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TEACHING AND LEARNING EXCELLENCE THROUGH SCHOLARSHIP

TALES

An open access journal published by the Community College of Baltimore County for the advancement of higher education through research.

IN THIS ISSUE

Tales

INFORMATION AND CONTRIBUTERS

Founded in 2020, Teaching and Learning Excellence through Scholarship is an open-access, peer-reviewed academic journal published by the Community College of Baltimore County. The inaugural issue published in August of 2021 and was recognized with a 2021-2022 Innovation of the Year Award from the League for Innovation in the Community College. TALES is focused on the scholarship of teaching and learning in higher education, especially at community colleges.

CALL FOR SUBMISSIONS

TALES is seeking article submissions for the 2023 issue. Please submit submissions directly to Robin Minor, rminor@ccbcmd.edu.

For author instructions and a template for articles:
https://tales.journals.publicknowledgeproject.org/

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LETTER FROM THE

Editor

Welcome to the second issue of *Teaching and Learning Excellence through Scholarship from the Community College of Baltimore County* (TALES from CCBC, or TALES)! As with any sophomore release, there are jitters about living up to the first. For *TALES* this was no short order – the first issue featured strong content written by articulate authors that was honed by our dedicated peer reviewers and presented professionally by our dedicated editors and CCBC's Creative Services. These efforts led to crucial support from President Dr. Sandra Kurtinitis, who funded a print release of the first issue. Provost and Vice President of Instruction Dr. Joaquín Martínez has further given *TALES* its most necessary and practical gift, funding for our publishing accounts so we can continue to release open-access content to you free of cost. Achieving this level of professional production in a year was no small feat; in fact, *TALES* received an award from the League for Innovation in the Community College for the inaugural issue!

This second issue not only lives up to the first, it surpasses it. For this issue Michael Hands led a team of peer reviewers that represented each academic school at CCBC. We met our goal to broaden beyond CCBC as well; this issue contains articles authored by colleagues at Montgomery College and Wor-Wic Community College. Such inclusivity improves the journal by making the discussion about best practices in teaching and learning span all of CCBC and also regional colleges so that we can learn from the insights of others while we share our own. To this end, *TALES* should publish diverse articles within the scope of best practices in higher education, and we are excited that this issue contains a new section of "Featured Tales" under the lead editorship of Jeremy Caplan. The authors of these articles elaborate on larger initiatives that have been undertaken to support women in technology at CCBC, and a collaboration between faculty at Montgomery College using open software to enhance digital course content. As you read these and the other insightful research articles in this issue, you may appreciate the appealing new design of our PDF files thanks to the professional work of David Zobel, the newest member of *TALES*' team of invaluable volunteers.

Where does *TALES* go from here? Now that we meet the prerequisite for having published multiple issues, *TALES* will apply for inclusion in the Directory of Open Access Journals. Having a broad readership is half our mission; having a broad body of published content is the other. You can help us with both! Please, register to be a TALES reader here, and also submit an article that shares your insights into best practices in teaching and learning. Your involvement is valuable to us and we'd like to hear your tale.

Until the next issue,

Robin K. Minor, PhD | rminor@ccbcmd.edu
Editor-in-Chief
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INVITED PERSPECTIVE

From the Performing Arts and Humanities Department, School of Arts and Communication, Community College of Baltimore County, Baltimore, Maryland.

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Entangled Education:

How Time, Connection, and Variety are at the Root of Lifelong Growth.

The following are some of my reflections on the Philosophy Matters Cohort, for which I received the 2020-2021 League of Innovations Award for Teaching Excellence. Throughout the reflection, I use the pronoun "we" to reflect the collaborative nature of the activities as well as to credit my colleague, Dr. Michael Walsh, who provided immense support in both planning and moderating a number of the activities.

Mycorrhizal Metaphors and the Wonder of Entanglement

One of the many tragic aspects of growing up is the wearing away of wonder. Weary with the world, what was once phenomenal becomes merely phenomena, and once profound questions become quotidian. Perhaps we become numb, calloused by the daily toil of life; or perhaps we simply know too much about the world and our humility hardens into hubris.

There are many other explanations, to be sure, but whatever the cause, the result is tragic: the erosion of wonder is a death knell for lifelong learning, suppresses gratitude and humility, and is spiritually and existentially enervating. What's more, most people do not even notice the atrophy; in fact, I'd argue that they mistake it for strength – no more wonder means no more unknowns; the world has thus been understood, one knows one's place, and one can live out one's days in comfort.

Unfortunately, my story is no different. As I reached adulthood, my wonder began caving under the weight of my convictions and the busyness of life, and nothing seemed inspiring – just problems yet resolved. As a result, I found myself viewing the world as a lab to be analyzed rather than a labyrinth to be explored. I had forgotten what made me want to learn.

However, this all changed about 7 years ago. While reading Peter Wohlleben's The Hidden Life of Trees (2015), I came across one of the most profound facts I've learned about our world: the mycorrhizal network, otherwise known as the "wood wide web." For those unfamiliar with the mycorrhizal network, it refers to the collection of mycelia, or fungal filaments (the underground portion of mushrooms), that enter into symbiotic relationships with various tree roots. The term comes from combining "mykes" (fungi) with "rhiza" (roots), which is quite apt: the roots and fungi are literally bound up and entangled with one another – and for mutually beneficial purposes (Sheldrake, 2020). The fungi provide water, nitrogen, phosphorous, and micronutrients for the tree, and the trees provide photosynthetic sugars to the fungi (Wohlleben, 2015). Their entanglement literally sustains them and provides the conditions necessary for forest ecosystems to flourish as they do. And what's more interesting – they are so entangled it is impossible to determine where one ends and the other begins. Upon inspection, the boundaries blur, and one realizes that to understand any one thing requires the exploration of a vast network of diverse connections (Sheldrake, 2020).

Mycorrhizal Metaphors and the Wonder of Entanglement cont.

More importantly, in addition to being profoundly interesting, this "entangled world" is also profoundly inspiring and instructive. Here, I thought, was a panacea to the disconnection, lethargy, and disillusionment plaguing our personal lives and society. The mycorrhizal network reveals how the foundation for a flourishing forest is characterized by interconnectedness, interdependency, diversity, exploration, and time. Importantly, it is not comprised of mere individuals; the beings therein are not singularly focused on their individual success; it is not some grand monoculture to maximize yields; it is not some superhighway to maximize efficiency; and it is not something quickly accomplished. Rather, it represents a model of success built upon the foundations of connection, variety, exploration, and time. This is why in his book, Entangled Life (2020), biologist Merlin Sheldrake encourages us to ask, "what would happen if we thought in the logic of mycelia, imagining the relationships of things in terms of involution and entanglement rather than separation and distinction?" (Miller, 2021). In his view, this would lead to a shift in how we approach our problems, our solutions, and our conceptions of success.

Like Sheldrake, the mycorrhizal network has become the metaphor through which I view most, if not all, things in this world. For example, look at concepts: in order to make sense of any one thing, you have to follow all of its connections to everything else, and only then will you realize you can't actually ever disentangle that one concept from many others. We live in a world of "webs" – relational networks that constitute our identities, our histories, our environments, and our conceptual landscapes.

It was this conceptual metaphor that I had in mind as I began reflecting on the success of the Philosophy Matters Cohort at the Community College of Baltimore County (CCBC). For, throughout the series of activities, we always emphasized the importance of collaboration and consensus, engaging with a variety of people, ideas, and experiences, and the importance of sustained engagement over a period of time. As a result, it seems to me that the success of the Philosophy Matters Cohort was largely due to the implementation of what I would call "entangled education," which is what I'd like to elaborate on below.

Creating an Environment of Sustained and Varied Activities

Because I will elaborate on each of these in the following pages, here is an overview of the experiences and activities in which the Philosophy Matters Cohort participated:

Philosophy Matters Cohort Series of Activities		
Activity	Semester	Commitment
Philosophy Club	Fall and Spring	Fall: biweekly – 2 hours Spring: weekly – 2 hours
Summer Reading Group	Summer	Weekly – 2 hours
Ethics Bowl	Fall	Weekly – 2–3 hours + All-day tournament
Ethics Week / Guest Lectures	Fall and Spring	Hour-long presentations
CCBC Humanities Conference	Spring	Presentation planning + Conference attendance
Professional Academic Conferences	When available	2–4 sessions at conference
Philosophy Classes	Ongoing	15-week semester

As this table reflects, we were able to create a learning environment that spanned a 1.5–2.5-year period (depending on students' interests and academic progress). Throughout this time, we offered a variety of overlapping activities that engaged with different disciplines and developed different skillsets. Importantly, we were able to maintain a cohort of students throughout the series of activities. As a result, this sustained entanglement of diverse activities appears to have created the conditions for deeper and more comprehensive learning, stronger social bonds, and higher overall engagement.

The Value of Time, Connection, and Variety

One of the most important aspects to a thriving ecosystem is time. Similarly, one of the most important elements of the Philosophy Matters Cohort was the regularity of contact over a sustained period of time. As shown above, students were engaged in coursework as well as varying activities throughout the year. At no point during their time in the cohort were they "on their own" or "just taking classes;" they were continually involved in a community in which they had the opportunity to discuss a wide variety of topics in an informal setting. This allowed for the implementation of spaced learning, retrieval exercises, and interleaving, thus providing them not only the space needed to explore new topics and questions, but, more importantly, the time to digest and to practice applying what they were learning to a variety of issues (Lang, 2016). For example, students may first encounter the topic of mercy killing in an ethics class to learn the terminology and the common perspectives; then several months later they may discuss it in Philosophy Club in an open and exploratory fashion, pulling from all relevant subjects; and then they may revisit it again the following semester through the lens of ethical debate, researching not only the morality, but also the legality of the issue. Discussing the same content in different ways over the course of 2 or more semesters both reinforced the content and allowed our students to examine and reflect on it in different contexts, as well as provided them the opportunity to develop different skills in the process.

As we reflect on the concept of thriving and flourishing, this should be obvious – time is essential. However, in a culture that rewards convenience and efficiency, and where prolonged time spent in college is seen as a burden and a barrier, it is becoming increasingly difficult to convince others of this point. Yet, we still require doctors to go to years of school before they can practice; an electrician works as an apprentice for nearly a decade before becoming a master electrician; athletes and musicians need to practice every day for many years to thrive at what they do; and we regularly abide by the principle that "change doesn't happen overnight." Why, then, do we expect students to learn important concepts in 1 semester, let alone an accelerated winter or summer semester? Flourishing entities – whether people, systems, or forests – need time to root, to form connections, and to grow.

The Value of Time, Connection, and Variety Cont.

Of course, 2 years can be daunting for students. For this reason, it was never presented to students as a 2-year program, and we did not require students to participate in every activity. Despite that, the majority of our students were involved in all activities because, I believe, they became immersed in the process. To borrow from Friedrich Nietzsche (2006), "one day we attain our goal – and then refer with pride to the long journeys we have made to reach it. In truth, we did not notice that we travelled. We got into the habit of thinking that we were at home in every place." The key to completing a long journey is finding a home in each moment, and I believe that is why our cohort thrived. Put more academically, the key to retention was – and is – de-emphasizing the goal. Retention requires engagement, and engagement is immersion in the present.

So how did we foster engagement? Put simply, we sought to build connections to each other and to thematic content. It was important for us to establish a community of trust and accountability before discussing contentious or personal topics. Therefore, we began with "core values" ice-breaker exercises, which allowed us to broach sensitive topics in an enjoyable and interactive manner. Moving forward, we always provided ample – and sometimes the entire – time for conversations about anything on our minds. In addition, we arranged our topic schedules collaboratively, and took a consensus-based approach in our Ethics Bowl practices while working towards our team's position. Building connections between the members of the cohort established both accountability and trust, and with the help of time it grew into a community of mutually supportive friends. These foundational connections were the key to the strong bonds they developed and the success they found both personally and collectively.

A second way we hoped to foster engagement was by connecting students to a variety of content and activities. To do this, we adopted an approach to learning that was inquiry based and exploratory: after raising a philosophical question, we would utilize Socratic questioning to identify the numerous related issues that also had to be addressed in the course of responding to the initial question. That is, we adopted a "where does this lead?" approach to our thinking. For example, to explore the question, "should we be vegetarian?" we had to traverse the entangled topics of climate change, food deserts, labor, government subsidies, personal health, public health, the economy, and many more beyond – otherwise the inquiry would be incomplete. By emphasizing the connections of different topics and the importance of exploratory inquiry, students cultivated an ability to "map out" the overlapping and intertwined "networks" of ideas. Similarly, the students both attended and led a presentation at the CCBC Humanities Conference, which was an event that reinforced our interdisciplinary approach due to all breakout sessions being led by either faculty from 2 different subjects or by a faculty-student collaboration.

Lastly, in the Summer Reading Group, we would choose a different region or theme every year (2017: Existentialism; 2018: Latin American Literature; 2019: Japanese Short Stories) to discuss how universal philosophical problems arise and how people approach them in a variety of contexts. This allowed us to transcend the limitations of any one subject and instead explore questions in their "natural habitat," surrounded by and connected to an endless family of connections. This had 2 benefits: first, the exploration enabled students to find the topic or subject about which they were passionate, thus increasing their engagement. Second, it cultivated a way of seeing the world in terms of connections rather than divisions, which not only better enabled them to work collaboratively, but also provided them a conceptual framework for better examining questions and ultimately understanding the world.

These efforts proved to be a resounding success. The students – the majority of whom were dealing with personal issues and who had struggled completing their Associate of Arts degree – became invested in the cohort, the content, and the college.

Academically, they honed their skills in reading, researching, writing, speaking, and collaborating, thus leading to improved academic success, which was reflected in markedly higher GPAs and eventual transfer or graduation. Moreover, their engagement in our cohort increased their involvement elsewhere at the college – just like that mycelium entangling itself with a number of different entities, they recognized the value in fostering connections and sought to build them wherever possible. Ultimately, emulating the blurred boundaries of those beings below ground, we connected our cohort to a number of people, activities, and topics that, with the help of time, ultimately strengthened their learning, their bonds, and their outlook on life.

A Person is a Person Through Other Persons

In describing the South African philosophy of ubuntu, Archbishop Desmond Tutu teaches us "a person is a person through other persons, that my humanity is caught up, bound up, inextricably, with yours" (Desmond Tutu Peace Foundation, 2013). Unfortunately, Archbishop Tutu felt it necessary to redefine what it means to be a human because individualism and disconnection have become pervasive features of our world and, as a result, people seemed to have forgotten our essential entanglement. Whether personal, social, historical, or spiritual, there seems to have been a breakdown in both community and existential purpose. Unsurprisingly, this has also affected higher education in the form of siloed schools and struggling students. And, as parts of this web, it has also affected my students and me. However, what we learned throughout our experience in this cohort was that it does not have to be that way. By embracing the conception of people and ideas as embodied and entangled, we can reaffirm and reestablish the value of community, the value of exploration, and the importance of regular contact. And in doing this, we can restore the connections that are necessary for one to thrive and flourish as a human being.

References

1. DesmondTutu PeaceFoundation. (2013, August 30). Ubuntu: *The Essence of Being Human* [Video]. YouTube. https://www.youtube.com/watch?v=44xbZ8MN1uk

2. Kimmerer, R. W. (2013). *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants.* Milkweed Editions.

3. Lang, J. M. (2016). *Small Teaching: Everyday Lessons from the Science of Learning.* Jossey-Bass.

4. Miller, V. (2021, July 28). "Mushroom as Metaphor: Entangled Life." *Commonweal Magazine*, *148*(7). https://www.commonwealmagazine.org/mushroom-metaphor

5. Nietzsche, F. (2006). *The Gay Science* (T. Common, Trans.). Dover Publications. (Original work published 1887)

6. Sheldrake, M. (2020). *Entangled Life: How Fungi Make Our World, Change Our Minds, and Shape Our Futures*. Random House Books.

7. Simard, S. (2021). *Finding the Mother Tree: Discovering the Wisdom of the Forest.* Alfred A. Knopf.

8. Wohlleben, P. (2015). *The Hidden Life of Trees: What They Feel, How They Communicate*. Greystone Books.

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FEATURED TALES

Grassroots Efforts to Provide Support and Opportunities for CCBC Women in the Technology Field

By: Wendy Chin, MS, and Vinitha Nithianandam, MS

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Supporting Open Education through a Coordinated Network of Support

By: Paul D. Miller, EdD, and Michael A. Mills, EdD

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WOMEN

IN TECHNOLOGY

Wendy Chin, MS; Vinitha Nithianandam, MS

OUR VISION

FOR STEM SUCCESS AT CCBC

We, Professors Wendy Chin and Vinitha Nithianandam, both who teach technology courses at the Community College of Baltimore County (CCBC), had a vision. This vision was to attract more women into the technology field and keep them enrolled in technology courses through graduation or transfer. We sought to do this by creating the CCBC Women in Technology Support Group. This group was founded in 2017. Our CCBC Women in Technology program brings female students with a shared love for science, technology, engineering, and mathematics (STEM) an opportunity to come together to participate in various events. These include free workshops and lectures, attendance at social events, and the ability to network with successful women in the profession. This grassroots effort is an ongoing process and continues to evolve and bring awareness, retention, advancement, and support to female students in academic pursuits and professional careers in the STEM fields.

WOMEN CONTINUE TO NEED ENCOURAGEMENT TO ENTER STEM FIELDS

Women make up less than 25 percent of the STEM workforce in the United States. Data from the US National Science Foundation shows that between 2006 and 2019, the number of women graduating with a degree in computer science declined. Some of the reasons females participate in STEM fields at lower rates than their male counterparts include lack of encouragement, active discouragement, and lack of female role models. There has been an increase in awareness of this ongoing role model issue. The incredible success of movies like Hidden Figures, which tells the story of several African American women working at NASA in the 1960s whose work in engineering and mathematics helped put the first humans into space, enables females to not only see how women have contributed to STEM, but to see themselves in that role.

Diversity in the workplace improves performance, morale, and the product. Individuals from different genders, races, backgrounds, and experiences bring different perspectives that can lead to innovative solutions. More women in STEM may mean anything from working in the cybersecurity field to mitigate cyberattacks such as ransomware to improving software that can service society and everything in between.

HIGHLIGHTS

OF CCBC'S WOMEN IN TECHNOLOGY GROUP ACTIVITIES

CCBC Women in Technology began in January 2017 with efforts from both Professors Chin and Nithianandam. We organized monthly meetings at both the Essex and Catonsville campuses and invited successful females from industry and government in the engineering/technology fields. Our guests were from high-tech companies, military, and government entities. They were invited to meet with CCBC female students to provide inspiration by sharing their experiences working in a male-dominated field. Listening to the stories of successful females in technology helped to motivate our female students.

The responses to the questions revealed that our attendees wished to meet monthly, host speakers, go on field trips, social events, and have a mentor. We averaged approximately 15–20 attendees when our meetings were held in person. Once we hosted hybrid events, our attendance increased to an average of 20–25 attendees. Our largest attendance was during the fall of 2021 when we hosted a student alumni panel that was held in a hybrid format. We had over 60 attendees, both male and female students, who attended either in person or via TEAMs. We had 4 female alumni and a moderator from our advisory board. This event was a great success.

In the fall of 2017, we invited guest speakers from the Million Women Mentors Programs, systems engineers from both Hewlett Packard and US CYBERCOM. We took a few students to the 4th Annual Women in Cyber Security Reception on October 17, 2017 at Columbus Center in Baltimore, MD. In 2018, we invited speakers from Lockheed Martin, Edwards Performance Solutions, IntelliGenesis, and Under Armour. We held a resume writing workshop, took 5 students to the Women's Leadership Conference in Virginia, and held a year-end celebration to recognize our mentors and celebrate our graduates.

The CCBC Women in Technology Group started a mentorship program is 2018. We had 4 industry mentors and 5 female CCBC faculty mentors. Each mentor met with their mentee monthly and provided guidance and support to the students. We shared our success with the CCBC Women in Technology program at the annual Cisco Regional Conference held at Towson University in October 2018

During the Women in Technology meetings, this questionnaire was distributed to all attendees:

WOMEN IN TECHNOLOGY:
INITIAL QUESTIONNAIRE +++

1. What do you wish to gain from this organization?

2. What mentoring opportunities are you most interested?

3. What activities interest you?
    a. Field trips
    b. Social activities/events
    c. Competitions
    d. Other – share your ideas here

4. Are you interested in training sessions, such as “Navigating in a Man's World" and/or similar topics?

5. Share any topics you would like to see added to our training opportunities.

6. Are Tuesdays at 2 PM a good time to meet for you? If not what is a good day/time to meet?

7. How often would you like to meet?
    a. Monthly
    b. Bimonthly
    c. Other

+ + +

HIGHLIGHTS

OF CCBC'S WOMEN IN TECHNOLOGY GROUP ACTIVITIES

We also received a grant from Cisco Corporation to host a weeklong summer camp titled IoT (Internet of Things) Hackathon for female high school students in the Baltimore area. Nine female students from local high schools participated and it was a great success. This 5-day summer camp allowed young women the opportunity to explore various topics within the STEM and cybersecurity fields. They actively engaged in hands-on activities, such as Raspberry-Pi, that linked research in IoT areas to practice. Camp attendees were introduced to all STEM-related programs offered at CCBC and careers in cybersecurity. The camp fostered a positive relationship between attendees and a network of young cybersecurity experts while expanding their knowledge in cybersecurity areas. Students presented their final project on the last day of the summer camp. Parents were invited to hear attendee project presentations and learn about their summer camp experience. Additionally, Kelly Schultz, Maryland Secretary of Labor, visited the summer camp and encouraged the students to study and stay in STEM fields.

In 2019, the Women in Technology Group invited female guest speakers from Rack Top Systems, CCBC's IT Department, Sekuva, and LYRASIS to share their career experiences. Also, 5 female students were selected to participate in CyberRange, a challenge on Cyber Intrusion Simulation, held in Baltimore City. We encouraged our students to participate in social events to broaden their network and to practice interacting with business professionals by taking them to multiple events. Our students attended the Women Center Leadership Conference in Virginia and multiple CAMI social events in Columbia, MD. We also held mock interview training by Silver Tree Consulting and held a year-end celebration for graduates and recognized mentors.

We hosted our second summer camp, IoT Hackathon 2.0 in the summer of 2019. Eight female high school students attended. In addition to the camp curriculum and being visited by CCBC department representatives, Dutch Ruppersberger, Maryland Representative in Congress, visited the IoT summer camp and encouraged students to choose to study in a STEM field. We also had a visit by 2 Under Armour young professionals who shared what it is like to work at Under Armour in the cyber/information technology field. During this summer we also launched the CCBC Women in Technology website and established a scholarship at CCBC. In the fall of 2019, we awarded 4 scholarships of $500 to CCBC students.

In 2020, we arranged a field trip to NASA Goddard Space Flight center with the cooperation of Dr. Nachimuthu Gopalswamy, a civilian astrophysicist. Mr. Damron, Cybersecurity Department Chair, Mr. Roberts, Outreach Coordinator, and 15 female students from CCBC participated in the field trip along with us. We also held a virtual resume writing workshop, focusing on writing a technology resume and also hosted 3 female executives from Penacity who shared their experience working in the technology field.

In 2021, we invited a cybersecurity graduate to speak with our students and share her experience and encourage the current students to stay in STEM. We also held a resume writing workshop and technology alumni panel. One of our alumna, Ms. Camilla Ngala Timfe, CCBC graduate from cybersecurity, was featured on Cisco's website! In November, Women in Technology hosted a student alumni panel held in a hybrid format. The forum topic was "How to Thrive and Succeed as a Woman in Tech." This forum was moderated by Ms. Angela Young, Senior Director of Business Development for Conviso. Over 60 students attended, both male and female. The panel consisted of 4 female cybersecurity alumni who were currently employed in industry. This event was a great success.

CCBC Alumni Panel Presenters:

Ms. Camilla Ngala Timfe, employed by Peraton Ms. Marie Camga, intern at Exelon Ms. Shenan Beaghan, employed by SOCStor Ms. Sara Nuff, employed by CyberCore Technologies

BRINGING MORE WOMEN

INTO STEM AND GROWING WOMEN IN TECHNOLOGY AT CCBC

Parents and teachers are key influencers on girls' major and career choices, and more education and support should be directed to encourage girls to take up careers in STEM. CCBC works with teachers and guidance counselors, and uses venues like the Baltimore County Public Schools Parent Newsletter and social media portals to incorporate messages aimed at attracting more young women into studying, and ultimately pursuing, careers in STEM disciplines.

When CCBC's Women in Technology began in 2017, we had few local or national resources. Today our group has evolved into a valuable and active entity at the college. It is successfully promoting technology education and career opportunities as well as providing role models for female STEM students. We also reach out to high school students in the Baltimore–Washington area. This organization continues to grow and evolve. We are working on a collaborative effort with the local Women in Cybersecurity group to form a partnership that will impact more female technology students. As our group grows, it is the intent to become a national example as to what support can do for underrepresented populations.

ACKNOWLEDGMENTS

The co-founders thank our students for their involvement, for helping each other to succeed in their schoolwork, and for moving on to the workforce. This group is grateful for the support of CCBC technology faculty, department chairs, technology outreach and recruitment coordinators, STEM pathway coordinators, and the college administration.

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SUPPORTING OPEN EDUCATION

Paul D. Miller, EdD, and Michael A. Mills, EdD

RISING DIGITAL

Technology Use at Montgomery College

While technology has become a mainstay of our society as a whole, within the educational setting it is underutilized and at times ineffectively incorporated into daily lessons. There is a distinct divide between its use in and outside of the educational setting as a tool for aiding the learning process (Lenhart, 2015; Li, 2007). Teachers and schools are challenged to find ways to adapt instructional best practices for incorporating technology into the classroom so that lessons are meaningful, relevant, and engaging for students (Greenhow, et al., 2010; Lenhart, 2015; Li, 2007; Pokhrel & Chhetri, 2021; Selwyn, 2012; Selwyn & Facer, 2014). The traditional education environment is in danger of becoming archaic if the system at large does not find appropriate ways to effectively integrate technology in an effort to empower student ownership of learning as they become digital natives defining the 21st century (Selwyn, 2012).

Throughout the COVID-19 pandemic, EdTech evolved and adapted at a rapid pace in ways to support the continuum of teaching and learning (Adedoyin & Soykan, 2020; Daniel, 2020). Education at Montgomery College (MC) has become more digitally supported, and faculty use of Open Educational Resources (OERs) and Reusable Learning Objects (RLOs) has become a mainstay at MC and other colleges worldwide. Over the past 2 years, faculty, support staff, and students at MC have identified and evaluated a variety of open-source, web-based applications and content creators and concluded that OERs and RLOs have the potential to redefine how education is delivered, tracked, and experienced by students and can also save funds associated with curriculum and support materials.

OERs and RLOs are foundational elements of the MC Open Initiative, which provides professional development and materials to faculty and students to adopt OERs to save students money while attending MC. Since its inception in 2017, it is estimated that students have saved $9 million due to the faculty's intentional use of OERs at MC. Furthermore, a study as part of the Achieving the Dream OER Degree Initiative found that students at MC enrolling in 1 or 2 OER courses on average attempted 2.05 more credits than otherwise similar students who did not take any OER courses (0.18 effect size); students enrolling in 3 or more OER courses on average attempted 5.39 more credits than otherwise similar students who did not take any OER courses (0.49 effect size). The estimated return on investment to MC from this combined increase in credit activity was $518,000, or 30%, after accounting for the program costs ($733,000) and additional instructional costs associated with increased course demand (ATD OER Degree Initiative ROI Analysis, 2018).

TARGETED IMPLEMENTATION

of Free Reusable Learning Objects in Spanish 101 and 102

MC's commitment to OERs and research in this area has led to an institutional adoption of Pressbooks (an open course content management system designed for creating eBooks) and the redesign of MC's Spanish 101 and 102 courses to replace a suite of fee-based practice activities with a series of free RLOs powered by H5P. H5P is a free and open-source content collaboration framework based on JavaScript. H5P is an innovative way to create, share, and reuse interactive RLOs aligned to specific learning outcomes. With over 41 different learning types (and counting), H5P provides the MC community with rich, interactive content for use on computers, smartphones, and tablets.

