

Mentoring in the Midst of the COVID-19 Outbreak in New York City

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Abstract

Confronted with the COVID-19 outbreak in New York City, Queens College and Queensborough Community College quickly transitioned from face-to-face to online instruction. Peer mentors working at both institutions continued assisting faculty in redesigned courses. The peers provided first-hand information about their experiences as mentors and as students enrolled in STEM courses and labs regarding the nature of the transition in STEM disciplines. Mentors responded to an online survey focused on: Basic demographic information (gender, race/ethnicity, etc.), how each mentor had assisted their assigned instructor during and following the transition, and the nature of the transition and its aftermath in the courses mentors themselves were enrolled. Demographic data and personal experiences during and following the transition were collected from 52 mentors via surveys. Additional information was collected from 8 of those mentors through a panel presentation discussing their experiences during the campus shutdowns. During the transition, mentors assisted faculty by helping them use video conferencing technology, by holding office hours, and by meeting regularly with faculty to plan weekly online activities. Responses revealed tremendous variability in mentors' perceptions of their own online course experiences. Prior research demonstrates that both mentors and the students they assist are helped by the mentoring experience (Johnson et al., 2019). This study highlights mentors' contributions assisting institutions confronted with a public health crisis and the valuable insight they provide institutions, not only about problems that arise in responding to the crisis, but also about best practices developed by individual faculty and their student mentors. This research was supported by Department of Education grant PO31C160208.

Literature Review

Natural experiments, in which unanticipated events impact human lives both in dramatic and, more often, subtle ways, have been an important component of the scientist's research toolbox for almost two centuries. At least since John Snow, the father of epidemiology, surmised that the Broad Street pump might be the source of a deadly cholera outbreak in London, disabled it and stopped the outbreak, scientists have appreciated the importance of unusual, sometimes traumatic situations as rich sources of information about the world and its impact on our behavior (Davey, 2002).

As Craig and his colleagues (2012) emphasized, natural experiments are important, "because they widen the range of interventions that can be usefully evaluated beyond those that are amenable to planned experimentation" (p. 1182). Then, too, the case for employing such a natural approach is best justified when there exists some reasonable expectation of learning something about us that would not be possible or allowable through controlled experimentation.

For example, research by Johnson and his colleagues (2002) employed a natural experimental paradigm to explore the impact of the 9/11 attacks on substance abuse and mental health. To do this they utilized a recently developed data collection system to examine information about admissions to substance abuse treatment centers in New York and four other major metropolitan areas before and following the attacks (Johnson et al., 2002; Johnson & Richter, 2007). Contrary to predictions, the overall pattern of results indicated that the September 11th attacks did not have an immediate, negative impact on the mental health of clients entering substance abuse treatment. In fact, in some major metropolitan areas such as New York, clients entering treatment shortly after the attacks reported lower levels of psychological disturbance compared to those entering before the attacks. Such unexpected outcomes are one of the primary rationales for conducting natural experiments when they arise since they can yield counter-intuitive outcomes.

Though the timing of a natural experiment is unpredictable, when one arises, it is critical to take advantage to answer both real and immediate research questions. The recent COVID-19 outbreak in New York City presented just such a unique opportunity to explore the impact of this health crisis and its related disruptions in educational delivery systems on students involved in STEM-related educational pursuits. More specifically, this research investigated the impact of the mandated transition from traditional face-to-face class instruction to online instruction on the educational experiences of undergraduate students enrolled in introductory STEM courses.

In so doing, this study sought to examine some of the immediate impacts of the COVID-19 crisis on the STEM education of college students at a four-year and two-year college in the New York metropolitan area, a region particularly hard hit in the early spread of the virus in the United States. To understand the true and immediate impact of this crisis as it affected students generally and students enrolled in STEM courses and majors, it was critical that the data be collected as quickly as possible. As with the aftermath of the 9/11 attacks in New York, the collection of real-time information is imperative in such instances to capture its immediate impact(s) (Johnson et al., 2002).

Previous research with peer mentors demonstrates that having mentors in class facilitates the learning of other students (Asgari & Carter, 2016). Research also demonstrates that while mentoring benefits other students, it also provides benefits for the mentors themselves in terms of career development and a broad-range of educational experiences (Amaral & Vala, 2009; Johnson et al., 2019; Nava et al., 2019). Additionally, studies demonstrate the salutary impact of mentors in specific STEM areas including engineering (Dennehy & Dasgupta, 2017) and chemistry (Amaral & Vala, 2009) and in professional training such as medical school education (Taylor et al., 2013).

Supported by Department of Education funding to enhance the proportion of under-represented minority students graduating with STEM degrees, our previous research focused on the redesign of introductory STEM courses and the deployment of peer mentors to randomized course sections to assist faculty and enhance the learning of students in their assigned sections. The current study highlights the unique contributions mentors made assisting higher education faculty and administrators confronted with a public health crisis. It further explores how the mentors themselves became valuable sources of information for these institutions, not only about problems that arise in responding to the crisis, but also about best practices developed by individual faculty in collaboration with their student mentors.

