# THE EFFECT OF COVID-19 ON CONSTRUCTION LABOR PRODUCTIVITY AT THE STUDENT HEALTH AND WELLNESS CENTER

# THE EFFECT OF MEDIA REPRESENTATION OF COVID-19 ON THE CONSTRUCTION INDUSTRY

A Thesis Prospectus
In STS 4500
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In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Civil Engineering

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

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In January 2020, the People's Republic of China started noticing increasing cases of a virus called the coronavirus, also known as COVID-19, in the city of Wuhan (CDC, 2022). Initial concerns were muted but as cases rose and news agencies started reporting the outbreak, the government became increasingly concerned and started issuing lockdown orders to reduce the spread. Unfortunately, these measures were far too little, and far too late, and COVID-19 managed to spread to other countries. Fast forward to March 2020 and the virus had infected so many people that the World Health Organization declared COVID-19 a global pandemic (CDC, 2022).

COVID-19 has had a dramatic impact on global economic progress and industries, particularly the construction field (Iqbal, 2021). Millions of the construction workforce have felt the adverse effects of COVID-19 on industry performance and site productivity. With the latest exposure to high influence social media platforms, COVID-19 limited the performance of work across all skilled-labor trades and construction management for on-site progress.

The technical project and tightly coupled STS research project proposed in this prospectus directly address this issue. The objective of the technical project is to observe the impact COVID-19 had on construction labor productivity and develop a real-time productivity tracking system that factors in pandemics. The first semester will be focused on creating a data collection plan and performing analysis work to get quantitative results. During the second semester, the results will be used to develop recommendations for a better method of measuring and keeping track of productivity in the field. The STS research project will focus on obtaining information on various studies to evaluate the effect of media representation within the construction industry, which will consist of finishing my STS research project and writing a sociotechnical synthesis.

## IMPACT OF COVID-19 ON CONSTRUCTION LABOR PRODUCTIVITY

In the Spring of 2020, COVID-19 established itself as a global pandemic affecting industries worldwide (Prodanova, 2021). In particular, the construction industry suffered unique challenges such as unmet contractual obligations, material delays and shortages, and in some cases, government-mandated suspension of operations (Alsharef, 2021). During the onset of the pandemic, several projects around the University of Virginia's Grounds were affected; among them was the new construction of the Student Health and Wellness Center. The project was being constructed by Barton Malow, a construction firm based out of Southfield, Michigan. The project execution team encountered numerous hurdles during the pandemic, such as equipment delays, labor attrition, transportation issues, and lack of inter-trade coordination. As safety measures were being instilled, productivity and efficiency rates were reduced to ensure the protection of the workforce as the pandemic continued to progress (Alsharef, 2021). While safety is a top priority on every construction site, the shortages in the availability of personal protective equipment and non-compliant workers impacted the progress of projects.

In preparation for the next major global event that will significantly affect the construction industry, the examination of how the COVID-19 pandemic impacted Barton Malow's subcontractors, how labor productivity at the project site was affected, and what could have been done differently to preserve project continuity throughout the pandemic need to be conducted. From a metric standpoint, the productivity rate can be identified and presented graphically through data analysis. This presumed reduction in productivity rate can be corroborated through published journal articles and papers. Productivity rates reportedly suffered across the construction industry (Otrachshenko, 2022). The number of construction jobs dropped in correlation with spiked COVID-19 case as shown in Figure 1 on page 3.

