



JOURNAL OF COLLEGE ACADEMIC SUPPORT PROGRAMS

FALL 2020/WINTER 2021 | VOLUME 3 | ISSUE 2



We dedicate this issue to the memory of *J-CASP* Assistant Editor Arun Raman.



FEATURED ARTICLES

Dual Credit and Advanced Placement Students in Developmental Education: What Happened?

Developmental Mathematics: Students' Predicted Outcome Value of Electronic Communication

Virtual Learning Assessment: Practical Strategies for Instructors in Higher Education

SPECIAL CONTRIBUTION

Staying on Course During the Pandemic Storm: Challenges and Opportunities

PROMISING PRACTICES

Harnessing Talent: A Tiered, Accelerated Leadership Model for Academic Support Programs

#CampusScavengerHunt: A Professional Development Workshop Using Digital Literacy to Build Student's Self-Efficacy and Sense of Belonging on Campus

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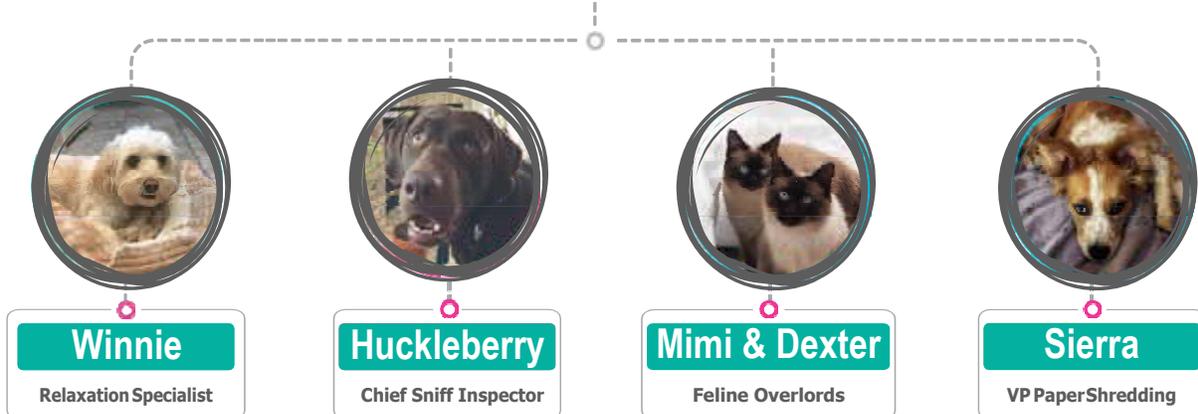
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It is with great pride that the executive boards of TADE and TxCRLA welcome you to this issue of the *Journal of College Academic Success Programs (J-CASP)*. In 2018, TADE, TxCRLA, and the Graduate Program in Developmental Education at Texas State University collaboratively sponsored the creation of *J-CASP*, and all three entities continue in their support of the journal. We want to extend our sincere gratitude for the *J-CASP*'s first editor, Michael C. McConnell, whose mighty efforts and mighty pen guided *J-CASP* through its first two amazing years and the transition to new editorial staff. We also want to thank *J-CASP*'s current Co-Editors, Russ Hodges and Denise Guckert, and Assistant Editors, Jonathan Lollar and Arun Raman, for their current leadership.

Please save the date for our upcoming virtual CASP conference scheduled for October 18–20, 2021. Registration for the annual CASP conference includes joint membership to TADE and TxCRLA. See a recap of our 2020 virtual conference and join the CASP listserv at <https://casp-tx.com/2020-conference>. Also, join our bi-monthly CASP Conversations, which are board-member facilitated discussions on current topics in the field of developmental education. Finally, consider adding to the wealth of practitioner-generated knowledge found in *J-CASP* by submitting a research article, promising practice, or exploratory piece. Submission guidelines are available at <https://journals.tdl.org/jcasp/index.php/jcasp/about/submissions>.

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Aaron Grimes, TADE President
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FOREWORD

Welcome to the Fall 2020/Winter 2021 issue of the *Journal of College Academic Support Programs (J-CASP)*. We extend many thanks to the former *J-CASP* Editor Michael C. McConnell, former Editorial Advisor Dr. Emily Miller Payne, and former Assistant Editor Cassandra Gonzales for their invaluable assistance. By serving as this issue's editorial consultants, Mr. McConnell and Ms. Gonzales have passed down their accumulated knowledge and guided us through the intricacies of editing an academic journal. Additionally, we could not have published this issue without the significant contributions of Assistant Editors Jonathan Lollar and Arun Raman, Editorial Assistant Meg Taylor, the article contributors, and the many reviewers that contributed their wealth of knowledge to assist in the peer-review process for our featured articles. We would also be remiss if we did not mention the extraordinary talents of our Layout Editor Cortney Akers and the many advertisers that support our free online journal.

Over the past 9 months, we have continued to confront the realities of a worldwide pandemic and its effects not only on the delivery of academic support in higher education but on our personal lives. On behalf of *the J-CASP* editorial staff, we extend our deepest condolences to all who have suffered the loss of family, friends, or colleagues to COVID-19. As you will read in the *In Memoriam*, we lost our esteemed *J-CASP* Assistant Editor Arun Raman over the holiday break to this grave illness. Although he is no longer with us, we mourn Arun and send heartfelt condolences to his family and friends.

In response to current learning environments, many of this issue's articles focus on teaching and learning in virtual worlds. We include three *Featured Articles* in this issue—two are research studies, and the third is a literature review. The findings and implications from our first feature article support the recent trend in accelerated models of instruction. In our second feature article, the authors explore electronic communication between students and instructors in developmental math classes and suggest that faculty encourage out-of-class communication to clarify course materials and assignments and to assist with building student-teacher relationships. Our third feature article is a literature review in which the authors outline several research-based assessment strategies for use in virtual environments. In addition, we include a *Special Contribution Article* based on one of our CASP 2020 keynote addresses—which hopes to inspire practitioners to persevere through the pandemic's challenges—and our two *Promising Practice* articles, which provide models for student academic support programs and faculty professional development.

We conclude this welcome with a heartfelt thank you to our readers. Working together, we all strengthen the broad field of college academic support programs.

Denise Guckert, Co-Editor
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Dr. Eboni M. Zamani-Gallaher is Professor of Higher Education and Community College Leadership and Director of the Office for Community College Research and Leadership at the University of Illinois at Urbana-Champaign. She also serves as the Executive Director of the Council for the Study of Community Colleges.

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IN MEMORIAM OF ARUN RAMAN



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 submission.
 be on the watch.
 there are ways out.
 there is light somewhere.
it may not be much light but
 it beats the darkness.
 be on the watch.
the gods will offer you chances.
 know them.
 take them.
you can't beat death but
you can beat death in life,
 sometimes.
and the more often you learn to do it,
the more light there will be.
 your life is your life.
 know it while you have it.
 you are marvelous
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 in you.

—Charles Bukowski

Arun K. Raman, M.A. (1985–2021) joined our community as part of Texas State University's Developmental Education program's 2020 doctoral cohort. He was pursuing a PhD in developmental education with a concentration in literacy. As part of his doctoral experience, he became the newest member of our *J-CASP* team as an assistant editor.

Arun's academic interests were borne out of his personal identities found within his own educational experiences. He was passionate about equitable access to postsecondary education and academic support for immigrant and minority students. Arun was committed to students' learning and development as independent thinkers and autonomous individuals. He believed we are all lifelong teachers and learners.

Arun was instantly a friend to everyone. He made and kept friends from all walks of life, valuing each friend and friendship as if they were a unique piece of his life's puzzle.

He had stacks of books instead of movies. He played tabletop role-playing games like *Dungeons & Dragons* instead of video games. He valued imagination and creativity over prescription. He thoughtfully questioned and introduced new points of view to any conversation. His classmates and faculty came to rely on and appreciate (and desperately miss) his responses.

Arun was a father, brother, son, and friend. He will always have a presence as a member of the 2020 doctoral cohort in the Texas State University Developmental Education program and in the hearts of all who knew him. Not only do we mourn the loss of a friend and colleague, but we also mourn for the loss of the great contributions he had just begun to make to our DE community.

