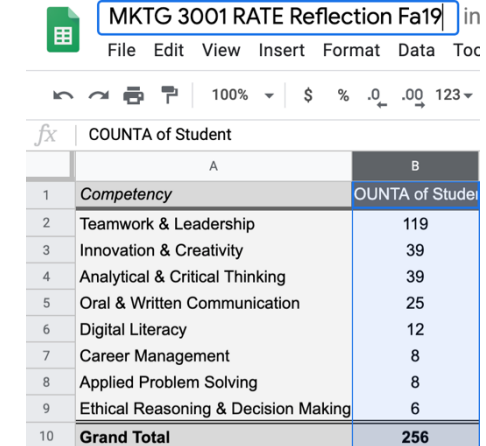
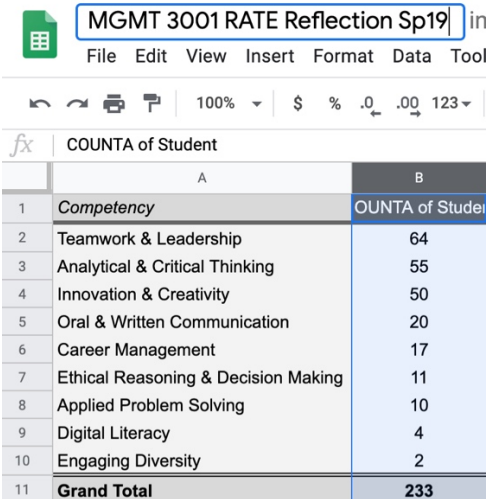
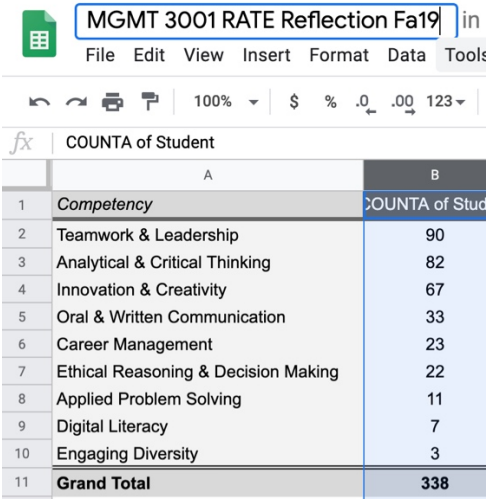
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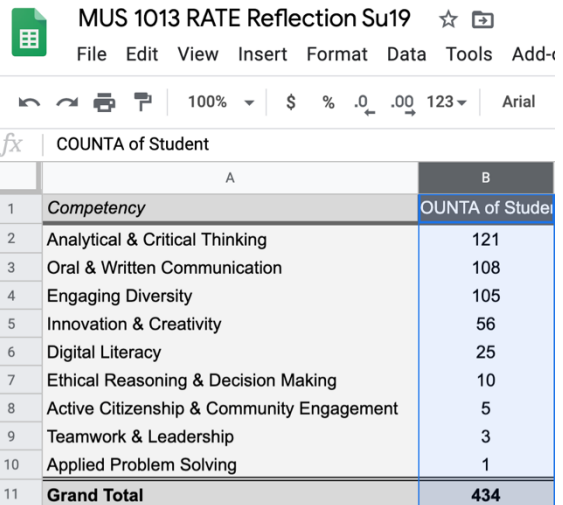
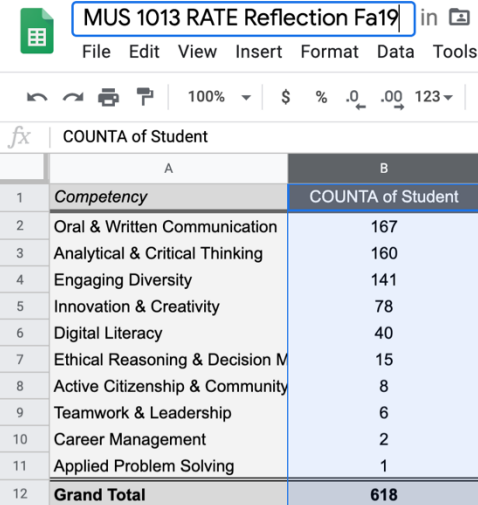


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## Appendix 4g

## Oral and Written Communication Skills

Sample quotes from 247 excerpts submitted from 21 online courses spanning 14 different disciplines with the majority of the excerpts submitted from Macroeconomics, History, English Literature, Management, and Music courses.

Please select a competency and reflect on how a learning activity or assessment in (title of course) has helped you foster the competency you selected.

