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Literature Review for a Certificate Program in 21st Century Skills

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Literature Review for a Certificate Program in 21st Century Skills

by

Mary Lalon Alexander

An Abstract of a Project
in
Creative Studies

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

May 2020

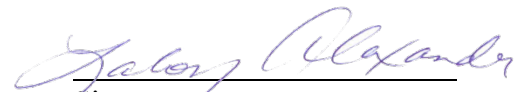
Buffalo State
State University of New York
Department of Creative Studies

Abstract of Project

Literature Review for a Certificate Program in 21st Century Skills

Artificial intelligence, automation, rising tuition costs, increase need for reskilling, and now the COVID-19 pandemic lockdown are just a few of the influences on the shifting landscape for higher education. In this project, I review the compounded pressures on institutions while examining the possible solution of modularized credentials and a focus on 21st century skill content to inform discourse on the subject at a private, faith-based university in Texas. The literature review yielded studies to inform a conversation about the growing problems and possible solutions for the future of higher education and training for the workforce. Additionally, as part of this project, I produced and presented a short presentation to the school about this subject matter.

Keywords: 21st century skills, unbundling, modularized credentials, future work skills, higher education


Signature

April 28, 2020
Date

Buffalo State
State University of New York
Department of Creative Studies

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Dates of Approval:

April 28, 2020



Dr. Susan Keller-Mathers
Associate Professor
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April 28, 2020



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Literature Review for a Certificate Program in 21st Century Skills

Section One: Background to the Project

The world is changing. If this statement was appropriate before, then the COVID-19 pandemic has made it more relevant than previously. The general consensus amongst academics and educational researchers is that change is not only inevitable, but necessary (Alexander et al., 2019; Gallup and Northeastern University, 2019).

For this master's project I proposed a literature review to address a potential undergraduate certificate and graduate certificate in 21st century skills. The purpose of the certificate programs is to better prepare graduates for the job force through a concentration on common soft skills. While the curriculum and certificate program is beyond the scope of this project, I reviewed the pertinent literature as part of the master's project.

The University of the Incarnate Word (UIW) is a private, faith-based university located in San Antonio, Texas. UIW is currently the fourth largest faith-based university and the number one Catholic university for Texas. We are a Hispanic-serving institution that is nationally recognized as the top faith-based bachelor's degree-granting institutions for Hispanics. The university is traditionally known for its liberal arts education and nursing program. Today it comprises 11 schools and colleges, including five professional health schools (University of the Incarnate Word, 2020a). The university was founded by the Sisters of Charity (CCVI) and is historically rooted in service to the community (University of the Incarnate Word, 2020b).

Part of that service is to prepare our graduates for the job force (University of the Incarnate Word, 2020b). However, the accelerated rate of technological change to society means that universities across the U.S. are attempting to prepare students for jobs that may not exist yet. Even if a graduate is lucky enough to find a perfect job match, current probability indicates that

he or she will most likely face at least one career change in their lifetime (Bakhshi et al., 2017; Hora, 2017). Reskilling is a necessary part of most industries today. Employers are looking for more flexible employees with the ability to think on their feet and learn new skills as jobs change (Bakhshi et al., 2017; Davies et al., 2011; Hora, 2017).

Additionally, the educational landscape is facing imminent change in order to keep up with the needs of today's students (Alexander et al., 2019; Carnevale, Gulish, et al., 2018; World Economic Forum, 2015). The traditional teaching and learning models still have relevancy in academics but must adapt to accommodate non-traditional students (National Academies of Sciences Engineering and Medicine, 2017). These adaptations may be in addition to the traditional models or in replacement of them. Regardless, if educational institutions do not recognize and address the need for change, they run the risk of self-extinguishing (Swinerton et al., 2018). The University of the Incarnate Word, like other traditional higher-education institutions, has come to recognize the issue, but is still struggling with how to address it.

Purpose and Description to the Project

This led me to two challenges: how to prepare students for unknown jobs and skills, and what are all the ways for UIW to remain relevant and attractive to potential students? The certificate program is one potential solution to relieving both challenges. The purpose of this master's project was originally to develop the curriculum for a certificate program to address part of the skills gap between education and industry. The potential advantages of this program include academic flexibility, reaching non-traditional and non-degree-seeking students, and opening the pathway to other certificate programs as UIW has not previously had an undergraduate certificate program. This program fits in with the current strategic priorities of

developing high-impact practices for students. Additionally, it meets the university mission to help develop students who will become concerned and enlightened global citizens.

However, after presenting the idea to the School of Media and Design at UIW, we determined that we should revisit the problem further. The factors that contributed to this decision included resistance from the faculty to the idea, the need for more input from other disciplines regarding the curriculum, and the sudden distraction of COVID-19 issues during February and March, 2020. At the time of writing this paper, the virus has been declared a pandemic. The vast majority, if not all higher education institutions are currently preparing for all-online classes for the remainder of the semester (Basken, 2020a). The university is not able to develop new curriculum while we adapt to new learning and teaching methods. Due to the compounded complications, I have restructured my master's project to a literature review that will support the development of new curriculum once the university is ready.

My personal goals for this master's project include:

- To identify and review supporting literature to help instigate new curriculum for 21st-century skills
- To identify and compare similar programs throughout the higher education landscape
- To define the set of skills that will best serve UIW's student population and job market

Beyond the scope of this project, I have developed larger goals about the potential new curriculum. These goals helped me to stay focused on the appropriate literature to meet the needs of my university and students.

- To integrate the program into the strategic plan and mission of UIW

- To initiate one pathway for students to achieve cross-functionality in the job force for today and the future
- To amplify the current UIW student experience beyond traditional career training
- To appeal to potential non-traditional students, not seeking a degree

Rationale for Selection

My rationale for this project included an ongoing love for curriculum development. I believe that many higher education institutions are in danger of extinction if they do not adjust to changes in student expectations and industry needs (Koerner, 2018). UIW must explore new pathways to adapt to this changing paradigm. Rather than the typical fearful reaction to change, I flourish with the idea of a shifting landscape and potential futures. That is why, in fact, I was initially drawn to the fashion industry. That passion has expanded to include a wide range of student development. This particular project helps to address the need for change while better preparing students for the unknown. The current virus pandemic seems to emphasize the need for new methods of teaching and learning in the world of higher education (Dignan, 2020).

The development of this certificate program helps to improve quality of life for future graduates through the application of cross-functionality. My hope is that this program will prepare students to think on their feet and make critical decisions rather than just following directions. Current policies promote the lower order thinking skills from Bloom's taxonomy of learning skills but we, as educational facilitators, need to help them achieve the higher order thinking skills (Koerner, 2018). This should include ethical decision making, both to meet the UIW mission and to produce globally responsible citizens (Saavedra & Opfer, 2012). Additionally, this program can meet the growing needs of a rapidly transformative job force and changing academic landscape (Alexander et al., 2019; World Economic Forum, 2018).

However, the program itself is not a part of the master's project. The literature review to support instigation of this program helps to supply evidence to the stakeholders of new practices at UIW. The literature review directly impacts the potential curriculum by helping to alleviate the fear of change and plan for transitions. Empirical evidence demonstrates to the stakeholders the potential for success. Additionally, through measured study of other programs, UIW will be able to prepare for transition to new ideas and programs.

Section Two: Pertinent Literature

To produce a program that meets industry needs and sets UIW apart from other universities attempting similar solutions, I must be thorough in the research. I started the search by defining the gap between education and industry in terms of skills. This included an extensive internet search using key words such as job skills, 21st Century skills, soft skills, and future of jobs. I utilized my school library's database, Google Scholar, and the general Google search engine. In addition to traditional scholarly papers, I examined research groups that produce industry white papers such as Pew, Gallup, and the World Economic Forum. As the pandemic progressed, I referenced academic blogs since scholarly research is not yet available.

This uncovered unexpected literature themes about how universities are adapting to economic and political pressures. The literature elucidated multiple issues bearing down on higher education to which I was previously unaware. Moreover, with the sudden complication of the COVID-19 pandemic, journalists and academics generated daily speculation about the future of education.

To inform a discussion of certificate programs, I collected information on certificates available through other universities as well as non-academic learning institutions such as LinkedIn Learning and Ideo. This helped to identify what the logistics of a certificate may look like. It helped to answer: how many hours of learning are involved, and how would this show on a graduate's resume? I will need to identify similar programs already in existence to see how to differentiate UIW from the competition while best serving the students.

Research for this program necessitated an internal review of the UIW curriculum and mission. I needed to identify current courses that may fit the program and possible gaps that should be developed. However, this requires more input from other departments and faculty

whose content expertise is more directly related to the specific subject matter. To gain institutional buy-in requires that I evaluate how the program and curriculum fully integrate with the university mission and strategic plan. To achieve this, I will eventually need assistance from faculty. My colleague Dr. Trey Guinn in Communication Arts is currently assisting me in this endeavor. We will work together to develop and promote the program. At that point, we will seek input and support from faculty, administration, and students. We will need assistance from specific administration leaders such as the Dean of Student Success, the Provost, and the committee for high-impact practices. Eventually this program will need the support and approval of UIW's president and Board of Trustees.