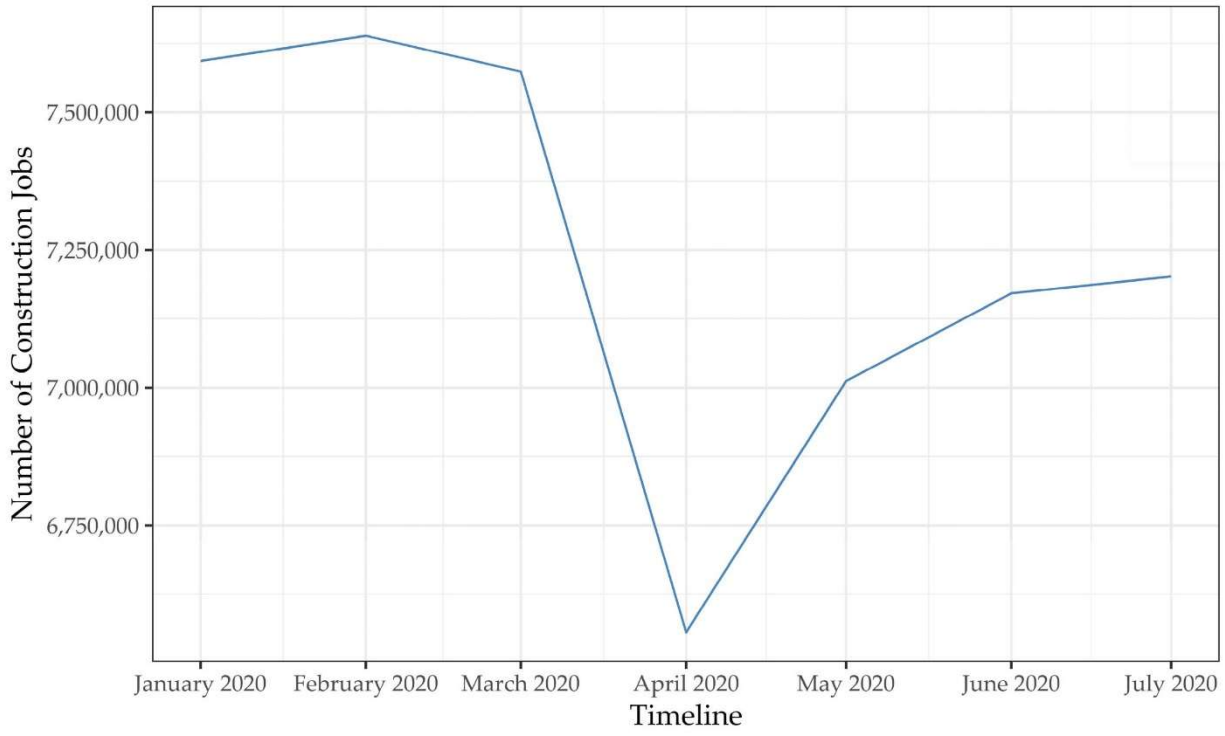


Figure 1: Construction industry employment data between January and July 2020. The number of construction jobs significantly dropped between March and May 2020. (Alsharef, 2021).

This project will require the analysis of Barton Malow's site documentation, which includes requests for information, submittals, specifications, monthly reports, schedules, and other documents. The team proposes to collect additional data from other relevant entities through interviews and site visits. The collected and analyzed data will be used to write a report summarizing our findings and creating a potential solution to improve construction productivity during future global market disruptions. In the Spring of 2023, the team will use the previous analysis to develop a better way to measure productivity in the field in order to provide Barton Malow with some recommendations to counteract the effects of a future pandemic/significant global event on construction labor productivity.

The technical project will be developed during the two-semester capstone class directed by Diana Duran and Matt O'Malley from the Department of Engineering Systems and

Environment. The first semester will be focused on creating a data collection plan and performing analysis work to get quantitative results. During the second semester, the results will be used to develop recommendations for a better method of measuring and keeping track of productivity in the field. The visualization of this two-semester capstone project can be seen in Figure 2. At the end of the second semester, it is expected to have a more efficient system that can be evaluated by Diana Duran, Matt O'Malley, and Barton Malow.