—Meg Taylor



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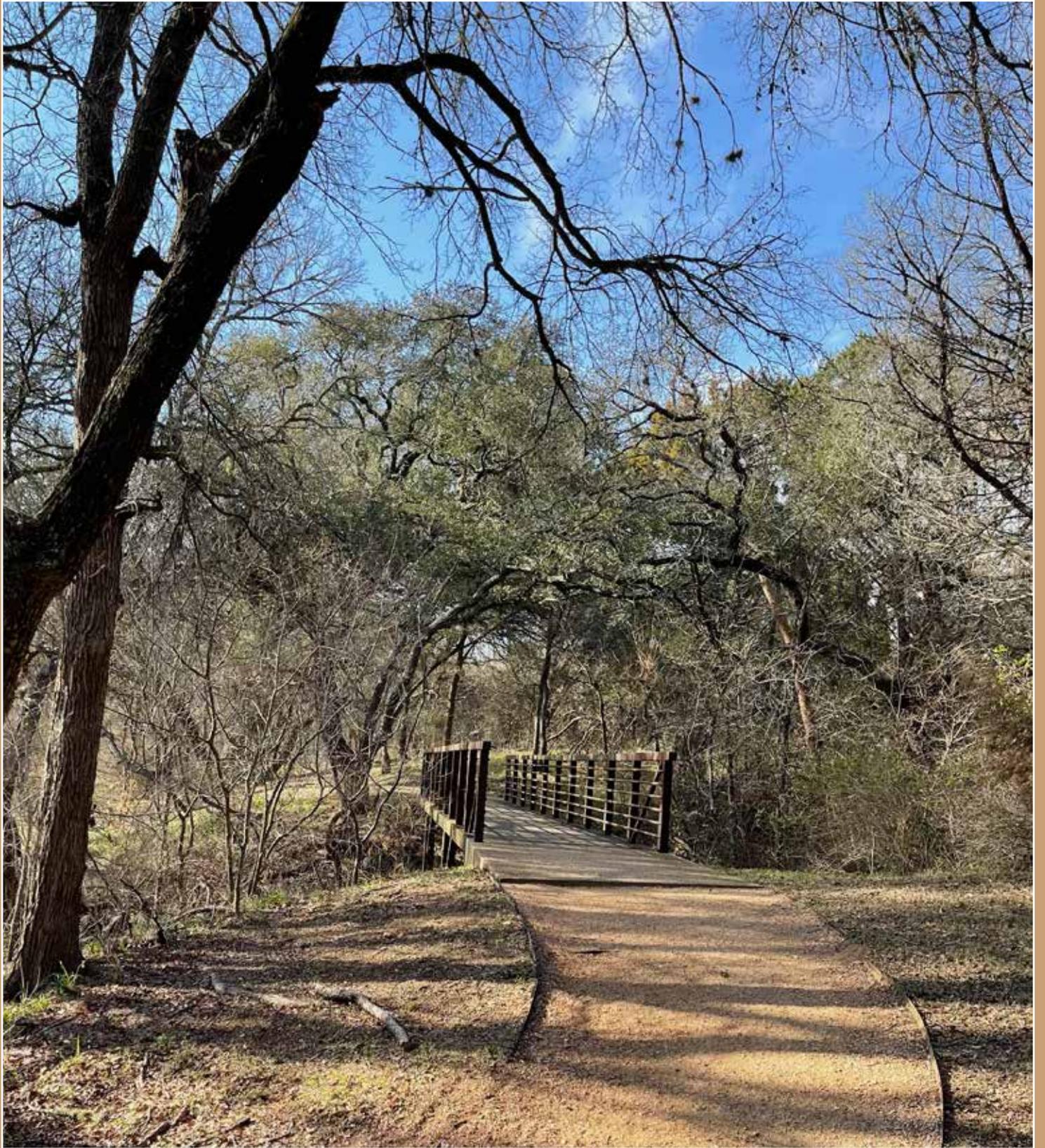


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Dual Credit and Advanced Placement Students in Developmental Education: What Happened?

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<https://doi.org/10.36896/3.2fa1>

ABSTRACT

Despite their better-than-average preparation, former dual credit and advanced placement students have placed into developmental education upon entering higher education. In this phenomenological study, six students were randomly selected to be interviewed from a group of 562 who placed into developmental education at one Texas university during a 6-year time frame, Fall 2009 through Summer 2015. Six themes, Utility of Developmental Class, Test Taking, Self-Awareness, Obstacles, Emotions, and Academics, and 20 sub-themes emerged from the interview data. The thoughts expressed by the students in this study suggest that developmental placement was a disorienting experience for many of them. Perhaps this was due to their newly acknowledged underpreparedness that necessitated they develop habits and skills more conducive to the college environment. Regardless of the source, in the end the students acknowledged various forms of personal growth as a result of the developmental course experience.

Keywords: developmental education, dual credit, advanced placement, developmental student perception

In anticipation of college, many students choose to enroll in a more challenging academic curriculum in high school. Two very popular college preparatory programs are dual credit (DC) and advanced placement (AP) programs. DC classes offer students concurrent credit for a high school and a college course. In the current literature, DC participation has been positively associated with transition to a 4-year college, persistence, and college completion and has been beneficial to students of all demographic groups (An, 2013; Robinson, 2011; Struhl & Vargas, 2012).

AP programs are designed for students who are perceived to be beyond the kindergarten through twelfth grade (K-12) curriculum or who have placed above the K-12 curriculum (Armstrong, 2013). In general, “AP courses offer admissions officers a consistent measure of course rigor across high schools, districts, states and countries—because all AP teachers . . . have to provide a curriculum that meets college standards” (College Board, 2014, para. 2). High school AP students can earn college credits as well, by passing the corresponding AP examination at the end of an AP course. In essence, students who have taken AP classes have benefited from increased course rigor and more experienced teachers, and they were better prepared for college (Foust et al., 2009; Santoli, 2002).

Overall, both AP and DC programs, due to increasing popularity, have been expanding in high schools (Steinberg, 2009). Approximate 1.17 million students in U. S. high schools took AP examinations in 2017, which was almost a 70% increase from 10 years prior (College Board, 2018). Furthermore, in a nationally representative study, 34% of high school students from a 2009 freshman cohort ($n = 23,000$) took at least one high school course for postsecondary credit with DC or concurrent enrollment (Shivji & Wilson, 2019). AP courses are offered in over 30 subjects, including English, mathematics, history, government, economics, biology, chemistry, and psychology. Recently, programs have been created in Texas and other states, such as the Advanced Placement Incentive Program (APIP), to entice high school students to attempt AP classes using monetary awards (Holstead et al., 2010; Jackson, 2010). These financial incentives may attract students to take AP classes in subjects in which they are not academically prepared, as students’ prerequisite skills are typically not tested before they are allowed

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to enroll. Researchers have shown that peer groups in high school play an important role in shaping the academic attitudes and behaviors of their members (Wang et al., 2018). Therefore, some students may attempt AP courses in subjects in which they have not excelled due to peer influence. Additionally, the standards to enter DC programs have been relaxed in some states, as with the placement protocol of the Texas Success Initiative. As a result, upon entering college, some former DC and AP students discover that they are not, in actuality, academically prepared for the rigor of college-level coursework. After taking required college placement examinations, such as the ACT, SAT, or Accuplacer, a percentage of former DC and AP students place into developmental, or remedial, classes.

Typically, developmental courses are offered in the basics: mathematics, reading, and writing. Historically, the developmental sequence for each of these subjects, depending on a student's placement and the institution, has been lengthy. For example, Bailey et al. (2010) reported that out of 57 Achieving the Dream colleges, at least 61% of them offered three or more levels of developmental mathematics classes prior to college-level ones, and at least 35% of them offered three or more levels of developmental reading. Moreover, when students complete a developmental course, they generally receive institutional credit, but these courses often do not transfer or apply to their degree plan.

A current concern raised by taxpayers regarding developmental education is that they effectively pay two times for the same instruction, once in high school and then again in college (Ventura County Grand Jury, 2013). Consequently, this may cause some community members to have a negative view of developmental education programs and services. Indeed, these taxpayers might be alarmed to discover that these developmental classes are not only comprised of students who have struggled with the high school curriculum, but also of students who were previously in DC and AP classes. Why should a former DC or AP student need remediation upon entering a college or a university? An explanation of the phenomenon is certainly warranted, but qualitative studies which have explored the placement and the lived experiences of former DC and AP students in developmental education could not be found with a thorough literature search. Therefore, the purpose of this phenomenological study was to explore the perceptions and lived experiences of former DC and AP students who have been enrolled

in a developmental class. The overarching research question explored in this qualitative study was: What are the lived experiences and perceptions of former dual credit and/or advanced placement students placed in a developmental class in a medium-sized public university in Texas? Findings of this study add to the body of literature by providing administrators and educators with a better understanding of the aforementioned phenomenon and a firmer foundation to make informed instructional decisions. Additionally, by gaining a fresh perspective from this study, policy makers may be able to implement reform that will provide better college preparation for future DC and AP students and, subsequently, reduce the need for developmental coursework.

Literature Review

DC and AP programs are designed to help students get an early start on college and to make the transition to college smoother. Also, DC classes are very modestly priced, when compared to college tuition, so parents often encourage their high school teenagers to enroll in them (Leonard, 2013). Ostensibly, a more rigorous curriculum should help students to become college ready. However, this may not necessarily be true.