As the literature is the primary outcome of this project, the pertinent literature is clearly worthwhile. The results of the literature will direct the project. This project, in turn, will direct organizational change in my organization. A literature review does not necessitate much support from others, but I am lucky that I have colleagues and friends that occasionally send me relevant studies discovered during their own research.

Section Three: Process Plan

Goals and Outcomes

The prime deliverable of this project is a literature review to gain stakeholder support and guidance for curriculum development of a certificate in 21st century skills. As this review is one part of a larger venture to create new curriculum and instigate changes at UIW, I listed the longer-term goals that helped to guide my review. I produced a presentation that demonstrated a persuasive argument to gain buy-in and support from key university personnel. Ultimately, my aspirational goal is that this project will open minds to the potential for alternative academic practices and models to help UIW navigate the churning waters of change.

Project Timeline

To achieve my stated goals and deliverables, I plan to utilize the timeline and action plan chart seen below in Figure 1. This timeline includes the project phase, specific actions and products, deadlines, estimated hours, and necessary support. Phase one specifically pertains to this master's project and includes pre-implementation research. The remaining three phases are beyond the scope of this project but inform my initial planning and review. In phase two I develop the curriculum. Implementation occurs in phase three, and the fourth phase is for evaluation and future projects.

Table 1

Project timeline and action plan

Project	Action/ Product	Deadline	Hours to Complete	Support Needed
1 Research	Proposal approval	February 3, 2020	15 hours	Dr. Susan Keller- Mathers
	Collect information & research	February 24, 2020	50 hours	Dr. Trey Guinn
	Compile pitch for UIW	March 1, 2020	6 hours	Dr. Trey Guinn
	Compile research for written documentation of master's project	March 25, 2020	40 hours	Sounding board partner
	CRS 690 project completion & presentation	May 2, 2020	60 hours	Dr. Susan Keller- Mathers
	Gain support and input	Spring 2020	N/A	UIW administration; faculty; students
2 Curriculum (post)	Develop pre and post survey for students and industry employers	Summer 2020	10 hours	Dr. Trey Guinn

Project Phase	Action/Product	Deadline	Hours to Complete	Support Needed
	Complete curriculum proposal	Fall 2020	25 hours	Dr. Trey Guinn and other necessary faculty
	Apply for IRB approval - surveys	Fall 2020	3 hours	Dr. Trey Guinn
	Collect pre-program survey results and analyze	Spring 2021	5 hours	Students & industry employers
	Curriculum approval or revision	Spring 2021	N/A	UIW curriculum committees; Faculty Senate; Provost
3 Implement (post)	Implement program	Fall 2021	N/A	UIW faculty on the program; students
	Collect post-program survey results and analyze results – compare with pre-program survey	2021-2024	10 hours	Students & industry employers
4 Evaluate (post)	Revise curriculum as needed	2021-ongoing	N/A	UIW faculty on the program
	Measure success, years 1-3	2021-2024	N/A	UIW census data; student evaluations

Evaluation Plan

Evaluation of this project includes utilizing benchmarks for assessment of the learning goals specified earlier. Table 2 below illustrates the corresponding assessment related to the expected goal for the master's project.

Table 2

Key evaluation assessments for goals

Goals	Evaluation Assessment
To identify and review supporting literature to help instigate new curriculum for 21 st -century skills	Collect, compile and compare data
To identify and compare similar programs throughout the higher education landscape	Collect data until topic is saturated
To define the set of skills that will best serve UIW's student population and job market	Check with key UIW personnel initially for evaluation; <i>use pre and post program survey to evaluate effectiveness (beyond project scope)</i>

Ultimately, the purpose of the literature review is to inform the curriculum development and gain buy-in from stakeholders. The true evaluation of the project will come through feedback from those stakeholders. Moreover, if we proceed with the development of the program, the review can be considered successful.

This program is one part of a whole in the university endeavor to produce job-ready students. Additionally, the program has the potential to attract a previously un-tapped student pool of non-degree seeking students. Feedback will most likely come in the form of student

evaluations and a pre/post program survey designed to evaluate the efficacy of the program. Prior to implementation, we can utilize written and verbal feedback from university administration, faculty and students. Furthermore, we can ask for informal feedback from colleagues at other educational institutions and industry leaders.

Section Four: Outcomes

For this project, I compiled a brief literature review to inform the curriculum of a potential certificate program in 21st century skills. The literature fell into themes of the changing landscape of higher education, unbundling universities, and 21st century skills. An additional product of the project is the presentation I made to my colleagues in the School of Media and Design at UIW. This presentation is described following the literature review.

The Changing Landscape of Higher Education

Artificial intelligence and robotics are taking over the job market. Research indicates that growing numbers of jobs may soon be automated through mechanical systems or computerized algorithms (Rainie & Anderson, 2017). As society is transformed by information technologies, more changes are inevitable (National Academies of Sciences Engineering and Medicine, 2017). Approximately one-third of the constituent jobs will soon be automated. This indicates that significant workplace transformations will initiate changes for most employees. Consequently, millions of workers may need to switch careers and learn new skills. In advanced economies, between one-third and half of employees that may need to reskill, upskill, and find new occupations by 2030 (Manyika et al., 2017).

Jobs in the U.S. are being reshaped. The nature of employment itself is changing. Benefits such as health insurance and other compensation are restructured on a regular basis. The infusion of technology in workplaces means that demands are growing for higher levels of performance. Reskilling worker competencies, including soft skills is an added stress. Unfortunately, there is no strong agreement on who is accountable for helping workers meet these challenges. Such drastic workforce changes are reshaping education as the information age

takes root. These changes are affecting the nature of careers and education by rewarding soft skills such as communication and analytical skills (Pew Research Center, 2016). Educational policy makers should prepare for key economic effects such as changes in the skills demanded, greater demand for higher-level skills, and irregular distribution of impact across demographics, education levels, job types, and locations. Expect to see some jobs disappear while others are created (Lee, 2016).

Only 22% of Americans agree that colleges and universities are doing a good job preparing students for future jobs. About 95% of the American public believes in the value of life-long learning, but they do not feel that higher education is best equipped to provide that learning (Gallup & Northeastern University, 2019). A recent study from the National Association of Colleges and Employers (NACE, 2019) found that students rate themselves as more proficient than employers do in seven out of eight career-readiness skills. Students and Employers agreed, however, on the importance of teamwork, professionalism, communication, leadership, and problem-solving or critical thinking competencies. This indicates that students may not be aware of what skill level is required of entry-level jobs, especially as those jobs change (NACE, 2019). Of employees already in the workforce, 35% claim they do not have the education and training they need to excel at their jobs (Pew Research Center, 2016).

The transmission model of education, through which teachers conduct factual knowledge to students through lectures, remains the leading approach to compulsory education in much of the world, including the U.S. Through the transmission model students acquire information, but do not necessarily practice application of that knowledge to new contexts and complex problems. Students rarely develop what are deemed 21st century skills, or soft skills, as they are not being

explicitly taught. To compound the problem, these skills are more difficult to assess than rote retention (Saavedra & Opfer, 2012).

“Universities need to rethink higher education. For example, should it still be four years? Is that the best use of people’s time? And is this model sufficiently affordable for the vast majority of people?” (Gallup & Northeastern University, 2019). Approximately a dozen U.S. colleges will close each year in the near future. Many small, four-year liberal arts colleges are the most likely to suffer if they cannot transform to emphasize training for the available jobs (Basken, 2020b).

The changing job marketplace needs greatly influence our educational landscape and imminent tectonic shifts in pedagogy. The emphasis is primarily on online platforms, but all education delivery modes may be looking at drastic changes to come. Experts foresee a new education and training ecosystem. This shift includes a mix of formal educational institutions in traditional classroom settings, online classroom settings, for-profit firms, and free or open source settings. Additionally, new delivery methods may utilize augmented reality components and gaming elements. Furthermore, students and employees seek real-time learning that they pursue based on their own initiatives (Rainie & Anderson, 2017). As the workforce environment rapidly changes, educational institutions must consider how to acclimatize swiftly in response (Davies et al., 2011). These trends may mean that embracing pedagogical innovation in higher education will impact the ways in which such establishments approach their core mission (Alexander et al., 2019).

Cost is a primary barrier to colleges and universities leading the way for reskilling and preparing the future workforce. Sixty-five percent of Americans say that cost of attending university is the leading obstacle to obtaining new skills. This is followed by higher education

not keeping up with evolving workplace needs and the time necessitated for a degree. Today's student wants to learn in the same way that they interact with social media. These learners want small, just-in-time learning. They seek knowledge that is in the moment (Gallup & Northeastern University, 2019). Additionally, economic and political pressures have increased wariness of the merit of a higher education degree, particularly considering the cost, access, and future-ready skills. This scrutiny has instigated approaches to new degree programs, and the growth in new forms of interdisciplinary studies. This indicates that universities hope to provide learners with complex, contextual experiences that connect disciplines while reconsidering how to exploit existing resources. As such, students have new opportunities to combine their formal education with alternate modularized online coursework. This reduces costs and creates a learning continuum to easily upskill in the evolving workforce (Alexander et al., 2019).