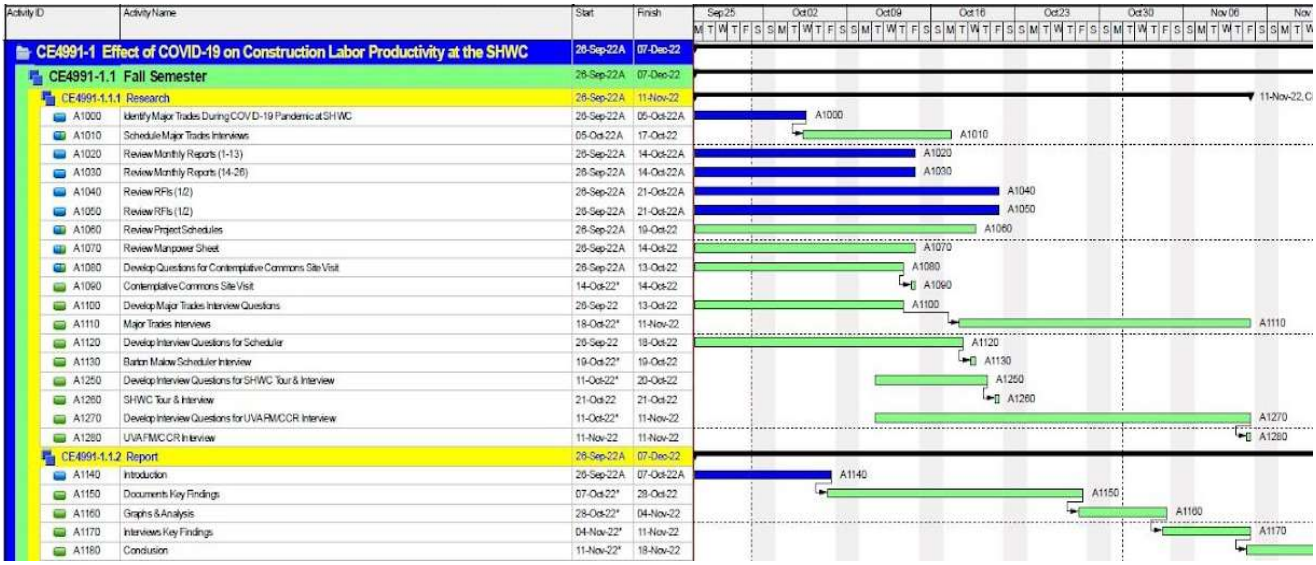


Figure 2: Gantt chart of COVID-19 effect on construction labor productivity. This figure visualizes the expected timeline for the major milestones and work progression on the technical capstone project. (Maleski, 2022)

## THE EFFECT OF MEDIA REPRESENTATION OF COVID-19 ON THE CONSTRUCTION INDUSTRY

With social media being one of the most rapid and impactful ways of obtaining and delivering information in the modern era, the spread of COVID-19 headed news articles worldwide (Ali, 2020). Being informed on prevalent societal topics is imperative to a working community. However, The World Health Organization has called attention to the "infodemic" that social media plays a dangerous role in amplifying the spread of misinformation (Cinelli,

2020). A survey study reveals that a large majority of adults obtained information about COVID-19 through social media as presented in Figure 3 below.

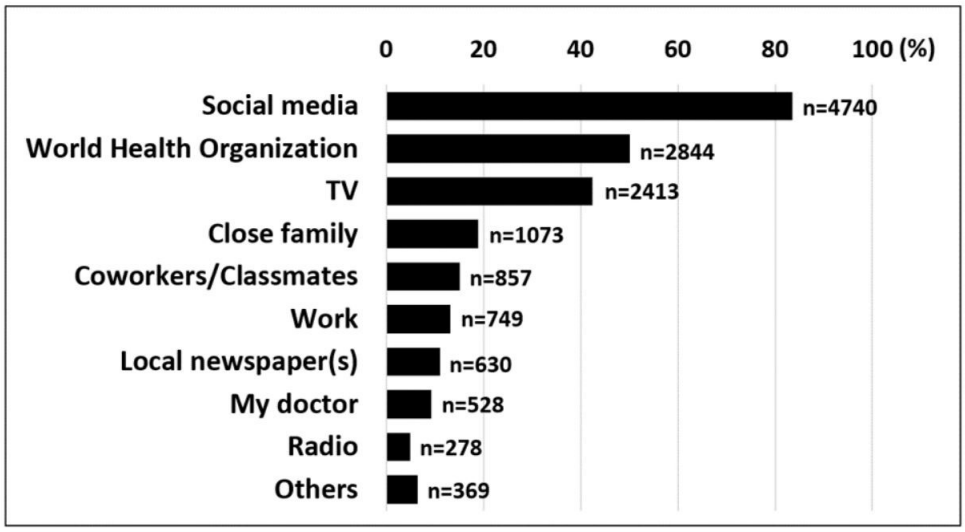


Figure 3: Sources of COVID-19 information. The trend reveals that a large majority of adults obtained information on COVID-19 through social media. (Ali, 2020).

Consequently, the construction sector has been highly disrupted by the spread of this misinformation by delaying and halting construction projects under development (Gamil 2020). In the construction industry, the skilled workforce is one of the most variable resources involved in projects. With the construction workforce being halted, schedules and costs are being negatively impacted across all projects (Ogunnusi, 2020). The construction sector represents a key component of countries' economies, approximately 13% of global GDP (Araya 2021). Through the misinformation on social media platforms, many organizations and leaders were quick to limit project and product progress.

The system in which media representation of COVID-19 can be examined through a view of Pinch and Bijker's framework of the "Social Construction of Technology" (SCOT) (Pinch and Bijker, 1987). The misinformation through the lack of communication with the parties involved can be demonstrated in Figure 4 below.

