ONLINE EDUCATION TO UNITE U.S CITIZENS

EDUCATION TECHNOLOGY AND LEARNING

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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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Education has no medium. Learning can be expanded from traditional lectures to independent ownership. Wellness, as a collective term, is an example of where the benefits of personal experience outweighs curriculum-based learning.

The technical project is following an earlier capstone project that proposed a national redefinition of the nation's welfare to be measured by a metric that is comprised of five pillars–Justice, Tranquility, Welfare, Liberty and Defense. This year, the objective is to develop an online education module that will empower community members to promote wellness through the five pillars.
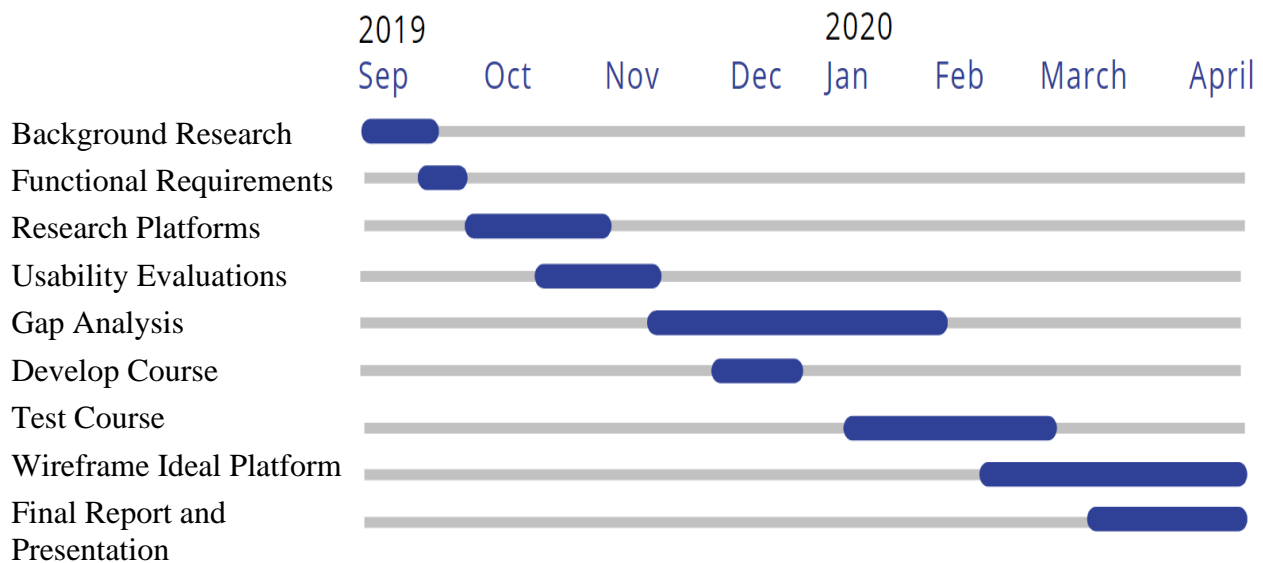

Figure 1: Gantt Chart: The Gantt chart timetable illustrates the goals and the intended time durations for each step. The blue markers represent the time spread between the months. (Bedir 2019)

The timeline for the year-long capstone consists of research, design, testing, and evaluation phases before the presentation of the final deliverable. The chart in Figure 1 illustrates the timeline of the team's intended progress for the length of the academic year. The research phase from September to November of 2019 involved gathering resources, selecting the platform and categorizing curriculum content. After creating the course, a cohort of test students will participate in the course in December and early January. Observations and feedback from the

users will be synthesized into actionable changes that will define the evaluation phase in January of 2020. The rest of the spring semester is comprised of iterations of the phases for confidence that the final product presented meets the needs and educates the users successfully.

While the main research focus of the technical project is engagement and actionable knowledge, the Science, Technology, and Society (STS) research follows the Social Construction of Technology framework and more specifically the Technology and Social Relationship model to examine the education technologies currently available, and the state of adaptation they are currently in. The STS paper will research the consistency of approaches and the success viability in acknowledgement of curriculum flexibility. The two topics are tightly coupled as they both share the principle of using technology as an advantage to learning where the technical topic will benefit from the STS research on educational technology to implement a strategy that best benefits the user.