These changes in the workforce and higher education have promoted speculation that can be thematically grouped. First, the primary higher education student population is changing. Not only do these encompass basic demographic changes, but epistemological changes. Life-long learning is a necessary trait of the future workforce (Alexander et al., 2019; Gallup & Northeastern University, 2019). This includes a re-evaluation of student needs and expectations to have constant access to learning platforms and resources to learn anytime, anywhere (Alexander et al., 2019). Second, higher education and workforce training will evolve into a blend of formal and informal training. This new ecosystem will include a mix of innovation in all education formats. New technology will greatly impact this new terrain (Alexander et al., 2019; Rainie & Anderson, 2017). Directly related to the new ecosystem, the third theme involves rethinking the higher education system altogether through unbundling and new credential systems. Unbundling is the process of disaggregating the traditional degree into smaller, customizable components

such as modularized training and certificate credentials. The trend for self-directed learning compels this particular development forward (Alexander et al., 2019; Rainie & Anderson, 2017). And finally, learners must cultivate 21st-century skills, competences, and characteristics to survive the future workforce. Soft skills are more in demand than ever before across all disciplines. Higher education must embrace these skills either as part of the existing curriculum, or as stand-alone credentials (Alexander et al., 2019; Rainie & Anderson, 2017).

Unfortunately, policymakers must prepare for a range of results since it is not possible to make specific predictions. Policy and institutional challenges will continue to evolve as disruptions linger, and require broad responses (Lee, 2016). Challenges to consider include both the technology and the discipline required of online learning that favors certain types of learners over others. This is often referred to as the digital divide. Faculty may also be resistant to these mass changes. As such, newer, more flexible faculty could potentially adapt quicker to newer ecosystems (Dignan, 2020). These challenges and others yet to surface must be planned for in any transition to less traditional educational systems.

May feel that colleges and universities do not properly promote or nurture the life-long learner with the high monetary and time costs (Gallup & Northeastern University, 2019). Additionally, these institutions have not yet broadened their learning constituencies beyond young adults (Davies et al., 2011). Low completion rates compared with high student loan debt is compounded by a more diverse student populations from the traditional college-bound young adult. Increasingly the college student majority leader is older, is more likely to be balancing work and family life with education, and has different needs from those of a traditional student. Universities and colleges are evaluating how to meet the academic and social needs of all students on their campuses (Alexander et al., 2019). Moreover, these new workforce challenges nudge

workers to think about ongoing commitments to learning and reskilling. This prompts a societal analysis about where such constantly changing skills should be learned as well as the evolving role of higher education (Pew Research Center, 2016).

While the very nature of traditional academic institutions' position is questioned, the makeup of a learning environment has also faced scrutiny. The traditional classroom reigned until recent developments of the COVID-19 pandemic, which will be discussed shortly. Online platforms are certainly not new, but have continued to develop and will likely be propelled dramatically forward in the next few years (Dignan, 2020; Rainie & Anderson, 2017). However, a newer style of learning that utilizes modularized and disaggregated degrees might cultivate more hybrid classrooms and remote learning. The main appeal of modularized learning and credentials is the possibility of more individualized training. It allows for degree-building through multiple institutions, including non-traditional informal institutions. Should the workforce begin to accept and validate a wider range of credentials, future and current employees would be exposed to a wider range of learning opportunities (Alexander et al., 2019).

Likewise, the rise of incubators and entrepreneurial partnerships between educational institutions and industry offers students the opportunity to adopt a philosophy of experimentation and propels a different system of evaluation for success. The potential for academic institutions to partner with online course providers or alternately create a variety of choices for students to master content at their own speed provides a new space for responding to the needs of learners (Alexander et al., 2019).

Innovative approaches to new degree programs show that institutions are seeking to connect diverse disciplines while maximizing existing programs, as evidenced by the rise in interdisciplinary programs. This shift to student-centered learning requires faculty and academic

advisors alike to act as guides and facilitators. Models of education have emerged that provide individual learners with options for education and training that transcend traditional pathways to degrees and other credentials. Badges and certificates provide prospective employers with evidence of skills gained through a wide range of educational opportunities and venues. While some content that these competing models of education will destabilize or replace the traditional campus system, others believe modularization and the opportunity for learners to “build their own degree” will increase the odds for students to succeed by combining traditional and nontraditional degree paths (Alexander et al., 2019). 63% of adults with a bachelor’s degree or higher level of education say they will need to keep advancing their skills throughout their career. Americans see increased emphasis on workers to continually improve their skills to keep up with job-related developments. Fully 71% believe demands to improve work skills will increase in the years to come (Pew Research Center, 2016). Industry experts recommended to train and educate Americans for jobs of the future and transition and empower workers to ensure broadly shared growth (Lee, 2016). A considerable number of industry respondents focused on the likelihood that the best education programs will teach people how to be lifelong learners (Rainie & Anderson, 2017). Accordingly, some say alternative credentialing mechanisms will arise to assess and vouch for the skills people acquire along the way. (Rainie & Anderson, 2017)

A new workforce reality demands next-generation college students and workers who are independent thinkers, problem solvers, and decision makers. This ensures that students gain a collection of newly-important thinking and reasoning skills (Silva, 2009). Institutions should integrate interdisciplinary training that promotes the development of skills and knowledge in a variety of subjects. (Davies et al., 2011). Since 1980, employment jobs requiring stronger social skills, increased by 83%. These skills were mostly interpersonal, communication or management

skills, Additionally, there was a 77% increase in jobs requiring higher levels of analytical skills, such as critical thinking. Workers responded that they the skills they rely on most in their jobs included interpersonal skills, critical thinking, and professional communication (Pew Research Center, 2016). The skills required to adapt to artificial intelligence include harder-to-replicate soft skills such as teamwork, communication, creativity, and critical thinking (Gallup & Northeastern University, 2019). Experts recommend placing prominence on developing skills such as critical thinking, visioning, and analysis capabilities. Programs should integrate media literacy into curriculum and include experiential learning that emphasize the ability to collaborate and respond adaptively (Davies et al., 2011). Intangible skills such as emotional intelligence, curiosity, adaptability, and resilience will be most highly valued as well as the most difficult to teach (Rainie & Anderson, 2017). Though many support the merits of 21st century skills, others levy robust arguments against these skills. They claim that the phrase 21st century skills is a meaningless expression and that it sidetracks educators from teaching necessary core content. They claim that these skills are not new and that emphasizing them will lower standards and deteriorate teaching. Furthermore, these higher-order and abstract skills cannot be measured in consistent and cost-effective ways. Proponents respond that 21st century skills are in fact not new, but newly important (Silva, 2009). While current measures may not satisfactorily assess these skills, it does not mean that the task is impossible (Scardamalia et al., 2012).

COVID-19

The current COVID-19 pandemic and resulting lockdown dramatically influenced education at all levels. Unfortunately, knowledge is limited to speculation at the time of writing this review. Researchers have not had sufficient time to develop studies, and the resulting

consequences of the lockdown may not be seen for years to come. Therefore, most of the information is supplied by editorial commentary from educational journalists.

This pandemic has forced school districts and universities across the nation to close and send students home. While many refer to the new method of teaching and learning as online learning, others rather insist that it is a form of remote learning. The difference is inherent in the original intent of an online class to be delivered online, while remote learning refers to the sudden switch mid-semester, in which many teachers and students were both unprepared and ill-equipped for the online format. This new reality has forced teachers and students to adopt to online and remote learning plans and technology. This mass shift to online classrooms will influence the timetable of educational change (Dignan, 2020). While most foresee a major alteration in educational policies and practices, no one can tell how those changes will manifest exactly. Closures of college classrooms multiplied in the U.S. What started as a handful of institutions quickly escalated in a matter of a few weeks. Some speculate that this will push education into a regular online platforms, while others fear that it will backfire as a bad experience (Basken, 2020a).

As such, this mass change challenges the nature of educational institutions. Universities and colleges must ask themselves whether education is about continuous learning or completing a degree and a finding a career? How is the institution helping to students to fully experience this in an unfamiliar format? How does the return on investment in education compare with current debt loads? Journalists predict that education is going to revolve around continuous learning from now on. Students and employees have had time to think more about their own learning and interests during the lockdown. Adaptation to online learning will make upskilling more likely and credentials more fluid (Basken, 2020b; Dignan, 2020). The current situation emphasizes the

need to closely monitor how institutions respond to disaggregating degrees (Alexander et al., 2019). Existing platforms such as Coursera, Udacity, and LinkedIn Learning may look more appealing for partnerships with traditional universities. Certificate and badge systems may become more commonplace and propel the workforce to accept non-traditional credentials. If these concepts become mainstream, the idea of spending hundreds of thousands of dollars on a four-year degree may be in question (Alexander et al., 2019; Dignan, 2020).

