Remote Learning Reconstruction

EGRS 451 Capstone

December 30, 2020

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We are in the front lines of remote learning research methods; despite the recency, remote learning has had a stigma around it that it is much less effective than typical learning. Remote learning is seen as the "sparknotes version" of real, in classroom learning. Often people would joke that they had just gotten into the University of Phoenix, the catch was that this program was purely online and "not a real university." In lieu of the COVID-19 pandemic, schools were forced to go home early around the time of spring break. Hushed rumours that we were going to get pre-recorded lectures on Moodle and some classes would meet on skype scattered around campus. And here we are, enrolled in online education.

At this time the issue was finding a way for the students to get any sort of dialogue with the professors to facilitate learning. Some classes became asynchronous, where we could click to listen to less than ten minute lectures and make sure we submitted our assignments by 11:59 pm. Other classes met through zoom, as discussion based classes, in which there were less outside the classroom assignments, but we encountered the issue of different time zones. Finals week came around, everyone submitted their final essays, projects, or exams, and school was forgotten for many. Most did not think much of the spring or online learning, rightfully so, we were amongst a pandemic, of which we were under prepared. Nevertheless, students retained the information they could, and for the most part grade point averages increased. However, nobody would say that the quality of education increased and that is the reason for the better scores. This could be due in large part to academic dishonesty or easier coursework that is completion based. Better scores and less comprehension is not a combination educators would like to see, or even students for that matter. This leads to the problem that developed and became apparent throughout the spring, summer, and now the fall with classes back in session. Our problem with remote learning is that, as of right now, online learning is inferior to traditional learning in

almost every way, if not every way. We are battling a less engaging environment where motivation, participation, and technological dependencies make learning a hollow facsimile of what it was before COVID.

One challenge to solving this is the digital divide that has developed between educators and students and put us in this position in the first place. As we type, there is a clear divide between those that grew up on skype and facetime, versus those who did not. We are not advocating for any way to raise children but just stating the fact that there is an easily understandable divide. Many current college students understand what they need to do technically. They can improve connection, or reboot their system or wifi when an issue arises. But remote learning is much more than just fixing a technical system, there are significant sociological issues that play a large part in remote learning. For example, in a survey of college leaders, a majority agreed with the statement that "students need more discipline to succeed in an online course than in a face-to-face course" (Allen & Seaman, 2005). On top of this, remote learning requires better time management, responsibility, and motivation (Bork & Rucks-Ahidiana, 2013; Public Agenda, 2013). Today's and tomorrow's students understand where they can hold their phone so it still seems like they are paying attention to the lecture. Humans innately look for the path with the least resistance, and the younger generation that grew up with these tools as toys will exploit that. In remote learning, assessments are often carried online whereby instructors are limited to proxy supervision of learners making it impossible to regulate and control cheating (Arkorful & Abaidoo, 2015). A base level of technical literacy must be required for the basic online learning reform. Any solution must be implementable at the individual level, regardless of technical competence. That solution must be

adaptable to each level of education; for example, an effective method of teaching and learning calculus may not be the most effective for teaching 1st grade.

Right now, the education world's best method of teaching and learning is through the traditional classroom style: lectures, labs, quizzes, exams, and mountains of homework. Show up for lecture, listen to the professor, participate, go back to the library, do practice problems, check with the professor in office hours. It works when it is possible to do it in person, but we obviously cannot do that right now. In theory, everything should work just as effectively through zoom; we have our virtual classroom space, we can see and hear the professors, they can have office hours, we have break out rooms for group work, so everything should work. Except it has not. Adedoyin explains this as these processes being without proper planning, design and development of online instructional programs due to the pandemic (2020). We have attempted the imitation of the traditional classroom in online learning and are proven daily that it is less impactful than it was in person. We have to divorce ourselves from the idea of a traditional classroom to put ourselves in a position for success on the digital education front.

Understanding the current state of remote learning requires the acceptance that this is a socio-technical issue and requires a socio-technical solution. Remote learning requires the consideration of values within it; some of these being psychological, socio-economic, and the individual's role within the family dynamic. We agree with Adedoyin with the statement that "online learning elements are technology driven and dependent on internet facilities, educational institutions can collaborate with telecommunication industries to either subsidize the cost of internet subscriptions or provide free browsing data to the students and instructors as part of their corporate social responsibilities" (2020). Remote learning is not a thing, but a process and our solution needs to value this more than anything else. Our solution is restructuring the classroom

experience to value interactions more than individual work. Some of the most effective ways to learn are highly social activities. There are people who are thriving, academically, during this strange time, but people value the social interactions of the traditional classroom and that is what makes the difference. The social interactions that occur alleviate the stresses of learning and alter the outlook of the student. It is no longer the student versus calculus, it is the student in calculus versus the other students in calculus. The collective feeling of the traditional classroom can be utilized without being in the classroom by restructuring the educational system. This project will further analyze the social, political, technical, and economic facets of restructuring online learning, specifically as a process.

The switch to remote learning has obviously affected the students' ability to learn and understand newer material. However, this is not the only factor when discussing the switch to remote learning. Socially, students are less engaged and feel separated from the learning process they once knew. As we haven learned in our studies, engineering is highly political. As we dive into the political aspect behind remote learning, we want to make note of the impact the school board along with the administration of Lafayette has on altering the students' learning experience. Past this, the technical availability of zoom and google meets are easily accessible, but does the technological advantage of some have a substantial impact on the quality of their education. As are all things, any substantial change at a college level requires the necessary economic factors to make this possible. Economically, we want to show the impact of COVID-19 and what the changes we are suggesting will have on Lafayette College financially.

As Lafayette College is currently online and potentially online in the future semesters, we have followed commonalities seen through our studies. Each of our three team members has seen the effects of remote learning first hand as we are current senior students fully immersed in

remote learning. After having six months or more of remote learning experience, we have taken note of what classroom styles have worked and what have not. Although each learning experience is individual to the student we chose to emphasize the importance of a quote from the Lafayette administration to the professors, "Teaching conditions are student learning conditions." To us, this signifies the importance of an online learning environment that fosters learning for *all* students. As we worked in contact with the Center for Integration of Teaching, Learning, and Scholarship (CITLS) at Lafayette, we developed the current student's perspective of the remote learning environment at Lafayette. What we hope to accomplish throughout our development project is to gain respect from Lafayette College on the issue of remote learning, support the CITLS mission to improve the student's experience, develop our Ideal Online Classroom, and further improve our online learning experience and that of future students.

In late 2019, a novel coronavirus, called SARS-CoV-2 or COVID-19, was discovered in Wuhan, China. COVID-19 was declared a pandemic on March 11, 2020 (CDC), which according to Merriam-Webster Online Dictionary is "an outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population" (2020). Due to the highly contagious aspect of the virus, social distancing guidelines were put in place to mitigate the spread of the virus. As a result of these guidelines businesses and institutions surrounding the globe were forced to close or take to online alternatives. This forced the educational field into Emergency Remote Teaching or ERT. The priority of universities at this period of time was to get their students home for obvious health concerns. Next, the goal was to create an adequate learning environment for the remainder of the semester; the solution was google meets and zoom. This style of virtual classes gave students and professors alike, some

sense of being in a classroom environment. However, after that semester, the focus has now become an effective online education.

In moving forward, it is easy to forget that remote learning has an extensive history from before the pandemic. A small subsection of the college-educated population has taken classes entirely online even. Online schooling has been experimented with since the birth of the modern internet, but one of the most major leaps in practice was with the Massive Open Online Courses, or MOOCs, in the early 2010s (Askeroth, 3). These courses exposed a poignant social failing in that they did not create dialogues between student peers and professors due to their large nature. This fact alongside the existence of pre-recorded video lecture classes stand in the face of modern developments. They also prove how integral getting the social element of a remote class right is because, for the past two decades, remote learning has banged its head against the same wall, regardless of what computer technology level is implemented.

Engineering studies education has influenced the way we view the world greatly. It is something to be very proud of, especially taking on the responsibilities of the big picture, engineering-technological issues. Consequently, this type of curriculum also shapes our understanding of issues. We all know that technologies are value-laden and especially very political, but too often we find people viewing issues that involve technology as solely technological issues. We know better than that; we know to question the appearance of the issue and to dig deeper into the problem to find its root cause. That is what we have encountered when analyzing online education. Many times, we jump to conclusions that we should fix a technological problem with a technological solution. This is not the case, we have a socio-technical issue at hand that requires a socio-technical fix, yet we are lacking socially on this issue. We have seen this with zoom; people have tried to change the format of breakout

rooms and functions of zoom. Additionally, there are services that allow you to view the screen of the students in the class to, essentially, virtually babysit them and make sure they are paying attention or not cheating. Instead of cutting down the vine strangling the tree, these "solutions" are just cutting off the dead branches and complaining about the vine. We are no longer in a state of ERT, we should have shifted to better online education but we are lacking. Kopp et al. (2019) defined a series of assumptions that plague higher education institutions which cover a wide variety of attitudes such as issues with cost, implementation speed, and lack of belief in the adaptability of people who take part in education (Adedoyin). It is interesting to note, the human resistance to change is the driving force behind our inability to improve online learning. This is a perfect example of the necessity to divorce our minds from traditional classroom thought. We are getting in our own way by being so resistant to change; the solution for online education will not only benefit us now, but it will reshape our understanding and approach to traditional in-person education if we return.