**Reflection, Real-word Relevance**

*“The experience that I had in mind when I chose this core competency was the learning journal and the reflection journal exercises that we completed every week. There were prompts that pertained to what we learned in the videos and text book that week. I think that these prompts got me thinking about the class material in a lot deeper sense and applying what we were learning to the real world.”*

*“The reflection journal exercises helped me to develop oral and written communication skills by expressing what I was learning through writing. These exercises got me thinking more deeply about the class material and it allowed me to communicate my reactions to the material. The written part of communication skills was obviously shown through the learning journal while the oral communication skills were more strongly developed through expressing to friends and family members around me what I have been learning. I think that these prompts and reflection exercises helped me to understand exactly what I should be thinking about to further my learning past the material.”*

**Reflection, Learner-Self-expression**

*Throughout the path of this course, I completed fourteen different reflection journal exercises. These exercises allowed me to build and develop my oral and written communication skills by more deeply thinking about the class material. I think that these writing exercises were vital for developing a stronger understanding outside of the classroom. The ability to express my feelings toward what I was learning very greatly helped me to develop my written communication skills. It allowed me to understand how to structure my thoughts in a professional and concise paragraph of writing. On the other side, these prompts also helped me to become more interested in what I was learning. I found myself many times telling my parents or friends about what I was learning in this class and how it connected to real life. I think that these prompts helped to develop my oral communication skills as well by expressing my thoughts on the class material to others around me.”*

**Reflection, Interdisciplinary Perspectives**

*“This class placed a strong emphasis on written communication through the use of class discussions, reflective assignments, and Critical Essays. In these writing assignments, we considered various aspects of the music we were learning about, but we usually put them into context with social, cultural, and racial contexts. We had to bring together all of these aspects to clearly and accurately depict our opinion about a given writing prompt. It was sometimes hard to get what I wanted across in a concise manner. Additionally, sometimes what I wrote about was taken in a different way than I intended which helped to show that I needed to make my writing clearer.”*

**Collaboration**

*“This course constantly required the skills to communicate effectively. In order to succeed in this course, you needed to hone the skills of communication, specifically written. I had to develop my written skills of communication in order to successfully contribute to and complete each group project task. My group communicated mainly through email and discussion chat groups. It was never easy to communicate with multiple people via computer but we made it work by being consistent in checking emails and always following up with each other. Having group roles also helped in the process because it divided tasks up more easily. I had never thought of myself as a leader but I was surprised to see myself taking more initiative with certain tasks. Instead of waiting to be instructed to do something I just did it because it needed to be done.”*

*“This course helped me craft more articulate and to the point written communication as I had to convey my opinions via responses to my peers online. This is an important skill to develop as it contributes to effective and powerful communication in the workplace and in personal life situations. A challenge that I faced during this course was not being able to speak and dive deeper into the material in a classroom setting. However, I was able to gain more perspective by reading my classmates discussion topics and by relating the course material to things in my everyday life. Furthermore, by communicating these to my classmates, I was able to find the deeper analysis that I was craving. This taught me a lot about the way that I learn and the benefits of effective communication in order to reach a better understanding of topics.”*

**Articulation**

*“Every single assignment for this class required us to articulate our thoughts through writing. It required an idea to be formed and clearly articulated to get the point across.”*

**Polished Product**

*“The YouConnect and Project assignments that we had to complete through the semester allowed me to strengthen my story telling abilities. As well as finding articles to strengthen my writing.”*

**Technology-mediated Learning**

*“This semester, SOC 42xx helped me engage oral and written communication. Although this was an online class, almost every assignment was me having to communicate to my classmates. There were no oral communications, mainly written ones. The discussion board was where we had to communicate. We had to be respectful of each other's thoughts. Yet, we had to bring arguments to the table that included many facts and examples from the articles that we read. When you communicate online requires you to speak clearly through your writing. This includes watching your grammar and language.”*

*“I have developed a deeper dimension of written communication. I have learned what it means to communicate with others online; people that you have never met before. It is harder to communicate with someone that you have never seen because you cannot see their reactions or read their body language. A challenge that I faced in the online class was making sure my ideas were not confusing. I had to make sure that people understood my point without hearing my tone of voice or picking up on body language clues. Overall, the discussion posts were a challenge for me because the assignments required deeper thoughts and meaningful responses. What I learned about myself through these experiences was that I do have the capabilities to communicate through written form. I also thought that was an area of weakness for me, but this semester I was able to successfully communicate my thoughts and ideas without having to sit behind a desk in a classroom.”*

*“During the Spring semester in 2019 in Spanish 1003, we had multiple assignments testing our oral and written communication. However, the assignments where we had to video chat with other*



*students to test our oral communication. These were called Charlas, and my experience with them was good, however, they made me anxious. Having to create questions and answers off the top of my head made me anxious, because I didn't want to mess up. However, learning oral communication is important when learning a language, because it is a key component to learning comprehensibility and sentence structure.”*

#### **Multiple Sources and Perspectives, Articulation**

*“I developed written communication skills because I had to transfer what I had watched in the film and researched online, into something that made sense on paper. I had to properly layout what I was trying to get across and connect the movie to what was learned throughout the course. It was a challenge because I had too much information coming from different sources. Also, I developed oral communication because I had to find a way to connect what had written into something I could explain to an audience (those in class). I had to explain the movie as if my classmates had not seen it yet. Then, I had to relate it to themes and devices we had focused on in class.”*

*“I also had to use a lot of different sources which is something that I am not super used to. I really learned the value of gathering different perspectives and relating it back to the subject at hand.”*