One big challenge that the switch to online platforms has magnified is the digital divide. Students and teachers without home access to appropriate devices or Internet emphasized many other discrepancies, previously ignored. Multiple concessions were made, including free Internet access from some providers, school districts supplying laptops and hot spots, and industry donors helping to fund lending programs. However, the lockdown also highlighted students without shelter or food when campuses were suddenly shut down. Physical schools provide a structure and shelter in ways that digital learning is incapable of replacing. The pandemic and resulting online learning may result in bigger-picture consequences as a result of the continued unintended suffering for marginalized students. The unsustainable debt load for students may become more critical, especially with many parents out of work during this time. Students may question the value of an online degree while paying tuition for face to face classes. Many schools will also suffer financially as refunds become necessary and future freshman may not want to come to campus in the fall. These challenges will continue to develop as the economy fluctuates. How higher education institutions respond to the challenges remains unseen (Dignan, 2020).

Unbundling Universities and Modularized Credentials

The makeup of college student population is no longer the young adult who just graduated high school. For the last few decades, almost one-third of postsecondary enrollment

consists of students over the age of 30. Current students now pursue credentials that may or may not include a bachelor's degree. The motivations of each student may vary, but many hope to become more effective or competitive in their current careers. New needs and interests have pushed the adoption of disaggregated degrees and modularized credentials such as certificates and badges. The rapid evolution of organizational and technological environments has generated interest in skill authentication for the career resume. The previous career model of obtaining a bachelor's degree in order to excel in one specific career is no longer a palatable choice for today's student. Individualized learning and multiple career changes occupy learners' attentions (National Academies of Sciences Engineering and Medicine, 2017). Financial and political pressures are forcing higher education to adapt rapidly. These institutions continue to look for alternative and additional income, for new delivery methods, and are expanding their definitions of a student to keep up with competition (Swinerton et al., 2018).

Disaggregation of education is currently referred to as unbundling. This process offers institutions the ability to divide student experience into smaller parts and separate conventionally integrated components into fresh products and services (Swinerton et al., 2018). Products previously vended as a unit, such as the core classes, career skill training, and the college experience can be separated into constituent parts such as singular skill training (Morris et al., 2019). At first glance, this system provides opportunities for untapped student populations, more individualized learning, and reducing costs into more manageable amounts. Potentially, a disaggregated system can help contribute to economic prosperity. However, very little research exists about higher education unbundling at this time. Researchers have yet to analyze the impact of such a dramatic change to the educational system in its infancy stage (Morris et al., 2019; Swinerton et al., 2018).

As this educational system continues to develop, the job industry continues to call for skill credentials, open-access training modules, and ways of authenticating these new credentials (National Academies of Sciences Engineering and Medicine, 2017). Unsurprisingly, private sector training platforms lead and currently dominate the shift to individualized skill training and qualifications. Flexible online courses and credentials are regularly delivered by new provider partnerships (Morris et al., 2019; Swinnerton et al., 2018). Higher education institutions have started to break degrees into certificate programs and shorter training. These new options are modularized to build up to a larger degree and structured to lead students to employment and further education (Carnevale, Ridley, et al., 2018).

While the system is still in a fledgling stage, students and employees have quickly adapted. In 2015, one-in-four U.S. workers had a job-related certificate or license. An example is an information technology certificate or a teacher's license. Fifty-two percent of workers with a postgraduate degree obtained some sort of modularized credential (Pew Research Center, 2016). The state of Oregon approved a new short-term certificate called the Career Pathway Certificate of Completion in 2007. This certificate was intended to prepare students for an entry-level job and to provide a transitional stage toward an associate's or bachelor's degree. Additionally, Oregon added an academic, transfer-oriented program called the Oregon Transfer Module for transfer students that progress from community colleges to four-year institutions (Carnevale, Ridley, et al., 2018). As the modularized credential and educational unbundling progresses, the benefits and challenges start to surface.

Benefits and Challenges of Unbundling

The compounded challenges of rising costs, distrust of higher education institutions and changing student needs mean that universities must become leaner, more efficient, and more

innovative organizations to survive. Growing competition from private sector institutions and demands of the workforce cultivate individualized, on-demand learning environments that universities are obligated to match. Consequently, unbundling and modularized training has received attention from forward-looking educational policy makers. Unbundling is a process whereby the institution separates out its constituent products, services and activities. As such, they also trim away functions perceived to be superfluous, and students then pick and choose the elements most relevant to their education. The unbundling of higher education can occur at the systems level, institutional level, course level, or academic staff level (McCowan, 2017). For the purposes of this paper, I will focus upon the institutional and course level of disaggregate degrees and modularized credentials. At the higher education level, some view the change to unbundling as inevitable, while others defend the traditional university system. They believe that unbundling will be an unparalleled threat to the academic system (McCowan, 2017).

Currently, employees with skill certificates show an increase in earnings over non-certificate holders. In the educational demographic of no postsecondary degree, certificate holders make approximately 20% more than those with only a high school degree. Modularized credentials are more accessible to students from lower-income backgrounds. Upskilling through a certificate program also boost earnings for established employees. These programs help many to transition to other careers and provide a segue without the time and cost investment of a bachelor's degree (Carnevale, Ridley, et al., 2018). Unbundling can potentially reduce costs through simplification of delivery methods. This system naturally lends itself to an online learning platform, with carries its own benefits and challenges. However, the cost reduction in tandem with a modularized system of payment, meaning that you pay for only the training you

need at the time, may bring in new student populations that were previously excluded from the higher education market.

Furthermore, the personalized learning and current emphasis on employability are prime benefits to unbundling higher education. The general population may see modularized training as desirable due to the lack of confidence in universities and traditional degrees to produce future-ready graduates (Gallup & Northeastern University, 2019; McCowan, 2017). Advocates also promote the idea that unbundling has a greater potential to empower learners to take control of their own learning and career path. Many of the benefits mentioned, however, support the viewpoint of creating employable graduates. This goal is only part of what higher education institutions claim as their mission. While these advantages of an unbundled system appear initially tempting, there are challenges, primarily associated with the other functions of universities (McCowan, 2017).

An unbundled system fails to address an institution's mission to further human understanding, metacognition and social equality. Full disaggregation directly threatens the relationship of teaching to research that help institutions promote the public good and social discourse (McCowan, 2017). As employers define specific credentials and skill sets for employability, the digital divide will become more apparent and may produce a new type of marginalized student or employee (Morris et al., 2019). In terms of the personalized learning benefit, unbundling opposers cite that learners often fail to recognize the necessary skills and competencies necessary for a particular career. Therefore, these students will tend to make poor choices for their education and miss vital training. A side effect of this is learning fragmentation and multiplicity of what is valuable and why. Disaggregated learning also indicates that the institution's role is undermined as a safe space for collective interaction and debate. Specifically,

the role of the university to integrate diverse cultures and viewpoints and to nurture adaptable understanding and respect for others is hindered. For developing countries, the potential for educational institutions to advance the society is severely endangered (McCowan, 2017).

Additionally, there is no guarantee that modularized training will provide rich learning environments for students. Without a centralized support system often found on the university campus, students may miss out on the current benefits of a university education such as mental and physical health clinics, financial planning, and tutoring services. The lack of constant supervision and guidance from mentoring faculty may lend itself well to a certain type of student but fails to support others. For that matter, students do not experience the benefits of cohort-building and networking aspects of a four-year degree on campus (McCowan, 2017).

Most of these speculations are simply that. With the current lack of empirical evidence, the full benefits and challenges of unbundling remain to be seen. The available evidence is inconclusive and tends to review unbundling as an all-or-nothing system rather than as integrated into the traditional higher education system. It is impossible, and most likely impractical to judge one system against the other at this time. What is clear is that the unbundled system and the traditional system of higher education have different purposes and end-products (McCowan, 2017).

To summarize, personalization and efficiency may significantly boost student access to post-secondary training, but potentially undermines alternate purposes and benefits of the current four-year degree model (McCowan, 2017). This leaves us with several questions to consider before unbundling any single institution. What is the mission and purpose of the university and how does unbundling meet or undermine it? How does the institution interact with external providers in the unbundling process? How is power distributed in such a relationship? How is the

role of faculty in a disaggregated degree redefined? How are student interests served or destabilized in this model? These questions help to guide the decision and process of unbundling (Cliff et al., 2020).