In the current state of online education, we came to the agreement that online classes make us feel dehumanized; like we are just a name on a screen. The loss of identity due to

online is crippling and students have this sense of "fake it till you make it," meaning that they will be doing in-person classes in no time, why treat online education as real classes. Joshi et al. sides with this general thought, "instructional achievement of online learning is debatable because it causes absence of face-to-face relationship among learners, learners, and instructors" (2020). Humans crave social interaction, there is no other way around it. When we keep ourselves from interacting with others it becomes detrimental to our mental health. We are not the only ones to see this trend. When we contacted Dr. Addy from Lafayette's Center for the Integration of Teaching, Learning, and Scholarship (CITLS), she directed us to several studies she found useful. McDaniel, Suffern, Joo, and Alamuddin highlighted the social impact the transition to online learning had on its students. "Students who participated in the present study also underlined the negative impact the emergency shift had on the social aspect of their learning experience, which had repercussions on both the academic and socioemotional levels" (McDaniel, Suffern, Joo, and Alamuddin, 2020). In a way, it was comforting to see that it was not only us who have felt the lack of social satisfaction due to online learning.

A study was performed by Blankstein, Frederick, and Wolff-Eisenberg on the spring 2020 semester and the effects COVID-19 had on students. The students polled came from twenty-one institutions across the United States, Lafayette College being one of them. Students were asked which departments they would like to hear more from, and 15,667 responses were recorded. In perhaps one of the more concerning graphics found in our research, almost fifty percent of polled students do not feel connected to other students, as seen below in Figure 1. This is saddening. Schooling is meant for learning but we know that learning is highly social and is better developed with social connections.

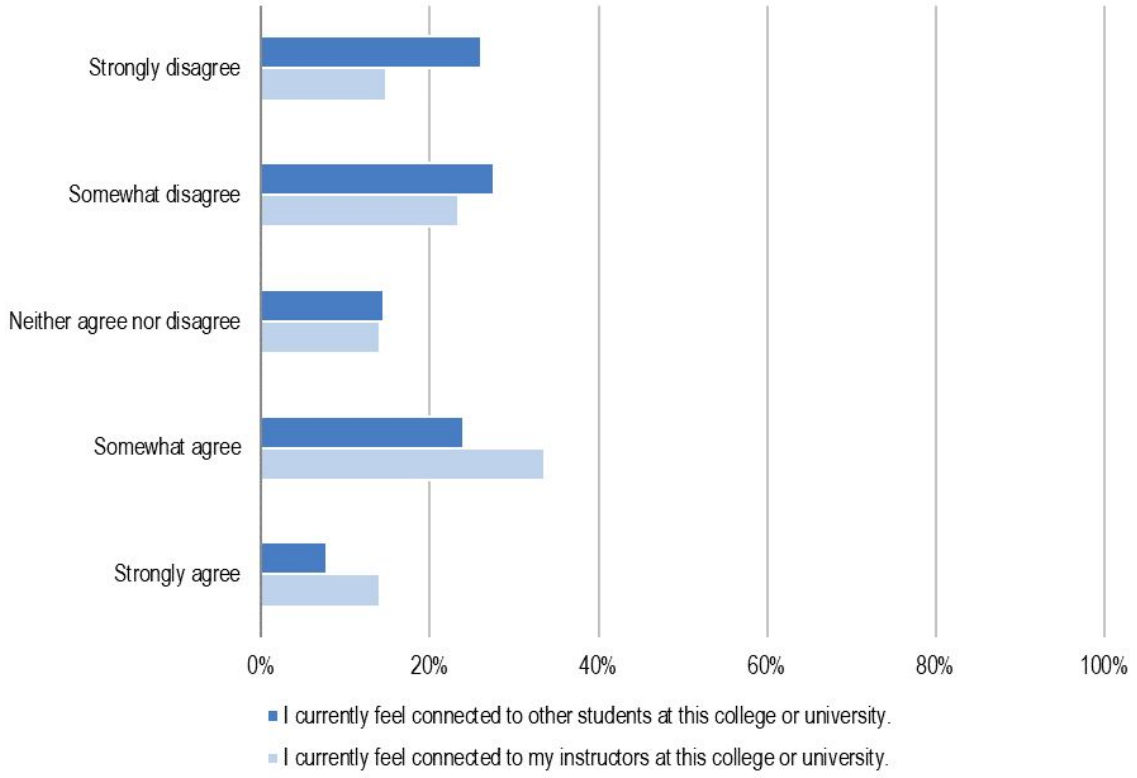

Figure 1. Students were asked to please read each of the following statements and tell us the extent to which they agree or disagree. Percent of respondents that selected each response.

It is not only the stifling of trivial conversations we lack. We are missing the ability to ask a quick clarifying question to our neighbors about a number or name that was mentioned by the professor. Students are unsure of when to interject to ask these questions, especially when they seem to be trivial ones. If a student were to chat or message a peer about the clarification it can, in turn, direct the confused student down a rabbit-hole of distraction. Many professors prior to the pandemic held a "no cellphone policy" because of the innate distracting nature of cell phones. Now in order to get back on track, the student must dance with the temptation of even

more distracting technology. Past this, the online classroom is lacking the social interactions that used to occur before and after learning was in session. These are much more valuable than most are willing to admit. These interactions bring comfort to the students and the professors, oftentimes relaxing the entire classroom prior to the lesson beginning. The comfort brought from social interactions open the students' minds to learning and make them more receptive to the goal of the lessons. These quick social interactions before and after class can fuel our day offering a recharge when we feel low. Debra Umberson and Jennifer Karas Montez, sociology researchers at the University of Texas at Austin, described the effects a lack of social interactions may have on the mind and body in a 2010 report in The Journal of Health and Social Behavior. "Lack of social interactions also damages mental health. The emotional support provided by social connections helps to reduce the damaging effects of stress and can foster 'a sense of meaning and purpose in life,'" stated Umberson and Montez. We know that isolation can negatively affect mental health, it is not surprising to note this can negatively affect a student's studies. As per the Suicide Prevention Resource Center, "Mental health problems can affect a student's energy level, concentration, dependability, mental ability, and optimism, hindering performance. Research suggests that depression is associated with lower grade point averages and that co-occurring depression and anxiety can increase this association." In being trivialized this way, we frequently lose our motivation to try to succeed in our studies. Due to the nature of remote learning, we must find ways to incorporate social interactions into the classroom to make up for what we are now lacking. As seen below in Figure 2, it is not surprising that 2 of the top 3 were mental health services and academic counseling. We understand that a student's mental health can be indicative of success and this data supports that. The combination of anxiety over grades and classes, academic counseling, and mental health are intertwined.