*“I developed my written communication skills throughout the semester, as we were required to post our own thoughts and then interact with classmates and their opinions. The replies in the discussion posts allowed me to interact with other students and agree or disagree with their responses to the prompt. One challenge I faced was disagreeing with my fellow classmates on certain aspects of the prompts. Toward the end of the semester, however, it got a lot easier to respectfully disagree, acknowledge their viewpoint, and explain my points. I learned how to better have a civil debate.”*

*“As MUS 10xx was an online course, we used a lot of written communication to interact with our classmates. For example, every week we had to post to a discussion board and comment on two of our peers' posts. This led to great discussions and I really appreciated hearing about my classmates' perspectives. The prompts we had were extremely interesting and thought provoking. My favorite prompts were focused on finding examples of the concepts outside of our course materials.”*

#### **Learner Self-Expression**

*“The ability to express my feelings toward what I was learning very greatly helped me to develop my written communication skills. It allowed me to understand how to structure my thoughts in a professional and concise paragraph of writing. On the other side, these prompts also helped me to become more interested in what I was learning.”*

#### **Learner Creativity**

*“Writing the YouConnect assignments helped create a more personal connection to the curriculum and also helped me to learn how to write a story at the same time. Since we were encouraged to take the assignment and make it creative, I wrote mine in the form of a travel log which ended up basically turning into a fictional story. I had not been encouraged to just take a writing assignment into my own hands before, but it proved to be pretty fun as I got to take it whichever direction I wanted. I learned that I enjoy creative writing and probably should take a class that focuses on it to enhance these skills.”*

## Appendix 4h

## Analytical and Critical Thinking Skills

Sample quotes from 214 excerpts submitted from 25 online courses spanning 16 disciplines with the majority of excerpts submitted from Economics, English Literature, Management, Music, Physics, and Sociology courses.

Please select a competency and reflect on how a learning activity or assessment in (title of course) has helped you foster the competency you selected.

**Reflection, Real-world Relevance**

*“Through reflection journals and group projects I applied data from the FRED and other sources to current events and other problem-solving activities. I found it hard sometimes because I didn't thoroughly understand the question or material, but by applying this knowledge to real-world situations it became clearer how the two connected. In this way, I learned how applying class work to the real world is beneficial in my comprehension of material.”*

**Interdisciplinary Perspectives**

*“Through a musical lens I was able to see how race, social and political issues all interacted during the early 1900's all the way up to the 1970's. This was helpful in my understanding of music and being able to see how an artist or band was able to shape how society viewed certain issues. For instance, rock and roll artists were oftentimes singing about issues that were for the most part not talked about. Issues like sex or drugs.”*

**Multiple Interpretations and Outcomes**

*“I think one of the big takeaways I had from this course was that there may be more than one valid point of view, or more than one correct answer to any given question. This was particularly true in our final assignment, in that there are multiple ways to document the history of rock and more than one timeline with more than one emphasis can be used. This was also true in our weekly discussions, where two people could take two different stances and still both be correct.”*

**Multiple Sources and Perspectives, Collaboration, Reflection, Articulation**

*“I think one of the main dimensions that I developed was the fact that there was never just one correct answer. This is very contrary to many of my science classes, where no matter how you look at the questions, the final result is the same for everyone. This was also the most challenging aspect of the class, as I found myself trying to look at the questions and writings from a point that sought out a single answer. However, throughout the discussions, it was evident that everyone not only had different perspectives and responses but correct perspective and responses. However, this challenge was fun to me, and I just had to focus on critically thinking about each question from many different points of view. Through this method, I learned that I'm not just able to do this, but I enjoy being able to come to several different correct answers. This also taught me to look inward and continuously challenge my own pre-taught ideas and beliefs.”*

*“I think one of the big takeaways I had from this course was that there may be more than one valid point of view, or more than one correct answer to any given question. This was particularly true in our final assignment, in that there are multiple ways to document the history of rock and more than one timeline with more than one emphasis can be used. This was also true in our weekly discussions, where two people could take two different stances and still both be correct.”*

*“The main dimension that this class allowed me to develop was to be able to draw the conclusion that there are more than one right answer for many different ideas, or in this case, music. One can gain insight into what the artist is portraying through lyrics or even just musical instruments and*

styles used. The biggest part about this is that everyone's opinion of what this means is often different, and that is okay."

*"There were many times when I used critical and analytical thinking while taking a course called MUS 10xx: during the summer term of 2019. Every week we were given a discussion prompt to answer and we had to analyze and use what we learned in the book to help us come to a conclusion about the prompt. While doing this weekly assignment and looking at other people's posts I realized that there were many different ways that the prompts could be answered, there was no right or wrong answer. Different people had different perspectives on the topics and I was able to strengthen my knowledge by reading what other people had to say. During this course, we also had to write a paper about whether we thought music was a good moral force, a bad moral force, or both. For this assignment, I had to analyze a lot of information that we had covered throughout the term in order to come to my conclusion. I also had to interview someone who was born before 1958 and add their opinion to my paper. Again, I had to consider someone else's perspective on the matter and recognize that all answers could be right. I feel like analytical and critical thinking is a skill that is very important to have. It is important to be able to consider other people's perspective and ideas on a topic, especially while trying to work as a team.*