Other Certificate Programs

In the search for other certificate programs, I found that there is little standardization. I reviewed traditional, accredited university models (Dolch et al., 2007; Guthrie & Bovio, 2014; Harvard Extension School, 2020; Stanford Center for Professional Development, 2020) alongside informal, popular industry-based models (Coursera, 2020; edX, 2020; IdeoU, 2020; Udacity, 2020). The university model tended towards an 18-hour program (Guthrie & Bovio, 2014; International Center for Studies in Creativity, 2020; Vasquez et al., 2019), though there was some variance from approximately six to 22 hours (Dolch et al., 2007; Harvard Extension School, 2020; Pastoral Institute, 2020; Stanford Center for Professional Development, 2020). Some models had no requirements to enroll (Coursera, 2020; edX, 2020; IdeoU, 2020; Udacity, 2020), while others required an undergraduate degree and/or industry experience (Dolch et al., 2007; International Center for Studies in Creativity, 2020; Stanford Center for Professional Development, 2020). I was unable to locate any certificate programs that specifically targeted 21st century skills as a whole, but some focused on unique aspects such as creativity (International Center for Studies in Creativity, 2020; Stanford Center for Professional Development, 2020), leadership (Guthrie & Bovio, 2014) or communication (Harvard Extension School, 2020).

21st Century Skills

Unbundling addresses the delivery method of education but does not dictate the content. The other theme that prevails in making future-ready graduates is the advocacy for integrating

21st century skills, commonly called soft skills, into education at all levels. The shift from an industrial to an information economy indicates new training needs for students and employees alike. The current well-being and prosperity of a nation is directly related to the innovative capacity of its citizens. As such, problems are increasingly more complex and multi-faceted, making creativity, adaptability and information navigation highly sought-after skills for the workforce. Climate change, terrorism, fake news, economic crisis, and the recent pandemic highlight an ingenuity gap. Innovativeness and the creation of new knowledge will determine which countries will lead in the next few centuries (Alexander et al., 2019; Scardamalia et al., 2012).

What are 21st century skills? Often referred to as soft skills, in opposition to technical skills or hard sciences, a 21st century skill is any skill that is essential for navigating the current century. Primarily, these skills are related to the manipulation of and use of information in various contexts. Individuals increasingly need to develop new ways of working, living, learning and thinking (Griffin et al., 2012). These are the skills needed for managing the complex range of data in a digital era of constant information. These skills help people to make sense of globalized societies and respond to the requirements of the 21st century job markets (Assessment of Transversal Skills 2020, 2020).

Automation, artificial intelligence and other factors have not only changed the types of jobs available today, but the skill-demands of existing jobs. Technology is a driving force for most industries, and requires employees that are savvy of the digital environment. Increasingly complex and ill-defined problems require more ingenuity and quick thinking. Additionally, daily collaboration and interdisciplinary teamwork dominate the work environment (Griffin et al., 2012). A quick key-phrase search for top skills or employment skills will provide a long list of

blogs, journal articles, and industry white papers that tout the benefits of interpersonal and problem-solving skills.

At least one-third of global companies reported complications in filling open positions in 2014, due to shortages of candidates with essential skills. Foundational literacies such as numeracy and scientific literacy are still key competencies. However, how workers approach complex problems and character qualities such as curiosity, initiative, persistence, adaptability, leadership, social and cultural awareness are now just as necessary (World Economic Forum, 2015). These workforce employers lament shortages of such skills in fresh recruits to their organizations. The role of information in society has changed, and consequently affected the structure of the workforce. While skilled labor is still important, technological advances in manufacturing and manual labor jobs have changed the type of skills necessary. New jobs arise every day that hinge on information skills. The knowledge-economy demands professions that are based on the creation, supply and consumption of information. Success in the workforce depends on the ability to communicate, collaborate, and share and use information to solve complex problems. The ability to adapt and innovate in response to a complex array of new demands and ever-changing conditions is essential. Future workers must harness and develop the power of technology to create new content and to expand human capacity and productivity. (Brinkley et al., 2012; Griffin et al., 2012; World Economic Forum, 2018).

The next decade will see an essential shift in job skills for both future and current employees. However, individuals most in need of reskilling and upskilling are the least probable to receive that training. (World Economic Forum, 2018). Skilled jobs are increasingly centered on unravelling amorphous problems and efficiently analyzing streams of information. To excel in this new world, employees must not only demonstrate strong skills in traditional studies such

as language arts and mathematics, but they must also master skills such as critical thinking, problem-solving, tenacity, teamwork and curiosity. While manual jobs decrease in the wake of automation, jobs that require non-routine analytical and interpersonal skills will see vast increases (World Economic Forum, 2015). As technology continues to adjust or outright substitute many work tasks, employees will need to upskill for creativity, adaptability, and collaborative skills (National Academies of Sciences Engineering and Medicine, 2017).

As such, the educational system must adapt to prepare graduates for the changing labor force. At the moment, artificial intelligence is unable to effectively demonstrate creativity, intuition, persuasion, and innovative problem-solving, or to organize and lead teams. Educational programs may need to add social and creative skills to their mix of hard analytical skills for career readiness. It is difficult to predict specific skillsets needed for different components of the future workforce. However, themes are evident through the research. The lists of skills, abilities and characteristics can be generalized into categories for educational institutions to investigate and integrate into existing curricula (National Academies of Sciences Engineering and Medicine, 2017) Artificial intelligence experts were asked what human talents that they believe computers and automation may not be able to duplicate. These respondents suggest that workers must learn to cultivate and exploit creativity, collaboration, abstract and systems thinking, complex interpersonal skills, and the ability to thrive in diverse environments. They also noted that these skills should be developed by educational training programs to prepare individuals to successfully work alongside artificial intelligence (Rainie & Anderson, 2017).

Skill development is not enough to prepare these new workers, however, Educational systems must adapt to meet 21st century needs by addressing values, habits, and learned traits. To address such challenges, educational policy and curriculum reform must be organizational and

pedagogical, not just technological. Knowledge and technological innovation will be inextricably linked, as is presently the situation in many knowledge-creating organizations. The goal in developing 21st century skills is not only to prepare graduates for an unknown workforce landscape, but also to equip individuals for fruitful and nourishing lives in an information-economy (Scardamalia et al., 2012). Education's new challenge is to provide their graduates with the navigation skills needed for an information society (Griffin et al., 2012).

Even today, employees often undergo supplemental training on the job through a mixture of formal and informal training programs. Education, once the terrain of young adults, pre-career, has now become a lifelong process. In this knowledge economy, lifelong learning is a side-effect of the change in the way we learn, think and work. Rapidly changing technology in the home and the workplace hastens the need for these new skills. Employees now need these skills to manipulate new information-based work tools. For instance, the need to access and process information means that there is an increasing urgency in the need for skills to evaluate the validity of that information. As knowledge exponentially grows more specialized, information and communication technology alter the nature of how work is conducted and the meaning of social relationships. Consider how social media affected an entire generation of relationships (Griffin et al., 2012).

I have grouped the many skills in the literature into four primary themes: problem-solving skills, communication and collaboration skills, literacy, and lifelong learning. There is another theme that runs through all of the other categories. While all of the skills are interrelated, global citizenship skills appear regularly in tandem with the other four themes (Griffin et al., 2012; Koerner, 2018; Saavedra & Opfer, 2012).

Problem-solving skills include decentralized decision making, creativity, critical thinking, analysis, innovation, adaptability, and effective decision making. Communication and collaboration contain interpersonal skills, teamwork, effective written and oral communication, conflict resolution, emotional and social intelligence, and leadership. The literature on literacy focuses on information navigation, media and digital literacy, dealing with information overload, computational thinking and sense-making. Finally, lifelong learning is about learning how to learn, taking control of your own career goals, managing time, initiative, metacognition, and cognitive load management. Global citizenship skills such as civic engagement, diverse collaboration, cultural intelligence, and ethical decision making are interspersed in the first four themes (Bakhshi et al., 2017; Davies et al., 2011; Griffin et al., 2012; Koerner, 2018; LaPrade et al., 2019; LinkedIn Asia-Pacific Edition, 2019; Pate, 2020; Popovic & Tomas, 2009; Puccio, 2017; Rainie & Anderson, 2017; Saavedra & Opfer, 2012; UdeMY for Business, 2019; World Economic Forum, 2018).

While 21st century skills have become something of a buzz-phrase, some object to the idea of refocusing educational efforts to these skills. Essentially, these proponents feel that education should not be reduced to job training and that the private sector has no place dictating educational priorities. However, advocates stress that teaching 21st century skills does not simply amount to job training. These skills have broad application and are not shaped to any particular kind of career or job. Employability still is an important consideration for students and is often part of the mission of any higher education institution. Teaching these skills must be inclusive, nurture equal contribution, and provide for deliberative governance and discourse. The other issue is that these are skills that are traditionally difficult to assess for quality and accountability purposes. While there are no widely-accepted assessments specifically for these skills, individual

researchers and institutions have started to generate possible tests for more research (Scardamalia et al., 2012).

Problem-Solving

The first grouping of sought-after skill competencies includes the necessary components of problem-solving. Not only does this comprise of the ability to produce creative solutions, but to critically choose the right solution. The ability to solve problems and troubleshoot commonly tops the charts of necessary skills for employees, regardless of the industry or career path (Bakhshi et al., 2017; Hora, 2017). Future employees are expected to change course quickly to solve non-familiar and complex problems in both conventional and groundbreaking ways (LaPrade et al., 2019; Partnership for 21st Century Learning, 2019). Ill-structured complications with multiple, complex constraints and multiple solutions continue to arise in the workforce. These situations are not easily remedied with manuals or routine processes (Hora, 2017). Leaders are expected to seek relevant information, evaluate the information and apply knowledge gained to solve these wicked problems (Hickman & Dvorak, 2019). Self-initiated problem finding and attunement to promising ideas helps to raise the bar for workplace accomplishments and promotions (Scardamalia et al., 2012).