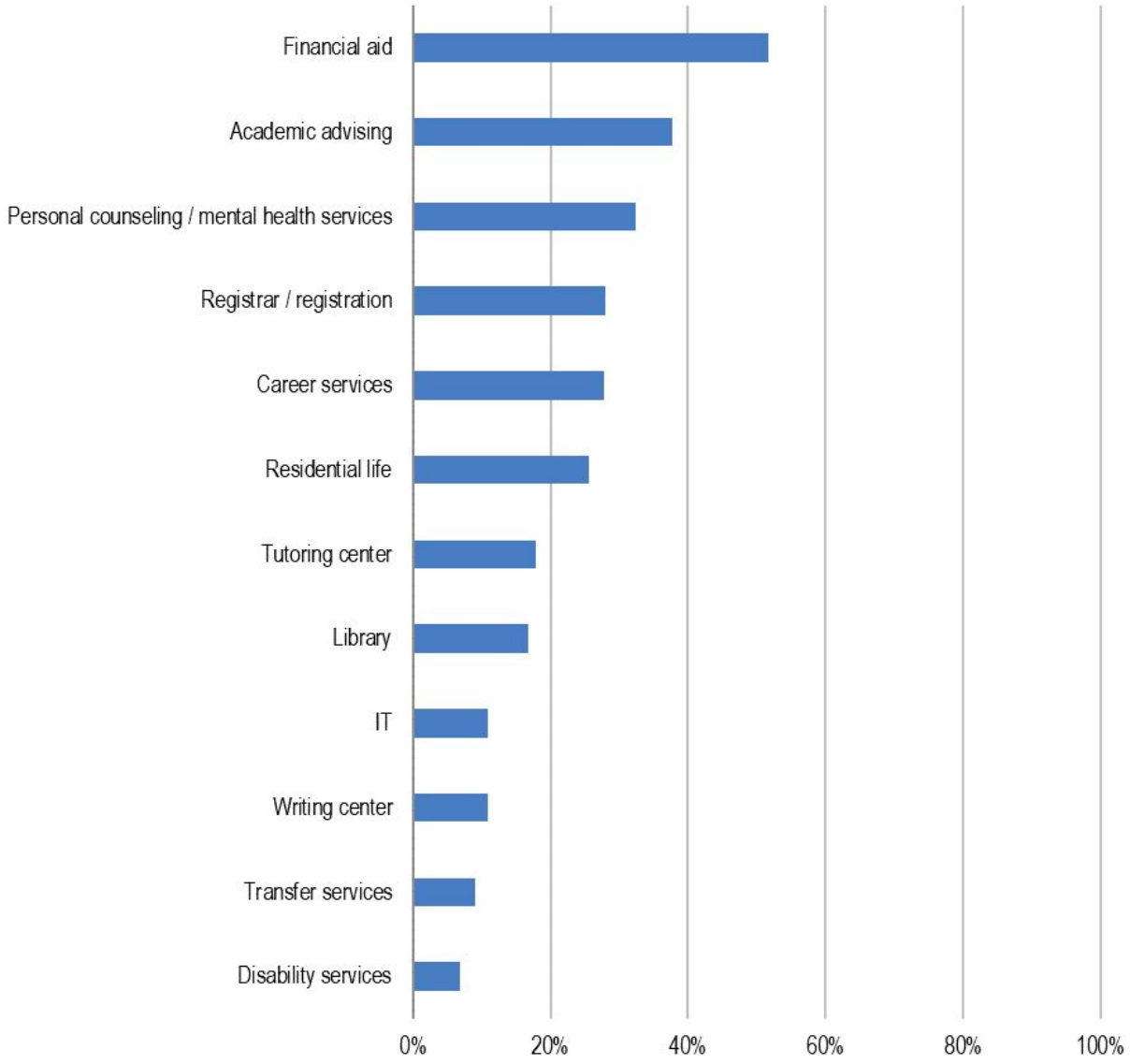

Figure 2. Students were asked would they like to hear more from any of the following offices or departments at this college or university about current services and resources? Please select all that apply. Percent of respondents that selected each office or department.

This is significant to learning due to the socio-emotional impact counseling services can have on students. We propose reallocating funds to improve the college's availability of

counseling services. Currently, students lacking social interaction need someone to talk to and may not know where to turn because the nature of an online learning environment has them feeling disconnected to their peers. This is up to Lafayette College to adjust. Making student's mental health a priority during these stressful times is not controversial; it is empathetic. Students need to know that the college they chose to attend has their back when things are tough. Bolstering the counseling service will gain the respect of students, regardless if they need to use the service. After supporting the service, the college needs to broadcast the availability and how to get in contact with counseling services when they need to or even if it is just a quick chat. Once these changes are made students will have a better chance of being successful in their studies.

The lack of in-person classes has taken more than we have anticipated. The innate competitive drive of the physical classroom has become scarce, and the lack of many facets of the social classroom experience that we took for granted are now absent. While true knowledge and understanding are acquired through entertaining curiosity with research and practice, it would be a lie to say that outcomes do not drive motivation. In fact, Kimoto finds when researching Outcome Driven Learning (ODL) that "ODL enables students to attain a higher level of service-learning where objectives are co-determined with organizational partners who strive to create meaningful outcomes." This is the idea of a student in calculus versus the other students in calculus. Subtle things like seeing a classmate's grade on an assignment or walking out of the classroom and asking your neighbor how they did are lost as we now load into and exit our zoom classes with the touch of a button. The individual standard that we all implicitly felt that we needed to hold ourselves to is almost impossible to develop in this lonely endeavor. Yes, we all

want to do well, but we have lost the competition based community that fosters academic excellence.

Traditional learning hinges on the fact that students learn as a group, and online learning, while in a 'classroom' setting, often feels like an individual battle. This is substantial because for the past nine months the world has been isolated from the human connection we all desire. Now we have to fight an uphill battle, in which our opponent is a two-headed beast of loneliness and isolation. This is the kind of social situation that students face, and it is a result of the forced restructuring of society by COVID-19. No one was mentally ready for this, and our behavior in response is quite evident of that. In order to get ourselves back on track motivationally, we need to understand what motivates us. Maksoud suggests, "Motivation is an essential factor for behavior change; therefore, understanding motivation is extremely important in the field of education, as it could offer a predictive as well as a prescriptive view of behavior (2018). Motivation is seen as the essential drive that stimulates and sustains learning, it is important to understand the factors that impact it. According to Lee, motivation is particularly "crucial to learning and performance in technology-mediated environments" (2000). It is incredible to note that Lee was able to recognize the importance of motivation in technology-mediated environments, twenty years prior to when we actually lived through the lack of motivation. Motivation has many slightly different variants of its definition. Students noted that talking with other students was integral not only for gaining content knowledge, but also for gaining valuable institutional know-how (McDaniel, Suffern, Joo, and Alamuddin, 2020).

What was missing . . . was talking to your classmates. That's missing, having conversations with your classmates, running questions back with them and exchanging ideas. [The courses in the spring] had message boards, but a lot of people didn't really utilize the message boards.

Student response from Ithaka S+R Remote Learning Survey

Moving forward, the social aspects of education are the driving factors. This can be seen as the means of motivation, a sense of mental relief of being in a social scenario, or the feeling of personal accomplishment. Our idea of building a more socially-centered educational model will allow for better education online, OR physically in the classroom. We believe that focusing on conversation, building relationships, and developing these "soft" skills will place our education system in a better state than we have ever seen. We suggest reshaping the design of the classroom to place the emphasis on social interactions with each other. We have modeled this as the "Ideal Online Classroom." Breakout rooms are the effective and necessary first step. The current use of breakout rooms are not being utilized to their full potential. Often, breakout rooms are used for a maximum of five minutes to briefly discuss something. We have seen that on the instructor's end the breakout rooms are not to their standard; there are functions that instructors wish they had that are not available. However, breakout rooms need to be slightly more privatized learning spaces where students can interact with each other and engage in peer teaching and learning. Professors should initiate the class lesson, guide the students through certain topics and methods, then send the students to small breakout rooms of 3-4 students to practice problems, develop thoughts, or have engaging discussions. During this the instructor should pop in and out of breakout rooms to answer questions or build conversation; the instructor is already able to join individual breakout rooms. After some time of practice, the class should

reconvene to further discuss and go over solutions. Then the process continues until class ends; individual topic, breakout room practice, reconvene, and clarify. As a method of motivation, instructors should call this homework and say if it is not finished in class, it is to be finished prior to the next class.

To accommodate for the time absorbing nature of our Ideal Online Classroom, the necessary time in the learning space must be longer. In our thinking, classroom time would be roughly double than it was in person prior to the pandemic. The compromise with the students would be less time spent on material outside of the classroom. Ideally, work outside of class time would be in preparation for the next class to make the flow of the lesson easier. Because of the awkwardness of online learning, it may take students some extra time to become comfortable in the new classroom environment and this additional time in the virtual classroom will allow for that. Professors may lecture for the general introduction to the new material but then the learning must become social. We are aware that students may not always discuss the material in these rooms but the stimulation of conversation will allow for a better mental state to receive the new material. The constant switch between large class lectures and the introduction of the material to small group work and discussions will create a learning flow we never imagined. The next step for our Ideal Online Classroom is to engage in active learning techniques developed through different interaction types. We want students to observe, communicate, reflect, and practice when working in the classroom. When students work like this in the classroom they are "actively working with concepts and people" (UC Davis, 2020). This type of active learning environment can be fostered through student-instructor interaction, student-student interaction, and student-content interaction. Many of the active learning techniques we are discussing are adapted from a 2020 UC Davis report on how to effectively

engage students during the pandemic. Student-instructor interaction is based on generating feedback for the students and having an ongoing dialogue to build familiarity with the students. This can be effectively communicated through announcements of summarization of the previous weeks or announcements in preparation for the upcoming lessons. We found that announcements in preparation for the weeks to come create an understanding for the students of the goals of the upcoming lessons. When students know the "why" of something they are doing, they are more motivated to complete the work. Student-student interactions consist of group work and group conversations. This is entirely in line with our Ideal Online Classroom model. These group work based methods focus on collaborative brainstorming that involves each individual student. When group work ends the students are more likely to participate in the larger classroom discussions. UC Davis's report also noted that "when working with smaller groups, it helps to emphasize individual accountability, positive interdependence, and positive interaction in grading the group's work" (Kirschner, Strijbos, Kreijns, & Beers, 2004). Finally, student-content interactions are based on the students' involvement with the material in non-traditional ways. These can be considered as watching videos, leading peer-instructed classes, or understanding assessment material like quizzes. We believe that having students engage in these will promote a more productive learning environment that promotes growth and process-based understanding.

Designing an online learning environment that is on par with the in-person learning environment we are all familiar with requires similar methods executed in ways we have not anticipated. We are developing a social learning environment that does not currently exist. This online learning environment lacks the typical social cues we use in-person to analyze and understand a situation. Socially, our goal is to reimplement those social cues to online learning.