*"Due to the need for looking at many different sources to understand the material and the time in which the material was popularized, I gained the ability to analyze these sources and synthesize that information in order to form a more complete image of the era. This was essential as I was not around during the musical era discussed in this course. This was the biggest challenge. Having no first-hand experience in the discussion. I had to heavily rely on what I was hearing and reading. Through this process, I learned that music is so variable. It can mean one thing to one person, and mean something completely different to someone else. Even the challenges of the time were not apparent or clear. Ultimately, it is through the synthesis of all these sources that I was able to form an idea of what this time was like."*

#### **Learner-Relevant**

*"One class I had really helped me develop Analytical & Critical Thinking skills by constantly having assignments where I had to really analyze what I was learning in the class and connecting those skills to my life. Throughout the semester, I had to learn about four core management functions and analyze how they fit in my life. This required the skill of really understanding what I learned, analyzing that information, and seeing how it fits in society."*

*"I used analytical and critical thinking when connecting the topics I learned about in the course to my life. I realized the different areas of Management and found that there wasn't a "right" way to manage yourself or people. I used these skills to learn more about myself and develop insight on how I manage myself and/or how I would manage others as well. The course taught me about different management options and the pros and cons for each which created challenges on deciding what aspects of management I would likely focus on more. I learned more about the ways I manage myself and ways I could change my management to be more effective and efficient.*

*This required the skill of really understanding what I learned, analyzing that information, and seeing how it fits in society. This strength is crucial to have in the future, for any career, internship, or opportunity to analyze and critically think about all the options available and make the best decision possible. Through this course, I learned how to take the information presented to me, pull out the important points, analyze them and use that information to think about the best choices to make which are important skills to have for the future."*

#### **Learner-Relevant, Learner Creativity**

*“The assignment that allowed me to develop my analytical and critical thinking skills was the YouConnect where we had to take what we learned in class and connect how they are relevant in our lives in a creative way for each core area of management.”*

***Learner Self-Expression***

*“The course fostered analytical thinking via a slew of methods. We would have weekly readings of scholarly articles as well as detailed discussion questions that forced us to really engage with the writer's thoughts as well as our own opinions. We also had weekly study guides which helped understand the instructor's perspective on some things. I developed analytical thinking by learning to really digest a set of information and not only understand the author's perspective/background info but also learning to form and articulate my own opinion and view on a matter.”*

***Learner Socially-Culturally Connected***

*“By taking this class I learned to analyze more closely by looking at different rock songs and explaining their musical elements. I also learned how to connect information from class to people I know by conducting an interview with my grandpa. Connecting the interview with my grandpa with class information was hard at first. To confront these challenges, I read the book chapters again to better understand the information. I learned that I am able to find deeper meaning to what I have learned in an educational setting by connecting it with my personal experiences.”*

## Appendix 4i

## Engaging Diversity Skills

Sample Quotes from 129 Excerpts submitted from 12 online courses spanning 8 disciplines with the majority of excerpts submitted from Music, Sociology, and Spanish courses.

Please select a competency and reflect on how a learning activity or assessment in (title of course) has helped you foster the competency you selected.

***Interdisciplinary Perspectives***

*“The first essay in this class made me think critically about diversity. That was because the prompt was to analyze music in its social context. This social context was about race relations at the time. Therefore, I was forced to search up and analyze how race relations influenced music styles.”*

***Collaboration, Multiple Sources and Perspectives***

*“During the Spring semester of 2019, I took MUS 10xx and used Engaging Diversity. I say this because there was a time when we had a discussion post about opinions on rock and roll music and the whiteness of certain black pop rock. Our group was very diverse, and we got to see everyone’s viewpoints and where they stood on this issue. I found I was most able to engage effectively with diversity when we were encouraged to respond to other’s discussion posts and provide further insights/questions about our viewpoints.”*

*“Engaging with students who have different opinions than I do was a good experience in this class.”*

*“I think that this class allowed me to understand the different things people value and how to respect their opinions.”*

*“Understanding what type of music I truly enjoyed the most while also learning about the history behind it. At some times it was hard to articulate what I wanted to say to others especially when they have a different opinion from me. I learned how to phrase sentences properly to not come off mean or angry. Understanding how to confront people is a skill that I believe I will use my whole life, whether it’s in the workplace or in any of my future relationships. I think that this class allowed me to understand what different things people value and how to respect their opinions.”*

***Multiple Sources and Perspectives, Reflection, Articulation, Collaboration***

*“Through dialogue and differing opinions, I learned how to engage diversity by considering multiple perspectives and analyzing relevant research. This has allowed me to understand others and society on a whole with a new level of complexity. This allows me to consider alternatives to what I may be reading or told by peers and to follow up on these alternatives by listening to the perspective with those who may be affected by the issue and considering relevant research.”*

***Reflection, Articulation, Collaboration, Learner-Self-expression***

*“Each week, I was required to complete assignments that made me think critically about my own values and cultural and societal opinions within the context of historical influence of this era of music. This led to self-inquiry and reflection that forced me to become aware of my own uninformed opinions and perpetuated biases. Because of this, I was able to increase my own awareness and therefore consciously work on my educated opinions and perspectives.”*