Creative thinking is an integral part of problem-solving. Employees must be able to innovate and generate novel solutions in the work environment. They should be able to create original works as a means of expression and utilize tools and resources in creative ways (Assessment of Transversal Skills 2020, 2020; Puccio, 2017). According to an Adobe (2012) survey, 78% of college-educated professionals believe that creativity is essential to their career. Of those professionals, 71% feel that creativity should be a specifically taught course like math and science, while 88% believe that creativity should be built into existing curriculums.

Creativity is the ability to work on unsolved problems, generate new theories and models, and to pursue promising solutions and ideas. This involves the ability to take risks and integrate failure as part of the problem-solving process (Scardamalia et al., 2012). Puccio (2017) reviewed several studies of 21st century skills and found that creativity is commonly listed as a top skill. It may be listed as problem-solving, imagination, adaptive thinking, curiosity, flexibility or other variations of creative thinking. The abilities to create new and valuable ideas, to work creatively with others, to refine existing ideas and implement innovations are innate to creativity. It promotes a flexible and adaptive way of thinking for problem solving and decision making (Hora, 2017). Creativity classes can teach problem-solving models, idea-creation techniques such as brainstorming, and promote collaborative work. Creative activities encourage acceptance of diverse perspectives, understanding of real-world limitations for adopting new ideas, and understanding that creativity and innovation are part of a continuous, iterative process of small accomplishments and frequent errors. Additionally, creativity breeds innovations that make useful contributions to the workforce (Partnership for 21st Century Learning, 2019). Future employees should be part of a global knowledge-creating civilization and contribute to a global initiative. These skills include an appreciation of the cultural dynamics that let the ideas to be used and improved to serve an inclusive, diverse, changing society (Scardamalia et al., 2012).

The ability to generate multiple novel ideas is useless, however, if those ideas are not critically evaluated and acted upon. Critical thinking is an equally necessary part of the problem-solving process. The ability to reason effectively includes both inductive and deductive reasoning as appropriate to the given context (Partnership for 21st Century Learning, 2019). Students and future employees must be able to express thoughts and ideas effectively in a complex situation. They must also be able to take and receive feedback (Hora, 2017). Critical

thinking includes the skill of analyzing parts of a whole to understand how they interact and produce global outcomes in multifaceted systems. Future employees must be able to effectively evaluate alternative ideas and points of view, synthesize the various aspects, make connections and interpret oftentimes conflicting information to draw best-analysis conclusions (Partnership for 21st Century Learning, 2019). This is intertwined with ethical decision making. The global citizenship aspect manifests as responsible and contentious problem solving (Koerner, 2018). Ultimately, creative and critical thinking depend upon high-level thinking skills exercised in the course of authentic knowledge work and problem solving (Scardamalia et al., 2012).

Communication and Collaboration

Collaboration and communication involve interpersonal interaction and discourse with multiple audiences (Assessment of Transversal Skills 2020, 2020). Many of the top skills that are most valued in the workforce are essentially communicative in nature (Carnevale, 2013). Communication is a form of knowledge building through progressive discourse aimed at advancing knowledge in the field. It encompasses discourse to achieve a more inclusive, higher order analysis. Open community spaces encourage peer-to-peer and extended interactions with diverse populations (Scardamalia et al., 2012). Not only is the ability to communicate in oral or written form a necessary skill for the job force, but also to be able to formulate arguments in a convincing manner (Assessment of Transversal Skills 2020, 2020). Graduates must articulate thoughts and ideas effectively using a variety of forms and contexts, and to listen effectively to decipher meaning. This meaning can include knowledge, values, attitudes, and intentions. In the workplace, employees use communication for a range of purposes such as to inform, instruct, motivate, and persuade. They must also utilize multiple communication media and technologies, and know how to judge their effectiveness (Partnership for 21st Century Learning, 2019; World

Economic Forum, 2018). Future employees need skills that demonstrate aptitude in a social context and reveal an ability to work in a diverse team setting (Carnevale, 2013; Davies et al., 2011).

Collective and shared intelligence emerges from teamwork of many individuals and aims to enhance the social reservoir of existing knowledge. Successful collaborations prize advances in community workforce knowledge, while enabling individual members to contribute to that success (Scardamalia et al., 2012). Employees must demonstrate an ability to work effectively and respectfully with diverse teams. Team members accept shared responsibility for collaborative work. Individuals should exercise flexibility and the inclination to be helpful in making compromises for a common goal (Partnership for 21st Century Learning, 2019). Future employees should be able to express frustration in a constructive way that maintains a productive team (Scardamalia et al., 2012). This requires individuals to be able to view and understand different viewpoints and to be able to negotiate. Such adaptability allows team members to interact effectively with others while managing projects, and to guide and lead others (Assessment of Transversal Skills 2020, 2020). This requires social and cross-cultural skills to interact effectively with others. Additionally, employees should understand how to conduct themselves in a respectable, professional manner. Collaboration creates an ecosystem of diverse ideas. The traits of collaboration include respect for cultural differences while working effectively with individuals that have a range of social and cultural backgrounds. Teamwork can teach graduates to respond open-mindedly to different ideas and values, and to leverage social and cultural variances to create new ideas (LaPrade et al., 2019; Partnership for 21st Century Learning, 2019). Moreover, individuals are more likely to participate in community and neighborhood activities and to display solidarity on issues affecting the local or wider

community (Assessment of Transversal Skills 2020, 2020). Community members tend to support inclusive rights when exposed to more diverse opinions and cultures (Scardamalia et al., 2012). Ultimately, through deliberate classroom collaboration activities, students learn to manage group projects and to guide and lead others (Assessment of Transversal Skills 2020, 2020; UdeMY for Business, 2019).

Leadership is an essential part of teamwork. The expectations of leaders are to communicate clearly, to listen, to share information effectively, and be open to diverse opinions and ideas (Hickman & Dvorak, 2019). Leaders must use interpersonal and problem-solving skills to influence and guide others towards a common goal. They must analyze the team to leverage strengths of members and inspire others to produce quality work. Leaders demonstrate integrity and ethical decision making while navigating a problem. Through effective leadership, graduates learn to be responsible to others, to act responsibly for the interests of the global community (Davies et al., 2011; Partnership for 21st Century Learning, 2019).

Literacy

The current media-driven world ushered in several issues for the population. There is an ever-growing abundance of information that can easily cause information overload (Koerner, 2018; LaPrade et al., 2019). Rapid changes in technology mean that the population must constantly adjust and learn new tools. Additionally, communication technologies have made it easier than ever before to coordinate and collaborate globally, with richly diverse cultures and peoples. To keep up with this, students and employees must learn to navigate mass information and marshal accelerated technology. Information, media and digital literacy have consequently become as vital to education as the traditional literacies in language and math. Individuals must critically sort through, evaluate, and determine validity and relevancy in the swell of available

and ever-expanding information (Davies et al., 2011; Partnership for 21st Century Learning, 2019). Information literacy encompasses analysis, selection, and the processing of information in order to construct new knowledge. Digital and technology literacy involve the ability to access and competently utilize appropriate tools to research, organize and collect information (Assessment of Transversal Skills 2020, 2020; Scardamalia et al., 2012).

Future workers must manage the stream of information from a wide variety of sources and outlets in an efficient manner. They are then required to use the information accurately and creatively for complex problems, and apply a fundamental understanding of the ethical issues regarding the access and use of such information (Partnership for 21st Century Learning, 2019). To accomplish this, graduates must plan essential strategies that guide inquiry while evaluating and choosing sources and tools based on the suitability to explicit tasks. Once an individual processes the information, they can then construct and integrate new knowledge to new situations. (Assessment of Transversal Skills 2020, 2020; World Economic Forum, 2018). Information literacy also involves going beyond provided information to actively seek supplemental data. Constructive use of knowledge resources can help to expand the social collection of improvable ideas (Scardamalia et al., 2012).

As part of information literacy, graduates must also understand both how and why media messages are constructed, and for what purposes. This is referred to as media literacy (Bakhshi et al., 2017; Davies et al., 2011; World Economic Forum, 2018). Students scrutinize how individuals interpret media messages in different ways and how diverse values and points of view are included or excluded in these messages. Media can impact beliefs and behaviors if the reader is not media savvy and cognizant of the possible effects. As such, students and employees should also adopt an essential grasp of the ethical and legal characteristics involved with media.

Not only should they be consumers of media content, but creators. This means that students should comprehend and utilize the most appropriate media creation tools and technology. Content creators need to effectively employ appropriate expressions and interpretations in diverse, multi-cultural environments through today's global society (Bakhshi et al., 2017; Davies et al., 2011; Koerner, 2018; Partnership for 21st Century Learning, 2019; World Economic Forum, 2018).