Utilizing a participatory action research model, faculty and students have collaborated to inform the design, development, and refinement of H5P RLOs designed to meet institutional goals through targeted student practice. As previously mentioned, H5P RLOs were developed and embedded as a part of MC's Spanish 101 and 102 curricula to substitute fee-based practice activities with free and open resources. The H5P-enriched courses were led by 2 faculty and consisted of 47 students who utilized the H5P RLOs as a part of the course expectations. Upon completion of the courses, students not only reported a high level of satisfaction (4.54 average rating out of 5) but were overwhelmingly (89%) in favor of the practicality and usefulness of the H5P practice materials as a viable tool that helped them achieve success in their courses.

Overall the students' and instructors' experiences with the H5P RLOs were positive. As one student said, "They [the H5P learning elements] are useful, and most importantly they cover the elements (vocabulary/grammar) covered on each unit." This coverage was enough to not only support outcomes but to provide just-in-time support in an engaging way. As another student said, "They are a fun way to make sure I know what we just learned and if I need to review anything before moving on" and "I liked how it gave real-world activities and it would tell you when you got an answer incorrect." In relation to the types of RLOs selected, the design team was happy to know that students "liked the variety of the activities as it helps cater to different learning types" and that "The exercises greatly help my understanding of how each concept works in sentences and in a real-world context." As one student reflected, "I think they [H5P RLO's] are awesome!" This certainly provided additional motivation to the development team who was committed to creating a product that was equal to that of a fee-based program.

PROMOTING THE

Adoption of Free Digital Technologies to Support Instruction at Maryland Colleges

With so much potential in support of the MC Open Initiative, MC, in partnership with the Community College of Baltimore County (CCBC), launched the Maryland H5P Collaborative Network (Network) in the fall of 2021 as a way of building awareness and increasing institutional adoption of H5P. Together, we aim to support organizational learning of H5P across institutes of higher education in Maryland. The Network offers a virtual community that provides opportunities to:

- share techniques in identifying best practices for creating and using H5P to support learning;
- support one another through problem solving, mentoring, and coaching;
- foster collaboration in a safe and informal environment; and
- improve performance and productivity through innovative development, integration, and practice approaches.

To date, the Network has an active membership of approximately 250 faculty and staff across 40 higher education institutions in Maryland and beyond and is recognized by the Maryland Open Source Textbook (MOST) Initiative and Maryland Online. To support the Network's rapid growth and initial success, MC and CCBC have partnered with MOST to create a statewide repository of professional development resources and support leveraging their existing Hub network. Together, we hope that this cross-institutional effort will support the design, development, implementation, and evaluation of OERs and H5P RLOs aligned with learning outcomes across multiple disciplines (e.g., world languages, nursing, library sciences/information literacy, etc.). Over the next academic year (2022-2023), the Network has plans to develop: just-in-time professional development OERs (e.g., instructional videos, how -to -guides, etc.) to support the awareness and adoption of H5P; solicit expert advice from instructional designers and developers of H5P; and coach and mentor opportunities to support the use of H5P.

In addition, MC is leveraging the Network to design, develop, implement, and evaluate an H5P micro-credential that represents the mastery of H5P RLO development in support of student learning. Upon developing the H5P micro-credential, MC will work with CCBC, MOST, and Maryland Online to replicate the badge at the Network level. This will enable the micro-credential to be awarded to Network members and recognized beyond MC.

The OERs and RLOs developed through the Network (e.g., discipline-specific H5P learning objects, instructional videos, how-to-guides, etc.) will be available to all MC and CCBC faculty and staff on the MC ELITE, CCBC Library, and MOST Commons websites and promoted using the MC Open Initiative. The availability of these OERs/RLOs will help expand the infrastructure and faculty/support staff knowledge necessary to promote change in all MC courses and student support services. This level of open access will encourage cross-institutional faculty/support staff and student collaboration through the intentional integration of OERs and RLOs into existing course offerings while reducing the cost of program materials at the student level.

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REFERENCES

1. Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities: the challenges and opportunities. *Interactive Learning Environments.* https://doi.org/10494820.2020.1813180

2. Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects, 49*(1), 91-96. https://globaled.gse.harvard.edu/files/geii/files/supporting_the_continuation_of_teaching.pdf

3. Greenhow, C., Walker, J. D., & Kim, S. (2010). Millennial learners and net-savvy teens? Examining internet use among low-income students. *Journal of Computing in Teacher Education, 26*(2), 63-68.

4. Lenhart, A. (2015). Teens, social media & technology overview 2015. Pew Research Center: Internet, Science & Tech. http://www.pewinternet.org/2015/04/09/teens-social-media-technology-2015

5. Li, Q. (2007). Student and teacher views about technology: A tale of two cities? *Journal of Research on Technology in Education, 39*(4), 377-397. https://doi.org/10.1080/15391523.2007.10782488

6. Pokhrel, S., & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future, 8*(1), 133-141. https://doi.org/10.1177/2347631120983481

7. Selwyn, N. (2012). Making sense of young people, education and digital technology: The role of sociological theory. *Oxford Review of Education, 38*(1), 81-96. https://doi.org/10.1080/03054985.2011.577949

8. Selwyn, N., & Facer, K. (2014). The sociology of education and digital technology: Past, present and future. *Oxford Review of Education, 40*(4), 482-496. https://doi.org/10.1080/03054985.2014.933005

RESEARCH ARTICLES

IN THIS SECTION

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DEVELOPMENTAL EDUCATION SUCCESS:

Exploring Student Success Strategies in Developmental Education at the Community College Level

The problem investigated in this study was the low completion rates of students in mandated developmental education courses at a local community college in the mid-Atlantic region of the United States. The purpose of this study was to examine factors that may contribute to the persistence of community college students who have completed mandated developmental education courses.

ABSTRACT

The problem investigated in this study was the low completion rates of students in mandated developmental education courses at a local community college in the mid-Atlantic region of the United States. The purpose of this study was to examine factors that may contribute to the persistence of community college students who have completed mandated developmental education courses. The qualitative study uses Tinto's student departure theory as the conceptual framework to examine the lack of persistence of students in developmental education classes. The study included interviews with 8 students who have completed at least 1 developmental education course in the past 3 years. Data analysis included an extensive review of the interview transcripts to develop codes, categories, and themes to answer the research question. The findings of this study identify personal or academic persistence strategies that may assist community colleges in increasing the success rates of students in developmental education. Completing a credential has social change implications, as it may provide significant job opportunities and the ability to earn higher wages impacting overall quality of life. Moreover, an individual that receives an associate degree may earn 17% more in their occupation than their counterparts with a high school diploma or equivalent.

INTRODUCTION

Across the United States, community colleges have open or broad admissions policies to create a gateway to higher education for anyone desiring to attend. The only primary requirement to enroll is a high school diploma or equivalent, such as a general education degree (Quarles & Davis, 2017). While community colleges enroll approximately 45% of all college students, a significant number of these individuals are underprepared to take college-level courses (Crocker & Mazer, 2019). Between 50% to 80% of new community college attendees are mandated to attend at least 1 remedial education course before taking college-level coursework (Barhoum, 2018; Boatman & Long, 2017). Currently, only 20% to 37% of students assigned to developmental education courses successfully finish the course(s) and continue to the next semester (Xu & Dadgar, 2018).

Community college students who require developmental education in either reading, writing, English as a second language, or mathematics begin their college careers at a disadvantage. The required coursework is noncredit bearing, even though students pay the same cost to participate while also increasing the time to degree completion (Bahr et al., 2019). The additional length of study and cost required for completing developmental courses is the leading cause of attrition among these students (Barhoum, 2018).

Underprepared students also face a myriad of personal challenges that hamper their ability to persist in developmental education coursework. Many of these individuals must work and provide for their families, forcing them only to enroll part-time, adding to the time it takes to earn a degree (Shields & O'Dwyer, 2017). The fact that they must pay for these courses that will not earn credit and take longer to reach their goals often leads to frustration leading some to give up. Twenty-five percent of developmental education students who earn an associate degree take up to 10 years to graduate (Shields & O'Dwyer, 2017). While a significant amount of literature discusses why students are unsuccessful, there is little information regarding success strategies employed to complete developmental education courses.

This study examined the challenges community college students face in the completion of mandated developmental education coursework and possible strategies to increase student passing rates and retention. The purpose of this qualitative study was to examine factors that may have contributed to the persistence of community college students who completed developmental education courses. This research study took place at an urban mid-Atlantic community college that offers developmental coursework in reading, writing, English for non-native speakers, and mathematics. Interviews were conducted with 8 participants that completed at least 1 mandated developmental education course within the past 3 years. The goal of this study was to identify personal or academic strategies of persistence from interviewees. The personal and academic strategies identified in this study may prove useful in increasing completion rates in developmental education classes that students are required to complete at a community college.

METHODS

This study sought to understand why a small group of students successfully completed their mandated developmental coursework and possible strategies that may increase these success rates for others. The study was qualitative in nature and utilized Tinto's student departure theory to examine the participant's perspective on the issue (Ravitch & Carl, 2016). Tinto's student departure theory provided a lens to consider how the participant's academic and social attributes affected their performance in mandated developmental education courses (Aljohani, 2016).

Tinto's student departure theory states that an individual requires integration and engagement with both the social and academic aspects of an institution to persist (Aljohani, 2016; Distefano et al., 2004; Tinto, 1988). The academic components include learning performance and communication with faculty and staff, while the social aspects include relationships with peers and participating in extracurricular activities (Distefano et al., 2004; Oseguera & Blackmon, 2012). While this theory assumes that attributes students possess before college such as academic preparation, family support, and academic skills play a significant role in their decision to remain in college, interventions at the college level may assist them in assimilating into the school environment (Distefano et al., 2004; Oseguera & Blackmon, 2012). When a student builds a relationship with the institution's academic and social components, their ability to handle the stress and demands of higher education increase, leading to persistence in their education journey (Fletcher & Mullen, 2012).

Tinto's student departure theory informs this study by providing a lens in which to consider why approximately only 10% of students in developmental education are successful and persist in college-level work (Barhoum, 2018; Walker, 2015). This point is especially true at the community college level, where the student population is more diverse, with significant numbers of underserved students requiring developmental education coursework (Bahr et al., 2019). Underprepared students frequently come to college without adequate academic preparation and family support that may also hamper their success (Oseguera & Blackmon, 2012). The key to academic success may lie not only in the student's preparation for higher education but also in their integration into the culture of the institution.

A generic qualitative research design was the best choice for this study as it offered an examination of the issues at the root of the problem without utilizing a specific lens (Caelli et al., 2003). The flexible nature of this approach allowed for the interviews to be as general or detailed as best fit the study (Caelli et al., 2003; Kahlke, 2018). Additionally, the generic method also worked well with this smaller sample size (Kahlke, 2018). Lastly, this approach allowed for changes as the data indicated to obtain a deeper understanding of the problem while contributing to the research in this area of higher education.

The data collection for this study was via interviews with participants that had completed at least 1 developmental education class within the past 3 years to ensure that their perceptions were still current. The developmental courses could include reading, writing, mathematics, and English for nonnative speakers. Eight students were selected for interviews. The interview questions were developed with a focus on student experiences in developmental education courses and included considerations for past experiences and choices that may have impacted their path to success in developmental education courses (Eberle, 2014). The interviews were open-ended and semi-structured in nature, with a script for the interview process to ensure the participants received critical information and understood the reason they were participating in the study (Jacob & Furgerson, 2012). A full account of the interview protocol is available by request to the author.

The questions asked during the interviews were open-ended and semi-structured. The questions related to components of the participants' social and academic interactions at the institution to ensure the integration of the conceptual framework based on Tinto's student departure theory. The interview questions were:

1. What was your primary reason for enrolling in community college?
2. Did you have a career in mind when you entered college? If so, what was it? Has it changed since entering school?
3. Does your family support your goals in attending community college? Please explain how they might help or hinder your educational goals.
4. How did you feel about being placed in developmental education? How did this placement affect your educational goals at the college?
5. How would you describe your self-efficacy when it comes to your developmental and college level classes?
6. What factors assisted you in your success in your developmental education classes? Please be specific.
7. Did you form connections with your peers, faculty, or the college community? If so, please describe how these relationships may have helped foster your success in your developmental education coursework.
8. The college offers a variety of resources including study groups, tutoring, and faculty office hours. How did the use of these supports help you to succeed in your developmental coursework?
9. Class withdrawal rates at the developmental level are high. What factors attributed to your completion of the class?
10. How did your developmental coursework prepare you for college level classes? Please explain why or why not.

Audio recordings were completed for each student interview. The audio recordings were collected with Otter and used to develop transcripts of the interviews to ensure accuracy in documenting participant responses. Additionally, the transcripts allowed for a thorough analysis that was essential to identifying themes in the data (Jacob & Furgerson, 2012). Once assured of the accuracy of the participants' interview responses, data examination looked for themes or strategies of persistence among the interviewees.

The coding process began after a detailed review of the transcripts to ensure their accuracy. Each transcript was reviewed several times, making memos where information related to the research question, framework, or items stated by other participants. Examination of the transcripts provided insight into the student experiences as similarities between participant responses emerged. For example, each participant discussed using additional resources such as faculty office hours, working with their peers, or

tutoring for assistance in their classes. Memos about this commonality were created, and each transcript was reviewed to find instances where students used these resources.

Each transcript was uploaded into NVivo software for analysis. Handwritten memos assisted in creating codes based on the initial transcript reviews using the NVivo highlighting feature. Each transcript was reviewed in the NVivo software, examples were highlighted, and a code was developed for each resource mentioned. This process allowed easy access to pull up each response, for example use of faculty office hours, and see which participants commented on this code and how they described the experience.

This process was repeated until all codable information was identified in the NVivo software. Discrepant cases were also coded as "discrepant information". The discrepant cases were reviewed several times to ensure they did not factor into the conclusions for the study. The codes for this study included: academic integration, social integration, challenges, stop-outs, COVID-19 effects, tutoring, office hours, coach class, writing center, library, additional supports, positive professors, learning strategies, peer support, family support, family challenges, career goals, work ethic (self-efficacy), college-level preparation, developmental placement, confidence, desire for a degree, and discrepant data.

Once all codes were identified, analysis moved to the development of categories. A careful review of the codes and relationships among them in NVivo led to establishing the relationships that became categories. The relationships feature allows information to be pulled from selected codes for review to see if they shared similarities. For example, participants mentioned resources that helped them in their developmental courses including tutoring, faculty office hours, coach classes, and the college writing center.

Once all codes were compared to each other, a final review was conducted of the transcript codes and categories in NVivo to ensure the analysis was complete. The categories for this study included acceptance of placement, personal or academic challenges, primary resources, additional resources, connection to others, outside help or hindrance, self-efficacy, and influential professors.

The creation of themes began by examining each category to see the correlating relationships among them. The NVivo relationships software feature assisted in creating new links between categories that fit together. For example, a relationship between the categories of influential professors and connections to others was identified. A participant's ability to connect to their faculty and classmates was crucial in their overall success in developmental education. These categories came together to become the theme connection to faculty and/or peers. This process was repeated with each of the categories to identify any possible correlations. The themes for this study included: the use of additional resources, connection to faculty and/or peers, overcoming challenges, and self-efficacy. Table 1 provides the progression of developing the codes, categories, and themes for this study

Table 1.: Organization of Topics from the Interview Transcripts.		
Codes	**Categories**	**Themes**
Office hours	Additional resources	Use of additional resources
Tutoring		
Coach class		
Academic integration		
Writing center		
Library		
Additional supports		
Social integration	Connection to others Influential professors Primary resources	Connection to faculty/peers
Positive professors		
Peer support		
COVID-19 effects	Personal/academic challenges Outside help/hindrance	Overcoming challenges
Stop outs		
Academic challenges		
Family support		
Family challenges		
College-level preparation	Acceptance of placement Self-efficacy	Self-efficacy
Learning strategies		
Career goals		
Work ethic		
Developmental placement		
Confidence		
Desire for degree		

RESULTS

The themes of this study provide insight into the academic and personal strategies used by students to complete their developmental education classes at a community college in the mid-Atlantic region of the United States. While each participant's experiences were unique, they developed similar methods to complete their courses and move on to college-level work. Their experience shows perseverance and a dedication to achieving their goals.

USE OF ADDITIONAL RESOURCES

The first theme relates to use of resources outside of class. The college offers various resources to assist students in the completion of their course assignments and test preparation. Every participant utilized additional resources to help them in their developmental classes. The most common included faculty office hours, tutoring, the writing center, and the library while other students mentioned coach class, the college website, and advising.

FACULTY OFFICE HOURS

Office hours proved very useful to several participants. Student 2 explained: "Yes, I was in his office hours, 3 days a week. I did the same thing before with [math] 082. When I passed [math] 082, I went to [math] 083, and I was confused in that area, but the office hours really helped me out because it is one on one; if no one else showed up for his office hours, then it was just me and him, and we just did multiple problems together until I understood it."

Additional participants also stated that office hours were helpful in their success in developmental education classes. Student 1 commented, "I often stayed after class and did the office hours." Student 7 also addressed this in their interview "I mainly used the professor's office hours for help." The feedback from participants highlighted that this extra help from their instructors gave them a place to take their questions or areas of confusion to seek clarity. This option helped their understanding of the material and assisted successfully completing their developmental education courses.

TUTORING SERVICES

Tutoring services are another resource that is beneficial to college students and utilized by the study participants. Student 2 explained how they used tutoring services at multiple campuses (the campus names are removed to ensure confidentiality of the college location). "I was taking tutoring 2 days a week; actually, I was taking 3 to 4 days a week because I didn't know that you were limited on your tutoring. So, I would take tutoring at [campus A] because I had classes on [campus A] campus, and I also had classes on the [campus B] campus, so I would take tutoring 4 days a week."

Student 3 also discussed how they used tutoring services to help them understand their course content. "Besides the tutoring they offer, the tutoring services are also another kind of help they offer, which I like, I was able to get from the class, and that helps me because I actually used it a lot. I tried to schedule tutoring appointments up to a couple times a week when I have a lot of work, and then really helps to get things done."

The study institution offers both drop-in and scheduled tutoring. Student 4 took advantage of the drop-in option frequently. They describe

their experience, "Yeah, I went to the tutoring center so I do have my class in the morning so after [instructor's name] class, I go straight to the tutoring center, do all my tutoring there so they helped me in their tutoring." While scheduling appointments with faculty for help is still a solid choice, the flexibility of drop-in sessions allows students to get assistance when they need it. The students who participated in tutoring identified this as a critical factor in their success in their developmental education courses.

Perez and Hansun (2018) investigated whether mandated tutoring bolstered student success in developmental math courses. Their study examined students required to complete 2 hours of tutoring a week versus no requirement and found that the former group had a 14.5% higher passage rate. While the study location does not require students to participate in tutoring services, it is evident that it assisted the participants in passing their courses

THE WRITING CENTER

Another resource mentioned by several students, especially those taking English for non-native speakers, was the college's writing center. This service is a free resource where students can bring writing assignments and receive help with the preparation, organization, and editing of their work. Student 4 said "I use writing center. The writing center helped me a lot. The time after class, I will just go straight to the writing center do all my stuff, they're gonna help you with your English and tell you where you are failing. I know how much I will appreciate them, but they helped me a lot. That right now, I can write a paper or whatever, like they helped me a lot."

While the benefits for students using the writing center are evident, it is an underutilized resource. The issues are similar to other resources; students lack free time and do not realize how the writing center can assist them (Arbee, 2020). Colleges can assist students by offering more flexibility in the writing centers' times and getting the word out to students about the resources they offer (Arbee, 2020; Nicols & Williams, 2019).

Developmental education faculty are a great resource to help make students aware of the college's options. Student 8 mentioned this during their interview, saying "the professor from the very first day of class mentioned all the different ways that we could get help if we didn't like his teaching style, we could get the information from all these different places to help us." The college's writing center was a key factor in student success for some participants, especially those from a non-English speaking background.

THE COLLEGE LIBRARY

The college offers librarians both in-person and online to assist students in finding items they need for classes. Students can drop in during certain hours or schedule appointments to get help with their assignments or projects. Student 3 said "I use the services in the library very often, because there is constantly different assignments from different classes where I need to look things up and the librarians help." The participant's research skills were positively impacted by working with the library staff as they learned how to find adequate resources for their assignments. The ability to search for sources is an essential skill for all college students.
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The second theme identified in this study relates to the participant's connections to their faculty and peers. The study participants highlighted their connection with their developmental education faculty and classmates during their

CONNECTION TO FACULTY AND/OR PEERS

interviews. The students who fostered relationships with these individuals felt more comfortable reaching out for help from their faculty or classmates when they did not understand course content, which helped them succeed. These relationships also boosted their confidence in their abilities and helped them develop new learning strategies to succeed.

FACULTY RELATIONSHIPS

The interviewees discussed their professors in every interview and benefitted from those who were engaging, welcoming, and willing to work with them to understand the content. These interactions helped to bolster their confidence in asking questions and in understanding the content. Every participant mentioned how their professors played a role in helping them to succeed. Student 1 spoke about their appreciation for their faculty in detail as they stated "I think when I first took like my math for success class, it was in like the basement of the school, and I walked in, there was like 6 desks, so it was clearly just me and a handful of other kids... But the professor was like, we're here, and we're gonna do this, and we're gonna learn this together... So I think specifically what helped me was the professor's being able to learn what my specific issue was, instead of just bad at math, like I'm bad at math because I do this." Student 2 added "I felt like I probably build bonds with my professors, and I think it's because if I have questions, I'm always like, willing to go to office hours or email. And I think when they see a student that's really working hard, that makes them want to help you more."

A warm environment in the classroom also made students excited to come to class. Student 5 said "Most of the professor was very nice with students, and they sometimes they find new ways to learn us most of students come to class, after work, like me, I work. I worked until 5, and then I go to ESOL class 5 'til 9. All of us was tired, but sometimes our professor asked us to stand up and walk around the class, and talk together, or play some games that was related to class. I think these activities, was helpful that I liked to be at class tomorrow... I didn't miss any classes. I everyday go class, and I was happy because of the atmosphere of there."

Another factor was having faculty that they felt comfortable with asking questions and sharing when they did not understand concepts. Student 6 explained the importance of this: "I've been very fortunate I've heard horror stories about other teachers. I think the professors like being willing to answer questions and, you know, working with us. I think that really helped. Yeah, I think that really made the difference, just the way you know making you comfortable and if you have a question about something, you know when going over, and I love teachers who like if there was a problem with one of the homework that's like next day in class. All right, let's go over the problem, you know, this number, number 7 because everybody seems to have trouble with it, and then breaks it down that way. I really like that. I'm a visual person, so for me, that really helped to kind of pick up the concepts a lot faster and a lot easier."

It is evident from the interviews that it is critical for students to feel comfortable with their faculty. Furthermore, faculty willing to work with students and be present help the students succeed in their classes. A few participants also discussed having faculty that did not appear invested in their success and how this affected their progress in their courses. In some cases, they even dropped the class.

It is evident from the interviews that it is critical for students to feel comfortable with their faculty. Furthermore, faculty willing to work with students and be present help the students succeed in their classes. A few participants also discussed having faculty that did not appear invested in their success and how this affected their progress in their courses. In some cases, they even dropped the class.

Student 2 explained how one professor harmed their success: "It definitely did. I actually ended up dropping my math class because I had [math] 083 this semester that they kicked us out of school. It felt like the instructor wasn't helping us. I just didn't feel like that she wanted us to succeed like she wasn't for us. I felt like at that time; she was kind of, I guess for herself. Whenever I asked her questions, I told her I was having a difficult time in math. And I said, so how can we meet up, will you be able to teach us online, like via Zoom or anything like that? And her response was, I'm gonna do what the school tells me to do, nothing more, nothing less... I left her class that day and dropped that class."

Student 6 also discussed their experiences with faculty that were not student-centered: "Some of them [professors] you felt like they were just kind of moving through the material kind of fast and it was sometimes hard to like, all right, when I don't know if I have this and some of my classmates who really were not grasping the concept, I kind of felt like we just kept moving on. Moving on, and they were kind of left behind."

The participants in this study indicated the benefits faculty had on their success. They stated that they did better when they felt the professor was invested in their progress and were more likely to reach out for assistance. When their instructors were doing the bare minimum, it hurt the class, leaving students frustrated. At least 2 of the 8 participants dropped courses due to ineffective professors. In some cases, the students actually "stopped out," leaving school for a more extended period. Student 8 left for several years because of various reasons, including personal challenges and ineffective faculty

PEER RELATIONSHIPS

Peer relationships are another factor of student success in developmental education. While not every participant highlighted their peers as a resource, several found this connection helpful. Not only did they connect with their classmates, but they also had study groups, formed group chats, and provided support to one another in their developmental classes. Whether the students worked on assignments together or just had general conversations about their classes, it served as another resource and connection to help them complete their courses.

Student 5 discussed their relationship with their classmates in their English for non-native speaker's class: "Yes, I did, um, I did. Sometimes we [students] call together with my classmates and talk about classes, or sometimes we check our homework together." Student 6 also talked about having a group chat with their developmental math classmates where they could ask each other questions about the content: "I think as far as peers, a lot of people like usually almost every single one of my math classes, we swap numbers, and so if there was something somebody didn't understand, we text each other, and I think that really helped. Because sometimes people other people would have a different way of doing things that it was just like, oh, I see what you did there, makes sense. You know they have a different, maybe a slightly different way or they explain it in a different way than, you know, it's like okay, that makes sense to me I got that, you know, so I think definitely having a relationship with my fellow students really helped."Student 6 also explained that they had a good grasp on most of the material, and they served as a resource for a classmate, which helped them. The more they explained the concepts, the better they understood the material. While not every student chooses to connect or work with their classmates, faculty may suggest that students create social groups to help them in their classes. Working with peers as a suggestion versus requirement would allow those interested in connecting while others can work alone if that is their preference.

OVERCOMING CHALLENGES

Study participants also discussed challenges they had overcome to be successful in their developmental education courses. These difficulties range from personal challenges to family issues and academic barriers. In each scenario, the student had to modify their life or school habits to complete their courses.

Several participants described health-related challenges during their developmental course that either affected them or an immediate caregiver. Student 2 provided several examples: "Ya, since I have been at school, I've had quite a few. Recently, I had cataract surgery. Last semester, I had COVID. I've had quite a few since I've been in school." Student 4 also had several major health events during school: "When my husband was admitted in the hospital because he's a kidney transplant patient. So, I think he had complications... And then I had a baby. So it was so much and tough on me, but I went through it I didn't drop the class. So, I went through it, and I passed the class. So another time was when I had my third baby. So, I think I missed 3 classes, then, but I didn't drop, but I finally I passed the class."

Student 6 described the general challenges of balancing school while working and having a family: "I had to leave behind my kids and my guy. He, you know, having to say goodbye like

go into work and then coming home and then like, all right, I gotta go to class now. That was definitely hard for them, trying to make sure they're situated before I would go to class was always, you know, a big stressor, you know, making sure that dinner is made everybody was set, if the kids had work, their own homework, making sure they were set with that before I left."

The participants also considered their academic challenges related to their developmental placement. While most accepted their need for additional help, they faced numerous challenges on their path. Student 1 talked in detail about their challenges with math and discovering their learning disability while in developmental math classes: "I came to found find out that I actually have like a math learning disability, it's called dyscalculia. I believe I'm pronouncing that correctly. And I had never been able to learn how to do like basic math on paper because of it I didn't know that, and it wasn't until I was in that class that somebody, you know, a friend of mine, I was like I'm in this class and they were like, you know, why don't you, you know maybe look a little further into that."

Three of the study participants were international students and discussed their challenges with the English language while they were in their developmental classes. Student 3 explained "I'm from Ethiopia, so my first language is different, so sometimes I have trouble my classes." Student 5 also had challenges with English "I read, and I don't have a problem with words, but speaking, it's new for me because I just came to the US 2 years ago, and before that, I didn't speak English." These examples reiterate the challenges international students may face as they learn English while participating in English-based courses.