Perceived Benefits of DC and AP Enrollment

In a phenomenological study of 21 DC students from an urban charter school, Robinson (2011) determined that DC enrollment has multiple benefits, especially for students marginalized and at-risk. Robinson discovered that all of the participants in his study believed that the DC classes had equipped them to be more competitive upon entering college, and many indicated that their writing skills had improved through engagement in the program's classes. Robinson asserted that DC programs can become a sort of recruitment instrument for colleges, facilitating the matriculation of students marginalized and at-risk into college who might not otherwise attend. Similarly, An (2013), in a quantitative study using federal datasets, discovered that first-generation students who participated in DC programs were more likely to complete a degree than those students who did not participate.

Struhl and Vargas (2012) reported on a longitudinal study that followed Texas high school graduates ($N = 32,908$) for 6 years post-graduation. The researchers matched 16,454 former DC students to 16,454 similar students who had not taken DC classes. They found that DC coursework was positively associated

These financial incentives may attract students to take AP classes in subjects in which they are not academically prepared...

with subsequent college enrollment, persistence, and completion and that it benefited all demographic groups. Similarly, Hughes et al. (2012), in a 3-year tracking study comparing thousands of DC students with comparable students in the same districts across the state of California, determined that DC students were: “more likely to graduate from college; more likely to transition to a 4-year college (rather than a 2-year college); and less likely to take basic skills classes in college” (p. 5).

Santoli (2002), with a review of the existing literature, determined that high school students in AP programs benefited from more experienced teachers and increased course rigor. Additionally, these students benefited from the AP coursework when they passed the corresponding AP examination and earned college credits. Santoli (2002) also stated that students in AP programs generally pursued more rigorous majors. Similarly, Foust et al. (2009) reported on the non-academic advantages of AP and International Baccalaureate (IB) programs. Like the AP program, the IB program offers students opportunities to earn college credits with advanced course taking, examinations, essays, and projects (Cech, 2007). After interviewing AP and IB students ($n = 84$) from four schools within one state, Foust et al. (2009) determined that students perceived that the classroom environment was better in their AP and IB classes than in their general education classes and that their teachers were more knowledgeable and better-prepared too. The AP and IB students mentioned that they did not have to worry about being ridiculed for overachievement because of the homogeneity within their classes (Foust et al., 2009). Moreover, although students may not have been enrolled in a subject area that was their specific strength area, the advanced academic environment helped shape their academic attitudes and behaviors in these critical pre-college adolescent years (Wang et al., 2018).

Disadvantages and Criticisms of DC and AP Programs

In an education policy brief for the state of Indiana, Holstead et al. (2010) revealed that many states funneled money into AP programs to provide incentives for students to take AP courses. For example, they reported that Texas AP students generally “receive between \$100 to \$500 for each score of 3 or above per eligible AP course” (p. 6), but that this amount varied across districts. Certainly, financial incentives encourage greater student participation in AP programs; however, Holstead et al. (2010) reported that the percentage of students receiving a 3 or a 4 on the AP exam has not increased over time. In many cases, student success rates have remained constant and have even decreased. Holstead et al. (2010) offered that this lack of improvement was possibly due to the monetary incentives, like the ones offered in Texas. These incentives may have motivated students who are unprepared for the rigor of AP courses to enroll in them.

Using 16 years of archival data from the College Board from 1997–2012, Davis et al. (2015) examined the passing percentages of Black students on AP examinations in three states, Texas, Florida, and New York. Results of descriptive statistics showed that more Black students failed than passed each year in all three states. In fact, when Davis et al. (2015) calculated composite passing percentages for each state for the 16 years, the percentages of Black students who passed AP examinations were 26.9 in Texas, 26.5 in Florida, and 35.4 in New York. Even though the number of Black students who took AP examinations had dramatically increased over the 16-year span (e.g., 995% in Texas), Davis et al. (2015) suggested that AP examinations were actually a poor investment for Black students. These researchers based their assertion upon negative cost effectiveness ratios ranging from -0.24 to -0.70 during the 16 years.

In addition to the academic challenges, Foust et al. (2009) reported that interviewed AP and IB students perceived that there were some non-academic disadvantages to program participation. Specifically, these students perceived that some unflattering stereotypes were associated with AP and IB participants. For example, both AP and IB students felt as though they were prejudged by non-participants and used terms like “geek[s],” “exclusive,” and “snobby” when describing these perceptions (Foust et al., 2009, pp. 300–301). AP and IB students also noted that the workload was extremely heavy. In fact, some students stated that they had to restrict their extracurricular participation and forgo social engagements because the AP and IB work was so time-consuming, and some of them even indicated that they regularly sacrificed sleep to complete their assignments.

Considering dual enrollment (DE), Speroni (2011) discovered that DE was found to have positive effects on student success only if students had taken the course from a community college and not from their high school. Speroni suggested that this disparity may well be due to lower quality high school DE courses taught by high school teachers. Also, when discussing the results of a quantitative study of 7,913 full-time students seeking a degree for the first time, Eimers and Mullen (2003) stated that when academic ability was held constant, the academic performance of former DC students was not really much better than students who did not participate in a DC program. However, Eimers and Mullen (2003) also concluded that the students with DC and/or AP credit were more likely to enroll in college a second year.

The extant literature is replete with studies that tout the benefits of DC and AP enrollment in high school (An, 2013; Foust et al., 2009; Hughes et al., 2012; Santoli, 2002). However, some studies have found that DC students are no better prepared for college-level classes than those students who

have not participated in these programs (Eimers & Mullen, 2003; Speroni, 2011). Furthermore, investments in AP programs by Black students have resulted in negative cost effectiveness ratios over a 16-year span (Davis et al., 2015).

These mixed reviews in the literature have highlighted benefits, challenges, and the efficacy (or lack thereof) of DC and AP programs, but they cannot provide the perceptions and lived experiences of students who have completed a rigorous DC or AP course only to be enrolled in a non-credit bearing course for underprepared students when they enter college. The viewpoints of former DC or AP students are critical to give voice to a subset of students who have not yet been heard in the literature. Moreover, by sharing these students' perceptions and experiences, this unique student group demonstrates explicitly the heterogeneous makeup of developmental education students. Thus, this study hopes to broaden the perception of what types of students enroll in developmental courses and to encourage further conversations regarding the challenges faced by developmental students.

Theoretical Framework

Critical theory, or *critical social science*, was used in this study to help the reader to understand the phenomenon of DC and AP students' lived experiences in developmental education from multiple perspectives. One of the tenets of *critical social science*, the terminology preferred by Fay (1987), is self-estrangement theory, which is based upon the idea that human beings have a limited understanding of their existence and their world, but they continually strive to make sense of it, which often leads to unhappiness and frustration (Fay, 1987). However, with the humanistic or secular version of critical social science, these individuals are capable of acquiring theoretical knowledge, which can guide them to make the changes necessary to lead more peaceful and happier lives. Wang and Torrisi-Steele (2015) asserted that belief systems and assumptions often help to maintain the status quo. However, with critical theory, simply recognizing disempowering assumptions and conditions that have caused oppression is not sufficient; action is necessary to create a beneficial transformation. Thus, both Fay (1987) and Wang and Torrisi-Steele (2015) emphasized the need for action or for a disruption of the status quo to effect change.

Fay (1987) used one of Plato's parables to explain the phenomenon of self-estrangement in

critical social science. In his parable, Plato described our typical human existence as humans chained inside of a dark cave. Plato explained that, over time, these individuals living in darkness may try to make some sense of their situation, and they may even find some happiness there. However, once people break free from the cave and see the sun, they would certainly not want to return to their former situation or state.

Extending this parable, students who could be in the dark with respect to their academic and, perhaps, their noncognitive strengths and weaknesses are the subgroup of DC and AP students who were placed into at least one developmental class upon entering college. These students, who may have experienced a form of self-estrangement in high school, perhaps partially due to grade inflation

Student:
"They
[instructors]
relied heavily
on online
homework which
was a bit of a
hassle because
the Internet
at the dorms
wasn't the best
sometimes."

practices (Gershenson, 2020; Hoyt & Sorensen, 2001), are enlightened when they receive the results of their first college placement examination. Faced with poor results, former DC and AP students may try to make sense of these results and their developmental placement. After all, many of these students have made mostly As and Bs in their college preparatory classes and have graduated in the top 10% of their class. These poor results and subsequent developmental placement must be discombobulating to many of these former DC and AP students because these developments do not mesh with their self-perception. However, after becoming aware of their academic deficiencies and, perhaps, after assimilating these recent developments into their own world view, these former DC and AP students can then take the necessary steps to remedy or attenuate their academic deficiencies and to, perhaps,

hone their noncognitive skills.

Method Research Design

In this qualitative study, a transcendental phenomenological approach (Moustakas, 1994) was used in an attempt to derive meaning from the accounts and perceptions of former DC and AP students who have been placed in a developmental class. According to Moustakas (1994), intentionality is one of the main features of transcendental phenomenological approach. This research was an intentional effort to explore the individual experiences of a group with the same phenomena (Creswell, 2014; Moustakas, 1994). Data were collected through individual interviews which is one of the recommended form of data collection for phenomenological research (Creswell, 2014).