Lifelong learning

Perhaps the most surprising finding is the emphasis that employers placed on the ability to learn. Lifelong learning is variously described as flexibility, the willingness and desire to learn new things, and the ability to continually learn. Due to the rapidly changing workplace and duties, this skill is underscored as a highly desirable aptitude (Hora, 2017). Autonomous learning encompasses identifying personal needs for learning and defining goals to meet those needs based on prior knowledge and experience. Learners also evaluate their own progress and results, while actively seeking feedback. Part of learning to learn is the ability to use several types of reasoning in a variety of situations, and to utilize systematic thinking by reflecting on the interaction of the parts to the whole problem in order to solve it. An aptitude for active learning helps to strengthen skills related to problem solving such as making decisions and judgements. Additionally, it helps with literacy skills like critically evaluating media resources and technology tools (Assessment of Transversal Skills 2020, 2020). In becoming lifelong learners, students and workers can progress faster and take charge at the highest executive levels. Social and individual metacognition is integral to the operation and assessment of organizational cultures. Engagement in continuous, lifelong and diverse learning opportunities helps an

individual to self-identify as a knowledge creator, irrespective of life circumstances or context (Scardamalia et al., 2012).

Thinking skills and content knowledge are not enough for today's life and work environments. Students must pay rigorous attention to developing adequate life and career skills in order to navigate the globally competitive information economy (Partnership for 21st Century Learning, 2019). They can cultivate a shared, interconnected knowledge that spans formal and informal settings. Additionally the ability to deliberately learn helps employees build on and improve the knowledge assets of the organization and community as a whole (Scardamalia et al., 2012). Understanding how to manage your career and life goals helps to maintain a degree of separation between one's professional and personal life, as well as to adapt to change, to manage goals and time, and to work independently (Assessment of Transversal Skills 2020, 2020). The characteristics of lifelong learning include the ability to adapt to varied roles, job responsibilities, schedules, and contexts. Lifelong learners can effectively work in a climate of ambiguity and shifting priorities. Flexibility helps learners to incorporate feedback effectively, to deal positively with praise, navigate setbacks, and balance diverse views and beliefs to reach viable solutions. Moreover, this skill helps to develop a sense of initiative and self-direction. Lifelong learners manage goals and time effectively by setting goals with success criteria and balancing tactical and strategic goals. They employ the ability to monitor, define, prioritize, and complete tasks without micromanagement. Essentially lifelong learners go beyond basic mastery of skills to explore and expand their own learning. They seek opportunities to gain expertise, demonstrate initiative, and reflect critically on past experiences in order to inform future progress (Partnership for 21st Century Learning, 2019).

Presentation to the School

While I had not completed the research to inform curriculum development, I had to start gaining support from colleagues to continue working on the possibility of a certificate program for 21st century skills. As such, I developed a brief presentation (appendix A) for the School of Media and Design that was presented February 28, 2020. The presentation introduced the upcoming problems that education, and UIW in particular, will soon face. I suggested a certificate program as a potential solution to help alleviate these complex issues. In the presentation, I outlined other certificate programs as well as a general outline for the curriculum with the help of my colleague in communication arts, Dr. Trey Guinn.

The response to the presentation was mixed. Some liked the general idea, some wanted a more detailed curriculum layout, some thought it “cheapened” the university experience, some were afraid that the program would poach students from their majors, and some wanted to take the idea to develop their own programs. Overall, the consensus was that we needed more minds on the task. I advocated for an interdisciplinary approach to the committee, the dean thought it needed to stay in-house until perfected.

One and a half weeks later, the school issued an online learning platform for all spring classes. Immediately attention turned from any curriculum development. No faculty member had the time to investigate the potential of a new certificate program, including myself. As we scrambled to turn our face top face curriculum into an online and remote format for students, this project was shifted to a lower priority.

Summary

This literature acts as the outcome of my master’s project. Through the review, I found that the higher education system faces many issues that are now compounded by the mass-shift to remote learning for the COVID-19 pandemic (Dignan, 2020). Automation and artificial

intelligence will change what jobs are available and the skills needed to successfully perform those jobs. Additionally, the knowledge economy requires new talents to navigate vast amounts of information, fluctuating media content, and rapidly evolving technologies (National Academies of Sciences Engineering and Medicine, 2017). The higher education system is under scrutiny for high costs and distrust of institutions today (Gallup & Northeastern University, 2019). One option that institutions face is to start using modularized credentials through unbundling the university. Degrees and other benefits of college can be broken into smaller components for student consumption. Badges and certificates that focus on mastery of a specific skill help students to personalize their education. While there are many benefits, this system also faces challenges by not addressing the full scope of the university purpose (Morris et al., 2019; Swinnerton et al., 2018).

Many employers are calling for graduates and job candidates to demonstrate 21st century skills. These include problem-solving skills, communication and collaboration skills, literacy in information, media and technology, and learning how to learn. These skills will help employees to work more effectively in an automated workforce by demonstrating abstract skills that machines cannot yet replicate (Assessment of Transversal Skills 2020, 2020; Davies et al., 2011).

In addition to the literature review, I compiled and presented a short presentation to the faculty of my school in order to gain support. The feedback was mixed, but ultimately any progress was halted due to the disruption of the pandemic. In the next section, I will reflect on the key learnings of this master's project.

Section Five: Key Learnings

This project started as an ambition to create curriculum for a certificate program in 21st century skills at the University of the Incarnate Word. However, initial resistance compounded by the consequences of a pandemic meant that I had to pull back on that ambition and concentrate efforts on a thorough literature review. The purpose of the review is to inform further discourse on the subject once the UIW community moves away from crisis mode and can contemplate new curriculum and educational models.

The literature review proved to produce valuable insights. Previous to this project, I was unaware of the concept of unbundling at the university level. I viewed the certificate program as simply an alternative to undergraduate minors. I failed to comprehend the full meaning of modularized credentials. Furthermore, I was overwhelmed by the relative consistency of employability skills. While they are commonly referred to by various names, there is a distinct set of talents that are necessary for the future workforce, which are remarkably consistent from study to study. What is not clear is how to assess these types of skills in an educational context. There is certainly a need for further research and experimentation. However, the pandemic fallout may provide just the push education needs to begin to adopt a system-wide change in how we serve our students.

This process has also produced key learnings. While I probably should have expected it, the mixed feedback demonstrated an underlying fear of change. This emphasizes the need to plan for and deliberately transition change. I may need to approach the subject differently upon return to campus. However, all efforts are currently on hold until the end of the semester. Currently the virus concerns override all curriculum development. I hope to talk with our task force committee for high-impact practices. They

may be the better route to start a conversation about possible system changes and best practices following the “new normal” that the pandemic has wrought on higher education. If nothing else, the lockdown and learning shift may provide an opportunity to highlight the need for change.

Research always works by nature of learning more. Therefore, I would evaluate this project as a success. The presentation introduced the idea to other faculty in my school. Now that I am more informed by the research, I will reinitiate the conversation at the earliest appropriate moment. I plan to continue with this initiative beyond the project and look for fresh opportunities within the setbacks.

Section Six: Conclusion

The purpose of this project was to review pertinent literature to inform a certificate program in 21st century skills at the University of the Incarnate Word. The literature revealed that education faces multiple obstacles to prepare graduates for future work. One system that is gaining attention is unbundling universities. This is a process of disaggregating degrees and utilizing modularized credentials to build personalized learning paths. Additionally, employers are calling for new hires to show greater aptitude for interpersonal and problem-solving skills. The process of synthesizing the literature helped me to better understand the problems that education face in the near future and some possible solutions. When I initially proposed the adoption of certificate programs, the faculty responded with a mix of feedback.

This helped me to see the act of creative change in progress on a personal level. As a change agent, I convinced myself that everyone would love the idea and we could start planning the curriculum right away. However, I realized that this may need to be a more systematic change that needs a strategic transition period. I certainly have a better appreciation for the need for the transition period partly due to Dr. John Cabra's class on organizational creativity at Buffalo State College. The rapid and forced changes brought on by the pandemic also demonstrate how radical change can have unintended consequences and push back from members of the organizational community.

To continue the work, what I see myself doing is to work with a committee of interdisciplinary colleagues to approach the problem from a big picture view. We need to really examine the issues that the university will face in the near future and generate possible solutions. The certificate program may or may not be a good choice for our

organization. However, we can consider it with other ideas. Additionally, this can include ongoing research as the data about the pandemic and its consequences emerge in real time.

Future research can explore alternative solutions to the changing educational landscape. As more institutions adopt unbundling and 21st century skill courses, more empirical research will surface. Furthermore, this subject will benefit from more scrutiny about how the delivery methods and the content each affect modularized learning and credentials. Clearly, the two most practical and difficult question to study are how to assess 21st century skills for accountability, and how well will modularized credentials be standardized for validity and relevancy?