Our method for the most effective way to do this is through more conversation and face-to-face interaction via breakout rooms. When communicating through text only we lose many of the social cues we experience from an in-person conversation. If two people had a conversation over text and then those same two people had the same conversation in person but blindfolded, the time in-person hearing each other's voices would prove to be a more effective conversation. This is due to the fact that a conversation involving our voices allows for us to use the pitch, tone, hesitance, and tempo of the conversation to understand the situation better. This is best exemplified by an MIT doctoral thesis in which Judith Donath attempts to develop social cues for an online community. She states that "online environments must provide the means to communicate social cues and information: the participants must be able to perceive the social patterns of activity and affiliation and the community must be able to evolve a fluid and subtle cultural vocabulary" (1996). Although at first glance it may not seem as though we are developing an online community, that is exactly what we are doing. Our Ideal Online Classroom is an online community that fosters the necessary social cues and interactions.

For anyone involved in education right now, be it student, administrator or teacher, it is quite clear that education quality has severely dipped due to the COVID situation. And while the process of "digital transformation is not a novel phenomenon", the speed at which it has been made to occur this year is unheard of. Digital technology incorporation "in higher education that would typically take many years because of differing managerial regulations were presented quickly within [a] limited number of days" after the COVID pandemic set in (Adedoyin, 2020). This rapid evolution skipped over the usual development of new learning methods that would occur outside a time of crisis. Without the two decades of experimentation with digital remote learning, it is likely that academic institutions would have stalled into complete failure and

disarray. It is now the job of educators and policymakers to go back through the hodge podge systems that have arisen over the past half year and combine them with the existing history of remote learning. With some additional new elements in the mix, remote learning can become the viable alternative to in person schooling that it has the potential to be.

Further delving into the creation of online learning during COVID, it seems that the changes that have shifted the learning environment to online are not just hastily completed, they are an incomplete metamorphosis. First and foremost, the remote learning of today is simply a band-aid fix. The ERT practices put in place by colleges guarantee that the current online classrooms are not fully thought out. Furthering this point, it isn't common knowledge that "adequately planned online learning experiences [differ] from courses presented online as response to crisis" (Adedoyin, 2020). Most educators have little to no prior experience dealing with an online classroom environment. In a September 2020 survey conducted by HEDS, around 10,000 college faculty and staff were asked how they felt about teaching in an online environment. A large majority of respondents reported feeling that they feel uncertain about the well being of themselves, their students and those around them. Additionally, they expressed major worries about the future of their colleges and the effectiveness of current online schooling. Those in charge of the current situation feel unsure of the quality and capability of an online education. Change is unlikely to come from the higher levels as they don't have much faith in the future of remote learning. Now the question is how can we make educators realize the potential of digital education without their views being clouded by the poor school performance of COVID education; which will be further divulged into in the following sections.

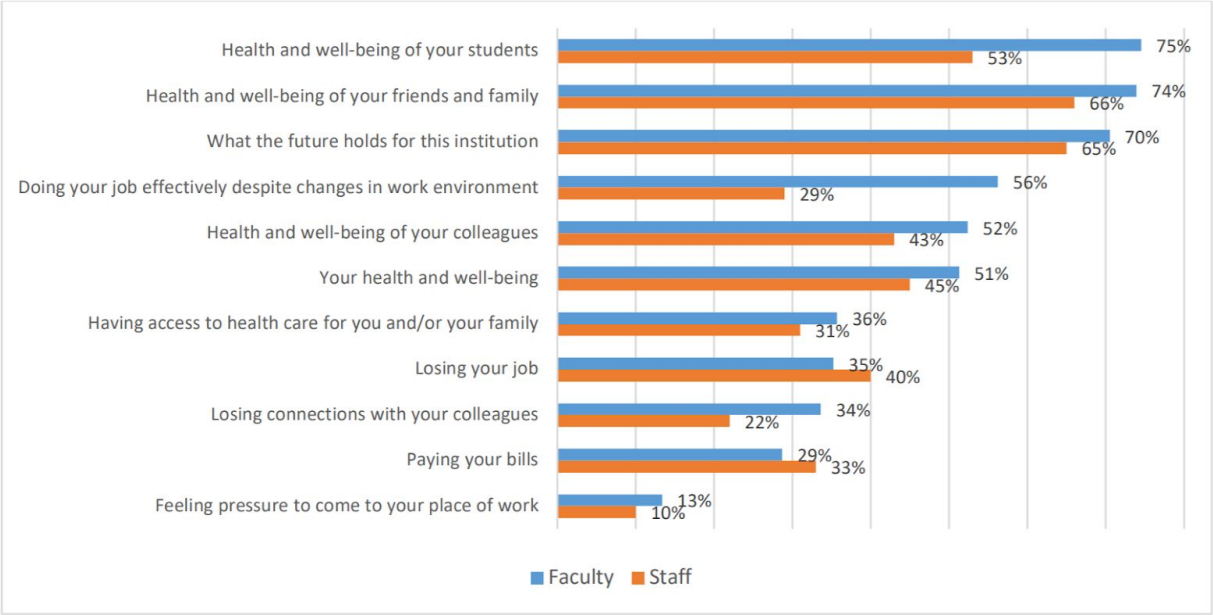

Figure 3: Percentage of Faculty/Staff that experienced different types of worries in the midst of COVID schooling (Blaich, 2020)

Another major roadblock to completing this metamorphosis to a flourishing remote learning environment is that it is almost universal that higher education institutions hold many pessimistic views of what digital transformation looks like, which are often unfounded when compared to the realities. This isn't just from the aforementioned lack of faith due to the COVID situation. It is borne of much earlier attitudes; ones that have simmered under the radar as digitalization is often swept under the rug or seen as a side operation to higher educators. As mentioned earlier, in a 2019 study, Micheal Kopp defined five major common assumptions that higher education institutions hold that prevent digital transformation. As an aside, 'digital transformation' in the context of education refers to the " the sum of digital processes necessary to achieve a change process that enables [higher education institutions] to successfully leverage the use of digital technologies" (Kopp et al., 2019). The first major assumption is that many organizations believe that digital transformation is a fad and not a movement with real societal

impact. In reality, digital learning has the potential to be a comparable alternative if done correctly. Digital learning isn't just a buzzword or a marketing strategy, it is a real meaningful alternative. If it was so fleeting, it wouldn't be pursued as a developing alternative for the past two decades. Digitalization is still in its infancy, and COVID has demanded that its growth be accelerated. If Lafayette doesn't stick to continuing developing this after the pandemic, a year's worth of mediocre digital education will have occurred fruitlessly.

The second major assumption is that digital transformation has to be quick. Many education institutions see that they are behind in the process of transformation, and then rush to make changes quickly. This is unhealthy as it will lead to half baked processes and underdeveloped learning environments. A prime example of the poor results of this line of thought is the situation we face today, in which every school skipped development and was forced to implement rudimentary online systems. ERT was an easy write off, and it is a failure to both the students and faculty taking part in it. Digitalization is a process, not a single decision point for professors and policymakers. It takes time to retrain students and their teachers to cooperate and learn effectively online. It also takes time to properly equip all students with equivalent access to the school resources, technology and internet that form the platform that digital education stands on. Underserved students often fell by the wayside over the past year due to external responsibilities, and pushing for a fast adjustment will keep them in that underserved position (Blankstein, 2020). It is the moral responsibility of colleges and universities, including Lafayette which values the student experience so highly, to provide an equitable and valuable education experience. Thus, as much time and consideration as possible should be inputted by decision makers in our community.

The third assumption surrounding is that higher education institutions often buy into the idea that digitalization is merely a technical issue that better technologies or implementation would solve. As has already been discussed in length, this is a one dimensional mentality that discredits the value of the social side of education. Digital learning should be a socio technical experience; one that is built on technology but carried forth by active social participation.

The fourth assumption is that only students, who are 'digital natives', have the capabilities to adapt to a digital learning environment while older adult educators cannot. This is one of the most incorrect assumptions, but it has a very wide reach in the public mindset. In reality, "students often fail to transfer digital competences available in their private lives to their learning environments" and that "no significant age-related differences in the use of digital technologies" (Kopp, 2019). Additionally, in the COVID learning environment, many teachers have become much more competent at a rapid rate. In a study this past summer, it was found through training workshops targeting specific digital skills technological literacy and competency can rapidly increase among professors regardless of background (Peisachovich et al., 2020). Digital natives are just a generational buzzword invented to drive home false narratives about generalized generational skill sets and differences. Discourses around millennials in higher education and the workplace have done unseen harm to the believability of an online classroom. The final assumption with digitalization is that it comes at too great a cost to go through with it. While this will be broken down further on in the report, it has to be said that this is a gross over exaggeration. The COVID situation has proved that the technologies are already almost all in place. Each one of these assumptions is almost entirely false but undermines the belief in the potential of digital transformation. Many people have also had these assumptions strengthened by their interpretations of remote learning's failings during COVID.