Selection of Participants

The participants of this study were six undergraduate and graduate students who had formerly taken DC and/or AP classes in high school and who placed into one or more developmental classes upon entering college due to their poor placement testing results. The names and contact information of all former DC and/or AP students who had placed into developmental education within six years, Fall 2009–Summer 2015, was obtained from the Institutional Research department of a medium-sized university in Texas. Simple random sampling was used to select student records ($n = 5$) from the sampling frame ($N = 562$). After six iterations of randomly selecting five names to contact, five of them consented to participate. A sixth student, who was originally passed over because of a 15-day response time, was also included in this study after contacting one of the researchers by email and consenting to be interviewed. Following the interview of the sixth participant, data saturation was reached, and no additional names were selected.

Data Collection

After each student agreed to participate in this study either by email or by phone, arrangements were made to meet the individual in a mutually-agreed-upon public location. With each meeting, the participants first filled out a short demographic questionnaire that was used to confirm that they had been placed into a developmental course upon entering college and to gather some basic demographic information, such as age and ethnicity. Once each participant completed the short questionnaire and eligibility was established, the individual was then asked to sign an Informed Consent form, approved by the IRB, after the contents of this form were thoroughly explained by the researcher. Each participant was also given a duplicate copy of this Informed Consent document to take home. Once participants consented to participate, they were allowed to review the interview questions before one of the researchers actually verbalized them during the interview. After the questions were reviewed by each participant, a handheld recording device was used to record each participant's responses to five open-ended questions using a semi-structured interview structure. In an attempt to obtain deep, rich data, the participants were asked about their placement testing experience and about what it was like being placed in developmental classes after being in DC and AP classes. They were also asked what it was like being in the developmental classes and how this experience has affected their outlook on obtaining a college education. Finally, they were asked what they would change or do differently, if they could.

One interview, lasting 30–60 minutes, was conducted with each participant over a 4-week time period. In all, six students were interviewed until no new information was offered by subsequent participants (Creswell, 2014). Post interview, the interviewing researcher immediately journaled about each experience

in order to record some of the nuances of the interview and to make notes about each participant's nonverbal behavior, such as anxiety level, posture, composure, and general emotional state. Finally, the researcher used peer debriefing with her co-researcher, also called analytic triangulation (Nguyen, 2008), in order to more accurately interpret what the participants had described and to maintain an unbiased viewpoint.

Within one week of each interview, the interviewing researcher sent each participant a draft version of the transcribed interview for review by email. In the email, each participant was asked about the accuracy of the text and was given the opportunity to clarify the statements made and to also provide additional information. Creswell (2014) described this process as member-checking, a strategy to verify the validity of the information collected. Four of the participants returned an email stating that the text was indeed accurate and that they had no additional comments, and two of them did not reply.

Data Analysis

Interview transcripts were transferred into an Excel spreadsheet for analysis. Then the researchers met to code the interview data collaboratively to create a shared understanding of the interview responses (Weston et al., 2001). Before beginning the process of coding, the participants' responses were read collectively to get a general sense of emergent patterns and assertions and to make preliminary decisions about how to proceed (Saldaña, 2016). Using a content analysis approach (Krippendorff, 2013), statements from the interviews were unitized into thought segments. Through several cycles of coding (Saldaña, 2016), similar thought statements were then sorted into categories. After careful reflection about the meaning and intent of the participants' responses to the interview questions (Saldaña, 2016), six distinct themes and 20 sub-themes emerged.

Findings

The students in this study ranged in age from 19 to 33 ($M = 23.2$, $SD = 5.2$). The two women and four men represented various ethnic groups: one Black, two Hispanics, one Hispanic/White, and two Whites. Five of the six students were currently enrolled in school, but, prior to the interview, one student had dropped out after completing 84 hours of coursework. Of the five who were enrolled in school, two of them were seeking a master's degree after successfully obtaining a bachelor's degree. The other three students were enrolled in an undergraduate program.

The six former DC and AP students were asked about their college placement testing experiences and also about their lived experiences after being placed into developmental classes. Six core themes and 20 sub-themes emerged from the interviews conducted with the students. The six major themes were: *Utility of Developmental Class*; *Test Taking*; *Self-Awareness*; *Obstacles*; *Emotions*; and *Academics*. In Table 1, exemplar statements are provided.

Table 1
Exemplar Statements from Student Participants

Theme	Representative Quotes
Utility of Developmental Class	<p>“In all actuality, I did not know it as well, because the stuff that they tested us on, I learned like three years prior, not last semester ...so I really did need to review.” [Helpful]</p> <p>“They spent a good portion at the beginning like retreading a lot of common knowledge in mathematics...They’re trying to stuff so much in so little time that you might skip one or two things, and those one or two things are like what I was weak at. It focused on the wrong parts, as it were.” [Curriculum and Pacing]</p> <p>“I have to know... but not just memorize it, but I actually like know by heart like what I need to do, especially if I want to become a lawyer.” [Motivation]</p>
Test Taking	<p>“I got my scores. I was off by a couple of points.... It was right there on the line.” [Placement Test]</p> <p>“For me, it was really nerve-wrecking because I suck at taking tests. I am horrible at taking tests. I get real bad anxiety. I start to shake, and so being there for four hours wasn’t ideal for me.” [Test Anxiety and Pressure]</p> <p>“...not a good test taker.” [Test Taking Skills]</p>
Self-Awareness	<p>“I felt like I shouldn’t be there because the thing with math and me is I’m good in math, and I like math.” [Misplaced]</p> <p>“I believe the first part was science. That one was pretty... it came natural to me. Mathematics was the one, the second part, and that one, not so much. I never really had a strong understanding of mathematics.” [Recognized Strengths and Weaknesses]</p> <p>“It’s kind of like an experience, like, hey, like I didn’t do so good on the ACT on the math portion, so I had to take a class.” [Accepted Placement]</p>
Obstacles	<p>“It sucked a little bit because I just spent, I want to say, like \$80.00 for the ACT and then I was told that, oh, there’s a chance for you to skip that class, but you have to fork over another \$80.00 bucks to take a one shot test.” [Money]</p> <p>“What really sucked was certain classes were only available for certain parts of the year. So, with developmental, that made my entire plan of getting out in four years extended by at least by an additional semester.” [Delay]</p> <p>“...should have taken one or two less advanced placement classes and taken a harder math class or two.” [Preparation]</p> <p>“You got half the class that feel like they don’t want to be there or they shouldn’t be there, and the other half of the class... they know they should be there, but they don’t care.” [Others]</p>
Emotions	<p>“Just maybe call it something different, except for developmental or something, where some kids don’t feel bad about it.” [Embarrassed]</p> <p>“It was pretty frustrating... It was frustrating because I wanted to be doing... I wanted to be doing something else.” [Frustrated]</p> <p>“I had to get through it, so I could get to my actual math class.” [Getting Through]</p> <p>“When you are in high school, you are kind of told that you want to challenge yourself. You want to take as many harder classes as possible.” [Others’ Influence]</p> <p>“You don’t feel as smart as you did when you were in high school, I guess.” [Not Smart]</p> <p>“I will be honest...disheartening. It is probably the best way to describe it.” [Disheartened]</p>
Academics	<p>“If I haven’t studied the things in a while, I forget about it. Once I see like a problem, I catch on quick.” [Knowledge]</p> <p>“I would tell myself, oh, I already know this. I’ll do it later. When I reflect on this experience, I would probably not put it off so much.” [Soft Skills]</p>

Utility of Developmental Class

The first theme, *Utility of Developmental Class*, was comprised of the students’ responses with regard to the content of the developmental courses and the pacing. There were three sub-themes within this theme: *Helpful*; *Curriculum and Pacing*; and *Motivation and Value*. The first sub-theme, *Helpful*, was formed from the students’ interview responses which spoke to the benefits students derived from the developmental class and how well this class prepared them for subsequent ones. Five of the six students interviewed mentioned that they thought the developmental class that they took was helpful to them in some way. For example, three of the students mentioned that the developmental class served as a good review. When speaking about the

developmental mathematics course content, one student admitted, “In all actuality, I did not know it as well, because the stuff that they tested us on, I learned like three years prior, not last semester ...so I really did need to review.” Another student expressed similar sentiments when he said, “I mean, when I went into my regular math class, I felt like I was a little bit more prepared.” However, this student really did not like the idea of taking the developmental mathematics class, and he remarked, “I didn’t like it, but I had to take it,” but he admitted that “it wasn’t that bad.”

Another participant, with regard to his developmental English class, suggested that the course facilitated his success in subsequent classes. He said, “I would take it again, cuz it really helped me.”

In fact, during his interview, he reiterated three times that the developmental English course helped him and repeated twice that he would take it again. Specifically, he stated that what he learned “was really helpful now in getting through English [1301],” and he added that the course content at the end of the course was the most helpful. Another student expressed the same sentiments about the material at the end of his mathematics course, but he was not completely satisfied with the course as a whole. He stated, “Once we got to the more complicated stuff, it helped out a bit, but I would say it *helped*, but it didn’t give me a strong enough foundation.”