This project unlocked new ideas for me in terms of helping students become productive citizens and employees of the future. I am easily absorbed in the research and know that there is more out there to explore. Curriculum development always excites me, and this research ignites ideas with every paper I read. My goals at the outset of this project were to identify relevant literature, to identify similar certificate programs, and to define a set of skills that UIW students should learn to succeed in the future workforce. As can be expected, these goals did not quite go deep enough for the project. I easily identified literature and other certificate programs. However, that was only a small part of the knowledge I uncovered in the review. Additionally, it was difficult to pinpoint specific skills, but rather I found categories or themes of skillsets. As with all research, I uncovered more questions than answers.

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Appendices

Appendix A: Presentation of Certificate Program to UIW on February 28, 2020




1



2



 **Our Questions**

How to remain relevant and attractive to potential students?

In what ways can we prepare graduates for unknown careers and jobs?

How might we, as an educational institution, adapt to this rapidly changing landscape?

This slide features a white background with a dark red header containing a university logo and the title "Our Questions". Below the header, three red, trapezoidal shapes are arranged horizontally, each containing a question. The shapes are connected by a horizontal band of a lighter red color.

3



 **Plan of Action**

 REVIEW & REVISE

 LOOK AT BIGGER PICTURE

 DEVELOP ALTERNATE PATHWAYS

 RESEARCH

This slide features a white background with a dark red header containing a university logo and the title "Plan of Action". Below the header, four red, trapezoidal shapes are arranged horizontally, each containing an icon and a corresponding action item. The shapes are connected by a horizontal band of a lighter red color.

4

The Mission and Strategic Plan:

Fitting into the Mission:

- ...Inspired by Judeo-Christian values, the Catholic Intellectual Tradition, and Catholic Social Teaching,¹ the University of the Incarnate Word aims to educate men and women who will become concerned and enlightened citizens within the global community.
- The University of the Incarnate Word is committed to educational excellence in a context of faith in Jesus Christ, the Incarnate Word of God. Thus, through a liberal education,² the university cultivates the development of the whole person and values of life-long learning. To that end, faculty and students support each other in the search for and communication of truth, thoughtful innovation, care of the environment, community service, and social justice.³

UIW Vision Statement:

- We will work to help every student graduate with the lowest possible debt and secure a career that lifts their lives, their families, and their communities. We will inspire our students to live life to its fullest sense, with the genuine abundance of God's love and grace. Additionally, we will commit to facilitate and support the work of the faculty and staff.

UIW Strategic Plan: High-Impact Practices

- Achieve excellence in UIW's undergraduate educational program by providing students several High Impact Educational Practices (HIEP) options as part of their academic experience.

5

Harvard Extension School

Business Communication Certificate

Required Courses	Average Cost	Completion Time	Application Requirements
3	\$8,250	1.5-3 Years	No application required


KEY LEARNING OUTCOMES

- Compose effective business communications, including proposals, presentations, and reports.
- Apply key communication methods—such as informational briefing, persuasive messaging, or conflict management—to meet specific objectives.
- Master the techniques of public speaking, including message development, content, projection, inflection, and delivery.


Source:

<https://www.extension.harvard.edu/academics/professional-graduate-certificates/business-communication-certificate>


6



Harvard

Prerequisites	On/Campus VS. Online	Diploma
Must be 18 years old to register for graduate credit	Courses can be taken on campus or online	If students earn a professional graduate certificate, the certificate will state: <div style="text-align: center; margin-top: 10px;">  </div>

7



Stanford Center for Professional Development

[Innovation and Entrepreneurship Certificate](#)


Required Courses	Average Cost	Completion Time	Application Requirements
8	\$8,035	Option 1: Complete an individual course – 60 day completion time Option 2: Complete the entire program in 1 year	Application required

KEY LEARNING OUTCOMES


- A greater understanding of the tools that every innovative organization needs to succeed
- A wider and deeper set of innovation skills, customized to fit both your organization's needs and your career goals
- A greater understanding the best and most current research on innovation and entrepreneurship

Source:
<https://scod.stanford.edu/public/category/courseCategoryCertificateProfile.do?method=load&certificateId=14800052>

8



Stanford

Prerequisites	On/Campus VS. Online	Diploma
<ul style="list-style-type: none"> • 5 years work experience • Bachelor's degree, or equivalent, with minimum of 3.0 GPA • Background in management or working in teams • An entrepreneurial and innovative spirit 	Courses taken online	<p>If students earn a professional graduate certificate, the certificate will state:</p> 

9

University of the Incarnate Word

Certificate in Religious Studies


Required Courses	Average Cost	Completion Time	Application Requirements
18 semester hours of graduate level coursework	\$18,000 *cost of actual course, as if enrolled in MA program	Minimum 2 semesters	Application required

KEY LEARNING OUTCOMES

- Offers the opportunity for students to enhance their knowledge in the field of pastoral theology and ministry

Source: <https://www.uiw.edu/chass/academic-programs/pastoral/certificate.html>

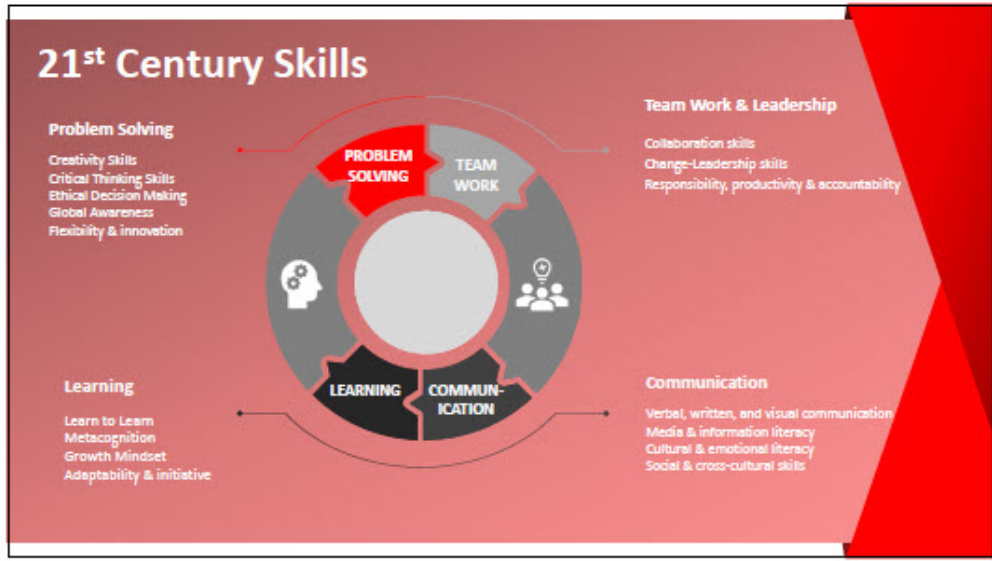
10



UIW

Prerequisites	On/Campus VS. Online	Diploma	Certified?
Bachelor's Degree required; special consideration for pastoral seeking UG students	Courses taken on campus	A nondescript completion document is awarded. None walk the stage; ceremony is like Meet the Masters	Earning a graduate certificate is not same as being certified Courses not transcribed but can be applied to future MA work

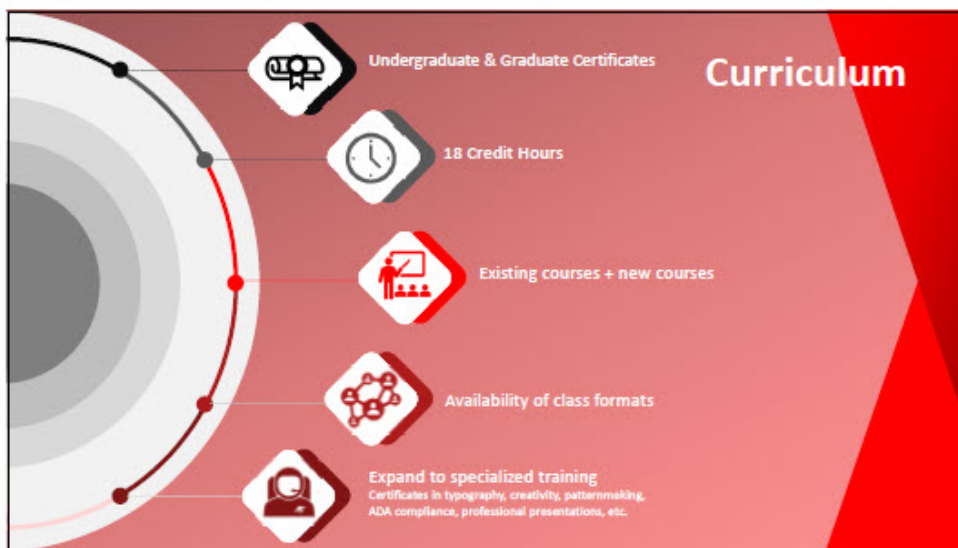
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12



13



14

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Mary Lalon Alexander
Name

April 28, 2020
Date