Another challenge participants had to overcome was financial or personal family barriers. Ali-Coleman (2019) found that many community college students are from low socioeconomic backgrounds, requiring them to work while taking classes. Moreover, community college students are more likely to have dependents or be the primary caregiver for family members, putting a strain on their educational goals (Bahr et al., 2019; Quarles & Davis 2017). Study participants spoke to these challenges. Some of them had to stop out of school to address their external challenges and return when they were in a better position to focus on school.

Student 7 discussed their challenges with going to school while working and how family support made it possible: "Definitely. So I think college in general is tough, but working full time, and I took 3 classes when I took the developmental class, so that was my heaviest semester. I backed it off after that, but it was definitely a lot of a learning curve that semester, trying to get back into the flow of being a college student working full time. So being able to lean on my fiancé and my parents, just to kind of keep me focused on what the goal is, definitely very helpful for getting me to keep going through the classes and know that it may be a little stressful, but it's doable, and I can keep pushing through it, and at the end of it all, it's the goal that I want. So, it's definitely nice having their support."

Student 8 also briefly explained how they returned to school for the second time due to personal challenges: "...in terms of, you know, home stability. It wasn't the greatest when I originally had to enroll in developmental class when I ended up actually taking it again for the second time and passing it. There were no major obstacles like the first time around." These responses support the research indicating that financial and personal barriers can prevent students from success in their educational goals

SELF-EFFICACY

Self-efficacy relates to a person's belief in their ability to succeed at any given task (Peaselee, 2018). The participants provided numerous examples indicating they had the self-efficacy needed to succeed in their courses. Student 1 had previously stopped out of school. When they returned this time, they had a different plan to help them achieve their goals: "I wanted to actually be successful and do something that I set out to do. I just kind of got like, I just, I was over it. I was like, this is what it is, what I'm going to have to work harder, I have to accept that. And, you know, try to get this done the best I can... I think that because I had tried this previously and had not been successful, I just got to this point is like I'm just gonna have to work harder. I'm just gonna have to try harder. I learned that I needed to have a strategy in the first place. I've learned that you know, procrastination isn't the thing to do, I kind of just got this attitude I hate to say it, it is so cliché, but like the Nike like, just do it like it just have to turn the laptop on or open the book or whatever it is and literally just start. Whatever it is, no matter how difficult it was, I felt like once I finally opened it up and actually started looking at it, I would start."

Student 2 also described their need to do the work even when it was challenging: "The goals simply...I couldn't get a degree without passing math, I couldn't take biology without passing math, so you have to look at the bigger picture." Student 4 made a similar statement as they described their time in developmental courses while facing outside challenges: "I keep going. I refused to quit. It did not stop at all, and I passed the class." These participants accepted that they would have to work hard to achieve their goals.

Student 7 mentioned how confidence in their abilities helped them in their developmental class: "I'm pretty confident in my ability to succeed, don't want to sound like I'm so smart, but like I'm confident in my ability to learn something and test well with it and understand it, so I was nervous, but I felt like I would be okay." Student 8 had similar confidence in their abilities: "I was very confident in it because a lot of it was review material, so I was very familiar... I was very confident that I was going to be able to get through the information and pass the course."

Self-efficacy is also increased when individuals focus on their overall goals to earn a degree, better career opportunities, or benefit their families. Student 1 described their career goals: "I wanted to have like a career where I could be home with my kids. I just wanted to just be able to do it and get through all the courses and try to take my career on a different path." Student 5 simply expressed their desire for a better life: "The first thing is I like to have a better job; I like to have a better life... I always liked to be in the medical field...like people who help others to find other people to find a vaccine for COVID-19." Student 8 also stopped out of school for years before returning with a career goal to help them push forward with their developmental coursework: "I'm interested in accounting... it's completely different from information technology, and it's something that I'm 100% set on achieving, you know, in terms of what I was before. I do have a set career in mind now."

DISCUSSION+ CONCLUSION

The findings of this study correlate with the research examined for this study regarding the challenges students face in developmental education. As previously stated, community college students are more frequently underprepared for the academic rigor of college (Crocker & Mazer, 2019; Finn & Avni, 2016; Flink, 2017). Furthermore, they are more likely to be from underrepresented groups (Boland et al., 2018; Logue et al., 2017). The number of underprepared and underrepresent students in community colleges across the nation indicate that they will need additional education and resources to succeed in their developmental and college-level coursework (Hagedorn & Kuznetsova, 2016). The students in this study were no exception; however, they found ways to persevere in their classes.

DISCUSSION AND CONCLUSION

The use of additional resources by participants in this study benefitted their success. The participants highlighted how using these services bolstered their confidence in the content and their ability to be successful in their courses. Hagedorn & Kuznetsova (2016); Hesser & Gregory (2016); and Swanson et al. (2017) have found that developmental education student students often come to school without critical thinking, time management, and note-taking skills, and they also do not seek help when they do not understand the material. By seeking assistance outside of class to work on assignments and seek clarity for areas of confusion, these students can build the necessary skills to succeed. Additionally, students that participate in tutoring, work with their faculty outside of class, or utilize other resources to help them succeed are more likely to pass their courses and move forward in their education (Cook, 2016; Crank et al., 2019; Walker, 2015).

The students in this study showcased the benefits of utilizing faculty office hours. Several students, in particular students 1 and 3, attribute much of their success to participating in faculty office hours. Seeking help from faculty via office hours is a strategy that can help students complete their developmental education courses, and research conducted by Abdul-Wahab et al. (2019) supports this study's findings. They found that student attendance at faculty office hours strengthens communication, comfort level, and ability to provide early interventions, allowing students to succeed in the course.

Tutoring services are another beneficial resource to college students and utilized by the study participants as it provides a more relaxed environment where students are more likely to ask questions and work with other students to understand the content (Joyce, 2017). All participants except students 2 and 6 used tutoring services at the study college and found it helpful. They liked the opportunity to focus on their areas of confusion and work on class assignments with the tutor's assistance. Additionally, they appreciated the variety of services available at the study institution including scheduled sessions, drop-in times, and the ability to receive virtual help at varied hours.

Participants also used the study institution's writing center to assist them in their developmental courses. Writing centers assist with all aspects of writing, which is beneficial to developmental education students. Like other forms of tutoring, Arbee (2020); and Nichols & Williams (2019) indicate that using a college's writing center can help students' overall writing abilities, organization of information for papers, and current and future academic coursework. This study did not have any participants completing developmental reading and writing courses; however, the writing center was a resource for all participants taking English for non-native speakers courses. It helped them in writing correctly in English and the nuances of grammar and formatting. This time spent completing assignments with writing center faculty one-on-one fostered a better understanding of English as a written language. In particular

DISCUSSION AND CONCLUSION CONT.

student 5 discussed how they struggled with writing in English and have become more proficient with the help of the writing center at the study institution.

Another key finding from this study was the importance of students connecting with their faculty and/or peers. The participants discussed how it helped them feel comfortable with their faculty and seek help or ask questions in and outside of class. Positive student-faculty relationships are shown to increase student involvement in the classroom and college community, lead to better academic performance, and decrease the likelihood of dropping out (Ingraham et al., 2018; Snijders et al., 2020).

While all of the participants mentioned their faculty during their interview, students 1 and 2 spent a great deal of time talking about how their instructors impacted their classroom experience. Their instructors welcomed their questions and offered help whenever requested, creating an environment that helped both students bring their questions and grasp the course content. Both participants attribute much of their success to their relationship with the faculty.

Every participant mentioned their relationship with the faculty teaching their developmental course and how it impacted their overall success. When the faculty member was helpful, engaging, and welcoming, the students benefitted greatly as they willingly asked questions and sought help. Developmental education faculty must work to create a learning environment that makes students feel welcome.

The results of this study suggest the need for additional training for those working with developmental education students. While each participant talked about their positive experiences with faculty and how it benefitted their work in the course, a few also discussed previous instructors that did not possess these attributes. Students 2 and 8 dropped developmental courses because they had instructors that offered the bare minimum, leaving them lost in the class. Student 2, in particular, discussed examples of both poor and excellent faculty. This student dropped out of a developmental math class because the faculty member offered little to no help. When they returned the following semester to retake the same course, they had a different instructor that demonstrated a desire to help them succeed. Not only did they pass this course, but they also went on to complete a college-level math class with the confidence and skills they obtained from the invested faculty member. The findings suggest that developmental education faculty need to provide a space for students to feel comfortable seeking assistance, which may require training opportunities to help them understand their crucial role in fostering student development.

Study participants also found that working with their peers was helpful. While not every student mentioned their peers, some found it essential to study and complete assignments with peers outside of class. Additionally, they would ask each other for help when they were confused about an assignment. Student 6 preferred to reach out to their classmates for help before contacting their teacher and found they frequently got the answers they needed.

> **Community college students face challenges relating to their preparedness for college-level work, socioeconomic challenges, and personal demands.**
>
> **(Finn & Avni, 2016; Flink, 2017).**

Some cases, including this study's participants, may require their education to take a back seat (Quarles & Davis, 2017). Several participants had to leave school to organize their lives before returning. Students who are successful in their developmental education courses work to find ways to overcome these challenges, even if they had to leave school and come back later. They returned once they had dealt with these issues and made contingency plans for any additional challenges. While the participants faced obstacles, they found ways to overcome them and remain on track with their education goals. It is critical that developmental education students identify ways to overcome personal challenges to be successful in their developmental education courses.

Self-efficacy is a critical factor in the success of community college students in developmental education as it predicts success and higher academic performance (Evans et al., 2020; Peaselee, 2018; Thompson & Verdino, 2019). The findings of this study also demonstrate self-efficacy as a critical factor for student success, and every participant demonstrated self-efficacy in their interviews. They had confidence in their ability to succeed or worked hard to develop learning strategies and skills necessary to pass their courses. This study indicates that students need confidence, goals, and a solid work ethic to succeed in their developmental education courses. While some participants started their journey with high levels of self-efficacy, others developed it during their courses. All 8 participants discussed how they came to trust in their abilities to learn the material, identified different learning strategies that worked for them, and became determined to succeed. Every participant also worked to establish confidence in themselves to push past their fear of failure. In some cases, it was working with their professor, using additional resources, or finding new ways to learn. It was also shown that having career or degree goals can assist students in building their self-efficacy and help with their forward movement through their coursework. The link between success and high levels of self-efficacy is evident in this study.

The themes for this study showcase the importance of students using both personal and academic strategies to complete their developmental education courses. The use of additional resources and connections to faculty and/or peers serve as academic strategies for the participants. They provide ways for students to obtain additional help and create relationships to help them with their studies. Overcoming challenges and self-efficacy are personal strategies for success in this study. The participants had to identify ways to overcome challenges in their personal lives that could harm their completion of these courses. The students also had to have self-efficacy or develop it while in developmental education to have confidence in their success. Overall, the study findings highlight the importance of both personal and academic strategies for successful completion of developmental coursework.

STUDY LIMITATIONS

The 8 participants represent 1 community college in the mid-Atlantic region of the US, so the findings of this study may relate to other institutions or be unique to this setting. Additionally, the study institution offers accelerated developmental education, co-requisite enrollments, and learning communities. Some of the participants completed their developmental courses in one of these formats. If another institution does not offer these options, the results of this study may not apply to their developmental education program

The study faced unforeseen challenges related to the global pandemic. When participant recruitment began, all students were off-campus, learning remotely. This hampered recruitment efforts as it was challenging to obtain interest from students at home. While participants were obtained over a few months, it is essential to note that the global pandemic may limit the study's findings as all participants were from developmental mathematics and English for non-native speakers courses. No students from developmental reading or writing participated in this study.

Additionally, some participants completed their developmental course before the pandemic, while others completed them during the pandemic. Moreover, some participants that completed multiple developmental classes had courses both before and during the pandemic. This point is an important limitation because those taking courses during the pandemic had to complete the developmental classes online regardless of their learning style. Students that learn best in person may have experienced challenges with the online environment. The study did not address this as it was not the focus of the research

RECOMENDATIONS + ACKNOWLEDGMENTS

While the findings of this study provide insight into academic and personal success strategies for students in developmental education, additional research is recommended. It would be beneficial to repeat this study with students from all areas of developmental education to see if the findings are validated. Additionally, future research may break down the different developmental subjects into separate studies to see if the success strategies vary between developmental reading, writing, mathematics, and English for non-native speakers. Specific studies in each area may provide findings tailored to these areas that could benefit future students. Some of the research used in the literature review for this study focused on challenges in specific disciplines; therefore, research on success strategies could build on those studies.

Lastly, it would be prudent to repeat this study when a global pandemic does not affect the delivery of developmental courses. The faculty and students were pulled from their in-person classrooms in March of 2020. They were forced to take in-person courses online without preparation time which may have affected the quality of instruction and content. Most of these courses remained online for the following fall, spring, and summer semesters. It might be beneficial to repeat this study in the future when students are taking classes in the manner they chose, not because it is the only available option

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REFERENCES

1. Abdul-Wahab, S. A., Salem, N. M., Yetilmezsoy, K., & Fadlallah, S. O. (2019). Students' reluctance to attend office hours: Reasons and suggested solutions. *Journal of Educational & Psychological Studies / Magallat Al-Dirasat Al-Tarbawiyyat Wa-Al-Bafsiyyat, 13*(4), 715-732. http://dx.org.ezp.waldenulibrary.org/10.24200/jeps.vol13iss4pp715-732

2. Ali-Coleman, K. Z. (2019). Essential Pathways: An examination of how community college compromise their unique contribution to American higher education. *Higher Education Politics & Economics, 5*(1), 54-69.

3. Aljohani, O. (2016). A comprehensive review of the major studies and theoretical models of student retention in higher education. *Higher Education Studies, 6*(2), 1-18.

4. Arbee, A. (2020). Factors underpinning students' use or non-use of a writing centre. *Per Linguam, 36*(1), 32-46. http://dx.doi.org/10.5785/36-1-881

5. Bahr, P. R., Fagioli, L. P., Hetts, J., Hayward, C., Willet, T., Lamoree, D., Newell, M. A., Sorey, K., & Baker, R. B. (2019). Improving placement accuracy in California's community colleges using multiple measures of high school achievement. *Community College Review, 47*(2), 178-211. http://dx.doi.org/10.1177/0091552119840705

6. Barhoum, S. (2018). Increasing student success: Structural recommendations for community colleges. *Journal of Developmental Education, 41*(3), 18-25.

7. Boatman, A., & Long, B. T. (2017). Does remediation work for all students? How the effects of postsecondary remedial and developmental courses vary by level of academic preparation. *Education Evaluation and Policy Analysis, 40*(1), 29-58. http://dx.doi.org/10.3102/0162373717715708

8. Boland, W., Gasman, M., Nguyen, T., & Castro-Samayoa, A. (2018). The master plan and the future of California higher education: Assessing the impact of state policy on minority-serving institutions. *American Educational Research Journal, 55*(6), 1369-1399. http://dx.doi.org/10.3102/0002831218787463

9. Caelli, K., Rey, L., & Mill, J. (2003). Clear as mud: Toward greater clarity in generic qualitative research. *International Journal of Qualitative Methods. 2*(2). http://dx.doi.org/10.1177/160940690300200201

10. Crocker, S. G., & Mazer, J. P. (2019). Associations among community college students' technology apprehension and achievement emotions in developmental education courses. *Technology, Pedagogy and Education, 28*(1), 37-52. http://dx.doi.org/10.1080/1475939X.2018.1562624

11. Distefano, A., Rudestam, K., & Silverman, R., A. (2004). Retention. *Encyclopedia of Distributed Learning* (pp. 391-392). SAGE Publications. http://dx.doi.org/10.4135/9781412950596

12. Eberle, T. (2014). Phenomenology as a research method. In Flink, U. *The SAGE Handbook of Qualitative Data Analysis* (pp. 184–202). SAGE Publications.

13. Finn, H., & Avni, S. (2016). Academic literacy as language policy in community college developmental writing. *Current Issues in Language Planning, 17*(3), 369–384. https://dx.doi.org/10.1080/14664208.2016.1201188

14. Mullen, C. A., & Fletcher, S. J. (2012). *SAGE handbook of mentoring and coaching in education: Responding to challenging circumstances.* SAGE Publications.

15. Flink, P. J. (2017). Adapting self-selected reading practices for college-level developmental reading courses. *Reading Improvement, 54*(3), 87–92.

16. Hagedorn, L. S., & Kuznetsova, I. (2016). Developmental, remedial, and basic skills: Diverse programs and approaches at community colleges. *New Directions for Institutional Research, 2015*(168), 49–64. http://dx.doi.org/10.1002/ir.20160

17. Hesser, T. L., & Gregory, J. L. (2016). Instructional support sessions in chemistry: Alternative to remediation. *Journal of Developmental Education, 39*(3), 22–28.

18. Ingraham, K. C., Davidson, S. J., & Yonge, O. (2018). Student-faculty relationships and its impact on academic outcomes. *Nurse Education Today, 71*, 17–21. https://doi-org./10.1016/j.nedt.2018.08.021

19. Jacob, S. A., & Furgerson, S. P. (2012). Writing interview protocols and conducting interviews: tips for students new to the field of qualitative research. *Qualitative Report, 17.*

20. Joyce, A. (2017). Framing office hours as tutoring. *College Teaching, 65*(2), 92–93. https://doi-org./10.1080/87567555.2016.1189393

21. Kahlke, R. (2018). Reflection/commentary on past article: Generic qualitative approaches: Pitfalls and benefits of methodological mixology. *International Journal of Qualitative Methods, 13,* 37–52. https://dx.doi.org/10.1177/160940691401300119

22. Logue, A., Douglas, D., & Watanabe-Rose, M. (2017). Reforming remediation: College students mainstreamed into statistics are more likely to succeed. *Education Next, 17*(2), 78–84.

23. Nichols, A. M., & Williams, B. T. (2019). Centering partnerships: A case for writing centers as sites of community engagement. *Community Literacy Journal, 13*(2), 88–106. http://doi.org/10.1353/clj.2019.0009

24. Oseguera, L., & Blackmon, E. (2012). Retention and diversity in higher education. In J. A. Banks (Ed.), *Encyclopedia of diversity in education, 1* (1862–1865). SAGE Publications. https://dx.doi.org/10.4135/9781452218533.n593

25. Peaslee, D. (2018). The relationship between faculty confirmation and community college student self-efficacy. *Community College Journal of Research and Practice, 42*(10), 635-649. http://dx.doi.org/10.1080/10668926.2017.1333931

26. Perez, E. B., & Hansun, T. (2018). Math course for liberal arts majors: A pilot with embedded remediation. Numeracy: *Advancing Education in Quantitative Literacy, 11*(1), 1-11. https://dx.doi.org/10.5038/1936-4660.11.1.6

27. Quarles, C., & Davis, M. (2017). Is learning in developmental math associated with community college outcomes? *Community College Review, 45*(1), 33-51. https://dx.doi.org/10.1177/0091552116673711

28. Ravitch, S. M., & Carl, N. M. (2016). *Qualitative research: Bridging the conceptual, theoretical, and methodological.* Sage Publications.

29. Shields, K. A., & O'Dwyer, L. M. (2017). Remedial education and completing college: Exploring differences by credential and institutional level. *Journal of Higher Education, 88*(1), 85-109. http://dx.doi.org/10.1080/00221546.2016.1243943

30. Snijders, I., Wijnia, L., Rikers, R. M. J. P., & Loyens, S. M. M. (2020). Building bridges in higher education: Student-faculty relationship quality, student engagement, and student loyalty. *International Journal of Educational Research*, 100. https://doi.org/10.1016/j.ijer.2020.101538

31. Swanson, N., Vaughn, A., & Wilkinson, B. (2017). First-year seminars: Supporting male college students' long-term academic success. Journal of College Student Retention: *Research, Theory & Practice, 18*(4), 386-400. http://dx.doi.org/10.1177/1521025115604811

32. Thompson, K. V., & Verdino, J. (2019). An exploratory study of self-efficacy in community college students. *Community College Journal of Research and Practice, 43*(6), 476-479. http://dx.doi.org/10.1080/10668926.2018.1504701

33. Tinto, V. (1988). Stages of student departure: Reflections on the longitudinal character of student leaving. *The Journal of Higher Education, 59*(4), 438-455. http://dx.doi.org/10.1080/00221546.1988.11780199

34. Walker, M. (2015). Exploring faculty perceptions of the impact of accelerated developmental education courses on their pedagogy: *A multidisciplinary study. Research & Teaching in Developmental Education, 32*(1), 16-38.

35. Xu, D., & Dadgar, M. (2018). How effective are community college remedial math courses for students with the lowest math skills? *Community College Review, 46*(1), 62-81. http://dx.doi.org/10.1177/0091552117743789

Stop Trying to Do It All!: The Team-Teaching Producer/Presenter Model for Virtual Classrooms

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PRODUCER/PRESENTER CO-TEACHING

While teaching during a global pandemic has had many challenges, perhaps the greatest challenge facing faculty has been pivoting to a virtual format. Research has indicated for years that a "producer" should facilitate virtual teaching, improving the experience for the presenter and participants, but many faculty attempted to "do it all," teaching virtual classes solo.

ABSTRACT

While teaching during a global pandemic has had many challenges, perhaps the greatest challenge facing faculty has been pivoting to a virtual format. Research has indicated for years that a "producer" should facilitate virtual teaching, improving the experience for the presenter and participants, but many faculty attempted to "do it all," teaching virtual classes solo. We employed team-teaching as we combined 2 virtual sections of our first year composition course (FYC) with one instructor acting as "presenter" and the other acting as "producer" to explore whether the team-teaching producer/presenter (TTPP) model of virtual teaching could increase student success rates and create a sustainable model for faculty. Using practical action research, we collected data from different course modalities of FYC sections at our institution over a period of 2 years to compare pass rates, retention rates, and student evaluation data across all sections of our FYC to our TTPP virtual sections; we analyzed our student feedback from various surveys; and we included our own anecdotal observations. Our preliminary findings showed improved pass/retention rates over those of solo virtual and hybrid virtual sections. Our student-evaluation numbers were among the highest across all sections of FYC. Overall, these findings suggest that there are many new opportunities for research to further demonstrate that virtual teaching, especially in the TTPP model, should persist beyond pandemic necessity and become a sustainable and affordable additional model for remote learning.

INTRODUCTION

Amid the many cliches arising from the COVID-19 pandemic, the refrain that professionals everywhere adapt to "the new normal" remains the most cloying yet pervasive. In the field of education, instructors were asked to quickly pivot to new modalities. Across the nation, faculty detonated centuries of classroom pedagogy and refashioned new methodologies from the shrapnel, often with little training or preparation, in an effort to keep their students progressing and their institutions functioning.

After the abrupt pivot in spring of 2020, Wor-Wic Community College (Wor-Wic) adopted 6 different course modalities for implementation in the fall of 2020 to support as many different groups of students as possible through the many pandemic-inspired unknowns. We offered virtual courses (synchronous classes with set meeting times offered through a video conferencing platform like Zoom or Microsoft Teams) as well as online classes (asynchronous classes offered through our Learning Management Software [LMS], Blackboard). We also offered many new combinations of these delivery models (and each was labeled as a variation of "hybrid"). Some of these hybrid modalities, like synchronous-virtual/face-to-face (where instructors delivered the class face-to-face for half of the students while simultaneously live-streaming the class via Zoom for the other half) or synchronous-virtual/online (where instructors delivered half of the class time synchronously via Zoom and the other half via asynchronous course work in our LMS) were quickly abandoned after the first semester when faculty burnout and student frustrations revealed them to be ineffective and unsustainable.

However, even the straightforward fully virtual model was also rife with frustration. Much of the frustration is encapsulated by Gallagher and Palmer's (2020) observation that "the approach most colleges are employing is simple 'remote learning' via live Zoom classes, a method little evolved from video conferencing from the late-1990s."

In other words, teachers were not matching pedagogy to modality. Faculty members, in their heroic attempts to "do it all" ignored best virtual teaching practices. As Huggett (2017) argued pre-pandemic, successful virtual programs "are the product of 2 key components: interactive design and effective delivery." Experts on virtual presentations in the field of education and in the private professional sector have long recognized that effective design requires a "producer," someone with the technical expertise to manage the presentation software during the virtual presentations (Huggett, 2017; Christopher, 2015). According to Huggett (2017), a producer can free up the facilitator to focus on delivering content "even if the technology doesn't cooperate" or "a participant needs extra assistance with their technology connections." Even if there are no technology problems, "having a producer makes for a better participant experience." Despite these early but well-established guidelines about presenters needing live support in the form of a partner for virtual class delivery, the speed with which faculty had to transform their face-to-face classes meant they often received little training, support, or resources, either technological or pedagogical, from their institution (Leiba & Gafni, 2021).

INTRODUCTION

As a result of this oversight, by the end of 2020, many faculty found themselves struggling to maintain an engaging, student-centered virtual classroom (Leiba & Gafni, 2021). Worldwide, faculty and students alike experienced frustration, exhaustion, disengagement, and burnout (Leiba & Gafni, 2021; Mortazavi & Salehabadi, 2021). Some institutions were ready to abandon virtual learning completely in favor of returning to the classroom (Davis et al., 2022). However, virtual learning has great potential at schools like Wor-Wic and other commuter institutions where many of the students are nontraditional, balancing work, school, and family obligations while facing financial, logistical, and health-related obstacles that reflect the vast inequality and paucity of resources across America. Noted education researcher and author Mike Rose (2012) reported that "the majority of...students in community colleges...are from low-to modest-income backgrounds. And some live in poverty. For the most part, they have not benefited from... quality educational resources. They typically must work—some full-time or close to it—have family obligations, and have limited transportation." None of these challenges have been eliminated over the decade since Rose described them, and the 2 years of ongoing chaos from the pandemic has only exacerbated the problem.

Since the 2 most popular community college course delivery models are opposite in their approach—synchronous in-person classes are engaging but often inconvenient to student schedules while asynchronous online classes are convenient but often lack the engagement of in-person classes—we felt that virtual classes could offer the possibility for a strong third option: the engagement of synchronous in-person classes and the convenience of asynchronous online classes. However, we understood that this course delivery model required a new innovation to be sustainable and affordable. Virtual teaching alone is not sustainable. Faculty simply cannot effectively "do it all" in a virtual course by themselves, but at a small community college like Wor-Wic we could not afford to add an IT person to each section to serve as a producer. Thus, as we moved beyond the "anything goes" mania of early pandemic pedagogy, we asked ourselves the following question: Could the well-documented benefits of team-teaching, namely, professional growth, increased confidence and collegiality, more teacher-student interaction, and enhanced motivation for both students and faculty (Kluth & Straut, 2003), be combined with the best practices of splitting duties within virtual seminars following the producer/presenter model to improve synchronous virtual teaching?

We piloted a section of a team-teaching producer/presenter (TTPP) course for a semester in spring 2021 and were so inspired by the positive experience that we implemented it again in the following 2 semesters (fall 2021 and spring 2022). Along the way, we sought continual feedback from our students about their virtual classroom experiences to explore their opinions, and they confirmed that it seemed much better than solo-taught synchronous virtual classes. As we move beyond the limitations of hastily implemented pandemic necessity, we see potential for this model as a viable long-term option for students and faculty.

METHODS

WHAT IS THE TEAM-TEACHING PRODUCER/ PRESENTER MODEL?

Our TTPP model combines the collaborative aspect of team-teaching with the cognitive benefits of splitting duties within virtual seminars. In practice, we combined 2 virtual sections of our FYC course that were offered on the same days at the same time. This meant that 44 students (22 from each section) attended a single virtual class via Zoom

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The producer was responsible for providing a seamless virtual experience: taking attendance, admitting students, managing the chat, advising students about technical difficulties, setting up activities, managing breakout rooms, and any other duties to facilitate the many overwhelming tasks that are necessary in a virtual class session. The presenter was responsible for leading the class: delivering lectures, answering students' spoken questions, giving instructions, and leading activities. The goal of splitting the work of virtual teaching between 2 SMEs was to improve the delivery of the course content through increased interactivity, real-time just-in-time mediation, and increased opportunities for communication and interaction with the professors both inside and outside of class. Both professors also collaborated frequently in the design of lesson plans and activities as well as shared the grading and communication load.