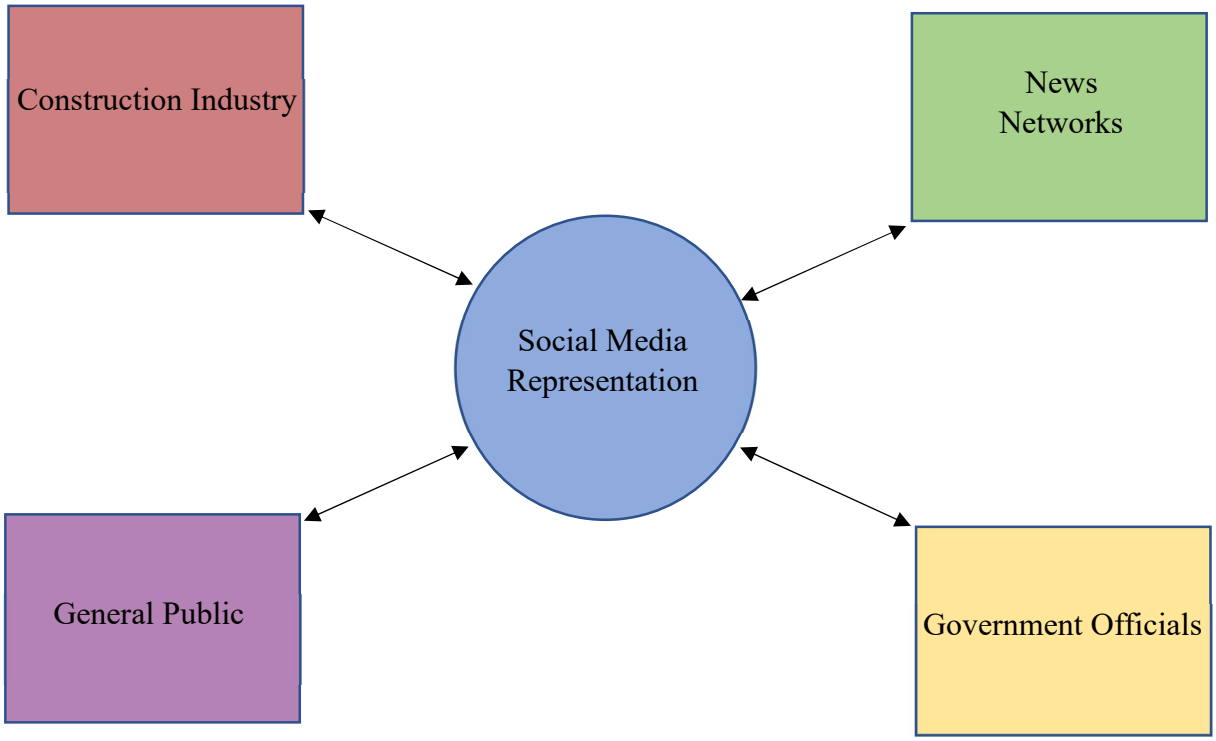


Figure 4: Current System of Communication: There is a lack of communication between parties with the use of social media. The lines connecting them to the issue do not overlap, which creates a barrier and major miscommunication between the parties. (Adapted by Alexander Maleski, 2022 from W. Carlson, 2009)

The Social Construction of Technology involves analyzing the development of technology as a process between relevant parties. As social media representation has grown over recent years, there are many relevant parties that can be associated with this technology in regard to COVID-19, such as the construction industry, government officials, news networks, and

general public. The stakeholders in Figure 4 reveal the missing overlapping links without the use of social media representation. This lack of communication results in misinterpretation between the groups, which can lead into misinformation. The use of the SCOT model will bridge that barrier of understanding where the major miscommunication occurs between all stakeholders. For this model, the news networks create reports on events happening across the country and uses social media to spread their voices whether true or false. The general public is observing the information that is on social media and make decisions on whether to believe it or not. The construction industry creates and follows policies from the given information on social media, which can result in the loss of many jobs and billions of dollars. The government officials try to regulate the information about COVID-19 on social media to properly inform all stakeholders. Through the SCOT framework, I plan on observing all stakeholders, their interactions through social media, and their interactions without social media.

The controversy of whether governments and organizations made the correct decision of shutting projects down is still up for debate (Cinelli, 2020). The misinformation on social media can be a contributing factor in the discussion of this topic (Bode & Vraga, 2021). Through analyzing published journal articles and papers, this factor can be determined from a societal standpoint. Being tightly coupled with the technical portion, the STS topic will focus on obtaining information on various studies to evaluate the effect of media representation within the construction industry.

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