The second sub-theme of the theme *Utility of Developmental Class* called *Curriculum and Pacing* was about these students’ views of the course content and the pacing of the developmental course. Four of the students spoke about the curriculum of the developmental class that they were in and the pacing. Three of the students mentioned that they thought the pacing of this course could be improved. For example, one student, when speaking about developmental mathematics, said, “It felt like I was learning my addition tables all over again,” and he stated that “the first six weeks of that semester was nothing but rehashing everything I’ve learned since middle school.” He continued:

They spent a good portion at the beginning like rereading a lot of common knowledge in mathematics I would say, your basics in geometry, algebra, Pythagorean Theorem, stuff like that. So by the time we reached the end, there’s not a lot of time left, but we’re trying to push through it all to reach that, what you’re supposed to know by that time. They’re trying to stuff so much in so little time that you might skip one or two things, and those one or two things are like what I was weak at. It focused on the wrong parts, as it were.

This student indicated that he basically had to learn the rest of it on his own, and he also mentioned that he experienced issues with the technology integrated into the mathematics curriculum. He stated, “They relied heavily on online homework which was a bit of a hassle because the Internet at the dorms wasn’t the best sometimes.” Another student found the pace of her developmental mathematics course to be quite slow. With regard to the instructor, this student stated, “By the time she was on the second problem, I had already finished the whole page of problems.” However, a third student, who had taken a developmental English class, found that the course content met his needs and that the developmental course adequately prepared him for the credit course. Finally, a fourth student expressed a

desire to accelerate faster through the course content. He stated, “I don’t know if they give you the option of being able to test out, but I would have loved to have been given that option.”

A third sub-theme of the theme *Utility of Developmental Class* called *Motivation and Value* was comprised of students’ interview responses regarding how the developmental class motivated them in some way or how it caused them to develop an appreciation of education. Four of the six students indicated that their developmental placement changed what they desired or what they valued in some way. For example, the first student expressed a desire for a greater depth of knowledge and automaticity with mathematics after taking the developmental class and comparing it to her college-level ones. She stated, “I have to know... but

not just memorize it, but I actually like know by heart like what I need to do, especially if I want to become a lawyer.”

In fact, this student mentioned a desire to know the mathematics material at a deeper level three times during her interview. She also related that her developmental placement gave her the impetus to try harder. Another student expressed a similar sentiment about his developmental placement when he said, “If anything, it made me like try even harder, I guess, cuz I didn’t want to like try to take it again, you know.” Overall, two students also saw a need to pay more attention after their developmental placement, and two students stated that they recognized the importance of studying. For example, one student, when reflecting upon what he might do differently, said, “Maybe study a lot longer for some of these developmental to pass the ACT, the math portion and all that.” Another student stated that taking a developmental class caused her to appreciate her education more.

This student, with regard to being in a developmental class, stated, “That experience helped me to value my education more.”

Test Taking

The second theme, *Test Taking*, was comprised of the students’ statements about test taking, and, specifically, placement examinations. There were three sub-themes within this theme: *Placement Test*; *Test Anxiety and Pressure*; and *Test Taking Skills*. All students who were interviewed spoke about the placement test, the first sub-theme, because this was a topic of one of the interview questions. Students in this study primarily mentioned taking the ACT or the SAT before entering a university, and four of the six students mentioned taking two or more placement examinations. One student said, “I only took the like placement testing once my sophomore year and once my senior year because I

Student:
 "...in high school,
 I was taking
 pre-calculus,
 and then I end
 up taking AP
 calculus, so
 I thought to
 myself: Well, I'm
 not gonna need
 it [developmental
 math]..."

didn't make a high enough score my sophomore year to get into [a specific university]." With regard to a certain placement test, another student stated, "I took it twice. The first round, my math scores were high enough, but my overall score wasn't good enough for me, so I took it again so I could see what I could improve better." With regard to her second attempt, she said, "My math scores were lower, but my English scores were higher and so my overall score was high, but my math scores weren't high enough for me to test out of the developmental class, my math class." Additionally, a third student, who was a returning student, stated that when he took the placement examination the first time in 2000, he "did just well enough in math not to have to take developmental." However, when he returned 10 years later, he was required to take another placement test, and he mentioned that "apparently, the standards had increased." With regard to his mathematics placement score in 2010, he stated, "It was way too low." Finally, a fourth student, who took the SAT twice, but was ill the second time she took it, also mentioned that she had taken an additional placement test. She stated, "I don't know if it was like the Asset or the Compass or something. It was one of the two." However, two students indicated that they took only one placement test. One of them stated, "I got my scores. I was off by a couple of points... It was right there on the line;" however, he did not attempt the placement test again. The other student indicated that he was placed into developmental English due to his poor placement testing results in that subject, but he did not speak of a second placement attempt.

Half of the participants stated that they had test anxiety and experienced pressure when taking college entrance examinations. Thus, the second sub-theme of the theme *Test Taking, Test Anxiety and Pressure*, was created as a result of these students' interview responses. One of the students with extreme anxiety stated, "For me, it was really nerve-wrecking because I suck at taking tests. I am horrible at taking tests. I get real bad anxiety. I start to shake, and so being there for four hours wasn't ideal for me." He also stated that, given the chance, he would have opted to take the developmental class rather than to take the ACT again and emphasized, "I hate taking tests." Another student expressed similar sentiments when faced with another placement test; she recalled that the school wanted her to take it, but she did not want to. She related that she felt under pressure when taking placement examinations by stating, "There's a lot of pressure for just one thing." Another student expressed similar views when she indicated that the importance of placement tests made her extraordinarily nervous because these tests could determine her future.

The third sub-theme called *Test Taking Skills*, emerged from students' statements regarding their test taking abilities. One student mentioned that she was "not a good test taker" four times during her interview. However, she stated that she took the SAT twice to improve her scores. She indicated that her strategy was to take the SAT initially to become familiar with it

before taking the test again. Another student, when referring to his placement testing experience, exhibited some test taking savvy when he stated, "You always knew if you were doing wrong on it because it'd give you more questions after you took the first questions." He surmised, "And that's how you knew if you were doing bad or good on it."

Self-Awareness

The third theme, *Self-Awareness*, is about how well the students in this study were able to reconcile their new developmental placement with their self-perceptions and also about how well they understood their academic strengths and weaknesses. There were three sub-themes within this theme: *Misplaced*; *Recognized Strengths and Weaknesses*; and *Accepted Placement*. Four of the six students interviewed made statements about being misplaced, the first sub-theme, and expressed some surprise by their placement. One student, with regard to her developmental mathematics placement, said, "I felt like I shouldn't be there because the thing with math and me is I'm good in math, and I like math." Overall, this student mentioned three times in her interview that she felt like she was misplaced and added:

I never had taken developmental math, and the funny thing about that was in high school, I was taking pre-calculus, and then I end up taking AP calculus, so I thought to myself: *Well, I'm not gonna need it, you know.*

Another student, with respect to his developmental placement, said, "I thought I was a pretty good student. I made all like A's and B's, and I think my senior year I made a C in like a history class, like one of the dual credit history classes." He continued, "I thought I was like pretty well-prepared, but I guess not." This same student recalled:

When I was placed in the math class, I was like whoa, this kind of sucks; I should be ahead, like I should be, I should be doing pretty well, but I mean I had to take a developmental class.

Much like the first student, this student also felt like he was misplaced. He elaborated, "I made an A in the class, and it was pretty easy. I wish I could have tested out or something." A third student mentioned how he had taken many AP classes and how he had perceived himself to be "one of the smarter kids in high school." Finally, the fourth student who expressed sentiments of being misplaced also indicated that she was a top student, in the top 10% of her class, but that she was ill the second time she took her placement examination, the SAT. She said:

I actually had a respiratory infection, and so I was on medication, but I had to take the test cuz it was the last time you could take the test. So, I did not do as well on that one.

The second sub-theme, *Recognized Strengths and Weaknesses*, emerged from students' interview responses regarding their self-perceptions of their academic abilities. One of the students, when commenting on his developmental mathematics

placement, implied that he was not really surprised by this placement and remarked, “For me, it was just, you know, I’ve got this weakness and I’ve got to work hard on it. I’ve never really accepted that, well, *I’m just bad at math* thing.” When recalling his experience in developmental mathematics classes, he stated, “I made an A in that class, in those classes, but it was *hard*. I had to work.” He elaborated more about his effort: “I was taking developmental math and upper-level history courses at the same time, and I was having to put in twice as much work with the math than I was for anything else.” When recalling his placement examination, another student spoke about his weakness in mathematics in relation to other subjects. He said, “I believe the first part was science. That one was pretty... it came natural to me. Mathematics was the one, the second part, and that one, not so much. I never really had a strong understanding of mathematics.” He assessed his strengths and weaknesses by saying, “I wasn’t really good at sports; I was good at critical thinking, and reading, and stuff like that.” He explained that his developmental mathematics placement helped him recognize a problem in this area, and he stated, “I realized that there were certain parts that I wasn’t good at and that I need to work on.” Another student, when emphasizing that she was not really a very good test taker, asserted that she is more comfortable with written assignments and projects, given over time.