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Well-being is a subjective term, but when it comes to the well- being of a country, objective measures are drawn as a means of comparison to the rest of the world. Gross Domestic Product continues to serve as the most common welfare indicator even as it intentionally fails to consider social and environmental influences on national success (Bergh, 2009).

The capstone team is partnering with Promise America Alliance (PAA), a 501c3 charitable corporation with the mission of "working to heal the current national divide" by exploring the Preamble to the United States Constitution and suggesting ways that the foundational components within and the measurement tools interpreted can make an impact in modern lives. ("Promise America Alliance", 2018). The technical project considers a proposal of measuring well-being through an alternative metric proposed from the previous capstone team's partnership with PAA weighing five pillars familiar from the Preamble of the Constitution: Justice, Tranquility, Defense, Liberty, and Welfare ("2019 annual report", 2019). The project intends to promote the pillars through a technological platform to encourage civic engagement of U.S citizens as the underlying takeaway. The capstone team objective is to extend learning ownership to the student through technology as the connection to make learning about wellness an engaging experience. The capstone team intends to achieve the objective through the development of online modules as part of a curriculum for a week long course. The pillars will be the focal topics of the modules that will contextualize the wellness score.

The modules will be accessible through an online course structured with the determined most effective online education platform. The intended user group for the application is college students. Students are familiar and comfortable with technology, with 96% of 18-29 year olds owning a smart phone ("Demographics of Mobile Device Ownership and Adoption in the United

States", 2019). The young adult age group is a demographic that has a large influence on the future of the country, and the course provides a foundation to activate civic engagement by matching user values with community outreach. A successful example of situational game play is iCivics, an online platform that educates children on civics and the history of American democracy through first-person stories where the user chooses the path that their character will follow. The platform is used by 5 million teachers worldwide and has inspired students to have a voice in their own school communities ("iCivics annual report 2018", 2018).

The platform provides the students access to resources that promote local engagement, a discussion forum for student collaboration, a course progress report, and pillar specific course content. With the anticipated outcome as enabling independent community participation, the modules will track involvement by the implementation of forums. Students will be prompted to reflect on their values and affirm their commitment through detailing purposeful actions for progress through civil engagement. The idea of using online social platforms as a medium to promote civic engagement has been studied in China and shown that "online civic engagement is positively related to offline civic engagement" (Chen, 2017). The modules enable the user to make real life decisions by incorporating interactive scenarios.

Course usability is the primary focus to define the success of the final content. A gap analysis will be completed as a means of organizing the research into educational methods that aid in the effort to produce a dynamic, intuitive to use, community-oriented and engaging tool. Prototyping and usability testing exercises will be performed to produce data that will guide optimal user interaction of the final developed website. The project is advised by Professor Stephanie Guerlain of the University of Virginia's Engineering Systems and the Environment Department and the capstone team is represented by Systems Engineering fourth year students

Alara Bedir, Rahi Desai, Neha Kulkarni, Kayla Wallet, and Ryan Wells. The paper will be published under the Institute of Electrical and Electronics Engineers (IEEE) formatting. The team will present the final course content and platform at the Systems and Information Engineering Design Symposium (SIEDS) at the conclusion of a two-semester capstone course.

From lectures to textbooks to videos and games, the way college students absorb information is limitless. Online platforms are making learning enjoyable. Only 3% of 500 college students reported preferring to not have any interactive course materials ("Cellphones in School are Essential to Learning, Say Students", 2017). Education technology companies are adapting to the demand with educational apps as the third most popular app category for Apple users (Clement, 2019). With the continued rise of technologies implementation into the daily lives of every person, it is inevitable that traditional education will adopt personal technologies as an aid to instruction.