Methodology

Respondents

Fifty-two mentors, 13 from Queensborough Community College (25%) and 39 from Queens College (75%), participated in an online survey at the conclusion of the Spring 2020 semester. Fifty-six percent of mentors identified as female and 44% as male. In terms of their self-identified racial/ethnic breakdown: 9% identified as African-American, 12% as Asian-American, 27% as Caucasian, 12% as Hispanic, 9% as Middle-Eastern, 6% as other and 25% as Southeast-Asian. 86% indicated that they were currently majoring in a STEM discipline (Table 1).

Table 1: Demographics of Peer Mentor Survey Respondents.

QCC	25% (13)
QC	75% (39)
Female	56% (29)
Male	44% (23)
African American	9%
Asian-American	12%
Caucasian	27%
Hispanic	12%
Middle-Eastern	9%
Southeast-Asian	25%
Other	6%
STEM majors	86%
Non-STEM majors	14%

Additionally, a panel was convened for the annual summer redesign workshop to discuss their recent experiences as mentors and students and to respond to faculty questions virtually. Eight mentors participated in this panel for STEM faculty to learn about the student experience during the distance learning transition.

Procedures

During the spring 2020 semester, peer mentors were assigned to assist faculty in the following disciplines: Biology, Chemistry, Computer Science, Environmental Science, Geology, Math and Physics. Confronted by the COVID-19 outbreak in New York City, Queens College and Queensborough Community College quickly transitioned from face-to-face to online instruction in mid-March. The administrative team working with peer mentors through a federally-funded Department of Education HSI-STEM research grant asked mentors to continue assisting faculty following the transition and to provide first-hand, student information regarding the nature of the transition in STEM disciplines at both institutions.

An online survey sent to mentors collected three types of information: Demographic data, the ways in which project-associated faculty used their assigned mentors to assist them in the transition from face-to-face to online instruction and the ways in which the classes these same mentors were enrolled in as students conducted the transition and its aftermath. Surveys were distributed to mentors work-

ing on the project near the conclusion of the spring semester.

The mentor panel consisted of 8 mentors who had participated in the project during and following the transition. The panel was created to provide instructors involved in the project to learn from mentors about their work as mentors and their perspectives as students enrolled in various STEM courses during and after the transition. The panel session occurred during the afternoon of the first day of two-day HSI-STEM workshop held within two weeks of the end of spring semester in June 2020.

Findings

Survey responses revealed that most mentors (92%) were contacted by the instructor they assisted before the campuses shut down. In the initial weeks following the campus shutdowns, mentors described assisting faculty in the following ways: Teaching them how to use Blackboard Collaborate Ultra, Google Hangout, and Zoom to conduct class sessions, holding additional office hours for students, meeting regularly with faculty to plan weekly discussion boards or online activities, and managing discussion board assignments. They also chose these survey responses as additional activities they engaged in during the transition period:

- Discussed ways to increase online student engagement.
- Assisted with technology questions.
- Acted as 'guinea pigs' for faculty lectures or presentations to provide constructive feedback.
- Acted as online moderators during synchronous classes.
- Responded to student questions on chat while instructor lectured.
- Helped students and professors maintain contact.
- Helped conduct a mock session of the class prior to the online transition.
- Helped to come up with project alternatives to testing.
- Helped set up virtual labs.

In their own words in response to the question, "Describe specifically how you helped transition the course to online," individual mentors stated:

"I worked closely with the professor to figure out possible options/ways to continue with the class online. I helped the professor test Blackboard Collaborate [Ultra]. I was available at all times throughout the week to communicate with students via email and I provided a Google Voice number where I also spoke with students via phone. I communicated with the students via Blackboard Collaborate [Ultra]. I helped organize the groups and worked on Think-Pair-Share group activities via Blackboard Collaborate [Ultra] that the professor set up."

"We created several discussion forums on Blackboard which students really utilized and corresponded with students through emails as well. We also helped Dr. C brainstorm alternative ideas for exam 3 and final assessments that would replace a real test which is difficult to proctor online, and harder for the students to do from home since it is timed. Instead, the students did team projects for these last two exams, solving problem sets together and providing context and accompanying figures for the problems they chose."

"I met with the professor to discuss strategies for the best way to present content virtually as well as how to most effectively interact with the students and how to maintain the group work aspect of the course. He was very receptive to the ideas of the peer mentors because we had no precedent to work off of. We came up with solutions for creating and sharing content videos, managing a discussion forum for students' questions, and creating group assignments that would act in place of traditional exams, which we decided to be unsuitable for the online course format."

"I offered my office hours online via Gmail and Google Hangouts. I joined the Blackboard Collaborate [Ultra] sessions with Dr. N and when he divided the students into groups, I went to each group asking them for any help they required and interactively engaging with the students of Bio 201 lab."