The third sub-theme, *Accepted Placement*, was about how some students accepted their developmental placement after receiving their placement testing results. For example, one participant said that his poor results on his placement examination in mathematics did not affect his outlook on getting a college education. Another participant, currently in graduate school, with regard to his developmental placement in mathematics, said, “I mean, I guess for me, it was just one of those things. I could always tell myself: *You know, so what? People have this problem all the time*. I did *really* well in English, reading comprehension, and writing, okay.”

Obstacles

The fourth theme, *Obstacles*, was comprised of some of the precipitating factors which may have interfered with students’ academic success once enrolled in the university. The sub-themes within this theme were: *Money*, *Delay*, and *Preparation*. Three of the six students mentioned money as something that they were concerned about, especially in relation to the developmental class. Therefore, the first sub-theme of the theme *Obstacles—Money*—is about the financial burden of the developmental class and the college

placement examinations. The student who felt like she did not derive much benefit from her developmental mathematics class stated, “To me, it was like a waste of money, for me to be in that class, even... at the end.” Another student, when speaking about the cost and of the poor results of his placement test, said, “It sucked a little bit because I just spent, I want to say, like \$80.00 for the ACT.” He continued, “And then I was told that, oh, there’s a chance for you to skip that class, but you have to fork over another \$80.00 bucks to take a one-shot test. I wasn’t the richest though.” This student also mentioned money again with regard to the tuition of the developmental class, and he was disgruntled that he did not receive any kind of credit for the class. He stated, “When you get your first tuition bill, it kind of hits you all at once, a little bit.” He continued, “Especially, when you are told that you have to take this developmental class and then you are told it doesn’t count as a credit.” Further, the cost of tuition had caused him to waver in his college plans. With respect to tuition, he stated, “Once I got the second half of my second year, and I guess it starts getting higher and higher in price, it made me think that maybe I might have to come up with a backup plan.” Another student mentioned that she was required to pay for the developmental class as a result of her placement and suggested that others are affected by this too.

Three of the six students interviewed indicated that taking the developmental class delayed their degree plans. Thus, the second sub-theme of the theme *Obstacles* is *Delay*. One of the students, who was not currently enrolled, indicated that the developmental course set him back because it did not fit within his degree plan. He explained, “What really sucked was certain classes were only available for certain parts of the year. So, with developmental, that made

my entire plan of getting out in four years extended by at least by an additional semester.” Although he was only required to take one developmental mathematics class, this student indicated that he was informed by his advisor that the delay would require him to enroll an additional year. Another student, who had taken developmental English, also expressed that he had been delayed in attaining his degree because he could not enroll in the first college-level English class initially. He stated, “It kind of set me back a little bit cuz I couldn’t take English, the first one, that semester.” Finally, the third student indicated that it set her back three hours, and she mentioned how some other students may have been set back even more.

The third sub-theme called *Preparation* emerged from student responses regarding the curriculum and instruction of their high school classes. Four of the six

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students interviewed indicated that their academic preparation for college was inadequate. One student, with regard to his DC and AP classes, stated, "I felt like they were good for me cuz they made me try harder, but I also felt like they didn't prepare me for the college, you know." He elaborated about these high school advanced classes by saying, "It's supposed to be a college class, but they were... they just didn't seem like anything I took here or I'm taking here [at the university]." Another student expressed a similar sentiment about his high school instruction when he expressed the idea that there were some concepts that his "high school teachers should've explained, which they didn't." One student expressed regrets about not focusing much on mathematics in high school. For example, with regard to the AP classes that he took in subjects other than mathematics, he indicated on two occasions that he probably should have "taken one or two less advanced placement classes and taken a harder math class or two." He explained, "So by the time I reached that ACT point, I would have had a stronger foundation. It probably would have helped me too in the long run." Finally, another student said that he struggled with his AP mathematics class in high school. He stated, "I barely passed that class. If anything, I think I might have passed the advanced placement class more out of mercy than anything else."

Emotions

The fifth theme, *Emotions*, emerged from students' feelings related to being placed into a developmental class after participation in DC and AP classes in high school. There were six prevalent emotion-laden sub-themes: *Embarrassed*, *Frustrated*, *Getting Through*, *Others' Influence*, *Not Smart*, and *Disheartened*. Four of the students interviewed reported feeling embarrassed about their developmental placement. The first sub-theme within *Emotions*, *Embarrassed*, is categorized mostly by the negative perceptions of these students' peers regarding these students' developmental placement and also by the stigma associated with this placement. One of the students stated this idea directly, "For me, it was... it was kind of embarrassing." Another one indicated that her friends asked her how she could be placed into a developmental mathematics class after taking an AP Calculus class in high school. Further, the third student suggested that the name of the developmental English course be changed because of its negative connotation. He suggested, "Just maybe call it something different, except for *developmental* or something, where some kids don't feel bad about it." Finally, the fourth student stated, "It was like a stigma, like, nobody wanted to be there."

The second sub-theme called *Frustrated*, emerged from students' feelings of irritation about being in a developmental class. One of the students in this study was extremely frustrated and upset with her placement and another student also mentioned that he was irritated, a lower intensity emotion closely associated with frustration (Turner, 2010). The student who seemed the most frustrated by her placement

stated, "It was pretty frustrating.... It was frustrating because I wanted to be doing...I wanted to be doing something else."

A third sub-theme, *Getting Through*, denoted how many students view their developmental classes as something they must endure. Four of the six students in this study used similar words when discussing their developmental classes. For example, one of the students indicated that "I had to get through it, so I could get to my actual math class." Another student stated, "I just wanted to pass it the first time and just keep working hard." The other two students also mentioned the idea of getting through the developmental course.

A fourth sub-theme, *Others' Influence*, emerged because the influence of others, particularly family, was a concept mentioned by students in this study. Two of the students indicated that they were influenced by family members or other important people in their lives. One student stated in general terms, "When you are in high school, you are kind of told that you want to challenge yourself. You want to take as many harder classes as possible." This student, who had dropped out of college, stated that his parents were encouraging him to go back to school, but that he was on the fence about it. He also mentioned that his parents would brag about his participation in the AP program. The other student stated that his father and mother were instrumental in helping him to come to terms with his developmental placement. He stated that when he received his placement results, his mom told him that his "English wasn't really that good" and suggested that he should work on it. He also said that his daddy helped him to reframe his developmental placement as "just another class" he had to take.

The fifth sub-theme, *Not Smart*, was indicative of how being placed into a developmental class and attending this class diminished some students' perceptions of their intelligence. Two of the six students indicated that their developmental placement made them feel less intelligent. One of the students said, "It made me kind of feel like I was not that smart or anything," and another student stated, "You don't feel as smart as you did when you were in high school, I guess."

The sixth sub-theme, *Disheartened*, had to do with students' feelings of disappointment after receiving developmental placement. Two of the six students interviewed for this study indicated that they were disheartened by their placement. When one of the students was asked what it was like to be placed into a developmental class, he responded, "I will be honest... disheartening. It is probably the best way to describe it." Another student expressed similar sentiments when he said, "At first, I was kind of disappointed. I didn't like it."

Academics

The sixth theme, *Academics*, emerged from students' perceptions of their prerequisite knowledge after entering the developmental class and also their views of their noncognitive abilities. There were two

sub-themes within this theme: *Knowledge* and *Soft Skills*. Two students mentioned that they thought they had a strong foundation in mathematics. One student made several statements regarding her prior knowledge of the content of her developmental mathematics class. She stated, "Like, I knew everything the teacher was talking about, what's going on ... because I already knew the stuff." The other student indicated that she was proficient in her basics. However, three of the students in this study mentioned that they had trouble retaining the material from both high school and developmental mathematics classes. For example, one student, currently in graduate school, when recalling his developmental class, said, "I did very well in that class," but he admitted, "I retained almost none of it when I took the GRE."