Though our initial plan was to keep the producer and presenter roles consistent, the most common theme revealed from our student feedback from our first semester was, as one student argued "You should have the instructors switch roles more often." As a result of those early suggestions, throughout our 3 semesters of employing this approach we changed roles regularly, usually between units. For example, in our institution's FYC course, the 4 units revolve around each of the assigned essays, so one instructor presented the first essay (the illustration assignment) while the other produced, and then the roles were reversed for the next essay (the cause/effect assignment).

METHODS

STUDY DESIGN

The hallmark of our effort to improve virtual teaching employed practical action research: a dynamic, recursive process that allowed us to identify the problem, incorporate our research, and then simultaneously gather results as we put the plan into action, continually adjusting our plan as we gathered more data, following Kemmis's (1994) "spiral of self-reflection." This approach was the best method for us to gather a variety of data and respond quickly to improve our courses and adapt to the constantly evolving reality of pandemic-altered education. Across 3 semesters, we collected data from a total of 96 students enrolled in our designated TTPP sections of our FYC course at Wor-Wic, a community college on the Eastern Shore of Maryland with an enrollment of approximately 4,000 students.

We compared student pass rates for our FYC courses across the college by delivery model through 2 years of pandemic-altered teaching (Table 1). We collected student evaluation data, which was anonymized, and aggregated the numbers by the delivery model (Table 2). Most importantly, we employed a grounded theory approach, developed initially by Glaser and Strauss (1967) that was "designed to create theories that were empirically designed from real-world situations" (Oktay, 2012) to analyze our students' comments on 2 course-evaluation data points: 1) we surveyed our students at the end of each semester with a single open-ended question: "What feedback do you have about this class and how does it compare to your other classes?" and 2) we also collated the anonymous written comments from our semesterly "Student Opinion of the Learning Experience" (SOLE) evaluations. We then analyzed the individual comments, which allowed us to prioritize our students' voices and experiences as active collaborators in the process of improving our virtual delivery each semester, and as we evaluated these data points, we discovered 4 themes that improved our students' experiences: pacing /interactivity, engagement, reduction of anxiety/increase of confidence, and speed/amount of feedback. And finally, as teaching professionals with years of experience, team teaching provided collaboration and helped drive the dynamic cycle of self-reflection throughout this research as we anecdotally noted many fringe benefits from the TTPP model, comparing this experience to both our other pandemic-altered sections and our pre-pandemic classes.

RESULTS + DISCUSSION

Overall, our pass rates for the past 2 years are inconsistent, but the average pass rate for our TTPP virtual sections was 5% higher than our solo-taught virtual courses (Table 1). Students rated the TTPP virtual class higher (on average) than all other delivery models for our FYC courses (Table 2). Student comments on some optional feedback and end-of-semester evaluations were also insightful about not only their positive impressions of our course but also their opinions about the ineffective nature of solo-taught virtual courses. And finally, throughout the delivery of this course, we recorded many "fringe benefits" that contributed to the instructors' opinions that this TTPP delivery model is the most sustainable approach to virtual teaching.

PASS RATES

The data we collected on pass rates by modality shows some promise; however, the data is not very conclusive due to its small sample size, and compounding the challenge of interpreting these numbers is the context: the rates are derived from mid-pandemic courses presented under shifting institutional policies. These policies are reflected in widely disparate pass rates.

Despite this inconsistency (the highest semester boasted a 63% pass rate; the lowest was 53%), the numbers we have gathered so far show some promise in that overall average pass rate for the TTPP model (56.3%) was somewhat more effective than the solo-taught virtual sections (50.7%) (Table 1). However, it would be difficult to draw firm conclusions from this limited data set.

Table 1 Student Pass Rates by Course Modality, Fall 2020–Spring 2022.

	Total students	Pass rates
Online (asynchronous)	512	61.91%
In-person	272	67.65%
Hybrid: in-person/online	222	66.22%
Hybrid: virtual/online	73	50.68%
Hybrid: in-person/virtual	83	67.47%
Team-teaching producer/ presenter	96	56.25%

Also, worth noting is that the hybrid face-to-face/online sections, where an instructor taught half the class in person and half joined virtually via Zoom, had pass rates comparable to the face-to-face delivery (67.4% and 67.6%, respectively) (Table 1). However, these sections were only offered in Fall 2020 (before we began the TTPP model), and the pass rates were buoyed by faculty who were asked to be as gracious as possible with students due to the constantly evolving pandemic. Additionally, faculty in our department did not find this live-streamed face-to-face classroom approach to be a viable model for teaching. Anecdotally, the faculty who taught this model left the classroom dazed, exhausted, and frustrated. They were unable to effectively divide their attention between the Zoom students and the face-to-face students, forever leaving one group behind. Thus, as a department, we abandoned this model. When it was first proposed, we should have quoted Huggett's (2017) exhortation: "Don't do it" and pointed out that this double-delivery is not sustainable for the presenter. Another contextual concern that may have affected these pass rates was that coinciding with our first offering the TTPP model, administrative guidelines shifted away from Covid-inspired flexibility back toward our standard emphasis on consistently applied policies. Considering the small sample sizes, these minor changes (which affected a handful of students in each class) likely had an oversized impact on the data. Still, despite these challenges, the TTPP model is a few points behind the delivery approaches that have been in place for many years: online and face-to-face courses. Thus, it is our hope that the rates for the new model will improve over time as we continue to offer TTPP virtual sections in the future.

VIRTUAL FEATURES BY DESIGN AND STUDENT PERCEPTIONS

Despite the limited data regarding student success, we do have multiple measures that reveal student appreciation of this model. Our primary source of support was derived from our end-of-semester evaluation numbers, which were among the top of our institution's FYC sections when compared to all course-delivery models (Table 2). In 11 out of 15 student-evaluation metrics from our SOLE end of semester survey, the TTPP model rated the highest by modality (ranging from 3.78–3.98 out of 4), and the other 4 metrics were also very strong (ranging from 3.7–3.93). We do recognize and acknowledge that this positive evaluation may have been the result of our enthusiasm, or we may have benefitted from the well-documented race (Smith, 2009), age, and gender biases (Arbuckle & Williams, 2003) in student course evaluations; however, as seen in the following sections, data from our students' written comments speak to both our effectiveness and their preference for the TTPP model, and as Cashin (1995) concluded, "in general, student ratings tend to be reliable, valid, and relatively free from...the need for control; probably more so than any other data used for evaluation."

Table 2 Student Evaluation Averages for FYC by Modality Spring 2021–Spring 2022.

	Team-teaching producer/ presenter	Hybrid: in-person/ online	In-person	Online	Hybrid: virtual/ online
Assignments useful in learning	3.88	3.79	3.71	3.80	3.70
Objectives agreed with course	3.85	3.83	3.76	3.84	3.80
Knew course expectations	3.80	3.78	3.71	3.81	3.80
Course clearly organized	3.92	3.73	3.67	3.78	3.50
Exams covered aspects of course	3.70	3.71	3.56	3.76	3.70
Instructor communicated clear/concise	3.98	3.81	3.77	3.78	3.50
Instructor used variety of instructional approaches	3.92	3.80	3.63	3.70	3.80
Instructor was fair and impartial	3.87	3.83	3.79	3.81	3.80
Instructor demonstrated importance of subject matter	3.92	3.83	3.76	3.79	3.70
Instructor related material to real life situations	3.78	3.74	3.68	3.76	3.20
Instructor encouraged multiple resources	3.93	3.86	3.78	3.80	4.00
Instructor provided timely/frequent feedback	3.88	3.73	3.76	3.79	3.50
Instructor enthusiastic about teaching	3.95	3.82	3.69	3.85	3.70
Instructor encourages self-learning	3.82	3.83	3.68	3.75	3.70
Instructor respects opinions/ expressions	3.82	3.82	3.80	3.81	3.80
Total number of students who completed the survey	34	46	118	132	6
Overall average	3.87	3.79	3.72	3.79	3.68

VIRTUAL FEATURES BY DESIGN AND STUDENT PERCEPTIONS

In analyzing the data gathered from anonymous SOLE comments as well as the comments from a non-anonymous survey we conducted each semester, via a process rooted in grounded theory, we noticed 4 distinct themes emerge from the student feedback. All 4 themes related to students' positive experiences inside and outside of the classroom: pacing/interactivity, engagement, reduction of anxiety/increase of confidence, and speed/amount of feedback. These themes illustrate that combining the collaborative benefits of team-teaching with the cognitive benefits of splitting duties creates a powerful and effective experience for faculty and students alike.

The first theme, pacing and interactivity of the course delivery, was likely the result of careful planning of each day's lessons to fully leverage the virtual environment to include many interactive components. We had some standard reading quizzes outside of class time delivered via our LMS (Blackboard), but we also supplemented these with in-class quizzes where students could collectively discuss and answer questions via polling software, elevating quizzes to a more interactive and entertaining game-show format. We used the Blackboard discussion board as a tool for students to share drafts of their writing during class and breakout rooms to workshop those drafts with real-time peer feedback. We employed the live chat feature of Zoom for students to ask questions of each other or the producer, share ideas or comments, and sometimes workshop several sentences of writing. This allowed class to move at a lively pace, minimizing interruptions to the flow of content delivery, as often results in solo-taught virtual classes. Several students noted appreciation for this design. As one student summarized, "Each class was varied between different activities and moved at a fast yet comfortable pace." Additionally, our TTPP sections had the highest average evaluation score of any modality in response to the prompt: "The instructor used a variety of instructional approaches."

Because of the more effective nature of the course pacing and the increased interactivity, a second theme involved an increase in engagement. Many comments referred to students feeling "less bored" than their solo-taught virtual classes, which speaks to the relationship between design and student experience. Having a second faculty member handle the technical responsibilities and student questions resulted in less "dead air," which helped keep the class session fresh and engaging for students. In addition to the evidence shown by earning the highest overall average score in the category "Instructor demonstrated enthusiasm about teaching," (Table 2) one student summed up their opinions as follows: "Both professors did a great job of fully covering the material in a way that was as entertaining as it was thorough. I can't say that at any point during the class I felt bored." Another student said, "I love learning in this class! I felt like I understood what I was learning and was able to ask questions if I didn't understand."

In conjunction with an increase in enjoyment, many students reported that they felt their anxiety about participating in a virtual class dissipate and their confidence as a writer grow. The option to put a question in the chat and receive an immediate answer from the "producer" encouraged some of the quieter students to more actively participate in class. As one student told us via a class survey, "I liked that I didn't feel like I was interrupting class by putting something into the chat. I was able to get a response BEFORE heading onto

VIRTUAL FEATURES BY DESIGN AND STUDENT PERCEPTIONS

a different area of what we were learning that day." We also frequently used Zoom's breakout rooms with clear instructions for the students to talk about their progress on their assignments, workshop ideas, complete peer review, answer questions together and other collaborative activities. As their anxiety about participating decreased, their confidence as a writer increased. One student's evaluation comment spoke to this specifically: "I appreciate how Professor Porter & Reddish take us through the smallest details of writing such as a thesis because these details have made me so much more confident as a writer."

Outside of our virtual class time, students found other benefits in our approach. The final theme in the data from the student evaluations spoke to an increase in both the speed and the amount of feedback. Students' work was often assessed more quickly than usual because we established clear guidelines together as instructors for when and how things would be graded, and we worked hard to complete "our half" promptly. Thus, team teaching provided authentic teamwork (because we wanted to help our students), a sense of professional accountability (because we couldn't let our teammate down by missing the deadline), and a bit of friendly competition (because we wanted to finish "our half" first). Students frequently got replies to their emails more quickly (sometimes within the hour) because they were directed to copy both professors on their questions. Students also had double the number of faculty office hours available to them. One of our frequent office-hour visitors told us, via survey, "I love how one teacher has an office hour before class and another has one after, it is really nice, because if I have a question before or after class, I can visit one of the office hours." And, again, we see this reflected in the data from the student evaluations as we boasted the highest average score of any modality in the category "Instructor provided timely and frequent feedback" (Table 2).

Not only did students receive more prompt evaluation and responses, but they had the benefit of 2 different perspectives on their work. Each student had 2 distinct faculty personalities to choose from when they had a question, so they could gravitate toward the instructor of their choice. This choice may have reduced students' anxiety about reaching out if they needed assistance. We also switched which students' work we graded for each essay, resulting in students receiving feedback from both of us throughout the semester. This led to some students electing to receive the quickest feedback, some students gravitating to their preferred faculty member, and others tailoring their questions to their audience, which is an important soft skill for students and burgeoning skill in composition. Several of our students addressed this feature specifically in response to a survey. They said things like "I also like having 2 professors because I can get different types of feedback on different assignments...having a second opinion always helps."

Overall, our students repeatedly praised the TTPP approach in a way that elevated it above all their other courses. One student wrote, "The dual professor virtual class format was refreshing, to say the least, and I would love it if all my classes would adopt this format." Another reiterated a similar message: "I like having 2 instructors and would recommend the teachers to people." This appreciation for the TTPP model was a popular refrain from our students—they may not have told their other teachers that they preferred the dual-professor format, but that message was resounding through our own evaluations.

COLLEGIAL COLLABORATION

For teachers completely overwhelmed in the middle of the pandemic, though, the most important benefits from the TTPP model were less quantifiable, but nonetheless vital to the courses' success, sustainability, and importance going forward. Team teaching has many well-documented benefits: professional growth, increased confidence and collegiality, more teacher-student interaction, and enhanced motivation for both students and faculty (Kluth & Straut, 2003). Accordingly, the TTPP model offered us, the professors, collaborative planning, shared resources, informal professional development, a built-in sounding board, and increased confidence. Often it felt as if a "hive mind" might be forming. At a time when most of us were socially distanced and feeling isolated and disenfranchised, we found camaraderie as we planned the course and wrote our syllabi collectively, built our Blackboard course shell together, and reviewed and revised our assignments, choosing what we liked best from each other's courses from the past.

As we developed each day's lesson plans through the first semester, we pooled our resources. We used cloud-based collaboration software (Microsoft Teams) to share our lesson plans, our PowerPoint slides, our ideas, and our activities. We frequently brainstormed ideas for classes that had "fallen flat" in the past and together we reimagined them for the virtual classroom environment. We frequently rewrote lessons and materials, developed striking visual aids, and integrated multi-media connections. Despite each of us having taught the course independently for over a decade, the course design felt fresh. We often met in the hallways or in our offices to reflect on our class session and brainstorm ideas for "next time," being sure to take notes in our shared lesson plans so we could be sure to implement those changes going forward. This improved both of us as teachers, and a frequent refrain in our conversations after class was, "I'm totally stealing that for my other sections." At times, an outside observer in a class can induce a "spectator effect" or amplify "imposter syndrome," but for us, having both professors collectively working through every class session to actively assist our shared group of students minimized these psychological factors and improved our confidence as professionals.

Adding to this improved course development, planning, and delivery, we also sharpened each other by sharing techniques that facilitated both the clerical work of teaching and honed our pedagogical approaches—we learned new ways to use Blackboard (even though we've both used it for decades) to streamline processes, we shared research with each other and made changes to our course design and delivery as a result, and we both became better teachers in our other FYC sections through the process. This is not to say that teaching the class was easier or lacked frustration, but during those challenges, especially during the social isolation in the waxing phases of the pandemic, we found that team -teaching provided us with a built-in sounding board. Collaboratively teaching provided us a colleague to share these frustrations with. We were able to express our concerns during hallway conversations, office chats, and via our Microsoft Team, and we could brainstorm solutions together. We could take turns responding to student queries—tagging in to support the team when our teammate didn't have the time or energy. At a time when many faculty members felt more removed from the workplace, adrift, we were anchored and steadier—which enabled us to address and tackle the challenges of this "new normal."

CONCLUSION

Unfortunately, the small sample sizes and fluctuating pass rates make it impossible to draw firm conclusions about the universal viability of this model. However, anecdotal conclusions are still possible. The TTPP model is more successful than the virtual/online model. It is more sustainable for faculty than solo-taught virtual classes or certain hybrid classes, like virtual/online or face-to-face/virtual. While our students' pass rates were not as high as face-to-face or asynchronous online, both methods have decades of research and practice behind them. Given additional time as well as institutional and faculty buy-in, we are hopeful that the TTPP method has potential to be a viable option to deliver synchronous online courses that, over time, could lead to even greater student success

CONCLUSION

Perhaps most importantly, this model provides a zero-cost solution to a growing problem in higher education: creating accessible, equitable teaching models that are as flexible as they are rigorous, in a way that is sustainable for faculty.

Because this is a bold new direction in synchronous virtual teaching and because there is a dearth of research for faculty to draw on, opportunities abound for both quantitative and further qualitative research. For quantitative research, pass rates and retention rates between TTPP virtual courses and solo-taught virtual courses could be compared, and these same metrics could be evaluated between TTPP virtual courses and other modalities. Even more possibilities exist for qualitative research. Since all virtual classes can be recorded and reviewed in detail later through traditional or automated techniques, the possibilities for analysis of virtual teaching (with careful planning from the outset) seem bound only by professionals' creativity.

Researchers might design a study to explore the quantity and quality of interactions both verbally and via the class chat box in TTPP virtual sections compared with solo-taught virtual sections. Research could be conducted to survey faculty members' and students' perceptions of virtual teaching, contrasting the TTPP model with solo-taught virtual sections. At larger institutions that have the resources to assign technical producers who are not SMEs, it would be useful to compare metrics between tech-support producers and SME producers to see if student perceptions and/or success rates were impacted by the type of producer. In general, we are excited to see what new directions research might take to help improve virtual teaching via the TTPP model.

Overall, if academia sees value in the possibility of virtual teaching, they need to follow the long-standing guidance that experts from the private sector have argued for almost a decade: flying solo is nearly impossible in the synchronous virtual setting. As Huggett (2017) said, "If your organization perceives a producer as an extra expense instead of a value-added necessity, then you may need to justify one....or get creative in how you can supply a producer on a shoestring budget." Our creative efforts to justify this necessary resource led to our development of the no-cost TTPP model, and we hope that other scholars will follow our model and test it and other new solutions for virtual teaching, particularly in community college contexts where commuting students will reap the most benefit. Such proposals, though, will require administrators to dedicate resources toward re-envisioning course design and planning.

However, there are some limitations to the TTPP model. The course design works best as a solution for large, multi-section classes, which, for many colleges, limits the field to first-year, gatekeeper courses like FYC. Likewise, the collaborative nature of this method requires a thoughtful pairing between faculty. In many ways, team-teaching is like a marriage: it works best with open lines of communication, suitable personalities, and complementary approaches to teaching and grading. Faculty must decide early on how to split the responsibilities, including grading, lesson planning, and student

CONCLUSION

inquiries. One of the best ways to maintain a healthy partnership is to utilize cloud sharing technology, such as Google Docs or Microsoft Teams for continual asynchronous communication, collaborative lesson planning, resource sharing, impromptu discussions, and mental health check-ins. Once a team has crafted a resource repository, the model becomes immediately scalable: faculty can split and re-pair as often as time and inclination allows.

The preliminary findings from our 3-semester pilot seem to echo what much of the current literature on virtual teaching suggests: while faculty and students alike appreciate the convenience and flexibility of online learning (Leiba & Gafni, 2021; Palmentieri, 2022), they often balk under the seemingly insurmountable drawbacks: the high bar of technical expertise and training, screen fatigue, isolation, cognitive overload, and decreased motivation (Leiba & Gafni, 2021; Mortazavi & Salehabadi, 2021). Those who report positive experiences with virtual teaching advocate for a paradigm shift in pedagogy: a more collaborative "community of teachers, learners and professional users, who can exploit the enormous potential of the IT environment" (Palmentieri, 2022). In this way, Palmentieri (2022) argues, students will no longer be mere spectators but "actors of a deep learning experience" who are "motivated to participate collectively in the construction of a cultural environment." Faculty, likewise, will have to give up the "role of 'sage on the stage' to take on the role of facilitator and 'guide on the side' of each student" (Palmentieri, 2022). The TTPP model offers an easily implemented opportunity for institutions to embrace these pedagogical guidelines and improve virtual teaching and learning.

Our hope is that faculty worldwide can build on the preliminary practical action research we shared and incorporate additional techniques for improving the virtual environment beyond pandemic necessity. Pandemics are not the only force threatening to destabilize higher education: the speed of technological progress, the looming cataclysm of climate change, and the ever-widening gulf of inequality require educators everywhere to continually respond to the constantly shifting sands around us. Adding an SME producer to a virtual class should enable other faculty at other institutions to respond to these challenges to improve student success. As one of our students from our first semester of our TTPP course told us via survey, "This class has been a class I've been trying to pass since my first full year at Wor-Wic in 2010... For the first time in years, I'm no longer afraid of failure because I'm having some success in this class." Reimagining course delivery, when done correctly, can have a life-altering impact for our students.

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REFERENCES

1. Arbuckle, J., & Williams, B. D. (2003). Students' perceptions of expressiveness: Age and gender effects on teacher evaluations. *Sex Roles, 49*(9/10), 507–516. https:doi.org/10.1023/A:1025832707002

2. Cashin, W. E. (1995). Student ratings of teaching: The research revisited. IDEA Paper No. 32. Kansas State University. https://files.eric.ed.gov/fulltext/ED402338.pdf

3. Christopher, D. (2015). *The successful virtual classroom: How to design and facilitate interactive and engaging live online learning.* AMACOM.

4. Davis, L., Sun Q., Lone T., Levi A., & Xu, P. (2022). In the storm of COVID-19: College students' perceived challenges with virtual learning. *Journal of Higher Education Theory and Practice, 22*(1), 66–82. https://doi.org/10.3389/feduc.2022.851019

5. Gallagher, S., & Palmer, J. (2020, September 29). *Universities online. The change was long overdue*. Harvard Business Review. https://hbr.org/2020/09/the-pandemic-pushed-universities-online-the-change-was-long-overdue

6. Huggett, C. (2017). *Virtual training tools and templates: An action guide to live online learning.* ATD Press.

7. Kemmis, S. (1994). Action research. In T. Husen & T. N. Postelhwaite (Eds.), *International encyclopedia of education* (2nd ed., pp. 42–49). Oxford and New York: Pergamon and Elsevier Science.

8. Kluth, P., & Straut, D. (2003). Do as we say and as we do: Teaching and modeling collaborative practice inside the university classroom. *Journal of Teaching Education, 54*(3), 228–240. https://doi.org/10.1177/0022487103054003005

9. Leiba, M., & Gafni, R. (2021). Zooming?!--Higher education faculty perspectives. *Issues in Informing Science & Information Technology, 18*, 121–140. https://doi.org/10.28945/4791

10. Mortazavi, F., Salehabadi, R., Sharifzadeh, M., & Ghardashi, F. (2021). Students' perspectives on the virtual teaching challenges in the COVID-19 pandemic: A qualitative study. *Journal of Education and Health Promotion, 10*(1), 59. https://link.gale.com/apps/doc/A653599539/GPS?u=sali69408&sid=bookmark-GPS&xid=db53f432

11. Oktay, J. (2012). *Grounded Theory.* Oxford University Press.

12. Palmentieri, S. (2022). E-Learning in Geography: New perspectives in post-pandemic. *AIMS Geosciences, 8*(1), 52–67. https://doi.org/10.3934/geosci.2022004

13. Rose, M. (2012). *Back to school: Why everyone deserves a second chance at education.* The New Press.

14. Smith, B. P. (2009). *Student ratings of teaching effectiveness for faculty groups based on race and gender. Education, 129*(4), 615–624.

Does Grade Point Average Matter for Matriculation into Postsecondary Education?

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DOES GPA MATTER?

Does a student's high school grade point average (HSGPA) of 2.5 or greater determine or predict a successful post-secondary enrollment? For this research, historical data from the 2015-2021 cohorts of Upward Bound Catonsville (UBC) scholars were retrieved from the UBC Community College of Baltimore County (CCBC) Blumen Database report.

ABSTRACT

Does a student's high school grade point average (HSGPA) of 2.5 or greater determine or predict a successful post-secondary enrollment? For this research, historical data from the 2015-2021 cohorts of Upward Bound Catonsville (UBC) scholars were retrieved from the UBC Community College of Baltimore County (CCBC) Blumen Database report. To ensure our scholars maintain a 2.5 or better HSGPA, UBC uses several methodologies to monitor and intervene if necessary to ensure that the benchmark is being upheld including monthly check-ins with assigned program coordinators, Tutor.com, and virtual tutoring with faculty. An all-hands-on-deck approach is put into play if a student slips below a 2.5 HSGPA; they are then assigned to meet with the program director until their HSGPA exceeds 2.5 HSGPA. These approaches are a combined methodology that somewhat mimics the graded response model (GRM) and hybrid data analytics (HDA). The qualitative and quantitative data show that HSGPA matters for UBC scholars with successful enrollment into post-secondary education. It is not the only thing universities or colleges use; however, it levels the playing field. The research shows that a 2.5 or higher HSGPA is recommended to enroll in post-secondary education and speaks to many characteristics of an individual's work ethic. When comparing CCBC average HSGPA of all freshmen students and all transfer students who enter the fall semesters, the UBC graduates' HSGPA is around 0.50 basis points higher. Post-secondary attainment helps lower unemployment ratios, improve quality of life, and reduce systemic poverty. If we want to solve some of America's labor ills, the findings support and suggest starting with getting a student's HSGPA to 2.5 or greater.

Does Grade Point Average Matter for Matriculation into Postsecondary Education?

INTRODUCTION

CCBC's UBC Program is a Department of Education (DOE) grant awarded through a competitive request for proposal process every 5 years. There are several benchmarks that the UBC grant is required to meet: 1) Funded to serve ratio; 2) Eligibility criteria; 3) Academic performance–grade point average; 4) Academic performance on a standardized test; 5) Secondary school retention and graduation; 6) Secondary school graduation (rigorous secondary school program of study); 7) Post–secondary enrollment; and 8) Post–secondary completion.

Benchmark 3 requires that 74% of participants served during the project year have a cumulative HSGPA of 2.5 or better on a 4–point scale at the end of the school year. Why is that HSGPA requirement essential? Most universities or colleges require a minimum HSGPA to be considered for admittance. Since UBC is a college preparation and readiness grant for high school students, without tracking our scholars' HSGPAs, the program would not be able to determine college readiness. Benchmark 5 provides UBC the statistics on how many of our scholars graduated with their high school diplomas and matriculated onto post–secondary education, which is benchmark 7. The data collected will determine if an HSGPA of 2.5 or greater determines or predicts a successful post–secondary enrollment.

The approved UBC objectives for the DOE grant cycle from 2017–2022 are presented below. The 5 objectives are tracked throughout the grant life cycle for attainment. This is the measurement that UBC must reach. Each year an annual progress report (APR) is completed by the program director on or about December 15 for the DOE to establish if the benchmarks have been attained. The overall goal of the UBC is to see our scholars matriculate from secondary education and complete post–secondary education within 6 years of completing the UBC program.

Objective 1. Academic performance GPA: 74% of participants served during the project will have a cumulative GPA of 2.5 based on a 4–point scale at the end of the school year.
Objective 2: Academic Performance on Standardized Tests: 80% of UBC seniors served during the project year will have achieved at the proficient level on state assessments in reading/language arts and math.
Objective 3: Secondary School Retention and Graduation: 95% of project participants will continue to participate in school for the next academic year at the next grade level, or will have graduated from secondary school with a regular secondary school diploma.
Objective 4: Secondary School Retention and Graduation: Rigorous Secondary Program of Study: 80% of all current and prior year UBC participants who graduated from high school during the school year with a regular secondary diploma will complete a rigorous secondary school program of study.
Objective 5: Post–Secondary Enrollment: 80% of all current and prior UBC participants, at the time of entrance into the project, had an expected high school graduation date during the school year will enroll in a program of post–secondary education by the fall term immediately following high school graduation, or will have received notification by the fall term immediately following high school from an institution of higher education of acceptance but deferred enrollment until the next academic semester (e.g., spring semester).
Objective 6: Post–Secondary Completion: 50% of all participants who enrolled in a program of post– secondary education by the fall term immediately following high school graduation or by the next academic term (e.g., spring term) as a result of acceptance but deferred enrollment, will attain either an associate's or bachelor's degree within 6 years following graduation from high school.