*“Responding to my peers each week provided an opportunity for growth where I could take in new perspectives, respectfully respond to them, and accompany such with my own knowledge and views. I really tried to keep an open mind through this process and follow through with peers individually to optimize the learning environment to its fullest potential. In the future, developing this skill through this course will aid me in my ability to communicate and think critically in complicated or unique situations where I am less familiar with societal and cultural norms. In my career, I can apply such to communicating with peers, bosses, and subordinates to retain appropriate and professional work relationships that are symbiotic.”*

***Learner Socially-Culturally Connected***

*“I was able to use the things I learned to examine my own culture and the culture of the country I studied abroad in. I learned that my understanding of my own culture helps me understand other cultures and that I'm very open to learning new things.”*

***Real-world Relevance, Learner Socially-Culturally Connected***

*“This class has helped me understand that the best way to learn or engage with diversity is to hear about experiences of people first hand, rather than from a textbook or website. Listening to the community and their needs first will be a top priority for me going forward in the public service industry. In my future work, I hope that I am able to engage with the public and develop my listening skills so that I can better serve my community.”*

## Appendix 4j

## Innovation and Creativity Skills

Sample quotes from 120 excerpts submitted from 14 courses spanning 13 disciplines with the majority of excerpts submitted from Management and Music courses.

Please select a competency and reflect on how a learning activity or assessment in (title of course) has helped you foster the competency you selected.

***Ill-defined, Integrated Assessment, Learner Creativity***

*“The final Spotify Playlist assignment helped inspire creativity. I had to look behind and think about all the songs I had heard throughout the course. The directions were vague enough to inspire creativity while giving some semblance of a direction to go. I was also allowed to make my own playlist and was not forced to choose songs that I didn't enjoy for the purpose of the assignment.”*

*“It was difficult at first to do an assignment that was fairly vague with its guidelines, but I later realized that it just gave me more room for creativity.”*

*“The final Spotify Playlist assignment helped inspire creativity. I had to look behind and think about all the songs I had heard throughout the course. The directions were vague enough to inspire creativity while giving some semblance of a direction to go. I was also allowed to make my own playlist and was not forced to choose songs that I didn't enjoy for the purpose of the assignment.”*

*“Through open ended projects I was able to express my creativity and innovation skills in relation to managing a business.”*

***Multiple Interpretations and Outcomes***

*“I learned that not all learning has to be proven by writing a paper on it, but rather can be articulated in a variety of different ways.”*

***Polished Product, Integrated Assessment, Learner-Creativity***

*“Creating a playlist for the final assignment in this class allowed me to apply the knowledge I accumulated in this class while also getting the chance to utilize my own creativity and interpretation of the music.”*

***Sustained Investigations, Multiple Resources and Perspectives, Learner-Relevant, Learner Creativity***

*“In this class, I have been able to link the fundamental textbook and additional resources used outside of class, such as articles and TED Talks, to express the passions and ideas of important figures in our lives today. In a project that I worked on throughout the entire semester, I was able to express myself freely and be as creative as I would like by drawing examples together and explaining the stories of why these figures are so important.”*

***Polished Product, Ill-defined, Multiple Interpretations and Outcomes, Learner Choice, Learner Creativity***

*“I was able to dig deep within myself to understand that I did not need someone to tell me how to execute a project; I could instead create my own masterpieces. This was difficult because it forced me to put a lot of thought and time into the assignments to determine what was the best I could*

give. However, it helped me to grow in my understanding of management and helped me to see that I am a creative and innovative thinker.”

**Learner Choice, Learner Creativity**

“This project allowed us to be creative with our theme since we could choose anything we wanted. Through open ended projects I was able to express my creativity and innovation skills in relation to managing a business.”

**Learner Relevant, Learner Creativity**

“What stood out to me the most when learning about this topic was the connection between myself and the articles and discussion posts. Not only was it something I found myself directly relating to, but I also learned more about myself through this.

“When it comes to school, you are rarely given the opportunity to be creative in the same way that managers from past generations restrict that freedom from their workers. I rarely ever thought of myself as a very creative person, or one who takes risks to be more innovative or different. In the first you connect, I read the instructions of the different ways we can choose to present our thoughts. Me being used to the restriction of creativity; I chose the option I was most comfortable with which was a paper. As the course went on, I started to get more comfortable with the idea of presenting my thoughts in different, more unique ways. Through this I learned that I love to be different in how I present topics and I really loved how I can show who I am through that.”

“I was able to generate new, varied, and unique ideas through the coursework. I was able to be original and personal when completing the coursework as it was personal to me. I learned more about the coursework because I could connect it to my life. This course allowed me to analyze my current work, school and career situation.”

“The concepts in this class allow you to be able to think artistically about music and then be able to have a dialogue with other students as well. It not only expanded my creative mind, it helped me articulate and argue my points in an organized fashion with my classmates.”

“I was able to generate new, varied, and unique ideas through the coursework. I was able to be original and personal when completing the coursework as it was personal to me. I learned more about the coursework because I could connect it to my life. This course allowed me to analyze my current work, school and career situation.”