On top of all of these assumptions, the inherent hierarchy of higher education institutions means that nearly everyone in the chain of command needs to be convinced in the quality for a change to be made (Kopp et al. 2019). Even at Lafayette College, a universal change in curriculum or teaching style couldn't be put forth by a few professors alone. Thankfully, we have a small, tight knit community, where the hierarchical pyramid is not too tall to overcome. Lafayette's small size provides the flexibility to change how to run the school semester to semester. This is something that larger colleges don't have access to, as they would get bogged down from extraneous cases such as vastly different communities within each program. The small student to faculty ratio also makes it easier to account for everyone's input when trying to push the learning experience in a better direction. If all the professors and students get on board and let their voice be heard, perhaps a change of attitude can occur within the Lafayette leadership. The College has provided access to many student resources in the past, such as counselling & advising, health services and access to a myriad of education databases. There is also a history of student and faculty led expansions to these resources and support networks. The funding and services just need to be redirected to properly serve our online community. Lafayette is the perfect organization for being a testbed of improvements to digital education. The politics of this matter should be quick to turn if the truth about what a digital education can be is made clear. Ultimately, in the current world situation, most people within education organizations only view the current remote learning situation as a temporary emergency stopgap. In doing this they continue to uphold the prior mentioned assumptions and do not fully commit to the changes required to make remote learning the best it can be. Attitudes of policymakers in higher education need to change before any successes can be realized, and a great starting point would be here at Lafayette.

As it's been made clear before, while remote learning is not a new phenomenon, the speed and scale at which it is occurring this year was previously unimaginable. In this speed to adapt to digital much has been lost; from the physical classroom space to the myriad of small interactions that form the social environment of a classroom. On top of this growing pile of lost elements is the awareness of digital learning as a socio-technical system. From the initial transfer in March and still continuing to this day, the largest concern for teachers and students alike is at the surface technological level. And although the technological base is what remote learning is built on, learning is fundamentally a human, social process. Processes are not objects. One design change will not cure the ailments of remote learning. Technology is important, yes, but if one tries to improve learning without stopping to consider the person behind each screen, then they have failed from the startline. Much of today's remote learning implementation reeks of this kind of mindset. Changes to better the process of remote learning need to blend improvements to both the hard technical context of the technology itself and the softer technical context of its social uses and interactions.

Let's begin by attacking the issues within the physical technological context. Right now the largest concerns for students and teachers during COVID remote learning are within the realms of the technical specs and internet connection. "Students with outdated technological devices might find it hard to meet up with some technical requirements of online learning" is a sentiment reflected across many accounts of recent experiences. Additionally, a student's ability to solve these problems comes at an economic cost. Accuriable technology quality is highly dependent on a students socio economic background. In person classes are a great equalizer. In an in person learning environment the college will provide resources so everyone enters the classroom on the same footing, but this support has ended with everyone being sent home

(Adedoyin, 2020). It is fundamentally unfair that students within economically disadvantaged communities, which are disproportionately representative of minority groups, all too often have little to no internet access and outdated personal computing technology (Fishbane and Tomer, 2020). These people would normally rely on public places for their internet based technological needs, but those places have often shut their doors due to pandemic. Colleges need to step in to provide a sure footing for all of their students to stand on, just like they do when crafting a campus experience. Tuition costs should be shifted to provide computers and internet access to students in need. Courses cannot bend to the lowest common denominator or they would all too frequently lose valuable class time, so students' access should be equalized to a base level. A good computer and stable internet connection are much smaller costs than many other services provided by the school that have been rendered useless to those off campus.

With the technological platform secured for students to be equally engaged, the next step is one that has not been considered as much, which is changes to class operation that acknowledge the fact that learning is a process. To start off, digital competency is an extremely important element of taking part in remote learning, and is the next layer of the sociotechnical system that is above the baseline of technology access. Making sure that everyone within a classroom, teacher and student, is fully aware of the potential uses of the hardware and software especially is very important for crafting a faux social environment. In a study this past summer, familiarity with using a technology is directly related to familiarity with operating as a ‘virtual simulated person’, and that technology workshops can greatly improve the engagement of those within a digital space such as a Zoom lobby (Persachovich, 2020). Familiarity with a technological social space allows one to engage more seriously with it. Free workshops and classes should be regularly held to increase understanding and comfortability maneuvering

digitally. Once this level of understanding is evened out, it is possible to move on to improvements to the final and most social layer of this socio-technical pyramid; the actual moment to moment social engagement within the classroom. To approach this as a problem means restructuring what is valued in the learning experience. Past online learning trends, especially MOOCs, failed in this department. As mentioned before, learning is a collaborative process when it's at its best, and MOOCs are exclusively one sided. There was no dialogue between anyone, just a professor talking to a crowd of digital onlookers. Each student in this kind of environment experiences a vastly different quality of education as they have no peers to reference for gaps of understanding outside of secondary text based social channels (Askeroth, 2019). Emphasis needs to be placed on community based learning, which will allow students to take ownership of their learning. Student dialogues are highly important for building understanding and mastery (Han, 2019). This means longer time in class and less struggling on work alone. Each class meeting should have a clear set of goals that students should work to achieve. Being transparent about the ultimate destination of their learning is foundational to motivating them to work hard in a digital environment (Howard, 2020). One sided lecturing like that of MOOCs should be sidelined for in class discussions of various sizes. Longer classes will facilitate time for professors to make certain that students fully grasp the material after each lecture is delivered. Secondary channels of discussion (technologies such as Slack) should be set up to simulate further social interaction that would naturally occur outside of the classroom between peers (Han, 2019). Outside the classroom, homework can be used to add depth to what was learned rather than echo ideas from the class. Homework can thus be reduced to a supporting role. The workload outside of online class should never feel like a sisyphean effort, and all too frequently do students express sentiments such as this one (Akkoyunlu, 2006). The

pandemic is a time of uncertainty such that consistency and clear image of required work is important for allowing students to properly motivate themselves. With these changes, students will spend less time on antisocial out of class activities and more time on constructive, in class ones, combating the motivational deflation caused by a lack of face to face interaction. These facets of learning should further the development of our Ideal Online Classroom. Ultimately, each layer of the sociotechnical system needs to be addressed to make improvements to remote learning, and a failure to address one of these factors will leave someone behind.

Now let us transform this theory into an action plan using data provided by Lafayette's very own Center for the Integration of Teaching, Learning and Scholarship. In a study of over 20 colleges and universities done by Ithaka S+R this spring, it was found that students felt despondent from a lack of communication with aid and advising departments from their respective academic institution. Of the nearly 20,000 student responses, over half of the students reported that they wanted to hear more about their financial aid situation. On top of that advising and counseling services were also in high demand for more student engagement, with at least a quarter of responders expressing desire for more communication. Students who find themselves increasingly put out of their element due to remote learning need the school to provide the resources, even digitally to make them still feel a part of the community. In the face of this, Lafayette should step in more than it already has. Reducing tuition for remote students is a start, but many of the myriad of services included in the tuition package are currently operating in a shallow echo of their in person variants or are entirely inaccessible. Counselling and advising is in extremely high demand; many students have lost most of their social support network of peers, and most freshmen haven't had the chance to develop one. In the same survey, over half of student responders attributed stress to inability to adjust to online learning and balance their life

responsibilities. As per recommendation by the Ithaka S+R team, the optimal solution to this kind of problem is to increase communication and available resources. Lafayette needs to create a large team of advisors, counsellors and therapists to assuage these fears found in the hearts of most students. Stress from school inhibits engagement with and enjoyment of school. Students who have the highest need, such as being from underserved communities, should be prioritized as they are most likely to fall behind due to them being disproportionately affected by COVID. Another issue was that highly technical coursework and outside of class group assignments proved exceedingly time consuming and difficult for most students. Additionally, a majority of students reported feeling disconnected from their peers due to remote learning. Out of class work for Lafayette students should be reduced to painless activities such as reading passages or watching videos, which a majority of students reported feeling comfortable doing without difficulty. In a September survey by the HEDS Consortium, faculty also reported feeling worry and stress over their courses and students in exorbitantly high percentages. To bring the community together, Lafayette classes should adopt a socratic seminar style, avoiding the pitfalls of past remote learning found in MOOCs. Faculty should use a deft hand to guide discussion and learning, as ambiguity in learning brings stress when paired with the already ambiguous world situation (Adedoyin, 2020). The student to faculty ratio at Lafayette is actually small enough to support this style of classroom organization for most classes. Even within these socratic classes, even smaller scale frequent peer to peer discussion should occur using the break out room feature of Zoom. This provides further opportunities to form bonds with both the professors and peers. Open communication between Lafayette students and faculty needs to be further developed. The town hall meetings are a start, but if they were split into more regular smaller meetings, with leaders that report back to the governing board, everyone's voice can be heard. Feeling like one

has an impact on their college experience even when trapped at home empowers students to be more invested in their education, thus having an easier time learning. In sum, the best way to engage students in the Lafayette community is to compartmentalize many interactions to a personal scale, thus the essential human connection of school can be resurrected.

