Designing the Masters Degree of the Future

Idnetifying the Flaws With Online Higher Education and Understanding Why They Remain Unsolved

A Thesis Prospectus
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Bachelor of Science in Systems Engineering

By
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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Intro

College degrees come at a hefty price point, averaging $148,400 at private institutions (Hanson, 2021). COVID-19 has only worsened this, with CNBC estimating that now more than half of students probably cannot afford college (Dickler, 2020). This is where online degrees come into play. As the Association of Public and Land Grant Universities states, a bachelor's degree increases career earnings by $1.2 million on average when compared to non-degree holders (Miller, 2018). Online degrees provide an avenue for those who cannot afford a traditional college degree, but are looking to get one to increase earning potential. As Franklin University states, online degrees provide balance, lower costs, and self-paced learning (Franklin University, n.d.). Unfortunately, this is where the rosy picture ends.

Online learning has its inherent flaws. For one, as the University of Illinois at Springfield mentions, inequity in technology access is a big issue (UIS, n.d.). With lower cost being a deciding factor for an online degree, having to pay for technological upgrades and better connectivity can be another hurdle to jump. This is not to mention that the often self-paced style of online learning coupled with a more detached feel to the instructor can create high dropout and low graduation rates, such as the roughly 8% graduation rate at the University of Phoenix, a for-profit institution (DataUsa, n.d.). While these problems can be solved, increasing greed within these programs is only eroding their quality. Although not true for all programs, online degrees are becoming increasingly for-profit, with over 70% of students in fully online degrees in Fall 2020 attending for-profit colleges (NCES, 2022). Stephanie Hall explains the ethical downfall well, stating that under the for-profit system that most online degrees are now a part of, “programs currently serve the bottom lines of third-party companies first, the college or university second, and the students third, if at all” (Hall, 2022, p. 28). The shift to for-profit

education amongst many online programs adds another level of greed and another hurdle for students to overcome as they strive for an educational experience that puts their needs first.

In May of 2023, the University of Virginia is planning to launch a new Accelerated Master's Program in Systems Engineering (AMP) in their new Northern Virginia (NOVA) location, to create the opportunity for working professionals in the NOVA area to be able to obtain a highly reputed system's engineering degree while continuing employment (University of Virginia, 2022). Thus, over the coming semester, I will be working with my capstone group to create a comprehensive Accelerated Master's Program in Systems Engineering for Northern Virginia area working professionals. While our program is to mainly be in person, brainstorming discussions brought up the increasing prevalence of online education programs. With that in mind, my subsequent STS research is around the following question "What are the flaws with the current state of online higher education, and why do they continue to exist?"

Technical Topic

For my technical project, I am working with Maggie Salomonsky, Salem Keleta, TJ Gwilliam, Mia Varghese, Professor William Scherer, and Professor Matt Burkett to create a plan for relaunch of the Accelerated Master's Program (AMP) in Systems Engineering at UVA NOVA. The hallmark of AMP has always been its mainly in-person cohort model, which allowed students and faculty to foster lifelong connections (University of Virginia, 2022). However, with the pandemic pausing this program for 2 years, reassessments were made and the program is now pivoting to being centralized in NOVA, as much of the alumni network is located there (University of Virginia, 2022). This program will subsequently help fulfill UVA's goal of creating a larger regional presence in Northern Virginia (Kira, 2021). Along with university success, a successful program will also set up the prospective students for a great

future. Master's degrees allow students to switch careers, specialize in a profession, expand their knowledge base, and reduce unemployment rates from 4.5% to 3.5% on average when compared to bachelor's degrees (NYU, n.d.). Furthermore, a master's degree creates an over $200 increase in median weekly salary in comparison to a bachelor's (BLS, 2020).

With our degree program being the solution to both the lack of a current AMP and the need for more regional presence in NOVA, 5 factors have been identified to consider the solution successful by balancing student and university needs: fair program price, stimulative teaching method, informative course of study, a well-marketed program, and well-run logistics.

To price this program, we are creating a simple financial model through Excel that uses all predicted costs as inputs and allows us to calculate our profit margins based on the chosen tuition cost. As with most good analysis, data will be prepared for 3 levels of enrollment (20 vs 30 vs 40 students). In determining the teaching method, market data was collected on similar programs to assess the level of competition. Ultimately, the cohort model (with a few online courses) employed in the first iteration of this program was chosen, as it was shown to be successful in the first iteration. Creating the course of study required further market analysis to determine the typical course of study expected by systems engineering students, and the types of concentrations offered. Marketing the program is the most crucial step to the entire project. For the program to break even, preliminary numbers show a necessary enrollment of 23 students, with the program being capped at 40. Outreach methods include LinkedIn advertising, email blasts, open houses, coffee chats with employers, and paper flyers around Grounds. The success of the project hinges on ensuring that this program makes a profit, as continued funding is dependent on that. Finally, most logistical issues such as classroom space will be handled with Professor Matt Burkett, as his contacts at UVA NOVA will help ensure that the tasks get done efficiently. In the context of

my STS project, this degree program acts as an antithesis to the online programs and for-profit online programs I hope to examine, and a benchmark for how higher education should be conducted (priced fairly, with a high standard for education quality).