METHODS

Each semester we collect student HSGPAs by obtaining a copy of the student's report card and the final transcript. Once a year, the annual progress report (APR) is completed for the DOE with UBC data entered into Blumen, a database management system. The data collected includes the 8 benchmarks mentioned in the introduction. When the APR is completed, the DOE provides data on previous cohorts from the National Clearing House database for benchmarks 7 and 8.

Does Grade Point Average Matter for Matriculation into Postsecondary Education?

METHODS

UBC uses several methodologies to monitor and intervene if necessary to ensure that the benchmark is being upheld including monthly check-ins with their assigned program coordinator (Table 5), Tutor.com (Table 4), and virtual tutoring with faculty (Table 1). Table 5 reflects a comprehensive approach which includes the program director meeting weekly with each student whose HSGPA is below 2.5. The findings analyze the UBC 9th through 12th-grade cohorts from 2016-2021. "The qualitative data provides the summative assessments while formative assessments result in quantitative data. Quantitative data has statistical value because it is measured in numbers while qualitative data is the type of data that describes information using groups and categories" (Formplus Blog, 2022). Both quantitative and formative data are used for this project.

Two different methodologies show similar results that support UBC's approach to assisting students with maintaining an HSGPA of 2.5 and above. Our scholars will be viewed in a favorable light when they see UBC as an organization listed on their college application; they can assume that this student is college ready. The first methodology is noted by Allen and Mattern (2019), who used the GRM. They examined summary indices of high school performance, including coursework, grades, and test scores based on the GRM. Universities that consider multiple factors in admission decisions, including high school coursework along with HSGPA and test scores, will have a more accurate picture of their applicants' level of college readiness and success.

Figure 1 gives us a raw picture of the 6-year outcomes of CCBC freshmen and transfer students with their matriculation. Note that students who earn an award and transfer are counted in both categories. When you compare CCBC's students with the outcomes and HSGPA, one can conclude that the higher the students' HSGPA, the better their success ratio of completion. For example, in cohort classes 2013 and 2014, the HSGP was below 2.5. Their completion ratio for C/O 2013, was 6,699 enrolled and 2,125 completed. In the C/O 2014, 6,192 enrolled and 2,109 completed. However, in C/O 2015 with an average HSGPA above 2.5, the cohort completion ratio was higher; 5,889 enrolled and 3,847 completed. More research can be conducted to confirm this hypothesis. Still, the raw data shows a glimpse of success, with students who enter a 2-year or 4-year higher educational institution more likely to succeed.

The second methodology is by Al Hazaa et al., (2021). Their methodology suggests that there is a significant relationship between HSGPA

Does Grade Point Average Matter for Matriculation into Postsecondary Education?

METHODS

with post-secondary education attainment and early years' salary. Most empirical studies' findings evidence of the power of HSGPA in measuring student readiness for college and positive findings on academic performance. They also correlate HSGPA to securing post-secondary education and post-secondary graduation. The methodology approach used was HDA which predicted graduation rates depending on high school performance. The research proves that HSGPA does matter, and Table 8 supports this methodology.

Quantitative data are shown in Tables 1-4. In tables 1, 2, and 4, UBC uses a similar approach to the GRM methodology. Tables 1 and 4 use GRM concerning the scholars' contacts in the subject matter classes with the virtual faculty tutoring and Tutor.com. When comparing virtual tutoring with faculty versus Tutor.com, one of our C/O 2022 graduates, Victory A. summed it up by stating that being on camera face-to-face with our faculty helps us to be able to understand the concept of our topic better and one con is the limited meeting time and availability. Adding the virtual piece by a faculty gave a personal touch to the students with a familiar individual assisting consistently. It tied the coursework and tutoring as a seamless approach. Table 2 is a mixture of both methodologies showing the results of the HSGPA, standardized test scores, and post -secondary enrollment. Table 3 is an example of the HDA method.

Qualitative (formative) data is shown in all figures by providing a visual methodology with the infographic, which shows the wrap-around services UBC offers to ensure our scholars achieve an HSGPA higher than 2.5. These wrap-around services are also provided as quantitative data in tables 2, 4-5. With every touch of a faculty or staff member with a student, the chances of that student achieving the desired outcome are higher. The wrap-around services add support.

Photovoice methodology is a qualitative approach that uses photos to reflect upon emotions and experiences. The qualitative and quantitative data help to portray how the methodologies used are comprehensive, detailed, and complex, just as getting a ninth grader through to enrolling into post-secondary enrollment with a higher than a 2.5 HSGPA. The HDA of HSGPA in measuring student readiness for college and positive findings to academic performance is shown in the wrap-around services that build good habits during post-secondary education. GRM method proves the combination of classwork, standardized test, and HSGPA assist with post -secondary enrollment.

RESULTS

During the COVID-19 pandemic, the program took our in-person tutoring virtual. Before COVID-19, the program did not understand the value of virtual learning or a hybrid learning environment. UBC was unsuccessful prior to the pandemic in recruiting and obtaining qualified tutors due to the hourly rates. UBC staff sent notifications to several external organizations to fill tutoring openings without success, so our posting went unfilled. After doing some research, we found that our asking amount was lower than what the market was asking for. CCBC was not competitive in this arena concerning experience and education attainment requirements.

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It was simply a no-brainer to convert to a virtual tutoring environment due to the pandemic and utilize our faculty as highly qualified tutors. Table 1 provides the hours clocked from our subject matter faculty for cohort years 2020-2021 and 2021-2022 for English, science, Spanish, math, history, and study skills/college applications. A total of 436 hours were clocked in the subject of math, showing that math is the subject that UBC scholars need the most help with.

Table 1: UBC Individual Virtual Tutoring Contact Hours with Faculty.

	2020-2021	2021-2022
English	56	67
Science	20	22
Spanish	5	20
Math	91	115
History	10	8
Study skills/college applications	2	20
Total hours	184	252

RESULTS

Table 2 Percentages of Students Meeting Benchmarks by Year from the Blumen Database.						
	Goal	Proposed Objectives 2020–2021	Proposed Objectives 2019–2020	Proposed Objectives 2018–2019	Proposed Objectives 2017–2018	Proposed Objectives 2016–2017
Number of actual students enrolled (Goal reflects funded to serve number)	76%	61	69	58	63	81
Academic performance GPA of 2.5 or better on a 4-point scale at the end of the year	74%	75%	61%	76%	78%	77%
Academic performance on standardized tests	80%	100%	100%	100%	100%	100%
Secondary school retention and graduation	95%	100%	100%	100%	100%	100%
Post-secondary enrollment	80%	100%	75%	82%	93%	52%
Post-secondary education completion	50%	11%	20%	31%	50%	18%

Table 2 shows the number of enrolled students in the program. It reflects UBC's actual student numbers, not those eligible to participate. Quantitative data are presented for multiple objectives (benchmarks) for the cohorts 2016–2017 to 2020–2021. Data line 2 shows that 4 out of 5 cohorts exceeded the goal of attainment. The 2019–2020 cohort fails to meet this benchmark by 13 basis points.

RESULTS

During the years 2017–2022, there were many organizational changes with UBC. The program director exited CCBC and UBC. A new program director was onboarded in August 2019. In October 2020, UBC became fully staffed with faculty and staff for the first time in 3 years. Data line 5 results show UBC had a 100% rate of secondary school retention and graduation; however, the program failed to meet the goal of post-secondary enrollment in 2 of 5 cohort years. Recruitment efforts suffered as well, with subpar performance in 4 of 5 cohort years. In 2020–2022, COVID-19 hindered recruitment efforts. The highlight of this data shows that with much love from the faculty and staff that remained committed throughout the organizational changes that benchmark 3 (academic performance on standardized tests) and benchmark 4 (secondary school retention and graduation) exceeded expectations.

Table 3 reflects the actual quantitative data of the prior experience scores for reporting periods 2014–2015 and 2013–2014. During these periods the program was partially staffed. Every benchmark exceeded expectations except post-secondary education completion. At this time, tutoring was in-person at the high schools, and nothing was offered virtually. We now know that some students can do well virtually or with a hybrid method. After the summer of 2017, the summer academy no longer had a residential component. The current model for summer academy is a commuter approach. The UBC scholars come to the CCBC campus Monday- Friday from 8:30 AM – 3:30 PM and some days they meet virtually on Google Classrooms. This shows how important the previous model is with the residential component. It allows the wrap-around services that UBC faculty and staff can provide holistically.

Table 3 Actual Attained Rates for Prior Experience Scores.

	2014-2015	2013- 2014
Academic GPA performance	76%	75%
Academic performance on standardized tests	100%	93%
Secondary school retention and graduation	100%	95%
Post-secondary enrollment	100%	86%
Post-secondary education completion	67%	41%

RESULTS

Table 4 depicts how many hours and sessions the UBC scholars logged utilizing Tutor.com, an online tutoring subsidiary of The Princeton Review. UBC contracted with Tutor.com out of need due to the pandemic for tutoring that could provide 24/7 services. The subjects vary from English and writing to study skills coaching. There were a total of 643 sessions from November 2020 to June 2022. 408 sessions were in the subject math, and 144 sessions were in the subject science. Math and science were the subject matters most utilized.

Table 4. Hours and Sessions Utilized by UBC Scholars on Tutor.com.

	11/2020 - 8/2021		9/2021 - 6/2022		11/2020 - 6/2022	
	Hours	Sessions	Hours	Sessions	Total hours	Total sessions
All subjects	152	391	92	252	243	643
Drop off essay review	2	4	2	3	4	7
Reading, writing, & literature	6	16	4	11	10	27
Spanish	4	10	4	9	7	19
Math- algebra I	6	13	4	8	10	21
Math- algebra II	47	55	25	59	72	114
Math- calculus	7	59	6	8	13	67
Math- geometry	18	72	15	62	32	134
Math- pre-calculus	8	23	3	12	11	35
Math- statistics	13	20	9	13	22	33
Math- trigonometry	2	2	2	2	3	4
Science- biology	9	30	7	25	16	55
Science- chemistry	7	18	3	10	10	28
Science- earth science	1	8	1	5	2	13
Science- physics	16	40	3	8	18	48
Social studies- civics and government	1	4	0	0	1	4
Social studies- US history	1	5	1	4	2	9
Social studies- world history	0.1	2	0.1	2	0	4
Study skills coaching- studying effectively	0.4	1	0	0	0	1
Writing- essay writing	2	4	3	9	6	13

RESULTS

Table 5: Contact Sessions and Time Spent with UBC Scholars from 2019–2022.		
	Sessions	Time (hours)
Academic counseling	2,222	30,053
Program correspondence	3,519	35,707
All other activities	2,523	65,843
Total	8,264	131,603

Table 5 presents quantitative from 8,264 sessions and 131,603 hours clocked in overall contacts with UBC Scholars from 2019–2022. This data is after the UBC program was fully staffed with faculty and staff and overlaps with the COVID-19 pandemic. Data line 3 is a combination of these services: recreational/educational field trips; career awareness; academic academies; college fair/ prep/ seminar; employment; financial aid assistance and counseling; parent orientation and workshops; and personal counseling.

Table 6: HSGPA of Students Entering CCBC in the Fall.				
	Total students	Students with HSGPA above 2.5	Percent of students with HSGPA above 2.5	Average HSGPA
Fall 2013	7,090	26	0%	2.46
Fall 2014	6,357	31	0%	2.30
Fall 2015	6,137	255	4%	2.56
Fall 2016	5,959	640	11%	2.62
Fall 2017	5,289	1,492	28%	2.72
Fall 2018	5,039	1,810	36%	2.66
Fall 2019	4,970	2,255	45%	2.66
Fall 2020	4,781	2,497	52%	2.72

Table 6 reports the average HSGPA calculated from students entering CCBC in the fall term. Entering students would include both new first-time students and students transferring into CCBC.

RESULTS

Figure 1 shows student completion rates 6 years after entering CCBC. It includes both new first-time students and transfer students. Note that students who earn an award and transfer are counted in both categories.

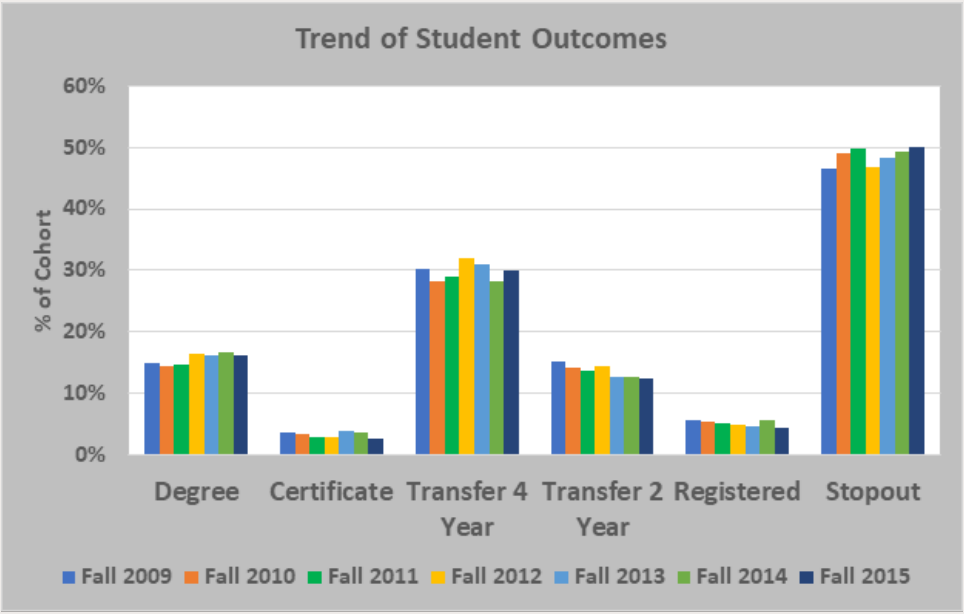

Figure 1. Six-year outcomes of CCBC students.

DISCUSSION+ CONCLUSION

The quantitative data and the formative assessments suggest that HSGPA does matter in the matriculation of UBC scholars from completing their secondary education and enrollment into a post-secondary institution. Quantitative data in Table 2 from cohort years 2016–2021 shows 2 years that the benchmark for post-secondary enrollment was not met. Within that same timeframe, the benchmark for the HSGPA requirement of 2.5 or greater was missed only one year, 2019–2020. In the cohort year 2019–2020, a new program director was onboarded, and the program was not fully staffed. Since October 2020, UBC has been fully staffed. In Table 3, both benchmarks exceeded the goal. The goal was achieved in 5 out of 7 years.

Does Grade Point Average Matter for Matriculation into Postsecondary Education?

DISCUSSION + CONCLUSION

Why is HSGPA important? For one, "A grading system is a common standard followed by universities worldwide to evaluate students' marks and academic performance. Generally, in schools and colleges, students' marks are evaluated as grades or percentages. In the United States of America (USA), HSGPA is used to evaluate students' academic performance. It is a standardized system followed throughout the country within different levels of education" (LeapScholar, 2022). Also, a low HSGPA can contribute to a scholar not matriculating to post-secondary education.

However, HSGPA is not the only thing that matters. College Raptor (2020) mentioned the holistic approaches universities and colleges take to evaluate applications, such as "academic rigor, application essay, demonstrated interest, ACT/SAT scores, extracurricular activities, college interviews, and community involvement/volunteer work." Many universities use this holistic approach and more. The UBC program also utilizes a holistic approach to prepare our scholars for postsecondary enrollment and success.

UBC attended a university tour at George Mason University in 2022, and one of the recruiters informed us that one of the items for selecting and evaluating applications is the weighted HSGPAs. Therefore, academic rigor is vital in enrollment into post-secondary education. Table 6, objective 5, is the benchmark that tracks our scholars through each grant cycle concerning the rigor of secondary education. It helps scholars to receive honor scholarships and gives a better opportunity for acceptance into aggressive academic 2-year and 4-year college or university programs.

Colleges look at students' transcripts for all 4 years of secondary education. It would send a red flag if they noticed low scores in 11th grade when a student was a straight A student in prior grades. College applications have a section explaining unforeseen circumstances that may have arisen while in secondary education. A higher education institution wants to understand any red flags because it gives a snapshot of how the student may perform as a post-secondary scholar. "The reasons for a low college grade point average are almost as varied as students themselves. Laziness, missing classes, and the inability to complete challenging work can play a role, but major life changes and stress can also interfere with good grades. Some students experience a dip in GPA due to illness, the death of a close friend or family member, disability, or financial problems. A low GPA doesn't necessarily ruin a student's future; the student can pull bad grades up with hard work. However, a very low GPA can have serious consequences both for their academic life and after graduation" (Thompson, 2017).

Does Grade Point Average Matter for Matriculation into Postsecondary Education?

DISCUSSION + CONCLUSION

HSGPA is also essential with scholar matriculation into post-secondary enrollment because it "measures the results of months of learning while standardized testing only measures knowledge at one point in time" (Empowerly, 2018). This research also gives a strong sense of urgency because even though GPA is tracked from secondary education through post-secondary education, many high schools do not publicly make their HSGPAs available. For example, in zthe search for HSGPA data, Baltimore County Public Schools did not have the information on their website. Even some universities and colleges do not post the average GPA for their institution. Since this is the most common universal tracker for enrollment into post-secondary education, it should be easily obtained and transparent.

UBC uses several methodologies to monitor and intervene if necessary to ensure that the HSGPA benchmark is being upheld including monthly check-ins with their assigned program coordinator (Table 5), Tutor.com (Table 4), and virtual tutoring with faculty (Table 1). An all-hands-on-deck approach is put into play if a student slips below a 2.5 HSGPA; they are required to meet weekly with the program director until their HSGPA is above 2.5 HSGPA (Table 5). These activities help to build good academic habits and character for the UBC scholars, so that when the UBC scholars enroll in post-secondary education, without other unforeseen incidents, they will graduate post-secondary education between 4-6 years.

In the current DOE grant, UBC is funded to provide services for 76 students in the target population: Baltimore County Public School students residing in zip codes 21207, 21227, 21244, and/or attending Woodlawn or Lansdowne High Schools. Two eligibility requirements are that students should be low-income, as defined by the federal government, and first generation students. Many of these individuals do not have role models to emulate. First-generation students' parents have not attained a bachelor's degree. When UBC scholars enroll in post-secondary 4-year universities, the skills, experiences, and knowledge obtained in this program set them up for success. At a Lansdowne High School commencement, one of the faculty members asked, "Why weren't more high schools written into UBC's grant?" She was especially asking about Catonsville High School (CHS). She stated, "all of the students enrolled at CHS do not have family income above the federal requirement; therefore UBC should be able to have CHS written into the UBC grants." When the research was completed for the high schools to be considered written into the UBC grant, CHS was over the threshold for income requirements. Due to the complexity of the requirements for participation eligibility, this link is provided for more clarity:

https://www.ecfr.gov/current/title-34/subtitle-B/chapter-VI/part-645/subpart-A/section-645.3

VIRTUAL FEATURES BY DESIGN AND STUDENT PERCEPTIONS

After we spoke, this educator stated that UBC scholars stand out at Landsdowne High School. As soon as a student inform her that they are a UBC scholar, she sees the difference between them and their classmates. We need more federal funding dedicated to UBC and other TRIO programs that support underrepresented students' matriculation to post-secondary education and beyond. Data from the US Bureau of Labor Statistics (2020) shows how education attainment increases a student's earnings potential after each degree obtained. "The chart highlights differences in 2020 earnings and unemployment rates by education, using data from the US Bureau of Labor Statistics (BLS) Current Population Survey. For example, workers with a bachelor's degree had median weekly earnings of $1,305 in 2020, compared with $781 for workers with a high school diploma. And the unemployment rate for bachelor's -level workers was 5.5 percent, compared with 9.0 percent for those whose highest level of education was a high school diploma" (Torpey, 2021).

Does HSGPA matter for successful enrollment into post-secondary education? YES! Without an educated population, we will fall behind other nations in providing the individuals needed for the U.S. workforce. That inflates unemployment rates. That perpetuates systemic poverty levels, and guess what? It starts with how well a scholar performs in secondary academia. The correlations to success in post-secondary education are directly tied to enrollment but even more to an individual's potential earning capacity. HSGPA matters! It shows current and future work ethics, regardless of whether it correlates to education or a career. This information has been well tracked and studied. "An increasing number of research papers show the complicated relationship between academic achievement and career success. Earning a good grade is not only a measure of subject matter knowledge or intelligence. Instead, it's a composite of knowledge, skills and personality traits" (Yec Council Post, 2020).

Utilizing the UBC methodology to ensure our scholars' HSGPAs remain above 2.5 gives other educators examples of methods to emulate. Without a 2.5 or greater HSGPA, our scholar's successful post-secondary education attainment may diminish.

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REFERENCES

1. Al Hazaa, K., Abdel-Salam, G., Ismail, R., Johnson, C., Al-Tameemi, R. A. N., Romanowski, M. H., BenSaid, A., Rhouma, M. B. H., & Elatawneh, A. (2021). The effects of attendance and high school GPA on student performance in first-year undergraduate courses. *Cogent Education Journal, 8*:1956857. https://doi.org/10.1080/2331186X.2021.1956857
2. Allen, J., & Mattern, K. (2019). Examination of indices of high school performance based on the graded response model. *Educational Measurement: Issues and Practice, 38*(2), 41-52. https://doi.org/10.1111/emip.12250
3. Bell, J. (2022). [Unpublished raw data on the UBC Individual Virtual Tutoring Contacts]. Community College of Baltimore County.
4. Bell, J. (2022). [Unpublished raw data on Tutor.com]. Community College of Baltimore County.
5. College Raptor (2020, June 18). What Is An Average GPA in America? https://www.collegeraptor.com/getting-in/articles/questions-answers/what-is-an-average-gpa-in-america/
6. Community College of Baltimore County. (2015-2010). Actual Attained Rate/ APR. [Unpublished raw data].
7. Empowerly (2018, November 9). GPA vs Standardized Testing: Which Weighs More? https://empowerly.com/blog/gpa-vs-standardized-testing-which-weighs-more
8. Formplus Blog (2022, March 18). Formative Vs Summative Assessment: 15 Key Differences & Similarities. https://www.formpl.us/blog/formative-summative-assessment
9. Kelleher, P.T. (2022, July). [Unpublished raw data on Average High School GPA is calculated from students entering CCBC]. Community College of Baltimore County.
10. Kelleher, P.T. (2022, July). [Unpublished raw data on Outcomes Analysis- 6 Year Model Trend of CCBC Students]. Community College of Baltimore County.
11. LeapScholar Blog (2022). USA Grading System in 2022: Understanding US Grading & GPA Marking. https://leapscholar.com/blog/usa-grading-system-understanding-us-grading-gpa-marking/
12. Morris, T. W. (2022). [Unpublished raw data on % = of Actual Students Enrolled]. Community College of Baltimore County.
13. Robertson, J. (2022) [Unpublished raw data on Contact Summary overall (All Contacts) With Count]. Blumen.
14. Thompson, V. (2017, September 26). The Consequences of a Low GPA in College. https://www.theclassroom.com/consequences-low-gpa-college-7621.html
15. Torpey, E. (2021, June). Education pays, 2020. US Bureau of Labor Statistics. https://www.bls.gov/careeroutlook/2021/data-on-display/education-pays.htm
16. Yec Council Post (2020, October 19). Do College Grades Predict Future Success? Forbes. https://www.forbes.com/sites/nickmorrison/2020/01/29/its-gpas-not-standardized-tests-that-predict-college-success/?sh=27a40cb132bd

Perceptions and Motivations of Associate Degree Nursing Students Engaged in Peer Mentoring and Tutoring Through Supplemental Instruction

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STUDENT PERCEPTIONS OF MENTORING

High attrition rates in associate degree nursing (ADN) programs contribute significantly to a nursing shortage in the United States that is expected to worsen. Nursing students find the learning environment stressful, intimidating, and overwhelming, leading to discouragement in the first year of their nursing education.

ABSTRACT

High attrition rates in associate degree nursing (ADN) programs contribute significantly to a nursing shortage in the United States that is expected to worsen. Nursing students find the learning environment stressful, intimidating, and overwhelming, leading to discouragement in the first year of their nursing education. Research is needed to identify specific retention strategies that can offer ADN students additional support and promote academic success. This study aimed to explore first-semester ADN nursing students' experiences with peer mentoring and peer tutoring provided through supplemental instruction (SI). A basic qualitative study was conducted, and participants' descriptions of their experiences participating in SI were documented using semi-structured interviews. The findings indicated that students feel SI is a positive experience, but improvement is needed. Exposure to different perspectives through peer mentoring and tutoring improved students' understanding ofcourse material. Stronger peer relationships created consistency for students. Peer mentoring boosted self-confidence among first-semester students, and attendance at SI sessions increased persistence. The findings support the use of peer mentoring to offer academic assistance to first-semester ADN students.

INTRODUCTION

The United States continues to experience a significant shortage of registered nurses (RNs) (Imison, 2017; Massey, 2019; Sharpe, 2018). A contributing factor to this shortage is the high attrition rate among students in associate degree nursing (ADN) programs (Colalillo, 2007; Harris et al., 2014). To reduce attrition rates, some scholars have recommended using peer mentoring and tutoring programs (Abshire et al., 2018; Karsten & DiCiccio-Bloom, 2014). However, there is little research documenting the use of peer tutoring and peer mentoring from the view of ADN students. To address this, the present qualitative study was conducted to assess nursing students' experiences in peer mentoring and peer tutoring as part of a supplemental instruction (SI) program to explore how these academic support strategies are utilized to improve student motivation and persistence.

Nurses provide healthcare in a variety of settings, including hospitals, clinics, skilled nursing facilities, and health insurance companies; the need for nursing care is increasing due to extended life expectancies driving growth in chronic illnesses (Massey, 2019; Sharpe, 2018). In the United States, the need for nurses continues to grow as baby boomers (i.e., individuals born between 1946–1964) reach the age of 70 and begin to experience increased healthcare needs (American Association of Colleges of Nursing [AACN], 2019; Buerhaus et al., 2017; Grant, 2016). While the need for healthcare providers increases, the number of RNs is declining, and these trends contribute to a shortage of nurses (Imison, 2017; Massey, 2019).

The demand for RNs is expected to increase by approximately 500,000 jobs through 2026 (AACN, 2019). However, only 140,000 newly graduated nurses pass the licensing exam and join the nursing workforce every year (American Nursing Association [ANA], n.d.). In addition to changing demographics, the rigidity of nursing education programs also contributes to the nursing shortage (Kubec, 2017). RN programs are designed for students to progress through courses sequentially. If a student is unsuccessful in any semester of a nursing program and withdraws, another student cannot fill the student's original spot so vacancies due to attrition remain empty for the remainder of the program (Kubec, 2017). As a result, class attrition is a contributing factor in the decreasing in nursing graduates (Harris et al., 2014). In recognition of the nursing shortage, community colleges have increased nursing program positions to compensate for attrition and improve graduation rates, but this strategy does not offer a comprehensive solution (Colville et al., 2015). Scholars and practitioners have begun to explore academic support strategies that can address the problem of attrition, and peer mentoring and tutoring provided via SI are examples of such support structures (Schrum, 2015).

Academic performance can be directly influenced by the availability of academic support programs, such as the SI program developed in 1973 at the University of Missouri-Kansas City (Paloyo et al., 2016). SI programs are now offered at many institutions of higher learning around the world. SI programs are free services offered to all students that provide support for academically

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rigorous courses through regularly scheduled, peer-led study sessions intended to contribute to retention rates, student learning outcomes, and student participation in course work (Paloyo et al., 2016; Skoglund et al., 2018). Improved academic success following student participation in SI has been supported in the literature (Channing & Okada, 2019; Guarcello et al., 2017; Skoglund et al., 2018). SI offers students additional assistance and control over their learning, which is in alignment with Knowles's adult learning theory (Curran, 2014).