In terms of the economic analysis of our solution, although we don't expect major cost differences, there are a few key factors to consider. We hope to rewire what exactly a typical classroom setting will consist of and apply this to our new found online college experience. We would like to see increased class time and decreased time working alone outside of the 'classroom' (zoom sessions etc). First, it is important to consider the pay of professors pre-COVID. While one would be hopeful that pay of professors and faculty would remain the same, as remote learning has tried to replicate the experience, there is no question institutions lost money from things such as housing, meal-plans etc. Using Lafayette specifically as our example, there is no question that there are economic deficits and they have an unclear future for recovery. Tuition and room and board fees are most institutions' bulk of revenue and with the 10% reduction in tuition itself, there are sure consequences for the college. For this example, we will say there are about 2,600 students enrolled at Lafayette College. Each student then is given the 10% tuition reduction due to COVID-19. Tuition was $28,278 prior to COVID and now it is $24,530 per semester. The difference is $3,748, and if we multiply that by the number of students we are averaging as enrolled, we get a 9.7 million dollar deficit. Evidently, there are other contributing factors such as students who may take a semester off or who choose to apply for access to facilities and things of this nature. Students who are just beginning their college education may simply opt out for a year (or two or three who know based on the circumstances) so, the College says they estimate a 10-30% fall in the number of enrolled students. An upwards

of a $60 million dollar deficit is being anticipated. How does this affect professors specifically? The college opted for a progressive pay reduction. The pay reduction was for employees earning $37,000 per year or more and depending on salary level the reduction could be between 0 and 6 percent. Figure 4 below breaks down the relative salaries and their cut.

Progressive Salary Reduction Structure

Salary Range		Effective Rates Within Salary Bands		
		Minimum	Average	Maximum
$0	$37,000	0.00%	0.00%	0.00%
$37,000	$50,000	0.1%	0.9%	1.6%
$50,000	$100,000	1.6%	3.3%	4.8%
$100,000	$150,000	4.8%	5.2%	5.9%
The maximum of 6% begins at $155,500.				

Figure 4. The Progressive Salary Reduction Structure at Lafayette College following the switch to remote learning (Fall 2020 semester).

As one would expect, decreased salary for professors may affect incentives for remote learning as well as further implications to consider when analyzing our project.

There is a strong correlation between pay and incentive for teachers. In a study done at Stanford University, Thomas Dee explores the idea of whether performance based incentives increase successful teaching. In addition, threats of dismissal increased teacher performance by a significant amount. An important factor to consider when pay-cuts are being made is how this may actually affect not only professors personally, but the academic achievement of students. Dismissal threats specifically increased the effectiveness of teachers in the study by almost fifty percent. Financial incentives improved performance by a standard deviation of 0.24. These

effects are pretty significant however, may be unavoidable in the climate in which online learning is prevalent and institutions must reduce their spending to compensate for the shift in learning from in-person to online. It is safe to assume that a long-term implementation of remote learning will not yield as dramatic effects from pay-cuts. As society becomes more acclimated to the new system, we can expect trajected decrease in effectiveness to increase when institutions adjust their long-term plans (Dee 2013).

A digital transition is driven by three things: time, quality, cost. In a publication written by Michael Kopp and his colleagues, Kopp proposes that a quality project is correlated with high costs. The costs that Kopp suggests are the costs for the need for digitalization, the training and support for those involved, and maintenance. Higher education has continuously changing budgets for technology however, a digital transformation requires additional costs for these institutions. Kopp says that unless these resources are not adequately invested in, then higher costs in the future will be the result. Another issue with an investment that isn't sufficient would result in a competitive disadvantage. What he means by this is that an institution that doesn't invest enough from the start will lag behind others who have invested an adequate amount for a sustainable digital development project. The investment consists of resources, communication, training, travel, material, and time. When investing into the project, there are multiple options for financing it. The options include external financing and internal financing, or a mixture of both. External financing requires a third party investor. For our example this would most likely be donors particularly alumni etc. The government could also be a plausible donor to a large institution. Internal financing would mainly mean taking funds from one sector of a higher education institution and placing that in the funding for the digital transformation. This is a sustainable way to use those resources not being taken advantage of when there are large

changes being made to campuses. The best approach for our goal would be to start a savings and implement these external and internal funding ideas quickly and consistently. Waiting to obtain the funding will stall the transformation and thus become more expensive in the long run so it is essential to be efficient.

Up until now we've examined the economic needs and background behind digital learning but, not actually how digital learning will affect the economy itself. Research done by Thomas Kennedy of J.P. Morgan analyzes the potential economic impact that digital learning could potentially have. The research suggests that there would not be any significant negative impacts on the United States economy in the short term. In the long term however, there could be significant impacts on the long term economy. In terms of GDP specifically, research had estimated only about $50 billion dollars being lost which in comparison to the over $20 trillion dollar economy, is not significant enough to worry too much about. This estimate was not considering the disbursement of COVID-19 cases nor, the work requirements of the evaluated jobs. There are many factors that could potentially harm the economy evidently most of them stemming from unemployment and changes in the workforce. Specifically, with lower schools closing, parents will have to stay home with their children. The financial impact of this is smaller than expected because most businesses would not be allowed to have workers come into the workplace as well. For those jobs that are less flexible, parents wouldn't be able to watch their kids all day even from home so they may need to hire someone else, or cut down their hours. Some workers may be forced to cut their hours because of their job, or even be left unemployed as businesses are closing or unable to function in a pandemic. The effects as you can tell are dispersed differently for a lot of people depending on their family make-up, professions, incomes, preferences, etc. Unfortunately, those with lower incomes tend to work in businesses

that are most affected by COVID-19 like retail and the restaurant business. In regards to the short-term, this could mean pretty substantial changes in income immediately.

Along with the immediate impacts, closing schools will clearly threaten long-term productivity. Productivity growth is affected by the productivity of businesses, our leaders, education, high functioning institutions etc. Schools closing has a direct impact on the labor force which obviously has a significant role in the productivity of the economy. An important consideration here is the assumption that schools are 'closing'. Schools are doing everything they can to function remotely however, this still affects the labor force involved as well as those people who may decide to put off different levels of schooling a year or two until things are normal. There is definitely a larger effect on children who were supposed to attend Pre-K or Kindergarten as these in person settings are what shapes young individuals' mind, social skills, and physical abilities. This will for sure slow down the generational turnaround in the labor force.

This article suggests access to things like the internet and computers are the best option for preventing the potential impacts on education and thus the economy in the long-term. Research shows that 14% of kids in the United States (ages 3-18) do not have access to the internet at home. Without the internet, children will not be able to participate in online classes or complete assignments. In the long-term this definitely will put the lower earning individuals and families at a disproportionate disadvantage. It is clear there are disproportionate impacts on society and thus the economy resulting from remote learning on society (Kennedy 2020).

In an article published by McKinsey and Company's Public and Social Sector written by Emma Dorn and others, startling evidence shows that educational institutions shutdowns could widen the existing achievement gaps. The shutdown of the United States education system,

forcing the use of remote learning evidently questions the quality of learning that education systems have created and used for years. In this particular day and age, the disparities across not only income levels but, white students and those of black and hispanic heritage are undoubtedly prevalent. With the transition to remote learning these disparities are elevated which, in turn, are predicted to have long-term effects on these students' economic stability and thus the economy at large.

As explored in the article above by J.P. Morgan, lower income households are more likely to have less resources needed to engage in a remote learning education system. Before the transition to digital learning, we acknowledged the increased likelihood of black and Hispanic students to live in lower income areas. In the past ten years the gaps in educational achievement have not been closing. The gap in productivity levels between white students and black and Hispanic students had an estimated deprivation of around $300-$500 billion dollars a year to the United States Economy at large. The gap in productivity of low-income students alone was ranging from $400-$600 billion dollars. This is equivalent to an upwards deficit of 8 percent in the total GDP. These gaps in ethnicities and lower income students before the forced transition to digital learning will undoubtedly compound in the future as the problem in our society has not improved in the past decade.

As we have set our goals for creating a more engaging and effective learning environment, the statistical models made by McKinsey and Company create a visual on how different groups are affected by receiving different levels of effective learning. It is clear there are different learning impacts on different types of students and this will certainly affect their economic standing in the future. The figure below, groups students into three different types; students who experience “average-quality” digital learning, students getting “lower-quality”

digital learning, and students who are not receiving any digital learning. These types of students in the figure have predicted learning outcomes given different estimated returns to non-digital learning.