STS Topic

To truly connect the human, social, and technological elements of my project, the main framework I will be analyzing the problem through is Actor-Network Theory. Actor-Network Theory (ANT), originally developed by Bruno Latour and analyzed further by Darryl Cressman, is a framework that treats every human and nonhuman participant in a "network" of connections as an actor (Cressman, 2009). With so many participants in the network that is online education programs, ANT is the best way to ensure all connections are analyzed.

In the online program space, the central actor is the degree program itself, which is the source of the intrinsic problems with online education. As stated in "How to Improve the Quality of Online Education from Online Education Directors' Perspectives," the flaws in the tech (actor) identified by education directors (other actors) are related to education quality, such as poor user interface and instruction quality (Akbaba & Johnson, 2022). An "Investigation of Advantages and Disadvantages of Online Education" backs this up, stating that internet access and network setup are overly crucial to student success in an online environment (Alshamrani, 2019). This major technical element is controlled by a major group of human actors, the leaders of these primarily for-profit online degree programs. As Stephanie Hall discusses in "Who Controls Higher Education?" for-profit systems create greed, and run counter to the idea that education is for good, not for profit (Hall, 2022). Anderson of The Atlantic furthers this idea, arguing that for-profit colleges prey on students without high school counseling, after which they inevitably drop out or end up in debt (Anderson, 2016). While those articles touch on the ideas of

poverty and inequities at the high school level, Robert Ubell, who works in online education at New York University, discusses the biggest social issue: do online education programs even help lower income students succeed? This actor-actor relationship between the program and the student is a source of inequity, as Ubell cites that students are more likely to fail or drop out of online courses, especially lower income students as they are often not afforded the same student service programs as their in-person counterparts (Ubell, 2018). In summary, actor-network theory affords the opportunity to analyze the social impacts resulting from the compelx interactions between the actors in the network. The degree programs themselves hold their own intrinsic flaws to analyze, while the greedy actors exacerbate social issues such as poverty and education inequality while being the major human influence over the problem.

While ANT is a very useful framework for this problem, supplementing it with Steve Woolgar's idea that machines can be viewed as text can create a more granular focus on the technology itself, something that can be overlooked in ANT's focus on relationships (Woolgar, 1990). Specifically, by viewing the degree as a machine, I can examine what it affords, the ideas imprinted upon it, and the ideas that it imprints. This includes further analysis into the societal view of the value of an online degree, and whether that is a result of the degree itself or our preconceived notions of prestige.

Research Question and Methods

The question I am tackling is: "What are the flaws with the current state of online higher education, and why do they continue to exist?" The importance of the question lies in the role that online education programs play. As an alternative to traditional universities, online programs must be up to par, or else they are a source of educational inequity. In answering this question, I plan to use two sources of data: institutional data, and studies/journal articles focusing on various

actors and relationships within the issue. For example, institutional data includes demographic and graduation rate data for major online institutions such as the University of Phoenix, which boasts a roughly 8% graduation rate (DataUsa, 2022). The studies and journal articles featured in my research will be much more varied. For example, “Why are so Many Students Choosing For-Profit Colleges?” and “Online Higher Education Commodity” are much more broad in nature, and focused on the entire network I am analyzing (Chau, 2010 and College Financing Group, 2022). On the other hand, papers such as “The Gender Equality Paradox in Science, Technology, Engineering, and Mathematics Education” focus more on a potential problem that more equitable online education can solve (in this instance, creating more opportunities for women to obtain degrees) (Stoet and Geary, 2018). The use of the studies and the journal articles may differ from the intent of the article. For example, the gender equality article will be used as an example of a problem that can be indirectly solved by solving the larger problem of online education inequity, something not mentioned within the paper itself.

Conclusion

Through the technical and STS components of this project, two problems have are being tackled: a need for higher UVA regional presence in NOVA through a new iteration of the Accelerated Masters Program in Systems Engineering, and an unfair higher education system that provides underwhelming online learning programs for those needing an alternative to a traditional institution. The technical deliverable for this capstone project, while not tangible, is the degree program itself. With its successful completion, we hope to expand the field and impact of systems engineering in NOVA, and provide a launchpad for professionals to expand their career opportunities. Regarding the social component, I hope to identify that the for-profit education system leads to greedy owners who fail to emphasize student learning or fix the

intrinsic problems with online education, leading to an underwhelming alternative for those who cannot, for whatever reason, attend a traditional university. Subsequently, I hope this leads to a more nationwide effort for traditional four-year univerisities such as UVA to develop their own affordable online programs that uphold the same educational quality exhibited in their in-person classes.

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