Mentoring is a process that incorporates a supportive role between a person with more experience and knowledge with a person with less experience and knowledge (Gruber-Page, 2016; Lin et al., 2018). Mentoring also promotes socialization, fosters a sense of belonging to the nursing profession, and increases grades leading to decreased attrition rates (Colalillo, 2007; Kim et al., 2013). Krause-Parello et al. (2013) suggested that peer mentoring should help ADN students develop a strong work ethic, and they also noted that peer mentor and tutor positions provided advanced nursing students with the opportunity to contribute to the future of nursing. In addition to the benefits experienced by mentors, mentees develop behaviors, attitudes, and demonstrate personal growth based on the role-modeling, guidance, and social support offered by the mentor (Zaniewski & Reinholz, 2016). In an educational context, peer mentoring relationships offer students further support that can reduce attrition rates (Fettig & Friesen, 2014).

In nursing, peer mentoring and tutoring can provide support for student nurses from their first semester through to their graduation and transition to licensure (Krause-Parello et al., 2013). Mentoring can also be appropriate for nurses who are developing advanced expertise (Krause-Parello et al., 2013). Peer mentoring and tutoring are common elements of SI, an instructional approach that utilizes peer interaction to encourage learning (Carlsen-Landy et al., 2014). The purpose of SI is to encourage students to engage with the educational material outside of a classroom setting (Carlsen-Landy et al., 2014). In nursing education, the use of SI resulted in an immediate positive impact on academic success for students who attended SI sessions (Harding, 2012; Roldan-Merino et al., 2019).

The success of mentoring relies on the relationship and the level of interaction that is fostered between mentor and mentee (Alzahrani, 2014). Identifying at-risk students early in the nursing program could lead to decreased attrition rates in ADN programs (Abele et al., 2013). Decreasing attrition rates will ultimately increase the number of students transitioning into the profession of nursing and assist with the nursing shortage.

Scholars and practitioners have begun to explore academic support strategies that can address the problem of attrition, and peer mentoring and tutoring provided via SI are examples of such support structures (Schrum, 2015). In nursing education, the use of SI resulted in an immediate positive impact on academic success for students who attended SI sessions (Harding, 2012; Roldan-Merino et al., 2019). Peer mentoring and tutoring provided through SI typically involves pairing new students with a student further along in the program who has demonstrated success and is more knowledgeable in a specific course or subject area (Channing & Okada, 2019; Guarcello et al., 2017).

This study utilized M. S. Knowles's (1975) theory of adult learning to explore the use of peer mentoring and tutoring provided through SI in the context of ADN programs. The intent was to examine how peer mentoring and peer tutoring experiences were linked to students' academic success and persistence. Mentoring models remain unclear and untested, and as a result, more research is needed to support the use of peer mentoring and tutoring interventions (Peltz & Raymond, 2016). Understanding the students' experiences can assist with the development of specific guidelines for the delivery of SI that includes peer mentoring and tutoring

METHODS

RESEARCH DESIGN

A basic qualitative research design was selected to support the present study. Research focused on the meaning of a phenomenon of interest often use basic qualitative research designs (Merriam, 2009). The present basic qualitative study allowed interpretations of the phenomenon of peer mentoring and tutoring to be constructed based on participants' descriptions of their experiences participating in SI as part of an ADN program.

METHODS: RESEARCH DESIGN

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Participant selection began after the researcher obtained permission from Capella University's Institutional Review Board and the ADN program director to solicit students for their participation in the study. Before obtaining approval to conduct the study, the researcher went to the campus and met with the program administrator to explain the purpose of the study. The researcher and the program administrator discussed the participant selection process, and the program administrator assisted in the recruitment process. The researcher drafted a recruitment email, and the program administrator provided information to students via a face-to-face announcement at the start of the SI sessions. The recruitment email was sent to the students in the ADN program, and interested students were asked to contact the ADN program administrator. The program administrator shared the contact information of the interested students with the researcher.

The target population was ADN students, and the sample included first-year nursing students that had participated in peer mentoring and tutoring through an SI program. The criteria were based on the research question and reflected the need to document the experiences of first-semester ADN students who had participated in a peer mentoring program offered through SI. Due to the voluntary approach of SI, there were no additional matching of mentors or mentees utilized for this study. The individuals selected to participate in the present study had no previous training or work experience in the nursing field. The sample included students that had participated in SI toward the end or after completion of their first semester in a selected ADN program. The student had to participate in at least one SI session to be included in the present study. Students who did not complete the first semester of the ADN program, regardless of SI session attendance, were excluded. Any students with a past, present, or future student-teacher relationship with the researcher were also excluded from the selection process.

METHODS: RESEARCH DESIGN

The data were collected through open-ended, semi-structured interviews. The purpose of the interviews was to collect descriptive data that would allow for the development of rich interpretations of the participants' experiences and to allow meaning to be derived from those experiences (Merriam, 2009). Open-ended questions were used to facilitate the emergence of themes during analysis (Yates & Leggett, 2016). An expert panel reviewed the guiding interview questions prior to the study. This review process led to the refinement of the interview guide, and the following 12 questions were used in the initial interviews:

1. What were your expectations when entering the peer tutoring situation?
2. What were your experiences of participating in a peer tutoring program?
3. What kind of relationship do you experience with your peer tutor?
4. What techniques, ideas, or support has the peer mentor (SI person) provided to you that has attributed to your success in fundamentals?
5. So far, how have you been doing?
6. What effects do you feel that participating in a peer mentoring program has had toward your outcomes in your first (fundamentals) semester?
7. What role does the peer mentoring play in motivating you toward academic persistence?
8. You mentioned that your peer mentor helped you with a study guide, is there anything else that your peer mentor helps you with?
9. What advice would you give future fundamentals students on how to use the peer mentoring/tutoring program to improve their course outcomes?
10. What would you like to see in a peer mentoring/peer tutoring program in the future?
11. Tell me 3 ways we could modify peer tutoring for future students?
12. Additions.

The data were digitally recorded to allow the researcher access to the interview for the data analysis process. Digital recordings were then utilized to create written transcripts of the interviews. The written transcripts were then manually analyzed by the researcher. The data analysis process for the present basic qualitative study followed 13 steps identified by Percy et al. (2015). A thematic analysis process was used to analyze the data. This process included assigning codes to the data and searching for patterns and themes within the participants' responses.

METHODS

ASSUMPTIONS

The present study relied on several assumptions. From a methodological perspective, the main ontological assumption was that reality is subjective, and the experiences of one individual may not be representative of another individual.

METHODS: ASSUMPTIONS

The present study relied on several assumptions. From a methodological perspective, the main ontological assumption was that reality is subjective, and the experiences of one individual may not be representative of another individual. Additionally, it was assumed that meaning is socially constructed, and interactions between individuals influence the perceptions, attitudes, and understandings of others. Thus, it was assumed that it was impossible for the researcher to be wholly unbiased though measures were taken to limit the potential for bias.

Theoretical assumptions that supported the research were associated with the selection of Knowles's (1975) theory of adult learning. Knowles's theory assumes that adults learn differently than children. Knowles (1980) summarized 5 assumptions between the educational model of education and the individual. The 5 assumptions are that (1) adults will move from dependency toward self-directed learning; (2) adult learners rely on experiences as a resource for learning; (3) adult learners are goal-oriented and rely on what they need to know as they become ready to learn; (4) adults have an orientation to learning that is task-centered, encouraging a problem-centered focus on learning; (5) adult learners have internal motivators to learn, developing self-fulfillment.

Knowles (1980) believed that adult learners' educational needs are driven by independence and self-directness as they mature. Curran (2014) noted the effectiveness of Knowles' adult learning theory was due to self-directed learning and the pre-established beliefs and learning experiences that shape an adult learner's motivations for learning. The participants represent mature adult learners. Maturity allows a learner to used past experiences to shape the learning process. The learning environment for adult learners includes drawing on their own experiences and taking personal responsibility for their educational advancement (Knowles, 1975).

Two final assumptions were specific to the use of peer mentoring and peer tutoring as academic support strategies among ADN students participating in SI. The first assumption was that improvements in student motivations and persistence would result from structured peer interaction, and these improvements would lead to a decrease in attrition from ADN programs. The second topical assumption was that decreases in attrition would help to significantly address the nursing shortage.

RESULTS

Percy et al. (2015) identified 13 steps that guided this basic qualitative study to determine how ADN students identified and described the role of peer mentoring following peer-led SI session experiences. Six themes emerged following the analysis of data obtained through semi-structured interviews with 9 participants.

The themes that emerged from the data analysis aligned with individual research questions while at the same time contributing to an overall assessment of the impact of peer mentoring and tutoring provided through SI.

Table 1 presents the study's research questions and the themes that most closely aligned to each question.

Percy et al. (2015) identified 13 steps that guided this basic qualitative study to determine how ADN students identified and described the role of peer mentoring following peer-led SI session experiences. Six themes emerged following the analysis of data obtained through semi-structured interviews with 9 participants. The analysis indicated that participants believed SI sessions offered a positive experience. Further, the participants felt that the content review provided through SI sessions improved academic success. As part of their feedback, participants offered suggestions to improve future SI sessions. The different perspectives offered by peer leaders in the SI sessions assisted first-semester students in understanding challenging information.

Interview data collected as part of this study were analyzed using an inductive process (Percy et al., 2015), and the findings were categorized into 6 themes that answered the original 3 research questions. The themes that emerged from the data analysis aligned with individual research questions while at the same time contributing to an overall assessment of the impact of peer mentoring and tutoring provided through SI. Table 1 presents the study's research questions and the themes that most closely aligned to each question. Theme 1 indicated that participants valued the SI sessions because they contributed to academic success. Theme 2 noted that despite the value of SI, improvements were still needed. Theme 3 identified the importance of different perspectives offered through peer mentoring and tutoring. Theme 4 suggested that strong peer connections helped to create consistency for students. Theme 5 revealed that peer mentoring improved students' self-confidence. Finally, theme 6 indicated that SI did increase persistence.

TABLE 1

Alignment Between the Research Questions and Themes

Research Questions	Themes
1: How do ADN students describe their experiences participating in SI?	Theme 1: SI is a positive experience. Theme 2: Improvements are needed.
2: What were the peer mentoring experiences of ADN students after participating in a peer tutoring program provided through SI?	Theme 3: Different perspectives improve understanding. Theme 4: Stronger peer connections create consistency.
3: How do ADN students describe the role of peer mentoring in light of their motivation for academic success and persistence?	Theme 5: Peer mentoring boosts self-confidence and motivation. Theme 6: SI Sessions increased persistence.

Abbreviations: ADN = associate degree in nursing; SI = supplemental instruction.

RESULTS CONT.

The core element of theme 1 was that participants felt additional instructional content provided through SI resulted in a positive educational experience. Participant 9 expressed gratitude about learning of the opportunity to participate in S: "Coming in, I didn't know they had SI, but then we were told we had it, and it was available to us, and I am glad SI was available." Participant 5's responses provided evidence of the value of SI based on her limited availability: "I made time for it [SI], and I had a little downtime between class and SI." She also highlighted the positive nature of her experience, further stating "It was a pretty good overall experience. I would like to have it as we are continuing."

The first theme was most closely aligned with research question 1: How do students pursuing an associate nursing degree describe their experiences participating in SI? In theme 1, SI was described as a positive experience that improved academic performance through the content review processes. Most of the participants felt that the content review, along with the application of the content provided by the peer SI leader, improved student success in course fundamentals. Participants felt the use of the time scheduled for SI sessions to review important content offered a positive experience leading to improved academic performance. Participants also felt that preparing for scheduled SI sessions assisted with accountability as the peer SI leader would review important course material.

The second theme that emerged from the data was that despite positive attitudes toward the SI program, students noted that improvements were needed to make the SI program less of a barrier to success. Despite the recognized need for improvement, the participants expressed positive attitudes toward the SI program. Participant 7 stated "The nursing program is hard... anyone should go to SI." Participants found value in the review of content that was offered through attendance in SI sessions. Participant 1 stated that "content was a bonus," and Participant 6 agreed by stating "I didn't expect the content, but I liked it." Some participants felt that the first semester of the ADN program was overwhelming, and as a result, some students didn't realize the importance of SI until it was too late. Participant 3 explained "You never really know what the questions ask you, it's hard. This is hindsight though; you are so overwhelmed in the first semester you had no idea you needed SI until later."

The third theme was that peer mentoring and tutoring provided students with different perspectives and helped students understand difficult material in the first semester of the ADN program. This theme was derived from participants' beliefs that SI provided insight into what to expect as they progressed in the ADN program. Participant 9 stated that SI leaders were able to give students guidance to "look at the material in a different way," and believed that the alternate perspective contributed to academic success: "I was able to get a better understating of the information by looking at it differently." Participant 9 also offered an example of how different perspectives were shared, stating "I think that giving an understanding about how to approach a class and how they approached this class...giving different things to look at, such as different web sites, different textbooks." Because SI leaders were able to lead discussions, students were often exposed to different ways of approaching problems. Additionally, Participant 8 noted that "practice problems provided a different perspective on the material." Participants believed that the insights shared by the SI leaders were helpful in seeing the material from a different perspective.

The fourth theme was that participants felt stronger connections with peer leaders than with instructors and appreciated the consistency of the SI leaders. Peer SI leaders motivated students to stay active and not fall behind. Participant 5 stated "They motivated me to not be lazy and to review before the exam." Some participants felt that the peer SI leaders were nice because, in addition to offering guidance and direction, they also offered moral support. Participant 7

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said "The SI leader would say 'if you can understand this, you'll be able to get it.'" Most participants felt SI was a good overall experience because of the peer SI leaders. Participants 4, 5, 6, and 7 all characterized the SI leaders as "nice." Participant 5 added that "SI was pretty good." Participant 3 stated that "the peer mentor was great," and Participant 4 described the peer leaders as "really helpful." These statements made by the participants demonstrated that first-semester students valued the mentoring relationships developed during the SI sessions.

The fifth theme was that SI sessions increased student motivation by using peer mentoring to boost students' self-confidence. Theme 5 was derived from participants' feelings that the SI sessions motivated them to keep up with the material. Participants cited higher levels of self-confidence when they achieved success in their exams. Most participants felt they had better success after collaborating with their peer SI leaders. Some participants felt that their peer SI leader knew exactly what to say to keep them on the track to success. Pep talks and words of encouragement provided by peer SI leaders offered participants motivation and further boosted the participants' self-confidence.

The final theme identified that SI sessions supported student success by increasing persistence during the first semester of the ADN program. This theme was developed based on the participants' belief that their success was supported by peer mentors when attending SI sessions. Multiple participants found the test-taking strategies and support offered by SI leaders very helpful. Participants expressed further support for SI sessions when asked to give advice to future nursing students. Participant 2 suggested "Take advantage of SI. Go and actually fill out the papers before the SI leaders give you the answers to see what you know." Participant 1 cited the importance of the knowledge gained by attending SI sessions stating "go and use those people as a resource. They have been through it, ask them lots of questions, they are really good about answering questions." Participant 4 added "the paperwork we got through SI really helped." Participant 5 recommended "going to all of the SI sessions and being prepared when you get there." Participant 8 reiterated the importance of "reviewing the material before going to SI, so you get more out of it." Participant 6 advised, "if you don't feel comfortable with material, you should go to SI." Participant 7 said "the nursing program is hard...anyone should go to SI." Participant 9 concluded with advice to "utilize SI and ask questions when you are unsure about a topic." The participants' responses demonstrated that they felt strongly that attending SI would help future students achieve academic success.

DISCUSSION+ CONCLUSION

Overall the results of this study indicate peer mentoring and tutoring provided through SI positively influenced students' experiences during the first semester of the ADN program. Some suggestions have been highlighted to improve the program and help students benefit from peer-based academic support. Students' perspectives can be broadened through the utilization of peer mentors because of the different perspectives these mentors share with their mentees. Mentoring experiences positively impact students' self-confidence and motivation, and participants' experiences suggest that student outcomes can be improved through peer mentoring in ADN programs.

DISCUSSION+ CONCLUSION

Participants felt that participating in SI sessions was a positive experience that assisted with content review and improved academic performance. Mentors offered a different perspective of course material, which helped first-semester students understand the difficult course material. Participants valued the SI sessions enough to provide suggestions for future improvement.

Participants felt that participating in SI sessions was a positive experience that assisted with content review and improved academic performance. Mentors offered a different perspective of course material, which helped first-semester students understand the difficult course material. Participants valued the SI sessions enough to provide suggestions for future improvement. Participants felt consistency among peer SI leaders was important as consistency enabled students and peer mentors to form bonds and connections. The connections with peer SI leaders were stronger than the bonds between students and professors in the ADN program. Participants also reported that peer mentoring boosted self-confidence and improved students' motivation. The self-confidence encouraged by peer mentoring positively influenced student outcomes.

Scholars highlighted the need to focus on persistence in nursing education to understand attrition rates in nursing education (Fagan & Coffey, 2019). Socialization into the profession of nursing begins with nursing education, and persistence in nursing education can be nurtured through mentoring (Fagan & Coffey, 2019). Socialization in education is supported by the adult learning theory (Knowles, 1975). Participants in this study valued the peer mentoring support they received during SI sessions. Adult learners need a learner-centered approach to education rather than the teacher-centered approach used to instruct children (Curran, 2014). Peer mentoring supports both the learner-centered approach, and the socialization adult students need to succeed. This study highlighted the importance the participants placed on the shared experiences of the peer SI leaders who offered mentoring support. The participants also valued the relationships that were fostered with peer mentors. Socialization into nursing education was provided via peer mentoring and was supported by findings.

Everett (2020) suggested that faculty should focus on incorporating retention strategies to decrease attrition rates in nursing education in the first-semester classes (Everett, 2020). Focus was placed on the first semester of an ADN program, where participants reported positive attitudes toward the SI program. The

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participants noted that improvements are needed to strengthen the SI program in the future. One of the main improvements suggested was revised scheduling to encourage attendance. Participants also recommended making the consistency of SI leaders a priority. Participants felt peer mentors helped with motivation and boosted first-semester students' self-confidence leading to overall persistence in the ADN program. The present study supported using peer mentors and tutors to assist nursing educators in ADN programs.

The primary limitation of this study was the narrow investigative scope. The sample of students who participated in peer mentoring and tutoring was limited to 1 SI program at a single college. The average class of first-semester nursing students at the college was 80–85 students per semester. From this average number, the number of students engaging in peer mentoring and tutoring is limited and varies each week peer tutoring is offered. No more than 15 students attended peer tutoring sessions for any week offered in the first semester of the nursing program. Thus, the sample frame for the present study limited the ability to survey a wide range of ADN students. This limitation was not expected to adversely affect the study's findings as qualitative studies rely less on large sample sizes and more on the ability to collect detailed descriptions of participants' experiences, beliefs, and attitudes (Griffith, 2013).

A methodological limitation was related to the limited availability of the participants to meet with the researcher. The students who participated in the peer mentoring and tutoring through SI had limited availability due to their busy schedules. ADN programs are very rigorous, with many obligations (Karsten & DiCiccio-Bloom, 2014; McKellar & Kempster, 2017). Furthermore, nontraditional students often face additional responsibilities, including work, family, and personal commitments that make scheduling interviews difficult (Olsen, 2017). Flexibility on the part of the researcher was necessary to ensure the interviews took place at times when the participants did not feel rushed or preoccupied. Thus, the researcher made every possible effort to respect participants' preexisting time commitments.

The nursing shortage continues to be a global issue, and high nursing program attrition rates are promoting the nursing shortage (Lisa, 2018; Peterson-Graziose et al., 2013; Smith et al., 2016). Academic support strategies, including SI, peer mentoring, and peer tutoring, need to be implemented to decrease attrition rates in ADN programs. The use of peer mentoring to offer academic support is well supported in the education literature, but little research has focused on the use of peer mentoring in ADN programs. Additional support is needed for nursing students to increase persistence, boost success, and decrease attrition rates. Retaining and graduating more nurses will help to decrease future nursing shortages.

This study answered several questions. Students pursuing an ADN described their experiences participating in SI as a positive experience. The participants further made the connection that attending SI sessions improved their academic performance. The participants appreciated the content review led by their peer SI leaders and valued the SI experience enough to make suggestions for improvement. These suggestions pertained to scheduling to improve attendance

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and consistency in SI leaders to improve upon the peer mentoring relationships that are established during the semester.

The study's findings indicated that peer mentoring and tutoring provided students with different perspectives and helped them understand difficult material during the first semester of the ADN program. The students placed value on shared experiences that the peer SI leaders were able to provide. The first-semester students also felt a stronger connection with peer SI leaders than with instructors. The consistency of peer SI leaders provided additional support that increased motivation and persistence among first-semester ADN students.

The final research question focused on how nursing students pursuing an ADN described the role of peer mentoring in light of their motivation for academic success and persistence. The participants felt that peer mentoring increased motivation by increasing the students' self-confidence. The content review, tips from the peer mentors, and experiences shared by the peer mentors led to increased academic success. That success encouraged students' self-confidence and promoted persistence within the program.

Providing first-semester ADN students with an opportunity to share their experiences with SI, peer mentoring, and peer tutoring provided a better understanding of what support ADN students feel they need. The present study supported the use of peer mentoring to offer academic support to first-semester ADN students. Additional support is needed throughout nursing education. This study focused on ADN programs, but the challenges associated with attrition are similar across the field of nursing education because of the rigor of nursing programs. The data presented in this study can assist nursing educators in deciding whether to utilize peer mentoring in ADN and other nursing programs. Decreased attrition rates will result in the graduation of larger numbers of nurses, improving the academic experience for these students, and decreasing the nursing shortage.

REFERENCES

1. Abele, C., Penprase, B., & Ternes, R. (2013). A closer look at academic probation and attrition: What courses are predictive of nursing student success? *Nurse Education Today, 33,* 258–261. doi:10.1016/j.nedt.2011.11.017

2. Abshire, D. A., Graves, J. M., Roberts, M. L., Katz, J., Barbosa-Leiker, C., & Corbett, C. F. (2018). Student support in accelerated nursing programs: Gender-based perspectives and impact on academic outcomes. *Nursing Outlook, 66*(1), 84–93. doi:10.1016/j.outlook.2017.08.010

3. American Association of Colleges of Nursing. (2019). Fact sheet: *Nursing shortage*. Retrieved from https://www.aacnnursing.org/News-Information/Fact-Sheets/Nursing-Shortage

4. American Nurses Association. (n.d.). *Nurse hiring outlook and industry trends: 10 questions for ANA's Health Care Economist Peter McMenamin, PhD.* Retrieved from https://www.nursingworld.org/~4afb8f/globalassets/practiceandpolicy/health-and-safety/rnjobmkt_peterminterview_final_030713.pdf

5. Alzahrani, H. A. (2014). Mentorship teaching in clinical teaching of nursing. *Middle East Journal of Nursing, 8*(4), 15–18. doi:10.5742/MEJN.2014.92588

6. Buerhaus, P., Skinner, L., Auerbach, D., & Staiger, D. (2017). Four challenges facing the nursing workforce in the United States. *Journal of Nursing Regulation, 8*(2), 40–46. doi:10.1016/S2155-8256(17)30097-2

7. Butina, M., Campbell, S., & Miller, W. (2015). Conducting qualitative research introduction. *American Society for Clinical Laboratory Science, 28*, 186–189. doi:10.29074/ascls.28.3.186

8. Carlsen-Landy, B., Falley, B., Wheeler, A., & Edwards, D. (2014). Adaptations of supplemental instruction: Our course assistants wear many hats. *Supplemental Instruction Journal, 1*(1), 7–21. Retrieved from https://info.umkc.edu/si/journal/

9. Channing, J., & Okada, N. C. (2019). Supplemental instruction and embedded tutoring program assessment: Problems and opportunities. *Community College Journal of Research and Practice, 44,* 241–247. doi:10.1080/10668926.2019.1575777

10. Colalillo, G. (2007). Mentoring as a retention strategy in a diverse, multicultural, urban associate degree nursing program. T*eaching and Learning in Nursing, 2*(2), 28–33. doi:10.1016/j.tein.2007.01.005

11. Colville, J., Cottom, S., Robinette, T., Wald, H., & Walters, T. (2015). A community college model to support nursing workforce diversity. *Journal of Nursing Education, 54*(2), 65–71. doi:10.3928/01484834-20150119-12

12. Curran, M. K. (2014). Examination of the teaching styles of nursing professional development specialists, part I: Best practices in adult learning theory, curriculum development, and knowledge transfer. *The Journal of Continuing Education in Nursing, 45*(5), 233–240. doi:10.3928/00220124-20140417-04

13. Everett, M. C. (2020). Sharing the responsibility for nursing student retention. *Teaching and Learning in Nursing, 15*(2), 121–122. doi:10.1016/j.teln.2019.12.009

14. Fagan, J. M., & Coffey, J. S. (2019). Despite challenges: *Nursing student persistence. Journal of Nursing Education, 58*(7), 427–430.

15. Fettig, K., & Friesen, P. (2014). Socialization of non-traditional nursing students. *Creative Nursing, 20*(2), 95–105. Retrieved from https://www.springerpub.com/creative-nursing.html

16. Grant, R. (2016). The US is running out of nurses. *The Atlantic.* Retrieved from https://www.theatalantic.com/health/archive/2016/02/nursing-short-age1459741

17. Griffith, D. A. (2013). Establishing qualitative geographic sample size in the presence of spatial autocorrelation. *Annals of The Association of American Geographers, 103,* 1107–1122. doi:10.1080/00045608.2013.776884

18. Gruber-Page, M. (2016). The value of mentoring in nursing: An honor and a gift. *Oncology Nursing Forum, 43,* 420–422. doi:10.1188/16.ONF.420-422

19. Guarcello, M. A., Levine, R. A., Beemer, J., Frazee, J. P., Laumakis, M. A., & Schellenburg, S. A. (2017). Balancing student success: Assessing supplemental instruction though coarsened exact matching. *Technology, Knowledge and Learning, 22,* 335–352. doi:10.1007/s10758-017-9317-0

20. Harding, M. (2012). Efficacy of supplemental instruction to enhance student success. *Teaching and Learning in Teaching, 2012*(7), 27–31. doi:10.1016/j.teln.2011.07.002

21. Harris, R. C., Rosenberg, L., & Grace O'Rourke, M. E. (2014). Addressing the challenges of nursing student attrition. *Journal of Nursing Education, 53*(1), 31–37. doi:10.3928/01484834-20131218-03

22. Imison, C. (2017). Nursing shortages put future of NHS at risk. *Nursing Standard 31*(37), Article 29. doi:10.7748/ns.31.37.29.s25

23. Karsten, K., & DiCiccio-Bloom, B. (2014). Acknowledging the academic rigor of associate degree nursing education: A grounded theory study of overcoming failure. *Teaching and Learning in Nursing, 9,* 153–163. doi:10.1016/j.teln.2014

24. Kim, S. C., Oliveri, D., Riingen, M., Taylor, B., & Rankin, L. (2013). Randomized controlled trial of graduate-to-undergraduate student mentoring program. *Journal of Professional Nursing, 29*(6), e43–e49. doi:10.1016/j.prof-nurs.2013.04.003

25. Knowles, M. S. (1975). Adult education: New dimensions. *Educational Leadership, 33*, 85–88. Retrieved from http://www.ascd.org/publications/educational-leadership.aspx

26. Knowles, M. S. (1980). My farewell address: Andragogy, no panacea, no ideology. *Training & Development Journal, 34*(8), 48–50. Retrieved from https://www.questia.com/library/p411170/training-development-journal

27. Krause-Parello, C., Sarcone, A., Samms, K., & Boyd, Z. N. (2013). Developing a center for nursing research: An influence on nursing education and research through mentorship. *Nurse Education in Practice, 13*(2), 106–112. doi:10.1016/j.nepr.2012.08.004

28. Kubec, C. (2017). Reducing nursing student attrition: The search for effective strategies. *The Community College Enterprise, 23*(1), 60–68. Retrieved from https://www.schoolcraft.edu/cce

29. Lin, J., Chew, Y. R., Toh, Y. P., & Radha, L. K. (2018). Mentoring in nursing. *Nurse Educator, 43*, E1–E5. doi:10.1097?NNE.0000000000000389

30. Lisa, S. (2018). The stories of nursing student repeaters: A narrative inquiry study. *Nurse Education in Practice, 28*, 190–114. doi:10.1016/j.nepr.2017.10.015

31. Massey, K. (2019). An acute shortage: As nursing jobs go unfilled, crunch is getting worse. *Arkansas Business, 36*(13), 1–11. Retrieved from https://www.arkansasbusiness.com/

32. McKellar, L., & Kempster, C. (2017). We're all in this together: Midwifery student peer mentoring. *Nurse Education in Practice, 24*, 112–117. doi:10.1016/j.nepr.2015.08.014

33. Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* San Francisco, CA: Jossey-Bass.