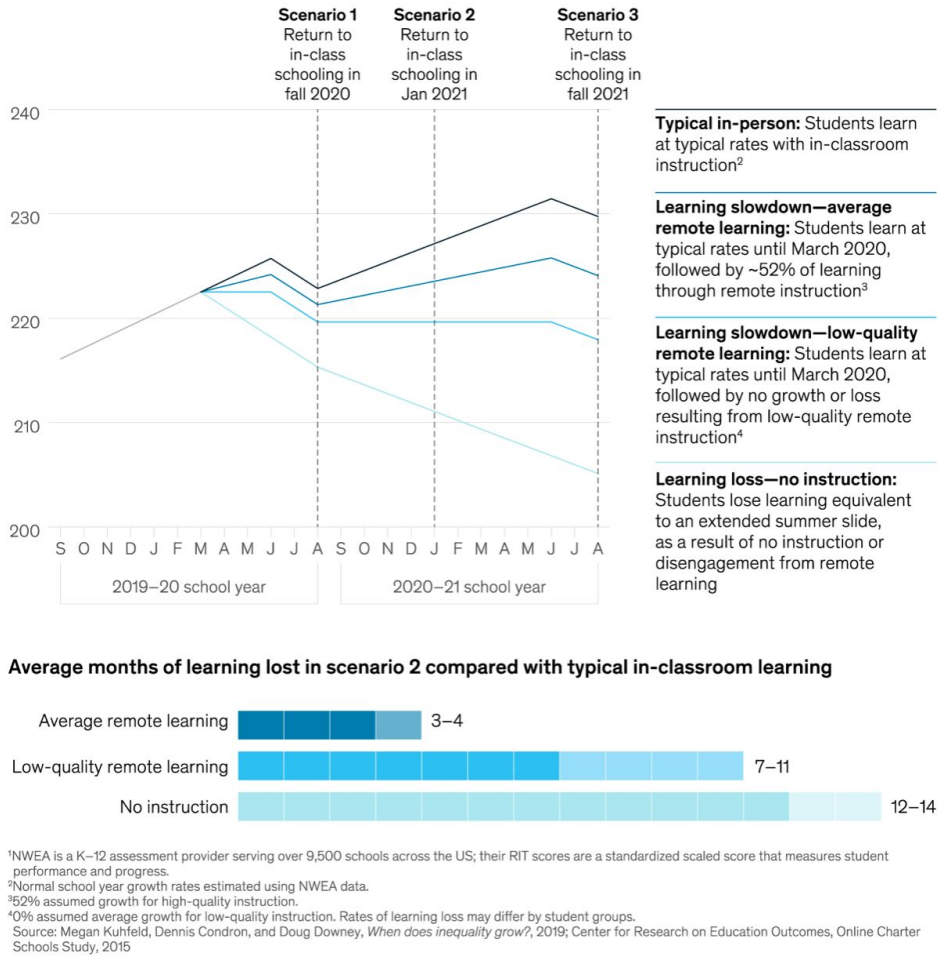

Figure 5. McKinsey and Company predicted learning outcomes by scenarios.

As shown in the figure above, all scenarios yield significant learning loss. Furtherly, this learning loss is predicted to disproportionately affect Black, Hispanic, and lower income students.

A shocking statistic found is that only 60-70 percent of students who categorize as black and hispanic students are engaging in their online instruction compared to 90 percent engagement from those who categorize as high income students. Low income students' engagement rate is at

60 percent. It is clear that an upwards of a 30 percent gap is a significant problem. Another angle to consider is how these minorities are experiencing oppressive, systematic algorithms in their online activities like we discussed in class. Could these oppressions have something to do with their decreased engagement? The study specifically notes this could be due to having less access to devices, a more interrupted learning environment, quality internet services etc. The lagging behind of these students thus translates to increased dropout rates associated with the closure of traditional school systems. McKinsey and Company predicts drop out rates due to digital learning to be around the 2-9 percent range.

So how exactly does this translate to economic damage? In addition to the highly stressed institutional budgets, longer term effects are predicted for both the individuals involved as well as society at large. There is an estimated total decrease in annual earnings of $110 billion dollars. Broken down, there is a greater predicted decrease in annual earnings for black, Hispanic, and low income students. In the Figure 5 below we have these potential annual earnings loss translated into GDP loss using the year 2040 for reference.

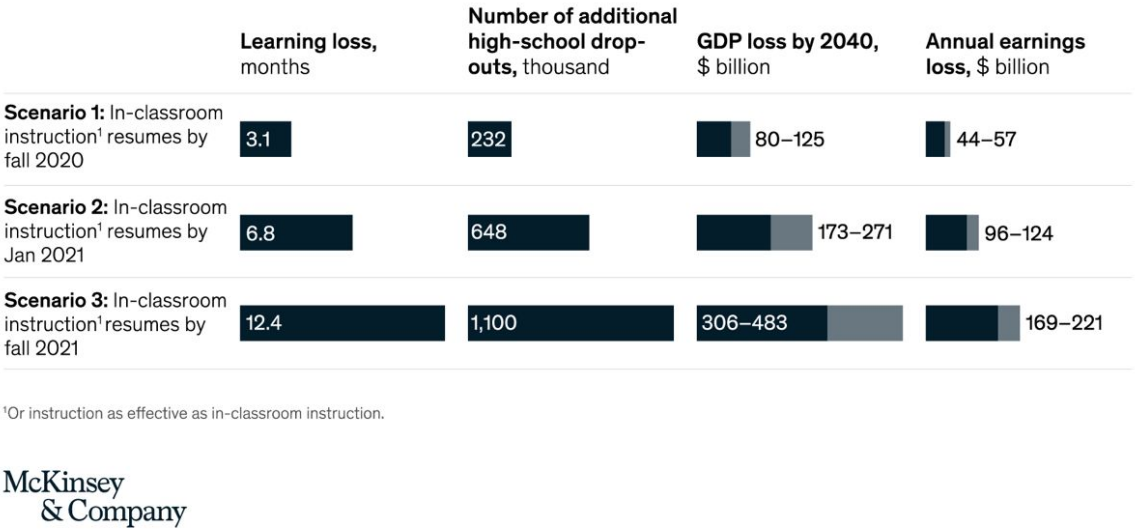

Figure 6. McKinsey and Companies predicted learning loss translated into GDP loss and annual earnings loss by 2040 ($ billion).

As you can see the learning loss (due to the low engagement rates) could be detrimental to a whole generation and is most certainly something that should be taken seriously. Carrying out our ideas to create a better quality learning community is essential to not only the social and physical well being of students and teachers, but also our society. We hope to shed light on this potential economic downfall before it's too late (Dorn, 2020).

As a disclaimer, the models used in the figure does not account for college students however, we assume very similar impacts will take place. Changes in education at lower levels will certainly affect abilities for college admission, success-fullness, completion, and thus professional lives. Another factor to consider are even further out expected returns to school and the hybrid digital and in-person education that has and will take place in the future.

Aaron Skonnard, the President and CEO of Pluralsight, takes an interesting approach to online education and the effect on the economy. Most of the literature we have analyzed reviews the impact of digital learning cynically. There is no doubt these approaches hold true however, could digital learning be beneficial to the job market in some ways? The expansion of the technical industry is growing rapidly. Even in non 'technical' industries there is no doubt that businesses are rapidly growing their demand for mobile working, IT work, software development etc. The technological presence and fluency gives almost any business a competitive edge. A survey done by Randstad in 2013 says that IT professionals and software developers are in it's top five most in-demand jobs. Additionally, the Bureau of Labor Statistics expected a 30 percent increase in employment of these jobs from then to now. Technological fluency is a highly sought after skill and exponentially growing especially in the context of the pandemic we're in now. As we discussed earlier in this paper, the job market is tough and unemployment rates are high. With the transition to Digital learning as shown prior, we predict less students completing lower and higher education meaning, less individuals entering the workforce and thus negatively impacting our economy. Engaging in remote education with a focus on technology could potentially combat some of our problems.

The mobile workforce has essentially transformed our ways of engaging in business activities. So, as young adults and children are being fundamentally forced to engage in digital learning there is no doubt that this could prepare them specifically for the new way of business workings. The core pieces to the new way businesses are approaching work is putting an emphasis on software development and coding, all of which are primarily engaged in remotely. Up until the pandemic the education systems were not yet supporting the high demand of these

areas. Increasing this focus in education is not only a potential additive to our economy due to the context we're in, it is somewhat a necessity we had been lagging behind on pre-COVID-19.

We hope to create a more effective learning environment in the context of the current curriculum transitioning to digital learning. Additionally, incorporating more software development and basic programming at the lower levels could make significant changes in the potential devastating outcome that is a result of forced online education in our 'now'. If we could shift the focus for younger generations, there could be less emphasis on the negative impacts and more focus on working with our rapidly developing digital environment. Better preparing the upcoming workforce could easily reduce the tensions associated with remote working and learning (Skonnard).

Creating an effective online learning environment, like all issues in the technological world, has underlying factors that need to be assessed when considering solutions. In particular, the reconstruction of remote learning is an issue that requires a highly socio-technical fix. In order to create an effective online learning environment, we must divorce ourselves from the idea of recreating the in person classroom. Instead, we have to understand what made the in person classroom environment so successful. Quickly, we came to the conclusion that the in person classroom environment was a highly social space that supported interactive learning. The in person model of a classroom allowed for social cues that benefitted the flow of the classroom. Online, we do not have those same social cues that stimulate productive learning. In order to build an interactive learning environment online we must force ourselves into situations where we can get back those social cues.

We have found through our research that students are unhappy with current social aspects of online learning. The figure below shows the feelings of current students.