"I demonstrated various online teaching systems to help the instructor choose the best fit. Helped train [the] instructor to use components of the various online teaching systems. Assisted with Blackboard administration including but not limited to: organizing links, creating new sections, populating sections, collecting class data, creating Google Sheets for collective class information, displaying class notes/editing notes/uploading for students, recording lectures for students who missed lecture requested, facilitated chat function for students, assisted with any issues with online onboarding. Assisted with facilitating online class meetings such as presenting slides/notes and creating groups within Blackboard Collaborate Ultra."

In addition to the information provided by mentors regarding how they helped the instructors to whom they had been assigned, surveys also queried mentors regarding how successfully the STEM classes that they were enrolled in for the spring semester had transitioned from face-to-face to online instruction. Mentors' responses revealed tremendous variability mentor's perceptions of how successfully their own classes had navigated the transition and managed online instruction.

- 50% of mentors were enrolled as students in a science lab class.
- 46% felt the online labs worked.
- 42% felt the online labs were not successful.
- 12% had mixed feelings - especially when they were in more than one lab class.

- 57.6% of mentors indicated that they preferred synchronous sessions in which they were able to ask questions and interact with professors/classmates and in which they felt greater accountability and more structure to their lives.
- 42.4% of mentors preferred asynchronous sessions which enabled them to work at their own pace and revisit lectures as often as needed. Also, mentors felt fewer technical issues arose in asynchronous classes.

Results from the mentor panel held during our summer course redesign workshop elaborated on some of these same themes while also introducing unique insights. Careful examination of the panel discussion notes indicated that a number of mentors felt that a balanced approach to online instruction that provided students with an opportunity to pause and continue lectures was important. However, mentors also felt that effective instruction required ample opportunities for students to interact with faculty and other students. Mentors also indicated that they often acted as the bridge between students and faculty and that office hours and check-ins with students helped maintain or enhance student course engagement. In addition, mentors indicated that they were able to monitor and manage the chat function on video conferencing sessions (like Google Meet) while the instructor focused on the lecture content. In this way, mentors responded immediately to student questions, but were also able to alert faculty when a number of comments focused around a specific lecture topic.

Faculty also employed mentors as 'guinea pigs' to try out new lectures or the use of new online tools with Blackboard Collaborate Ultra that they were not familiar with. They also assisted in responding to various assessment approaches and provided feedback regarding the ease or difficulty of various testing formats. Instructors who used mentors in this way indicated it helped them refine their lectures and assessments.

In response to faculty questions regarding individual student's personal lives as they coped with the unfolding pandemic, mentors indicated that a number of students coped with COVID-19 directly as either they or their family members contracted the illness and, in some instances, family members died. Mentors felt that their own willingness to have open, frank dialogue with fellow students about such events was therapeutic for both groups and, once again, helped maintain student engagement with their courses. Many faculty members had also engaged with their students similarly and mentors felt that in so doing, had been "humanized" in their students' eyes, reinforcing that they were all in this together.

Interestingly, while some mentors felt there was less interaction with students following the transition and far less class discussion, other mentors and some faculty as well felt that the anonymity associated with online instruction allowed some students, especially those reluctant to speak out in face-to-face classes, to become more comfortable asking questions and participating in class discussions.

With respect to courses mentors were enrolled in, a number of interesting insights were put forth. For example, while mentors were almost equally divided on whether they felt online labs were successful, some emphasized that trial runs for the use of new equipment or lab activities was essential to their ultimate success with students. A number also emphasized the value of the breakout groups available with Blackboard Collaborate Ultra in which the moderator could jump in and out of groups while monitoring participation and the quality of the discussion. Mentors felt this approach made the online experience more similar to an actual face-to-face classroom.

One final point with respect to virtual labs was the difficulty involved in moving from a real-life, three-dimensional lab experience such as a frog dissection to a two-dimensional video depiction. This was a major challenge in various disciplines and particularly problematic for a geology lab, where tactile interaction with various rocks and minerals is considered essential for learning disciplinary content. To overcome this obstacle in future geology labs, should classes remain online, specimen kits will be purchased and placed on reserve in the library where students will be allowed to check them out and interact directly with the materials.

Conclusion

The current research highlights the varied ways mentors assisted faculty forced abruptly to transition to online instruction in response to the pandemic outbreak in New York City including: Providing their technical expertise and assisting faculty working with students on online platforms such as Blackboard, Google Hangouts/Meet and Zoom. Then, too, the present study reveals how mentors themselves became valuable sources of information regarding the classroom practices of STEM faculty forced to make such a transition with regard to lectures, but also importantly with regard to laboratory instruction. Of particular note was the sense on the part of multiple mentors that their involvement with students helped the students to maintain engagement with their courses and/or to become more involved in their remote classes.

This point is particularly germane in light of the results of a recent survey sponsored by the Education Trust that sampled students in New York State, the epicenter of the early COVID-19 outbreak in the United States (<https://newyork.edtrust.org/covid-19/#learn>). In general, responses to the survey indicated that, "Students nationwide face widespread uncertainty and a profound sense of disconnection from their usual supports..." It may be that the presence of peer mentors in classes provide an important and essential antidote to counter this disconnectedness and, thereby, to enhance students' academic engagement during an unprecedented, national health crisis.

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