34. Olsen, J. M. (2017). Integrative review of admission factors related to associate degree nursing program success. *Journal of Nursing Education, 56*(2), 85–93. doi:10.3928/01484834-20170123-05

35. Paloyo, A., Rogan, S., & Siminski, P. (2016). The effect of supplemental instruction on academic performance: An encouragement design experiment. *Economics of Education Review*, 2016(55), 57–69. doi:10.1016/j.econdurev.2016.08.005

36. Peltz, C. M., & Raymond, D. M. (2016). Effects of associate degree nursing students' characteristics on perceptions and experiences of mentoring. *Journal of Nursing Education, 55,* 258–265.doi:10.3928/01484834-20160414-04

37. Percy, W. H., Kostere, K., & Kostere, S. (2015). Generic qualitative research in psychology. *The Qualitative Report, 20*, 76–85. Retrieved from https://nsuworks.nova.edu/tqr/

38. Peterson-Graziose, V., Bryer, J., & Nikolaidou, M. (2013). Self-esteem and self-efficacy as predictors of attrition in associate degree nursing students. *Journal of Nursing Education, 52*, 351–354. doi:10.3928/01484834-20130520-01

39. Roldan-Merino, J., Miguel-Ruiz, D., Roca-Capara, N., & Rodrigo-Pedrosa, O. (2019). Personal tutoring in nursing studies: A supportive relationship experience aimed at integrating, curricular theory and professional practice. *Nurse Education in Practice, 37,* 81–18. doi:10.1016/j.nepr.2019.05.005

40. Sharpe, J. (2018, December 3). Nursing shortage continues across nation. Lehigh Valley Business. Retrieved from https://www.lvb.com/nursing-shortage-continues-across-nation/

41. Schrum, R. A. (2015). Nursing student retention in an associate degree nursing program utilizing a retention specialist. *Teaching and Learning in Nursing, 10*(2), 80–87. doi:10.1016/j.teln.2014.09.002

42. Skoglund, K., Wall, T. J., & Kiene, D. (2018). Impact of supplemental instruction participation on college freshman retention. *The Learning Assistance Review, 23*(1), 115–135. Retrieved from https://nclca.wildapricot.org/tlar

43. Smith, L., Engelke, M., & Swanson, M. (2016). Student retention in associate degree nursing programs in North Carolina. *Journal of Applied Research in the Community College, 23(1), 41*–56. Retrieved from https://www.ingenta-connect.com/content/montezuma/jarcc

44. Yates, J., & Leggett, T. (2016). Qualitative research: An introduction. *Radiologic Technology, 88*(2), 225–231. Retrieved from http://www.radiologictechnology.org/

45. Zaniewski, A. M., & Reinholz, D. (2016). Increasing STEM success: A near-peer mentoring program in the physical sciences. *International Journal of STEM Education, 3*(1), 1–12. doi:10.1186/s40594-016-0043-2

Survey of the School of Mathematics and Science at a Community College Regarding Academic Dishonesty

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ACADEMIC DISHONESTY SURVEY

After receiving many anecdotes about student cheating and plagiarism in online and remote classes during the COVID-19 pandemic, the School of Mathematics and Science (SOMS) at the Community College of Baltimore County convened an Academic Integrity Committee to investigate these issues. A survey was sent to SOMS faculty members to determine their opinions about where cheating was most likely occurring. The committee hypothesized that instructors would feel that cheating and plagiarism were on the rise and that most faculty members felt ill-prepared for this.

ABSTRACT

After receiving many anecdotes about student cheating and plagiarism in online and remote classes during the COVID-19 pandemic, the School of Mathematics and Science (SOMS) at the Community College of Baltimore County convened an Academic Integrity Committee to investigate these issues. A survey was sent to SOMS faculty members to determine their opinions about where cheating was most likely occurring. The committee hypothesized that instructors would feel that cheating and plagiarism were on the rise and that most faculty members felt ill-prepared for this. This paper aims to summarize the survey results. Overall, the results indicate that faculty seem doubtful of their ability to ensure academic honesty and would like to see materials that help them in these areas. The survey results guided the committee in determining what projects most deserved the committee's attention. The committee was able to develop materials for new instructors and wrote a document of practical recommendations for several types of online exams. The committee also gave a presentation at the college's Teaching and Teaching Fair to help faculty become more familiar with the tools available on the new Learning Management System (LMS), Brightspace. The committee has begun researching ideas such as Honor Codes and other methods of gaining student buy-in. There may be an opportunity to make more concrete recommendations in the future. One of the limitations of this research is the sample pool, which was a small percentage of total faculty members and therefore may not indicate what most faculty believe. Another limitation is that surveyed faculty members were from mathematics, biology, and physical sciences departments. These different disciplines have different assessment types and use different tools. The college also switched to a new LMS system involving new plagiarism detection tools. Further data may be required to determine the exact cause of faculty discontent.

Survey of the School of Mathematics and Sciences at a Community College Regarding Academic Dishonesty

INTRODUCTION

Remote and online instruction is not new. Remote education was taking place by correspondence as early as the 18th century. Education has occurred through correspondence, radio, television, and the internet. Before the age of computers and the internet, it was possible to take correspondence courses remotely. In each case, remote education benefits the student through convenience and flexibility (Kentnor, 2015).

Academic dishonesty and plagiarism issues are also not new. As long as faculty members and programs have been outlining material to learn, students have been devising ways of getting around these requirements (Baird, 1980; Swift and Nonis, 1998). In this paper, academic dishonesty refers to all forms of cheating and can refer to many types of unauthorized behaviors. These include but are not limited to plagiarism, cutting and pasting, using websites or unauthorized help for homework or other assignments, and using devices and websites during exams.

In the internet age, there has been a rise in fee-for-service assignment preparation services (Rogerson & Basanta, 2016). Some online sites operate as information repositories or student support centers. However, the reality is that students have access to graded work, answers to assignments, essays, or entire exams. This is known as file-sharing. The most well-known file-sharing sites are Chegg and Course Hero. Chegg has tutors who answer questions for students, and Course Hero allows students to upload course content. These materials are often copyrighted materials belonging to faculty members and not students. In addition, when these sites are accessed during assessments, it is an unfair advantage to the student using the site.

According to McCabe et al. (2001), rates of cheating among accounting students in the U.S. nearly doubled from 39% in the early 1960s to 64% by 1993. Krou et al. (2019) found that more than 50% of the college students surveyed engaged in cheating behavior within 6 months of completing the survey. Research indicates the increase in cheating can be tied to a rise in student beliefs that only the grade matters or that they "need to get ahead" (Simkin & McLeod, 2009).

Though most students agree that cheating is not ethical, almost half believe it is socially acceptable, especially for a student in a challenging situation (Saat, 2012; Chala, 2021). For example, students are more sympathetic towards a student who might cheat to ensure a job. In addition, students state that they believe academic dishonesty is wrong but are reluctant to report other students (Waltzer et al., 2021).

Academic dishonesty has been characterized as academic fraud (Becker, 2006; Lewellyn & Rodriguez, 2015). In business, fraud indicates that there has been unethical behavior. In business, a fraud triangle helps identify persons likely to commit fraud, and a similar model can be used in discussing academic fraud (Ramos, 2003). This fraud triangle depicts 3 elements that are present when fraud occurs. These elements are incentive/pressure, rationalization/attitude, and opportunity.

INTRODUCTION CONT.

In academics, students feel pressure to achieve the highest grades possible (Isakov & Tripathy, 2017). Schools with a strong focus on competition and achievement tend to encourage higher rates of cheating among students (Anderman & Koenka, 2017). Opportunities may come as specific assessments occur with minimal supervision, such as an online quiz, exam, or lab report, where students all have similar calculations (Noorbehbahani et al., 2022). Rationalization may depend on the situation, but some feel "everyone is doing it" or the "ends justify the means". Often students may feel little connection to a particular course of study and are only interested in graduating or achieving a place in a program (McGee, 2013).

During the COVID-19 pandemic, all face-to-face classes rapidly pivoted to remote instruction and all students took exams remotely at the end of the spring semester of 2020. At the time, it seemed the only possibility. The School of Mathematics and Science (SOMS) at the Community College of Baltimore County (CCBC) was told it could not require students to acquire any additional technology that might enable proctoring despite the remote testing.

In the fall 2020 semester, most classes were still offered online rather than in a face-to-face setting. In the fall of 2020, some face-to-face courses were offered at CCBC, but most SOMS classes were offered in what was known as the synchronous remote modality. This meant that students attended classes remotely (online via Microsoft Teams or Zoom) at a particular time, but exams were taken remotely. The testing center was not open at this time. The assessment options were using a proctoring software called Respondus LockDown Browser (RLB), live online proctoring using Zoom or Microsoft Teams, or continuing with open book exams. Using oral exams was also mentioned. Some faculty members had minimal training in teaching online classes or in assuring the integrity of the process in an online course. During the fall of 2020, faculty members became increasingly alarmed at the ethical problems they observed in conducting exams.

In this situation, it was not surprising that faculty members perceived a jump in the number of students suspected of cheating in the fall of 2020. When students perceive that they are not being supervised or that specific directions and rules are absent, they might feel more empowered to "do what it takes" to pass a class. Research shows that a strong instructor presence or honor codes can lower the incidence of cheating in a course (McGee, 2013).

There are several types of remote proctoring software, and some of the different types and proper training have been described (Nigam et al., 2021). The remote proctoring software RLB is a tool that can be used to help ensure integrity in exam situations because it prevents access to other applications and keeps students from being able to print, take screen captures, or copy and paste while taking an exam. This is the proctoring software that CCBC offers for online courses. Using RLB is not the solution it might seem, however. Despite proctoring and browser lockdown software, bypassing the safeguards offered by RLB during exam situations is still possible. For example, special instructions from professors about camera placement do not prevent an additional device or additional notes or information outside the sweep of the initial camera video of the student's physical location.

Considering these circumstances, the SOMS Academic Integrity Committee was formed. The committee felt that a survey would help faculty members in SOMS identify topics of concern. Once these concerns were delineated, the committee could develop ways to assist and train faculty members. Appropriate training might equip faculty members to address academic dishonesty in the classroom more confidently.

METHODS

The SOMS Academic Integrity Committee helped formulate the questions, and the resulting survey was sent to SOMS faculty. All faculty members of SOMS received the survey, including adjunct faculty members. Out of the 182 total faculty members who received the survey via email, 33 responded. The survey is provided below, and it consisted of questions where the faculty member chose one answer, any answer that applied, or gave further comments explaining answers. In this survey, cheating refers to academic dishonesty in assessments, and plagiarism refers to academic dishonesty in written assessments.

Survey on Academic Integrity Sent to All SOMS Faculty Members

1. How concerned are you about cheating?
   a. Very concerned
   b. Concerned
   c. Somewhat concerned
   d. Somewhat unconcerned
   e. Unconcerned
   f. Very unconcerned

2. How concerned about plagiarism are you?
   a. Very concerned
   b. Concerned
   c. Somewhat concerned
   d. Somewhat unconcerned
   e. Unconcerned
   f. Very unconcerned

3. Approximately what percentage of assignments are checked for plagiarism?
   a. 0%
   b. 25%
   c. 50%
   d. 75%
   e. 100%

4. How many classes have you observed academic dishonesty
   a. 0
   b. 1
   c. 2
   d. 3
   e. 4
   f. +5

5. What percent of students do you suspect of cheating in a face-to-face class?
   a. 1–5%
   b. 6–10%
   c. 11–15%
   d. 16–20%
   e. 21+%
   f. N/A

6. What percent of students do you suspect of cheating in a remote modality course?
   a. 1–5%
   b. 6–10%
   c. 11–15%
   d. 16–20%
   e. 21+%
   f. N/A

7. What percent of students do you suspect of cheating in an online course?
   a. 1–5%
   b. 6–10%
   c. 11–15%
   d. 16–20%
   e. 21+%
   f. N/A

8. Describe what draws your attention to academic dishonesty.

9. Do you use Safe Assign? Yes or No

10. Was there a website(s) used by the student that facilitated the academic dishonesty (ex. Course Hero, Chegg)? Yes or No

11. Which websites were used?

12. What action(s) were taken if there were websites to facilitate academic dishonesty?

13. Do you complete a SIR for all instances that you would consider academically dishonest?

14. Explain why you do not complete for all instances of academic dishonesty?

15. What academic dishonesty are you the most concerned about, cheating or plagiarism?

16. What resources do you give your students to educate them about cheating?

17. Do you feel that you are well prepared to prevent academic dishonesty in your classes? Yes or No

18. What would help you be better prepared to prevent academic dishonesty in your classes?

19. What suggestions do you have for promoting academic integrity in your discipline?

Survey of the School of Mathematics and Science at a Community College Regarding Academic Dishonesty

RESULTS

33 faculty members in SOMS responded to the survey. Of these, 16 were in the mathematics department, 5 were in the biology department, and 12 were in physical sciences. Table 1 shows how the respondents felt about cheating. The percentages do not add to 100% because not all survey participants answered every question. 78% of respondents felt very concerned or somewhat concerned about cheating. In contrast, 33% of SOMS respondents felt very concerned or somewhat concerned about plagiarism. Table 2 shows these same results broken down by department.

Table 1. Percent of Faculty Respondents Concerned about Cheating and Plagiarism.

	Very concerned	Concerned	Somewhat concerned	Neither concerned nor unconcerned	Somewhat unconcerned	Unconcerned	Very unconcerned
Concern about cheating on assessments	45%	0%	33%	3%	6%	0%	6%
Concern about plagiarism on assignments	30%	0%	3%	9%	12%	0%	3%

Table 2. Percent of Faculty Respondents Concerned about Cheating and Plagiarism by Department.

	Very concerned	Concerned	Somewhat concerned	Neither concerned nor unconcerned	Somewhat unconcerned	Unconcerned	Very unconcerned
Math (16)	8%	0%	18%	0%	3%	0%	0%
Biology (5)	0%	0%	40%	20%	0%	0%	20%
Physical Sciences (12)	7%	0%	9%	0%	3%	0%	3%

Survey of the School of Mathematics and Science at a Community College Regarding Academic Dishonesty

RESULTS

Faculty reported that 73% had seen cheating in at least 3 classes, while 15% reported having seen cheating in 5 or more classes. In addition, 18% of respondents reported checking for academic dishonesty and plagiarism in 100% of assignments, while 6% reported not checking any assignments for academic plagiarism. Four respondents were very unconcerned about cheating or left the question about cheating blank.

There were also survey questions about suspected rates of cheating by course modality, shown in Table 3. The face-to-face modality refers to a class where all instruction and assessments take place in a face-to-face setting. Remote synchronous is a format where instruction and assessments occur remotely using video software during scheduled days and times, but a physical presence is not required. The course must be accessed from any location using a computer with internet access and a camera feature or webcam. Online asynchronous is a format in which all instructional hours and assessments (the testing center had not yet opened at the time faculty members took the survey) are completed online in an asynchronous format with no scheduled times and a physical presence does not take place at the CCBC campus.

Table 3. Respondents' Estimates of Rates of Suspected Cheating by Course Modality.

	0%	1–5%	6–10%	11–15%	16–20%	≥21%	N/A
Face-to-face	27%	39%	6%	0%	3%	0%	21%
Remote Synchronous	0%	30%	15%	15%	12%	21%	3%
Online asynchronous	3%	15%	6%	6%	6%	9%	24%

Survey of the School of Mathematics and Science at a Community College Regarding Academic Dishonesty

RESULTS

The modality that had the highest reported cheating and plagiarism was the remote synchronous modality. In Table 3, 48% of faculty reported that at least 11% of the students taking this modality cheated. In contrast, 6% of respondents thought up to 5% of students cheated in a face-to-face class. Again, the responses in the table do not add up to 100% because not all participants answered every question. Also, there were many not applicable (N/A) answers to the percent cheating in an online asynchronous class. This result may indicate that more faculty were not teaching a fully online asynchronous course rather than that there is less cheating in this format, or respondents may have elected to leave the response for that modality blank. 24% of respondents to the survey responded N/A when asked to report the number of students cheating in an online asynchronous class. Of the remaining respondents, 15% reported that 1–5% of students cheated, and 15% reported that 16–21% cheated in their online asynchronous courses.

Proctored exams were the type of assessment respondents felt most likely to see academic dishonesty. 69% of respondents felt cheating most often occurred on proctored exams, while 60% of respondents thought cheating most often occurred on written assignments. Respondents were less concerned that cheating took place on proctored quizzes, but 42% felt unproctored quizzes were an area where students were likely to cheat. The least concerning type of assessment was lab reports, where only 18% of respondents felt that lab reports were an area where cheating occurs most often. Table 4 shows these results. Note that the percentages here add up to more than 100%, because respondents were able to select all activities where they suspected cheating occurred in their courses.

Table 4. Suspected Rates of Cheating by Assignment and Assessment Type.

	Suspected Rate of Cheating
Written assignments	60%
Proctored exams	69%
Proctored quizzes	21%
Unproctored quizzes	42%
Labs	18%

Survey of the School of Mathematics and Science at a Community College Regarding Academic Dishonesty

RESULTS

Faculty respondents commented on what drew their attention to possible academic dishonesty. These included when different students had the same error, problem-solving was too detailed, unusual techniques not taught in class were present, or scrap paper for an exam was submitted late. For plagiarism, respondents reported that they relied on a high match on Safe Assign or writing beyond a student's usual writing style as tip-offs that plagiarism had taken place.

Faculty respondents were asked about websites they encountered investigating student dishonesty. 51% of respondents reported that a website was involved during academic dishonesty. The websites mentioned by respondents included Chegg/Mathway, CourseHero, Quizlet, PhotoMath, Wolfram Alpha, and Bartleby's.

67% of respondents who suspected a student of academic dishonesty did not file a student incident report. Some respondents reported that they felt too overwhelmed to be able to respond to every incident of cheating. Others reported giving a warning or a zero for some infractions and did not report the cheating. Some faculty reported frustration with the high bar of proof required to prove that a student had committed academic dishonesty, especially on exams.

Faculty respondents gave examples of resources they gave students to educate them about academic cheating. Some faculty reported using their own honor code, and other faculty members used quizzes, videos, and discussion posts to educate students about academic dishonesty.

63% percent of respondents reported that they did not feel well prepared to prevent academic dishonesty in their classes. Several felt the only solution would be a return to in-person classes with face-to-face exams and a more transparent discussion about what to do in specific situations. Many respondents were adamant that the testing center should be opened and have hours to accommodate larger number of students

DISCUSSION+ CONCLUSION

One of the key survey results was that over 78% of the SOMS respondents felt very concerned or somewhat concerned about cheating. 33% of faculty members who responded felt very concerned or somewhat concerned about plagiarism. In addition, 73% of faculty members who responded reported seeing cheating in at least 75% of their classes.

DISCUSSION + CONCLUSION

Most instructors teach under the notion that students understand that their coursework is important and that students will behave in ethical ways. Professors expect students to do their own work. Academic integrity demands a commitment to values of honesty, trust, fairness, respect, responsibility, and courage (International Center for Academic Integrity, 2021). These values create a community dedicated to learning and exchanging ideas in an ideal academic environment. Ensuring these ideals of academic integrity helps the college and the student maintain trust and helps future academic institutions or places of employment feel confident that a student's transcript means something. The institution and the students should value proficiency in knowledge, skills, and abilities (Holden, 2021).

Faculty become concerned when this agreement is breached, even if students never hear these ideas directly from the faculty member. When faculty members take the time to discuss academic dishonesty issues and to inform students of their policies, cases of academic dishonesty may drop. When a faculty member takes the time to learn the appropriate policies and communicates these effectively to students, fewer academically dishonest behaviors occur (Boehm et al., 2009; Tatum & Schwartz, 2017). One method of combatting academic dishonesty, then, is to have a specific class policy and to communicate this policy clearly and repeatedly to the class. Similarly, honor codes are also effective at reducing academic dishonesty. Research shows that when students are specifically asked to be honest that they are more likely to be honest (Tatum and Schwartz, 2017).

48% of faculty respondents reported that at least 11% of students cheated in the asynchronous remote modality. Still, only 6% of respondents reported that up to 5% of students cheated in face-to-face classes. 24% of respondents reported a not applicable answer (N/A) for the asynchronous remote classes. In comparison, 15% reported that 16-21% of students were dishonest, and another 15% of respondents reported that 1-5% of students were dishonest. It may be that

DISCUSSION + CONCLUSION

the 24% of respondents that reported a N/A answer for this modality were not teaching a fully asynchronous course. Many face-to-face courses that were forced to shift to a remote setting in the pandemic were shifted to a synchronous remote setting where the class met at a specific time using Zoom or Microsoft Teams technology to host or record the course.

Unfortunately, the committee does not have data from before the pandemic, but literature reviews indicate that the pandemic likely increased the academic fraud that faculty members observed (Chen et al., 2020; Butler-Henderson & Crawford, 2020). Chegg, one of the most used websites, reported an increase in website traffic of almost 150% in the number of questions asked per day in a comparison between 2019 and 2020 (Lancaster & Cotarlan, 2020)

Faculty members who took the survey reported that they were most concerned about cheating on proctored exams. 69% of faculty respondents felt that proctored exams were the most significant academic dishonesty problem, while 60% felt that written assessments were a significant cheating problem. Relatedly, many respondents felt it would be beneficial if a provision could be made that online students be required to take their exams in a proctored setting. One of the difficulties with this strategy is that one of the college's goals is to provide online instruction beyond the range of a one-hour drive to one of the CCBC testing centers. One of the upfront requirements for specific online courses could be finding an in-person situation to facilitate assessments. Several respondents felt the only solution was returning to face-to-face classes and assessments or expanded hours at the testing center.

67% of respondents reported not filing a student incident report when academic dishonesty is discovered. The reasons this is the case are many and varied. Sometimes an instructor will communicate the correct information or handle the situation independently and expect the student to conform from that time on. In asynchronous remote classes, it is up to the students to find and digest the necessary information. If they do not successfully do this the first time, the faculty member may prefer to correct the student and allow for a resubmission.

Some respondents feel it is not their responsibility or too overwhelming in an already loaded semester to try to detect cheating and file the appropriate paperwork. Sometimes cheating is not detected, and students may be encouraged to regard cheating as a possible strategy. This result is unavoidable since the cheating was not detected. If a faculty member detects cheating but fails to act on it, the faculty member is communicating that cheating is acceptable to get through a class. For most faculty members, this is not the intent (Martin, 2017).

Some faculty respondents felt they had caught students (especially in examination situations), but the proof bar is too high. This frustrates the instructor that illegitimate work must be allowed to stand. The burden of proof means that some academic dishonesty must be let go. It is not the goal to prosecute innocent students,

DISCUSSION + CONCLUSION

but it can still feel very frustrating to the faculty member if they feel they cannot address cheating effectively.

63% of respondents reported they were not equipped to prevent academic dishonesty in their classes. This seems like a meaningful result. If instructors feel that they are not prepared to prevent academic dishonesty, tools and support should be provided. In response, the SOMS Academic Integrity Committee is developing tools to help SOMS faculty members. Several committee members spoke at a professional development conference held at CCBC called the Teaching and Learning Fair about assessing written documents using the new plagiarism detection software Urkund. This plagiarism software comes with the CCBC's new LMS Brightspace. The committee designed the information to be helpful to any class where written assessments are given.

There are some limitations to the research and some areas for further research. One of the main limitations is the sample size and how the sample size was selected. There was no attempt to select the respondents, so respondents were not balanced regarding demographic data. Survey respondents were also self-selecting. This may mean a particular bias in the survey that results in skewed results. In the future, it would be interesting to survey all instructors at CCBC in all disciplines and attempt to balance the data so that it would be representative. This type of survey may be able to discern what types of training information would be most helpful to faculty members.

Students were not surveyed, but this would also be an area for further research. Some students are confused about what is expected of them. The committee has discussed finding out if some presentations or lessons could be incorporated into Brightspace to help students understand what is expected of them. Some instructors have already taken on projects of this kind individually, but it might be beneficial to have lessons universally available to instructors.

Some may doubt the utility of the SOMS Academic Dishonesty Committee now that many classes have returned to the face-to-face setting. Plagiarism and correctly citing sources is a concern regardless of the modality of the course. Online classes, as well as other types of remote classes, will not disappear. It is imperative, though, that as a college we are aware of how academic dishonesty is most likely to occur and how faculty and students can partner to minimize incidences of academic dishonesty

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REFERENCES

1. Anderman, E., & Koenka, A. (2017). The relationship between academic motivation and cheating. *Theory Into Practice, 56*(2), 95–102. https://doi.org/10.1080/00405841.2017.1308172

2. Becker, D., Connolly, H., Lentz, P., & Morrison, J. (2006). Using the business fraud triangle to predict academic dishonesty among business students. *Academy of Educational Leadership Journal, 10*(1), 37–54.

3. Boehm, P. J., Justice, M., & Weeks, S. (2009). Promoting academic integrity in higher education. *Community College Enterprise, 15*(1), 45–61.

4. Butler-Henderson, K., & Crawford, J. (2020). A systematic review of online examination: A pedagogical innovation for scalable authentication and integrity. *Computers & Education, 159*. https://doi.org/10.1016/j.compedu.2020.104024

5. Chen C., Long, J., Liu, J., Want Z., & Zhang, J. (2020). Online academic dishonesty of college students: A review. In *Proceedings of the 2020 International Conference on Advanced Education, Management and Social Science (AEMSS2020)* (pp. 156–161). Atlantis Press. https://doi.org/10.2991/assehr.k.200723.121

6. Holden, O., Norris, M., & Kuhlmeier, V. (2021). Academic integrity in online assessment: *A research review. Frontiers in Education, 6:*639814. https://doi.org/10.3389/feduc.2021.639814

7. International Center for Academic Integrity [ICAI], (2021). The Fundamental Values of Academic Integrity (3rd ed.). I*nternational Center for Academic Integrity*. https://academicintegrity.org/images/pdfs/20019_ICAI-Fundamental-Values_R12.pdf

8. Isakov, M., & Tripathy, A. (2017). *Behavioral correlates of cheating: Environmental specificity and reward expectation. PLoS One, 12*(10). https://doi.org/10.1371%2Fjournal.pone.0186054

9. Karim, M., Kaminsky, S., & Behrend, T. (2014). Cheating, reactions, and performance in remotely proctored testing: An exploratory experimental study. *Journal of Business Psychology, 29*, 555–572.

10. Kentnor, H. (2015). Distance education and the evolution of online learning in the United States. *Curriculum and Teaching Dialogue, 17*(1&2), 21.

11. King, C., Guyette, R., & Piotrowski, C. (2009). Online exams and cheating: An empirical analysis of business students' views. Journal of Educators Online, 6(1).

12. Krou, M., Hoff, M., Pino, N., & Acee, T. (2019), Rationalizing the decision to cheat: An empirical analysis to determine whether social rational orientation can predict academic dishonesty. *Journal of College and Character, (20)*1,

9–24. https://doi.org/10.1080/2194587X.2018.1559196

13. Ladyshewsky, R. (2015). Post-graduate student performance in 'supervised in-class' vs. 'unsupervised online' multiple-choice tests: Implications for cheating and test security. *Assessment & Evaluation in Higher Education, 40*(7), 883–897. https://doi.org/10.1080/02602938.2014.956683

14. Lancaster, T., & Cotarlan, C. (2021). Contract cheating by STEM students through a file sharing website: A COVID-19 pandemic perspective. *International Journal for Educational Integrity, 17*(3). https://doi.org/10.1007/s40979-021-00070-0

15. Langenfeld, T. (2020). Internet-based proctored assessment: Security and fairness issues. *Educational Measurement, Issues and Practice, 39*(3), 24–27. https://doi.org/10.1111/emip.12359

16. Lewellyn, P., & Rodriguez, L. (2015). Does academic dishonesty relate to fraud theory? A comparative analysis. *American International Journal of Contemporary Research, 5*(3).