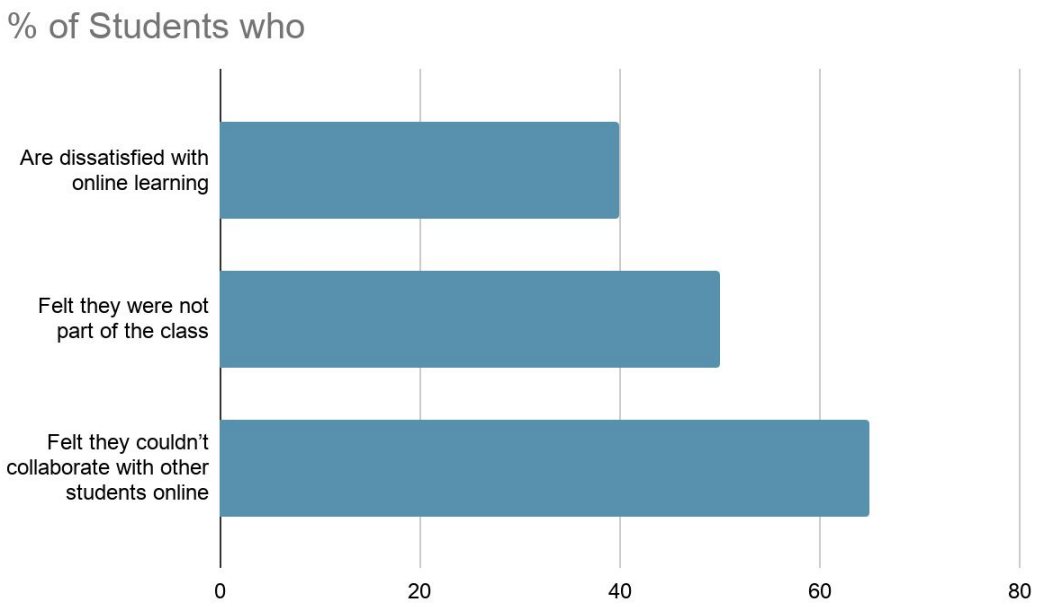

Figure 7. From 2020 study done by the Non-Profit Organization "Digital Promise," which originated as part of 2008 Congress's Higher Education Opportunity Act

The data is important because it shows the lack of students' satisfaction socially of online learning. This can negatively affect a students mental capacity due to emotional factors involving stress from lack of social connections. This stress can in turn negatively affect a student's concentration and motivation to complete work. What we have encouraged to combat this is our development of the Ideal Online Classroom. Using methods such as active learning techniques, placing an emphasis on small group practice and discussion breakout rooms, and increasing the time spent in the classroom, we can take back the social implications that online learning has previously lacked. This will improve our remote learning experience undoubtedly.

One thing that truly stands in the way of future development of remote learning is the attitudes of changemakers in the education system. Thanks in no small part to the pandemic, digitalization of the learning environment has quickly garnered quite a bad reputation in most

learning communities. Additionally, most people aren't cognisant of the storied modern history remote learning has to pull lessons from. On top of this, COVID has forced the hand of many educators to pull the trigger on loose implementation of poorly thought out ERT programs. Or, in the worst cases, many have left the online implementation of the classroom education entirely up to professors to work out for themselves.

Through our research we found that approaches to online learning are plagued by many false beliefs that permeate through the minds of educators. Digital education is perceived as a lesser form of education when compared to the long developed, varied styles of in person education. Many assumptions, such as digitalization being a temporary, fad solution or that digitzalation is too hard for older generations. While this is not actually true, the pandemic situation has given a concrete example that reinforces this belief in the eyes of many. The negative press and numerous student experiences reinforce this too. To fight back, the hard data about the value of remote learning needs to be made public. Even once this pandemic ends, remote learning can still provide for unsersevred students who cannot attend school. This has already been one of the main purposes of past remote experiences, but they have vast room for improvement. Getting policymakers on board is hard without a stellar example of success. Lafayette College can be that success. We have the resources and are small enough to quickly adapt to the Ideal Online Classroom. If Lafayette can execute the theoretical classroom into reality then perhaps remote learning can gain more of a foothold as a long term alternative to traditional schooling.

The economic context in which digital learning lives in is a difficult reality. In the midst of a pandemic, institutions and individuals are facing many short falls. Families are forced to reconsider their jobs and hours to support their children's education from home. Work hours are

being cut if not lost completely due to the shutdown of businesses. Institutions are losing considerable amounts of income due to students not residing on campuses and being able to take advantage of the resources they have paid for. Most students aren't paying full tuition and thus the school is forced to cut budgets and compensate in other areas all while attempting to create additional resources specific to creating a better remote learning environment. As a result, significant salary cuts are inevitable. For Lafayette College in particular, we suggest redistributing our funds in the places we have found could make a significant difference in success such as personal support services to lighten the impact emotionally, so students and educators can put their best foot forward.

Putting this theory into practice is not aimless either. Using data collected from students during the pandemic, there are clear focus areas on which to improve the remote experience to improve the quality of education at Lafayette. From the multi college survey Lafayette took part in earlier this year, it's quite clear that students need to be active players in their classroom and college communities to get value out of their education. Students don't feel supported by their learning institutions during COVID. Lafayette needs to make it's mental health and education advising services fully compatible with the online environment to properly assuage student's stresses while they are stuck at home. Stress is at an all time high right now among students and this should be acknowledged. Additionally, the student community should be allowed greater input into how online classes function. The classroom should fit the earlier mentioned Ideal Online Classroom; high student vocal engagement, no one sided lecturing and work that connects people on an individual level. Work that isolates students for long periods of time has to be reduced, as a majority of students find themselves stressed and disconnected from college. The aim of each class should be clearly spelt out by educators so as to reduce stress on students

who may feel they don't quite grasp the full picture. A focus on classroom learning through interaction and transparent goal setting would provide more opportunities for students to teach each other, also reducing stress on the faculty who similarly report feeling overwhelmed. Entering a remote classroom should always be a time to bring people together for communal activity that energizes students to learn. Lafayette's classrooms already often operated this way when offline, so it shouldn't be difficult to communicate why it is important to recapture that essence. We can communicate it as going back to the old way of learning with new mindful techniques of education.

Our research additionally showed that the economic impacts are affecting society inequality and the disproportions have significant long-term implications to individuals and the economy at large. Black, Hispanic, and low income individuals are especially at a disadvantage with the transition. With our proposed focus on creating a better quality learning environment with more substance, we hope to combat some of the inequality and thus create better economic stability all around.

In terms of challenges relating to creating a digital learning environment, there were a few things that we noted. Most obvious and most prominently, in this day and age people have become accustomed to a personal and social education system. The overall consensus is that digital learning is, and will not be considered as 'ideal' anytime soon. Humans are creatures of habit and although we do see the benefits it is simply not a habit in our society. We can research and implement new ways of running our academic institutions to create better successful outcomes but, at the end of the day we cannot change the pre-existing bias of students who were 'forced' to engage in an online learning environment.

Furtherly, as we can encourage institutions to engage in a better ‘classroom’ setting online, we cannot guarantee that students will take to it. A dual understanding of both the institution and its students is necessary for this to work. To a certain extent, our ideas will provide a better environment for this however, does not guarantee students will participate to the extent that will make them as successful as our intentions. For example, with increased opportunity for student-student dialogue yes, this should increase engagement however, students still could very well keep their camera off, sit back and let other students speak. A large part of our project was analyzing the very real and impactful problems with this type of learning but, we did this to increase awareness. Our research was done in hopes to motivate institutions, educators, and students, so we hope that this awareness will result in that dual understanding absolutely necessary to create successful outcomes. Again, we can not guarantee that formatting classes will change the mindsets of students.

Our biggest challenge was probably the fact that this transition to digital learning and the unclear future it holds it is happening now. Due to this, there isn’t a lot of confirmed research for the subject. A majority of the studies are just coming out now and can not give completely accurate predictions and information as the future is so uncertain. Fortunately, these studie are taking place as the impacts on society are evident. With this reality, it is also difficult to grasp the importance of these changes to those not being affected or to those who don’t realize the magnitude of the potential impacts a satisfactory digital learning engagement has. During this pandemic everyday people wake up hoping it is coming to an end. Although the near future is promising that doesn’t mean we should ignore the fact that students aren’t performing at the same rates, emotional well-being is being affected, and there are detrimental effects on our economy and society at large.

Moving forward, we want to bring attention to our research at Lafayette College. We are fortunate enough to have a smaller and closer knit college community and with this brings the advantage of being heard. We hope that we can, as a unit, recognize our short falls in terms of transitioning to a digital learning environment. As an institution we never want to fall behind other institutions as our research showed that if we don't take action now, we will thus become at a competitive disadvantage and end up putting forth more resources in the long term. We are confident in Lafayette College's determination to yield successful students and flourish as a community and functioning unit in general.

After we can recognize the issue as an institution we hope the college will conduct a survey in advance to the next digital learning semester. The survey should be administered with the intention of recognizing student preferences and past student experiences with the school's specific approach to remote learning. With an upwards of about two semesters with remote leaning under students' belt, this input has the potential to be extremely impactful and is a valuable asset we should take advantage of. We hope our input will inspire an even deeper conversion and student specific conversation as we work together to improve our communities system in particular.

In conclusion, doing our research has shed much light on the issue of remote learning. We feel we discovered some very good information and were able to put it together in an effective manner for the betterment of the students' experience at Lafayette College. We hope that the CITLS department at Lafayette College can use this report in their mission for our educational development. It is of the utmost importance to understand that the issue of remote learning is one that is sociotechnical. We feel that if we can properly adjust the social aspect to remote learning we can develop a process that is highly engaging and beneficial to the students.

We want to thank those at the CITLS department with their help in our study. And we hope that the administration of Lafayette College hears our voice.

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