The second sub-theme, *Soft Skills*, was composed of the students' perceptions regarding their high school performance. Two of the students mentioned that they did not take their high school courses very seriously. One student said, "I just like kind of brushed them off and just did the minimum to get like the highest grade." She really did not give her high school classes her full focus. With regard to her developmental mathematics class, she stated, "My grades in high school were good, but going to that class and then comparing it to my actual college-level courses, I noticed how much I really didn't pay attention to my high school classes." In fact, this student, who reported that she graduated in the top 10% of her class, mentioned her lack of attention to high school instruction two more times during her interview. When asked what she might change or do differently when reflecting on this experience, she indicated that she would tell herself: "Just, actually, don't just do the bare minimum because that's not going to work. It really isn't." Another student, when asked what she might do differently, remarked, "I would've taken it more seriously probably. Um, yeah, I would've taken it more seriously probably." When looking back on her academic experiences, this same student mentioned procrastination as something that she might change. She explained that she would typically tell herself: "Oh, I already know this. I'll do it later." However, this student also described how she perceived her work ethic to be better than some of the other students in her developmental mathematics class. She said, "If you're put in a group, then you ended up doing all the work." When she perceived that others in her group were, perhaps, not quite as motivated as she was, she stated that she would tell them: "No, I take every class seriously. That's how I got to be in AP."

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Discussion

Many DC and AP students take very rigorous courses in high school, ostensibly courses that give them a glimpse into college. Researchers have suggested that DC participation has been positively correlated with transition to a university, persistence, and completion of college and that this participation has benefited students of all demographic groups (An, 2013; Robinson, 2011; Struhl & Vargas, 2012). Similarly, studies have shown that many AP students were also better academically prepared for college (Foust et al., 2009; Santoli, 2002). However, even after taking advanced classes, some DC and AP students have still placed into at least one developmental class upon entering a university. Indeed, some taxpayers have openly voiced their concerns about effectively paying two times for the same instruction, once in high school and then again in college (Ventura County Grand Jury, 2013). These taxpayers would most likely want to know why so many students, who have been on an advanced track in high school, have placed into developmental education courses.

Certainly, the inability to retain information over time may explain why some former DC and AP students have placed into developmental classes. In this study, three of the students indicated that they had trouble remembering the material that they learned in high school and in their developmental classes, and one of the students expressed a desire to learn the course material to a greater depth. In fact, Smilkstein (1993) wrote about the two levels of knowledge, procedural and declarative, which this student verbalized. Smilkstein indicated that students can acquire procedural knowledge without declarative knowledge, or a real understanding of the underlying concepts. Critical thinking skills are developed by using procedural and declarative knowledge together (Smilkstein, 1993). Some of the students in this study may have learned mathematics procedures, but they may not have learned the course content to a great enough depth to retain it or to use it in subsequent college-level classes. One student expressed this sentiment when she stated that she would like to "not just memorize it," but to "know by heart" what she needed to do. To enable knowledge and skills to transform students' current understandings, learning must include an ongoing process of purposeful application of knowledge and skills within real-world contexts (Roumell, 2019). A lack of declarative knowledge might explain why three of the five students placed into a developmental mathematics class upon entering a university indicated that they were unable to retain the mathematics content over time. Therefore, when preparing for college, students would be well advised to

not only consider the level of high school courses taken, but also the depth of learning in the courses.

Several of the students indicated that they had developed habits which were not conducive to their success, such as procrastination and inattention, which may have also interfered with these students' achievement in high school. Specifically, these students stated that they would do the work later or give limited attention to instruction because they already knew the material, or so they thought. After taking the developmental class, four of the six students in this study recognized a real need to develop these soft skills. Adams (2013) described soft skills, in the context of higher education, as noncognitive attributes that can facilitate student success, such as resilience, character, resourcefulness, ambition, professionalism, and integrity.

Although a majority of the students initially viewed their developmental class as something that they must endure, rather than a class that could benefit them, many of the students did eventually find value in it. However, the developmental class did extend some students' time to degree, and this delay may have contributed to one student's decision to withdraw. Overall, five of the six former DC and AP students indicated that the developmental class did help them in some way, if only for a good review.

Former DC and AP students experienced a range of emotions from being placed in and attending developmental classes (e.g., disheartened and frustrated). Evidently, these students were also embarrassed by their placement, as half of the students in this study expressed this sentiment. Developmental placement also took many of the students by surprise as four of the six students interviewed expressed sentiments that they had been misplaced and, subsequently, had trouble reconciling this developmental placement with their self-perception. Most likely, these students were kept in the dark with respect to their academic abilities with practices of grade inflation at the high school level (Gershenson, 2020; Hoyt & Sorensen, 2001) and discovered with the results of their placement examination that they were underprepared for the rigor of college-level coursework. When placed into a developmental class, these learners felt misplaced, as well as out of place, and they also did not feel as intelligent as they once did.

The thoughts expressed by the students in this study suggest that developmental placement was a disorienting experience for many of them. This phenomenon can be compared to the one described by Fay (1987) with Plato's parable and by the tenets of critical social science. These students, when confronted with placement examination results which did not coincide with their own personal perceptions of their academic abilities, were, perhaps, just beginning to see the sun from the darkness of their cave. As entering college freshmen, these students, who may have been kept in virtual darkness by their high school teachers' grade inflation policies and by the lack of rigor in their high school courses (Hoyt & Sorensen, 2001), may have held

a very distorted view of their foundational knowledge and academic preparedness. In fact, Gershenson (2020) discovered that all racial subgroups of Algebra I students in North Carolina from a 10-year period performed better on a standardized test, as well as 2 years of subsequent mathematics classes, when their teacher did not inflate grades, despite differences in the socio-economic composition of their schools. Due to these common high school practices, college placement results may have been some students' first indication that their academic skills were subpar.

Some of these advanced students may have taken action to attenuate their academic deficiencies in high school if they had been made aware of them (Fay, 1987). In this particular study, the students' inaccurate self-assessments of their academic abilities may have caused some complacency. After all, two of these students reported that they were in the top 10% of their class, and two others thought that they were smart, well-prepared students. In all, two thirds of the students expressed sentiments that they had been misplaced. More than likely, these advanced students, who had been kept in the dark about their academic abilities, would have possessed the capacity to rectify or attenuate their academic deficiencies and to modify their behavioral habits (e.g., paying more attention and learning course content to a greater depth) before entering college if they had fully understood their situation (Fay, 1987). Moreover, underprepared students influenced by their peers (Wang et al., 2018) or enticed by monetary incentives to enroll in AP classes (Holstead et al., 2010) might have avoided developmental placement in college if they had realized that their abilities were lacking.

Implications

Several systemic issues currently exist in our secondary school system that should be addressed. One of them is the lack of prerequisite requirements for students to enter pre-advanced placement (PAP) and AP courses. Students who are ill-prepared for these classes are enrolling in them and are further encouraged by financial incentives, like the AP/IP, to give them a try. However, Davis et al. (2015) determined that AP examinations have actually been a rather poor investment for some students. The lack of alignment between the rigor of advanced high school classes and that of college courses could be attributed to the fact that educators may have been compelled to educate all students in their classrooms (e.g., No Child Left Behind Act of 2001, Pub. L. No. 107-110, 115 Stat. 1425) at the expense of those who are better academically prepared. One of the students in this study confirmed this assertion by stating, "It's supposed to be a college class, but they were...they just didn't seem like anything I took here or I'm taking here [at the university]." Hoyt and Sorensen (2001) wrote, "Lax and/or inconsistent standards may create student attitudes, behaviors, and expectations for performance that lead to failure in the college environment" (p. 32). Moreover, high school teachers

of advanced classes may be under pressure by their administrators to keep their passing rates high, despite the composition of their classrooms. Hoyt and Sorensen (2001) suggested that “teachers need administrative support when they give low grades to students who do not demonstrate an understanding of the subject matter” (p. 32), and they recommended that “students who are underprepared for courses should be redirected into courses appropriate to their skill level” (p. 32). Of course, most administrators, counselors, and teachers would rather not discourage the ambitions of the young, and therein may be where the problem lies. However, effective counseling can do much to ameliorate the negative impact of a policy change, and students who have been redirected to more suitable classes might then recognize a real need to improve. Finally, with only adequately prepared students in their classrooms, instructors of advanced courses might then be better able to maintain the rigor of their courses, a rigor more comparable to that of colleges and universities.

Perhaps as a result of current practices within secondary schools, much diversity exists within developmental classrooms. As such, strides should be taken to accommodate this diversity; a one-size-fits-most model for teaching may be highly ineffective. In the current study, one of the students mentioned that he would have liked to have been given the opportunity to place out of some of the mathematics content, and other students indicated that the curriculum and the pacing of their developmental mathematics course could be improved. Specifically, two students, one from each discipline, indicated that they found the instruction on the more challenging concepts, typically not covered until the end of the course, the most helpful. Perhaps, an accelerated model that allows students to test out of some of the more basic concepts would be a good fit for students who have been on an advanced track in high school (Bishop et al., 2018; Saxon & Martirosyan, 2020).

Limitations and Recommendations for Future Research

One of the limitations of this study was that a student may have taken a DC or AP course in high school English, for example, and then placed into college developmental mathematics, or vice versa. The researchers assumed that former DC and AP students have the propensity to do well in both disciplines which may not be true. Also, if a student had taken a DC course in high school, for example, and received college credit, the requirement for a college placement examination was waived. Therefore, some DC students who may have needed developmental studies did not receive this placement.