17. Lilley, M., Meere, J., & Barker, T. (2016). Remote live invigilation: A pilot study. *Journal of Interactive Media in Education, 1*, 1–5.

18. Martin, B. (2017). Defending university integrity. International Journal for Educational Integrity, 13, 1–14. https://doi.org/10.1007/s40979-016-0012-z

19. McCabe, D., Trevino, D., & Butterfield, K. (2001). Cheating dishonesty in graduate business programs: Prevalence, causes, and proposed action. *Academy of Management Learning & Education, 5*(3), 294–305.

20. McGee, P. (2013). Supporting academic honesty in online courses. *Journal of Educators Online, 10*(1). http://dx.doi.org/10.9743/JEO.2013.1.6

21. Moore, R., & Vitale, D. (2018). High school students access to and use of technology at home and in school. *ACT Center for equity in learning*. https://equityinlearning.act.org/research-doc/high-school-students-access-to-and-use-of-technology-at-home-and-in-school/

22. Moore, R., Vitale, D., & Stawinoga, N. (2018). The digital divide and educational equity: A look at students with limited access to electronic devices at home. *ACT Center for Equity in Learning.* https://www.act.org/content/dam/act/unsecured/documents/R1698-digital-divide-2018-08.pdf.

23. Nigam, A., Pasricha, R., Singh, T., & Churi, P. (2021). A systematic review of AI-based proctoring Systems: Past, present, and future. *Education and Information Technologies 26*, 6421–6445. https://doi.org/10.1007/s10639-021-10597-x

24. Noorbehbahni, F., Mohammadi, A., & Aminazadeh, M. (2022). A systematic review of research on cheating in exams from 2010 to 2021. *Education and Information Technologies.* https://doi.org/10.1007/s10639-022-10927-7

25. Ramos, M. (2003). Auditors' responsibility for fraud detection. *Journal of Accountancy, 195*(1), 28–35.

26. Rogerson, A., & Basanta, G. (2016). Peer–to–peer file sharing and academic integrity in the internet age. In: *Bretag (ed) Handbook of Academic Integrity. Springer, Singapore*. https://doi.org/10.1007/978–981–287–098–8_55

27. Saat, M. (2012). A longitudinal study of accounting students' ethical judgement making ability. Accounting Education: *An International Journal, 21*(3), 215–229.

28. Swift, C., & Nonis, S. (1998). When no one is watching: Cheating behaviors on projects and assignments. *Marketing Education Review, 8*(1), 27–36.

29. Tatum, H., & Schwartz, B. (2017). Honor codes: Evidence–based strategies for improving academic integrity. *Theory Into Practice, 56*(2), 129–135. https://doi.org/10.1080/00405841.2017.1308175

30. Trenholm, S. (2007). A review of cheating in fully asynchronous online courses: A math or fact–based course perspective. *Journal of Educational Technology Systems, 35*(3). https://doi.org/10.2190/Y78L–H21X–241N–7Q02

31. Waltzer, T., Sauelson, A., & Dahl, A. (2021). Students' reasoning about whether to report when others cheat: *Conflict, Confusion, and Consequences. Journal of Academic Ethics, 20*, 265–287. https://doi.org/10.1007/s10805–021–09414–4

The Effect of Active Participation on Online Course Performance

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ACTIVE PARTICIPATION IN ONLINE COURSES

Student participation and engagement in online classes can have significant effects on academic performance. This study examines this relationship using survey data obtained from 2 online economics classes at the Community College of Baltimore County.

ABSTRACT

Student participation and engagement in online classes can have significant effects on academic performance. This study examines this relationship using survey data obtained from 2 online economics classes at the Community College of Baltimore County. A cursory exploration of the data shows that a large percent of students (33.33 %) allocates 3–5 hours each week to studying and completing other class-related activities, while 45.45 % of students regularly read the lecture materials before the class. Controlling for a student's prior grade point average, attitude towards the course, and anticipated score, an ordinary least squares regression analysis indicates that student engagement has a positive, though not statistically significant, effect on performance.

INTRODUCTION

Student engagement refers to students' involvement or interest during a learning exercise, and the level of interactions that exist between the students, their classes, and their institutions (Axelson & Flick, 2011; Trowler, 2010). Oftentimes, student-to-student interaction in and out of the classroom, active participation, and the level of involvement in class activities have been linked to student academic performance (Pratton & Hales, 2015).

Student participation in course delivery has a significant effect on performance. O'Connor (2013) investigated class participation and student engagement and emphasized a shift from small to large class size for participatory student interaction. Barkley (2010) also noted the increasing importance of student engagement as a gauge of student success. Using structural equation modeling, Gonzalez et al. (2021) found that student participation in academic exercises improved students' academic performance, enhanced students' well-being, and prevented students' unacceptable behaviors. Song et al. (2019) further explored the "learner's participation in online course" delivery and other synchronous methods of instruction. They found that the frequency of course access, discussion postings, and the importance of strategic communication with a virtual agent have significant effects on student achievement. These result from efficient use of technology and information dissemination, experience in the area of study, and instructional tasks (Vonderwell & Zachariah, 2014). In order to compare student performance and assessment in online and traditional methods of instruction, Ni (2013) found that student performance is "independent of the mode of instruction". Ni also noted that while there is increased interaction in online platforms, student-to-student participation is generally "less intimidating".

This paper centers on the engagement of students who are enrolled in an online class. Are adequately engaged students more likely to perform well in the class? Put differently, if the student's prior GPA, attitude towards the course, and anticipated score for the class are controlled for, do well-engaged students perform better in the class than their peers? The goal of this research study, therefore, is to investigate the role student engagement plays in student academic performance.

METHODS

SURVEY PARTICIPANTS + DATA COLLECTION

A total of 33 students completed the survey in the spring of 2022. These were the students that took ECON 201 and ECON 202 online, asynchronous classes at the Community College of Baltimore County (CCBC). The students surveyed were in a combination of majors at CCBC. Fifteen students completed the survey in ECON 201 while 18 students did so in ECON 202. While it was completely anonymous, the survey was administered electronically and available from April 19, 2022 to April 30, 2022 to boost student participation. A partial list of the survey questions is provided below, and the entire survey is available upon request to the author.

Select Survey Questions and Response Options

1	Which classroom activity do you enjoy the most	Lecture videos.
		Office hours via Microsoft Teams.
		Discussion boards where you comment on your classmates' posts.
		The announcement provided each week by the professor.
2	Which of the following would you say motivates you the most to study?	The desire to ask questions via emails
		Completing assignments.
		Bonus questions on assignments and discussions.
		Positive feedback on assignments
		Your desire to graduate with a good grade.
3	How much time do you set aside each week to study and do your assignments, projects, and discussions/readings?	<1 hour
		1–2 hours
		2–3 hours
		3–5 hours
		>5 hours
4	Generally speaking, what change would you like to see in the class?	Teaching method.
		Time taken to complete a lecture.
		More time should be given to submit homework assignments and discussions.
		More time for exams and quizzes.
		More bonus questions.
5	How often do you read the lecture materials on Brightspace or MindTap before the class?	Never
		Rarely
		Occasionally
		Regularly
		Always

METHODS

QUANTITATIVE ANALYSIS

A quantitative analysis was conducted to provide estimates on the effects of student engagement on class performance. To estimate this effect, consider the following equation:

$$Perform_i = \alpha + \beta * Engage_i + y'X + e_i,$$

where $Perform_i$ indicates student i's performance score in the class at the time of the survey, $Engage_i$ represents the student's engagement, X is a vector of other controls which includes student's prior GPA, attitude towards economics, and the student's anticipated grade for the class. All these variables were obtained through the survey responses. The variable $Perform_i$ uses the student's current score in the class while the variable $Engage_i$ is obtained by aggregating the student's responses to questions 3 to 5 in the survey. The error term e_i denotes other factors that could affect performance that are excluded from the estimation, and α, β and y are parameters to be estimated. The parameter α is a constant that measures the estimated average performance score for students who have zeros for all the independent variables in the regression while y measures the effect of other controls. The main parameter of interest is β, and its a priori expectation is positive, indicating that well-engaged students are more likely to perform well in the class.

RESULTS+ DISCUSSION

Figure 1A presents student-reported current grade point average (GPA) before the class began. As shown in the figure, 48.39% of the students reported that their current GPA was 3.5 or higher, 25.81% of the students had their GPA in the range of 3–3.49, while 3.23% had their GPA in the range of 1.99 or below. This variable (GPA as of last semester) served as one of the controls for the study.

The student current and anticipated score are displayed in Figure 1B. As the figure shows, 70.59% expected to score 90% or above (that is, "A") but currently, that number reduced to 29.41%; 57.14% had anticipated a score of 80–89.99% (that is, "B") but currently, that number reduced to 42.86%; and while 20% anticipated a score of 60–69.99% at the beginning of the class, that number tipped up to 80%. Therefore, the percentage of students dropped as one goes up the scale (that is, from 60–69.99% to 90% or above) for current score but rises for anticipated score. This implies that a lot of the students expected a high score at the end of the semester but currently had low scores. As the next section shows, this disparity may be explained by multiple factors including student motivation and class activity; number of hours allocated to studying and completing assignments, projects, and discussions; student communications with the professor; students readiness before the class (in the online Brightspace or MindTap programs used by CCBC); ability to complete and submit assignments, discussions, and tests before their deadlines; and overall feeling about economics and relevance of the course to their program.

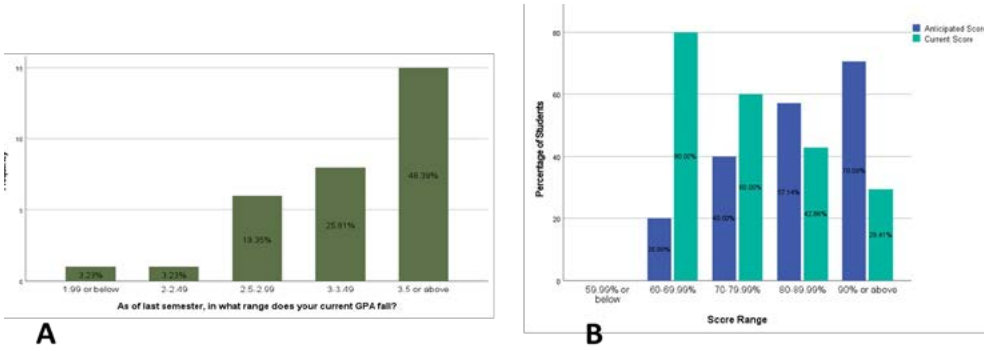

Figure 1. Self-reported GPA (panel A) and grade in the online course (panel B).

STUDENT MOTIVATION + CLASS ACTIVITIES

Figure 2 highlights student motivation and the classroom activity they enjoyed the most. As shown in Figure 2A, 66.67% of students indicated that a "good grade" is what motivates them the most compared to "completing assignments" (21.21%) and "positive feedback" on assignments (9.09%). This agrees with the findings of Bodkyn & Stevens (2015) and Arjani (2016) that student motivation fosters student interactions and performance in classroom activities. Regarding class activities, the students enjoyed the professor's weekly announcement 45.46% of the time while lectures and discussion boards were enjoyed 30.30% and 24.24%, respectively. This 45.46% enjoyment rate is likely due to the fact that, in addition to specifying due dates, the weekly announcement also gave detailed information about homework assignments, discussion questions, quizzes, exams, lecture materials, and the group project. These tend to provide extrinsic motivation for completing weekly academic activities

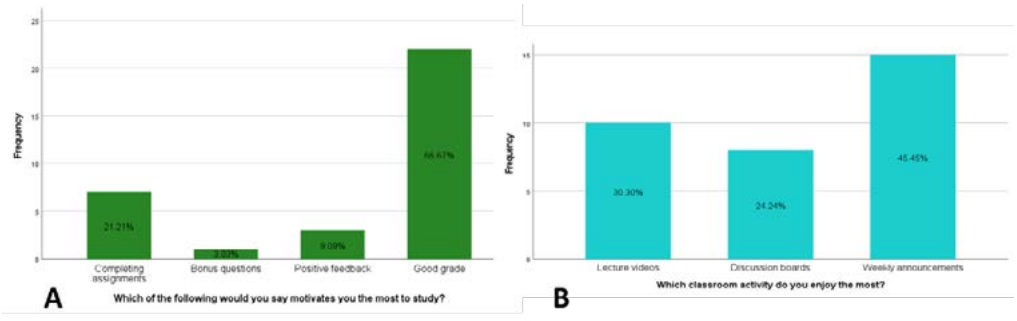

Figure 2. Motivation to study for (panel A) and favorite part of (panel B) the online course.

NUMBER OF HOURS ALLOCATED

The literature suggests that time allocation is directly related with students' grades (Grave, 2010; Razali et al., 2018). As shown in Figure 3, 33.33% of students allocate 3–5 hours each week to study and do their assignments, projects, and discussion/readings while 21.21% spend 2–3 hours and more than 5 hours. This indicates that a large number of students spend a sizable amount of time to study and complete other class-required activities.

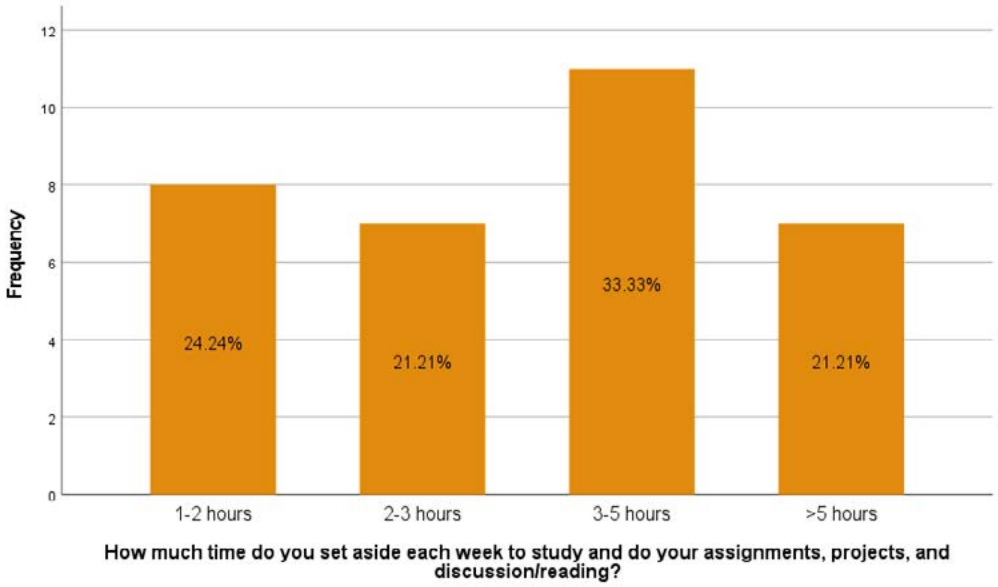

Figure 3. Estimated time spent per week on the online course.

STUDENT COMMUNICATIONS WITH THE PROFESSOR

Figure 4 shows the frequency of communications through emails, questions, and office hours and students' opinions on the utility of the communications. As shown in Figure 4A, 37.50% of the students rarely communicate with their professor, 31.25% occasionally communicate, while only 3.13% always do so. Similarly, in Figure 4B, 36.36% never asked questions about the class while 33.33% of the students rarely do so. Only 3.03% always ask questions. In Figure 4C, 75.76% of the students never went to their professor's office hour while only 3.03% do so regularly. In Figure 4D, 51.52% of the students had a neutral response to the question of whether their interactions with the professor through emails, office hours (via Microsoft Teams), or phone calls helped them understand the class materials better. The reason for this lack of communication may be because those surveyed were online students and rarely communicate with their peers and professor.

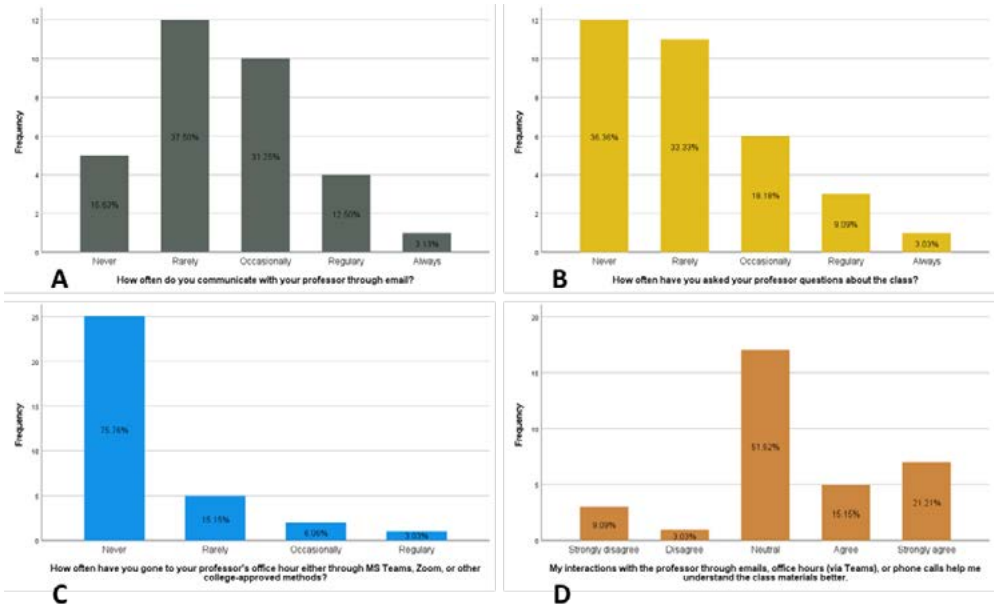

Figure 4. Student responses to questions about communication in the online course including how often they emailed the professor for any reason (panel A), asked questions about the course (panel B), attended office hours (panel C), and how effective the communication was in helping them understand the course material (panel D).

READINESS BEFORE CLASS AND COMPLETION TIME

Student readiness and completion time are presented in Figure 5. As shown in Figure 5A, 45.45% of the class regularly read the lecture materials on the online learning platform called MindTap, 24.24% always read the lecture materials before the class, while 3.03% never do so. In Figure 5B, about 42.42% of the students rarely miss homework, discussion, or test deadlines while 36.36% never misses the deadline. Only 6.06% do so regularly. This indicates that students actively complete the assignments, discussions, and tests on time

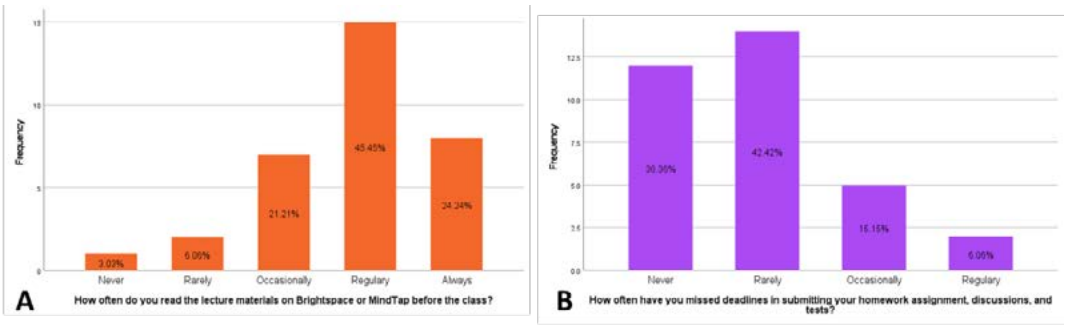

Figure 5. Self-reported student rates of reading lecture materials before class (panel A) and finishing assignments and assessments on time (panel B).

GENERAL FEELINGS ABOUT ECONOMICS AND ITS RELEVANCE TO THEIR PROGRAM

Finally, Figure 6A indicates that 40.63% of the students are neutral when asked if they have a good feeling about economics while 18.75% strongly agree to that question. On program relevance in Figure 7B, 42.42% strongly agree that the course is relevant to their program, 36.36% agree, while 3.03% strongly disagree. This means that a large proportion of the students are taking the class due to its relevance to their program

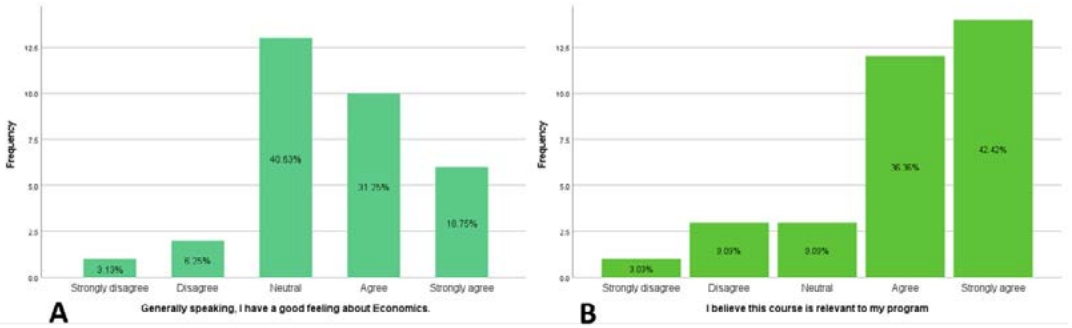

Figure 6. Student sentiments towards economics as a subject of study (panel A) and its relevance to their overall program (panel B).

SUMMARY STATISTICS

Some of the students had missing responses on the dependent and GPA variables, and this resulted in the list-wise deletion of 4 cases, leaving 29 cases for the regression analysis. On average, the students' scores fall within the 2.5 GPA level whereas an average student scored a 3.13 GPA the previous semester (Table 1). The student engagement score was 1.94 on average, with higher scores indicating greater engagement with a maximum score of 3.5.

Table 1. Summary Statistics from the Survey Responses.

Variable	N	Min	Max	Mean	SD
What range does your score in this class fall right now?	30	1	4	2.50	0.938
As of last semester, in what range does your GPA fall?	31	0	4	3.13	1.056
What range did you anticipate your score to be at the beginning of the class?	33	1	4	3.06	0.864
Student engage-ment score	33	1.13	3.50	1.94	0.532
Generally speaking, I have a good feeling about economics.	33	0	4	2.48	1.064

Abbreviations: GPA = grade point average; N = number of responses; SD = standard deviation.

SUMMARY STATISTICS

The correlation between the student's current score and major variables are reported in Table 2. All the variables (attending office hours, questions via discussion board, and ability to communicate with the professor through email) are negatively correlated with the student's current score. For example, the correlation coefficient between the ability to communicate with the professor through emails and current score is −0.1824. This is because only 3.13% of students always communicate with the professor through emails, whereas 37.50% of the students rarely do so.

Table 2. Correlation Coefficients between Current Course Grade and Major Variables.

	Current score	Attending office hours	Questions via discussion boards	Communication with the professor through emails
Current score	1.0000			
Attending office hours	−0.10234	1.0000		
Questions via discussion boards	−0.1513	−0.0000	1.0000	
Communication with the professor through emails	−0.1824	0.4490	0.3154	1.0000

REGRESSION RESULTS

The effect of student engagement on student performance was estimated using the ordinary least squares procedure. The regression model uses the current score in the class as the dependent variable while student engagement is the main independent variable of interest. This variable was obtained by averaging the responses to questions 3 to 5 in the survey to yield an aggregate score for students engagement. Each response was coded by a number from 0 to 4, and then averaged. The higher the score on the engagement variable, the greater the student's engagement in course-related activities. Note that the question on how often a student misses a deadline was reverse-coded before combining it with the other questions used to derive the engagement variable.

As shown in Table 3, only the anticipated score for the overall class is significant at the 10% level. Overall, controlling for a student's prior GPA, attitude towards economics, and their anticipated final grade for the class, the effect of student's engagement on their current score is positive and follows a priori expectation. However, the associated p-value is high (p-value = 0.772), indicating the effect is not significant.

Table 3. Ordinary Least Squares Regression Results for Key Variables.

	Beta	Standard Error	Standardized Beta	t-statistic	p-value
(Constant)	-0.057	1.058		-0.054	0.957
GPA as of last semester	0.224	0.162	0.253	1.380	0.180
Student engagement	0.093	0.317	0.052	0.293	0.772
Anticipated score for class	0.409	0.203	0.377	2.015	0.055
Feeling towards economics	0.162	0.146	0.191	1.106	0.280

Abbreviation: GPA = grade point average.

CONCLUSION

While it might be concluded that student engagement has no effect on student performance, there are a number of reasons that conclusion may be flawed. First, this study uses survey responses from online-only students and does not account for in-class activities. Engagement in online classes is remarkably different from in-class courses, and so the results of this study may not generalize to in-class engagement behavior.

Researchers who are interested in assessing engagement in online classes resort to tracking information from online activities on the course platform and/or retrieving students' reported rating of their engagement, and these may sometimes be unreliable. The accuracy of the results reported in this study are therefore dependent on the veracity of the students' report of their engagement. Second, the lack of significance is not surprising, given the small sample size used in the study. The small class size for this course posed a significant constraint on the sample size for this study, so increasing the sample size was not feasible. The study would benefit from a large-scale study to get a better understanding of the impact of student engagement on academic performance.

Third, in addition to the sample size limitation, the dependent variable (current score in the class) was measured as an ordinal variable to enhance anonymity and encourage students to provide that information. This form of measurement could have masked significant information in the dependent variable. More research needs to be done to appropriately understand the effect of student engagement on academic performance

REFERENCES

1. Ariani, D. (2016). Why do I study? The mediating effect of motivation and self-regulation on student performance. *Business, Management and Education, 14*(2), 153-178.

2. Axelson, R. D., & Flick, A. (2010). Defining student engagement. Change: *The Magazine of Higher Learning, 43*(1), 38-43. https://doi.org/10.1080/00091383.2011.533096

3. Barkley, E. F. (2010). *Student engagement techniques. A Handbook for College Faculty.* The Jossey-Bass Higher and Adult Education Series.

4. Bodkyn, C., & Stevens, F. (2015). Self-directed learning, intrinsic motivation and student performance. *Caribbean Teaching Scholar, 5*(2), 79-93.

5. González, C., Varela, J., Sánchez, P. A., Venegas, F., & Tezanos-Pinto P. (2021). Students' participation in school and its relationship with antisocial behavior, academic performance and adolescent well-being. *Child Indicators Research, 14*, 269-282. https://doi.org/10.1007/s12187-020-09761-5

6. Grave, B. S. (2011). The effect of student time allocation on academic achievement. *Education Economics, 19*(3), 291-310. https://doi.org/10.1080/09645292.2011.585794

7. Ni, A. Y. (2013). Comparing the effectiveness of classroom and online learning: Teaching research methods. *Journal of Public Affairs Education, 19*(2), 199-215.

8. O'Connor, K. (2013). Class participation: Promoting in-class student engagement. *Education, 5*(3), 340-344.

9. Pratton, J., & Hales, L. W. (2015). The effects of active participation on student learning. *The Journal of Educational Research, 79*(4), 210-215.

10. Razali, S. N. A. M., Rusiman, M. S., Gan, W. S., & Arbin, N. (2018). The impact of time management on students' academic achievement. *Journal of Physics: Conference Series, 995*(1). https://iopscience.iop.org/article/10.1088/1742-6596/995/1/012042

11. Song, D., Rice, M., & Oh, Y. (2019). Participation in online courses and interaction with a virtual agent. *International Review of Research in Open and Distributed Learning, 20*(1), 43-62.

12. Trowler, V. (2010). Student engagement literature review. *The Higher Education Academy, 11*(1), 1-15.

13. Vonderwell, S., & Zachariah, S. (2014). Factors that influence participation in online learning. *Journal of Research on Technology in Education, 38*(2), 213-230.

TALES

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