**Learner Creativity, Collaboration**

“Throughout the entire semester we were really pushed to come up with unique perspectives and ideas, specifically on the YouConnect assignments and the ongoing project. We had to adapt the ideas that we learned from the textbook and the resources and apply them to a creative assignment. It really made you think, especially the semester long project. We had to imagine that we were the directors of an organization and we had to apply what we learned to this organization. It was quite fun and engaging.

“We really developed our ability to apply what we learned in applicable settings. Instead of simply being taught and told to memorize, we had to take what we had learned and apply it to a creative assignment. This was very effective as we were consistently engaged with what we had learned. In addition, we learned to challenge ideas and be able to back up our ideas. We really had to elaborate and consistently explain why we thought or did things in a certain way.”

“I really developed my creativity by being able to think and create my own views. In most courses you don’t get the ability to use your own thoughts like



*you do in this one. I also really enjoyed being able to interact with my course mates and seeing their point of view.”*

***Learner- Relevant, Learner Choice, Learner Creativity***

*“In XXXX class, we were asked to complete this YouConnect Project, which allowed us to articulate the materials we learnt each week in a personal and creative way. It didn't only teach me how to apply the knowledge and skills on myself, which essentially helped me understand the course material so much better, but also encouraged us to present it in whichever way we wanted to. As for me, I chose to submit this assignment in the format of a podcast where I would be the "host" of the recording and talk about the question surrounding the materials that we learnt. Through this process, I learnt how to present my understanding of management in a more interesting and engaging way, specifically for recording it in a podcast; as well as learning to do some recording, editing and audio compilation, which was definitely something fun to play around. This project has made management so much more fun.”*

## Teamwork and Leadership Skills

Sample Quotes from 99 excerpts across 12 online courses spanning 8 disciplines with the majority of excerpts submitted from Economics, Management and Physics courses.

**Collaboration**

*“I used my teamwork and leadership very often. In this course, we had many assignments that required you to work with another person or a group of people to complete an assignment. In many cases, I took the lead and scheduled times to video chat with my partner or group about a certain assignment. In the video chats, we were able to create an outline regarding how and when we will complete the assignment before the deadline. I believe that my leadership skills allowed me to be an easy-going partner and made the assignments that much easier to complete.”*

*“I am an introverted leader and I believe that is a beneficial aspect of my personality as a leader. In a teamwork setting, you need to be able to actively listen to your coworkers and I believe that I have that strong trait. Although I am introverted, I believe that I also am starting to exhibit more confidence in talking. As I start to progress with my interest group, I am taking on more responsibilities and more leadership experiences.”*

*“There was a time I took the leading role in a project of my class. We had four members in the team, and each of us needed to cooperate and contribute to the success of the project. At first, members showed enthusiasm and confidence towards our work, but later on, as time went by, people started to show a passive attitude and only finish the work we were assigned to. As the leader, I quickly noticed this change and I knew that it was the time to make some changes; otherwise our project would not turn into a good one. So, I decided to change their attitudes by starting from me. I tried to create a positive vibe and began to manage teamwork actively. After seeing my changes, my members contributed more to this project so that they would not be left out. I also encouraged people to share their ideas with others and provide feedback, as well as encouraging advice for others. Later on, my team changed into an actively cooperating and effective one, and our project eventually turned into a good one. I could apply the leadership skills I gained from past experiences to your company's highest good. As a leader who effectively managed the team and led the team to success, I am capable of solving more difficult problems in the group and lead the team project in your company to greater success.”*

**Collaboration, Sustained Investigation, Polished Product**

*“In this course, we had a project over the course of multiple weeks (I think about 10 total), that was a group project. It was an online course during the Summer of 2018. We analyzed a movie, Ex Machina, using theoretical concepts and readings from throughout the course. We submitted a presentation outline and created a presentation with voice overs.”*

*“It was interesting to do a group project through an online course. It required a lot more clear, concise communication, mostly through email, than group projects I've done through in-person courses. Sometimes it was hard to get everyone to contribute to the project, especially in a timely fashion. Everyone had different schedules and conflicts to work with. I improved my ability to check-in with the project and assess its status, and try to keep the group on task as best I could. I tried to work with everyone and be accommodating of schedules, and help out as needed if someone was struggling to complete something. I learned that I'm very much a finisher. I don't like to leave projects incomplete. If others are not pulling their weight, I will work to complete the project so that it is done, even if it means doing more work. I think I also gained skills as a leader and organizing a group project. The communication through email was crucial.”*

*“We always had to work in groups on Tiki-Toki timeline projects. From this constant group work, I learned that teamwork needs to be a collaboration that incorporates every members' ideas, even if I am positive my own answer is correct.”*

*“I developed more patience and learned to control myself when editing final drafts so that I did not completely rewrite everything others had written to make it sound more professional. Initial challenges our group faced with our assignments was confusion about due dates and expectations for discussion submissions.”*

*“We eventually started a group chat that allowed us to communicate more directly and immediately and ask each other about due dates when we were unsure. This also allowed us to get to know one another better and therefore held us more accountable to contributing to the assignments each week.”*

*“I also was able to develop leadership skills in weeks when I was the first (or only) member to submit a discussion post, by getting the document started and contacting the other members outside of the discussion to make sure they knew something was due. I learned that I prefer to be the person in charge and that allowing others to have that opportunity is a skill that I need to continue to develop.”*