The Science, Technology, and Society (STS) topic will examine the ways digital educational technologies have transformed the way people learn. The research applies to the fields of higher education and technology developers. The paper is focused on researching learning technologies marketed towards college students and young adults and couple the psychological motivations of engagement with the interactions necessary for educational comprehension. In the United States, 96% of 18 to 29-year olds own a smart-phone ("Demographics of Mobile Device Ownership and Adoption in the United States", 2019). Equipping existing technology such as smartphones with educational apps and online content enables the user to learn about anything, anywhere. "…the learner has their own responsibility in learning, and realizes their own pace of learning according to their own style, which takes place in the context of a full co-operation and an opportunity for continuous self-evaluation" (Damyanov & Tsankov, 2018). Technology applications have the potential to provide a personal study space that, through a highly interactive environment, allows the student to have more control and personalized instant feedback. The personalization is a motivator for students to

remain attentive and responsive to progress. Traditional resources that are confined to in person classrooms, or "Formal Resources", and external online resources, or "Informal Resources", are both seen as necessary by the modern student (Wolfe & Cedillos, 2015). The codependence can be defined further with the aid of the Technology and Social Relationships STS Framework.
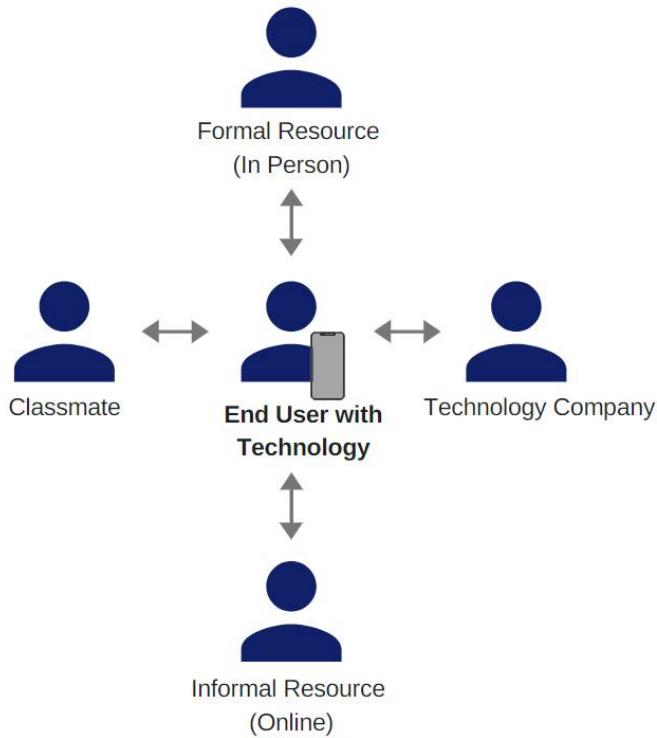

Figure 2: Modified Technology and Social Relationship Model: This model depicts the collaborative benefit from the relationships between the end user and influencers. (Adapted by Bedir from B. Carlson, 2019)

Figure 2 depicts the ongoing feedback driven relationship between the end user and actors that influence the knowledge gained.

Damyanov and Tsankov (2018) present their empirical study to provide some key insights on the engagement elements that contribute to the positive relationships that students have with their smartphones. 57.9% of the 14-18 aged respondents indicated that gamification is critical to their engagement (p. 138). The gamification structure of competitiveness and reward-based learning is a motivation technique that the authors imply could be improved in current education technology applications thereby including technology developers into the adaptation call for action.

User experience (UX) design is another critical aspect of the interaction between the student and the technology. In order to ensure attention, and maintain a positive experience, the

designer must take into account design principles that take the user's perspective (Nielson, 1994). Project specific UX research is an iterative process that continually makes changes based off of feedback from the end user. This relationship is depicted in Figure 2 with the end user associated with the technology company. Allowing the product's user to aid in engineering allows for the innovation to answer the precise needs that the diverse makeup of society is requesting through interpretive flexibility- the concept that social groups adapt the technology to meet their distinct needs (Bijker,Hughes & Pinch, 1987).

Further research into the psychology of engagement and the capabilities of technology allow for the dissection of the success of current applications that have caused the growth of online education, while also assessing the details where traditional classrooms prevail.

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