#### ***Collaboration, Multiple Sources and Perspectives***

*“Teamwork and Leadership was implied through group assignments. These group assignments allowed for groups to discuss their thoughts about the topic of the assignment, and use teamwork to come together and decide on the best response to the question provided. During this, we developed skills such as group thinking and classmate relationships that provide for a much better understanding of the course material, as the discussions were full of insight and other classmates' theories. A large challenge that I have when it comes to assignments is allowing my response to focus merely on what the question is referring to, as I tend to go off track with many of my responses individually. The teamwork exercises allowed other classmates to promote their input on my responses, and ultimately forced me to stay on the task at hand. This was very beneficial. Within myself, I have learned that working together on group projects in an economics perspective forces your brain to work productively, as it is very easy for the group as a whole to meld their ideas together into an exceptional answer to the question provided.”*

#### ***Collaboration, Ill-defined, Articulation***

*“There were not clearly defined roles within the group allowing everyone to share the responsibilities of leading discussions and submitting the homework. The format encourages learning how to engage as a group. Even though you also need to be self-sufficient, there are others available to help you understand and compare your understanding with.”*

*We worked in homework groups to complete and submit our weekly homework assignments. We individually completed our homework to the best of our abilities first, then uploaded them to a shared online discussion. I had to be able to clearly and concisely explain my understanding of the problems and advocate for my answers when I believed that I had the correct answer. I took on the responsibility once to twice a month of submitting the homework.*

## Appendix 4I

## Digital Literacy Skills

Sample quotes from 62 excerpts across 12 online courses spanning 9 disciplines with the majority of excerpts submitted from Economics, Management, and Music courses.

***Technology-enabled Learning***

*“Because of my consistent use of technology for this course, I feel more adapted to the technological environment and use it regularly for work or class. I am able to navigate systems better thanks to this course, and I can apply this to future situations. If I am to be working with others who are less capable in terms of digital literacy, I can also act as a teacher and provide them support, helping them learn as well.*

*The first challenges that I faced with this online course were learning all of the online programs and sites. It was difficult to make sure that I had completed all my assignments as they were spread out in so many places, but over time I got extremely comfortable with each of the programs/sites, and knew my way around. I learned about each part of the programs/sites, and the little things that could help me use it in an even greater capacity.”*

***Technology-enabled Learning, Collaboration, Reflection, Articulation***

*“I developed the ability to communicate with others in an online setting. I found it hard to respond to posts without just saying what others were saying, but I learned how to word my thoughts in my own words instead of copying others.*

*I learned how to communicate with others in an online setting in my own voice. I also learned how to give feedback on others posts in a way that would help them without sounding too negative. In the future I can respond to questions asked online in a forum setting and communicate feedback to posts effectively.”*

***Technology-enabled Learning, Polished Product***

*“I think that this course caused me to become much more digitally literate on the basis that the entire course was online. It really taught me how to use the Canvas course better. For this reflection, I will use the final Spotify project. It brought together several digital media, Spotify, Word, the textbook, and Canvas, as a means to sum up the entire semester's worth of information.”*

## Appendix 4m

## Ethical Reasoning and Decision-Making Skills

Sample Quotes from 48 excerpts across 9 online courses spanning 6 disciplines with the majority of excerpts submitted from Management, Music, and Sociology courses.

***Real-world Relevance***

*“I combined examples from real life, examples from the texts we were discussing, and philosophical reasoning to argue my points. These things came together to deepen my understanding of an ethical position.”*

***Interdisciplinary Perspectives***

*“My mind was broadened to specific social issues that I was not previously aware of like how minority groups are disproportionately disadvantaged with the chances of living around hazardous materials.”*

***Collaboration***

*“Through the discussion board, I was able to understand others' point of views. They would give their opinion as to why they thought a topic was just and fair. Other times I would only look at my perspective and think that was the morally just answer to the question. In this course, however, I was able to engage with other students to respectfully dispute our own reasoning to the beliefs on different topics. This challenged me to always look at both sides to an argument even when I think my answer or belief is correct. I have learned that I can be very open-minded and want others around me to be more open-minded. I feel like those that I am close to have my old way of thinking still in their minds and I want to open their eyes to see that we need to respect one another by looking at all points of view.”*

***Reflection***

*“Every week we discussed a certain societal issue and weighed out certain factors. These discussions are held class-wide, so other people's opinions and feelings need to be accounted for. Additionally, we are writing a paper on a certain sociological policy change, which will need to encompass much reasoning and decision making.”*

***Articulation***

*“Some challenges I faced were completely understanding some issues based on my perspective, but after asking questions in the journal, my confusion was cleared up by having another person explain it to me. I learned that there is a lot happening around me in society and how everything interconnects. This class helped me see more things from a more ethical standpoint than just a black and white image.”*

***Multiple Sources and Perspectives***

*“I had to learn all of the dimensions of this course of ethical reasoning because it exposed me to various ways people think and how different things affect people in a variety of ways. I learned that there is more to the world than just the way I think. There are many points of view.”*

## Appendix 4n

## Applied Problem Solving

Sample quotes from 47 excerpts across 7 online courses spanning 5 disciplines with the majority of excerpts submitted from Economics and Physics courses.

***Real-world Relevance***

*"I had to use the formulas from throughout the course on homework problems that addressed real-life scenarios like drawbridges and car crashes."*

***Real-world Relevance, Polished Product***

*"The main activity that has fostered applied problem-solving in my learning experience has been working on the project for econ 11xx. Not having any economics experience prior to this class has made it necessary to be able to apply course concepts to a topic. I not only needed to understand course concepts but also be able to apply them to real-world situations and I think that best aligns with applied problem-solving."*

***Real-world Relevance, Learner Values***

*"I found this assignment to be very valuable both as a current student and as a future elementary school teacher. As a student, it is imperative that I am able to take the knowledge that I learn in my courses and apply them to both course content and the real world. In this particular assignment, I took the course content and applied to a real-world problem that I am passionate about. In the future, I hope to continue to use the new ideas and terms learned in this course to continue to propose potential solutions to issues that affect the students I interact with on a daily basis."*

***Technology-enabled Learning, Collaboration***

*"I learned applied problem solving when struggling with a group project in an online class where you don't really know anyone. I solved this problem of the online group projects by reaching out to people and meeting new people in order to do the projects to the best of our abilities. I have definitely gained confidence from this course and will continue to reach out to new people and do what is best for myself and others."*

## Appendix 4o

## Career Management

Sample quotes from 16 excerpts across 4 online courses spanning four disciplines with the majority of excerpts submitted from one Management course.

***Learner Relevant***

*“I developed a self-awareness of my values, personality, skills, and strengths. I was able to apply those in assignments that developed my understanding of my leadership and management style for a future career. A challenge I faced was being honest with myself when an aspect or skill was not the best it could be. The good thing about management and leadership is that it can be improved and there is room for growth. I learned a lot about how I would manage an organization and work with other people.”*

## Appendix 4p

## Active Citizenship and Community Engagement

Sample quotes from 15 excerpts across 10 online courses spanning 6 disciplines with the majority of excerpts submitted from Music and Economics courses.

**Collaboration**

*“I developed a consciousness about what it means to contribute to the success of a group. In our group each person was supposed to participate in first submitting their individual homework along with the questions they had. All of the group members did good in submitting their individual assignment. However, when it came to turning in the final homework, but there was one member who took advantage of the group and did not participate.”*

*“This one person ended up not only inhibiting the efficiency of the group but the development of his own skills required actively engaging and participating as a member. I ended up contacting the person in three different ways asking him if he could participate like the rest of the group and do his fair share. He gave an excuse of “not being aware.” This is not possible because every week we discussed in the discussion forum whose turn it was to turn in the homework for the group and also created a group message to make sure it was done on time. This person refused to join. In the end he was held accountable.”*

*“What I learned about myself in this group, is that I love working with people and being able to hear different perspectives and methods on how people found answers or understood the course work. It helped me in gaining insights about the course work that I may not have found by just reading the material/going through the problems on my own. It was nice to have a support system to talk about questions everyone had on the work as well. Working in a group is very beneficial, as long as everyone is trying to actively learn and engage to build an efficient class environment.”*

*“I was actively engaged with my community, which happened to my fellow classmates. These classmates also opened my eyes to new realms of thinking which is an impact of how we affected one another. Without the weekly discussions and the interactions we all had, I would not have expanded my thoughts on the music we learned about. There were many times where I read people's posts and I was surprised and enlightened to see how they interpreted the prompt. This allowed for a more meaningful discussion and open flows of communication as all of us were in the same boat.”*

**Reflection, Articulation**

*“Many of the topics that we discussed in this course were connected to people in our American society. For instance, we talked about the history of healthcare in America and the history of its practices in healthcare which has affected numerous communities differently.*

*Understanding the history and current practices allowed us to discuss more about health disparities in connection with socioeconomic status, immigration status, gender/sexuality, race and even politics. Many of the discussions in the course were helpful in determining ways that we could possibly propose to solve some of these health disparities in our society or challenge us to think about how and where we can get involved to advocate for certain health/illnesses.*

*Because we had weekly discussions in this course, it was sometimes hard to think about what to say when talking about our thoughts in relation to our readings, but thinking about active citizenship and community engagement in relation to our readings made it easier to create well written and thought-out discussion posts that could be engaging in the class. In this class, I*



*learned that when you get to understand the various ways that health impacts our society and how health disparities exist, it is able to challenge you to not only think critically about these issues but also challenge you to look at your positionality and helps you think about what you can do to prevent health disparities in our society.*

***Learner Self-Expression***

*“During the discussions we had on Canvas, Professor W. had us practice a dialogue with very specific guidelines while also providing us the freedom to express our opinions and thoughts. I believe this to be an effective strategy because students must learn different ways of communicating and continuously practicing this will help solidify that strategy of communication for outside of college, especially when discussing topics that may move to heated discussion or emotional evocative subjects like we had in class.”*

***Learner Socially-culturally Connected***

*“We had to interview someone for an essay which I thought was a great way to go into the community and learn about music in their lives.”*