In the present study, 562 students placed into developmental education within a 6-year time span. More than likely, this phenomenon occurs regularly at other university and community college campuses across the United States. However, with a thorough literature search, no studies about this phenomenon could be found. Therefore, more research is needed

about this subgroup of developmental learners to raise awareness about this phenomenon and to guide administrators, counselors, and educators as they strive to meet these advanced students’ needs. For example, a comparison of this subgroup of learners with those on a more traditional path to college after graduation could provide better insight into this phenomenon. Also, these advanced students could be studied by high school to detect possible trends. Furthermore, the current practice of offering fewer developmental courses to decrease students’ time to a credit course may be creating some disadvantages for advanced learners because these courses may now be too broad or, possibly, too tailored to their classmates with more extensive needs. Finally, an investigation into some of the common practices in secondary schools, which may be contributing to the phenomenon, may be warranted.

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Developmental Mathematics: Students' Predicted Outcome Value of Electronic Communication

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ABSTRACT

This study investigated the predicted outcome value of electronic communication from the viewpoint of developmental mathematics students. Students at a large Texas community college completed a combination of instruments that were administered in three prior studies. Three reasons for using electronic communication that were included in this study were procedural/clarification, personal/social, and efficiency. Results indicated that (a) student-initiated electronic communications conversations were correlated with students' predicted outcome value of electronic communications; (b) instructor immediacy behaviors via electronic measures was correlated with students' reasons for electronic communication; (c) instructor immediacy of electronic communication and the reasons for communicating explained 34.3% of the variance in students' predicted outcome value of electronic communication; (d) procedural/clarification reasons was the largest predictor of predicted outcome value; and (e) the β weight and structure coefficient suggested that personal/social reasons was a possible suppressor.

Keywords: developmental mathematics, electronic communication, predicted outcome value, regression, suppressor variable

Communication is an essential element of a productive society. The mobile phone is one technological tool that has transformed communication on a global scale. Asurion (2018) reported that, while on vacation, "Americans check their phone an average of 80 times a day" (para. 2). Recording the number of times people check their phones does not gauge the effectiveness of communication; however, it does provide a measure of the ease to which technology-based communication tools can be accessed and verifies Americans' obsession with their phones. Technology-based communication, which includes text messaging, email, and social media easily accessed from a smart phone, can be useful in forming relationships. Schreiner et al. (2011) posited that students (specifically high-risk) "do not stay or leave institutions as much as they stay in or leave [faculty] relationships" (p. 333). Chickering and Gamson (1987) claimed that students tend to persist through difficult times when they have a connection with their instructors. Perceptions of the usefulness of technology to form relationships might vary by generation. Brandon (2017) reported that 52% of millennials in his study thought that technology had improved their peer relationships but 57% of the boomers thought that technology had ruined peer relationships.

Developmental Mathematics Classrooms

In this study, we examined the use of electronic communication in developmental mathematics classrooms. These classrooms provide an interesting setting for a study because the population is comprised of many students who exhibit high levels of mathematics anxiety (Zientek et al., 2010, 2019) and for which mathematics has been an obstacle (Bahr, 2008). Students enrolled in developmental mathematics often have been classified as non-traditional or at high-risk, which means they tend to be over the age 21, hold full-time jobs and/or have family responsibilities, and must complete one or more remedial mathematics course (Schreiner et al., 2011). Furthermore, according to Ganga et al. (2018), only about 25% of students who enroll in at least one developmental course will graduate in 6 years. Many also will decide to delay their enrollment in a college-level mathematics course (Zientek et al., 2020). Interactions between developmental mathematics students and their

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instructors are important to consider and can occur through extra-class technology. Therefore, we investigated the predictive nature that students' reasons for communicating electronically with their instructor and instructor immediacy had on students' value of electronic exchanges.

Encouraging Student-Faculty Contact

Student-teacher relationships have been identified as fundamental to students' academic success and satisfaction with their college experience (Bippus et al., 2003; Dobransky & Frymier, 2004; Hershkovzt & Forkosh-Baruch, 2017; Li & Pitts, 2008; Schreiner et al., 2011; Young et al., 2011). Chickering and Gamson (1987) declared that one of the most basic elements in student motivation is recurrent student-faculty contact. They also claimed that when students know faculty members are concerned, then students believe they can persist through the "rough times" (p. 4). The benefits of student-faculty contact are abundant in the literature. Astin (1984) theorized that frequent interaction with faculty members was a strong factor associated with student satisfaction. Tinto (2012) posited that students were more likely to succeed if they were academically and socially engaged with faculty. Astin (1984) and Tinto (2012) both emphasized the importance of student-faculty contact in their respective theories on student engagement and student retention. Providing time with the teacher outside of class hours, even if it is only 5 minutes before class, can influence students more than teachers might realize (Dinman, 1996). Sorcinelli (1991) maintained that student-faculty contact is an evidenced-based characteristic of good teaching.

Sunnafrank (1988) proposed that initial communication behaviors impact attempts at future relational outcomes. In other words, people try to predict consequences of their interaction with others to decide whether to continue further or discontinue the relationship. Predicted outcome value (POV) has strong associations with oral communication, familiarity level of the interaction, nonverbal expression, and liking (Sunnafrank, 1988) and is relevant to instructional communication. Furthermore, the principles of POV theory pertain to both face-to-face extra-class communication and email communication (Young et al., 2011).

Extra-Class Communication

The focus of this study is extra-class electronic communication. Dobransky and Frymier (2004) defined extra-class communication as student-

teacher interactions outside of formal class time that is initiated by either the student or instructor. Extra-class communication provides students with opportunities to discuss a variety of topics or ask questions without fear and allows the value of the communication to be retained regardless of the physical availability of the instructor. In regards to extra-class communication, POV relates to students' prediction of the importance of extra-class communication with their instructors (Bippus et al., 2003; Young et al., 2011). Students have a choice to seek out extra-class communication and will choose experiences they perceive as beneficial (Young et al., 2011). Bippus et al. (2003) posited that faculty members need to exhibit behaviors that encourage students to seek out extra-class communication, but his conjecture was not focused on technology-based communication.

Email

Early research on extra-class communication focused on face-to-face interactions between students and their instructor (Young et al., 2011). As technology evolved, email became a communication tool that was readily-available across universities and colleges. Therefore, it should not be a surprise that, as the popularity of email grew, researchers studied whether email communication was beneficial (DeBard & Guidera, 2000; Waldeck et al., 2001). Research has indicated that email can supplement face-to-face communication and can help reduce students' anxiety about asking questions (Waldeck et al., 2001). Email communication has the added benefit of being able to transcend the confines of space and time. According to Young et al. (2011), "unlike face-to-face context, email allows students and teachers to

communicate at any time without the need to be physically present among one another" (p. 382).

Among developmental mathematics instructors, email has been a leading choice to communicate with students about their course and to provide students with grade or performance updates (Skidmore et al., 2014). Regarding email, researchers have found that developmental education faculty members primarily use email as a reminder tool (Cafarella, 2014; Jacobson, 2005). Faculty members interviewed in Cafarella's (2014) study indicated that email was an effective way to increase student attendance, which they theorized would benefit student success. In fact, attendance has been identified as a predictor of student success (Albert et al., 2018; Zientek et al., 2013). Jacobson (2005) investigated the intervention of sending

Student-teacher relationships have been identified as fundamental to students' academic success and satisfaction with their college experience.

an email reminder to students who missed class. While Jacobson (2005) found that attendance did increase, sending attendance reminders alone did not translate to more learning for some students.

Frequency

High-risk college students have identified genuineness and authenticity as the basis for connecting with their instructor (Schreiner et al., 2011). When looking at how email communication influences student-teacher relationships, Young et al. (2011) found frequency of emails and teacher immediacy were two instructor qualities that increased the likelihood of developing relationships. More frequent emails indicated a greater likelihood of developing a relationship (Young et al., 2011). While studies of student-faculty contact that pre-date technology-based communication have indicated that frequency of contact was important to student success (Sorcinelli, 1991), Schreiner et al. (2011) found that for students at high-risk, the quality of extra-class communication (not electronically mediated) was more important to developing a relationship than frequency of communication.

Immediacy

Immediacy also influenced the development of student-teacher relationships (Young et al., 2011). Immediacy has been defined as perceived physical or psychological closeness between people or more specifically, for teachers, verbal and nonverbal behaviors that enhance interaction (Babad, 2007; Dobransky & Frymier, 2004). Teacher immediacy behaviors in technology-based communication include using students' first names, appropriate capitalization, and various emoticons (Waldeck et al., 2001). Research suggests that when teachers used immediacy behaviors, students were more likely to communicate via email (Waldeck et al., 2001). Babad (2007) claimed that teacher immediacy measures the same characteristics as teacher enthusiasm, but noted the two concepts are mutually exclusive in literature. Immediacy behaviors enhances student learning and motivation (Dobransky & Frymier, 2004).

Reasons For Extra-Class Communication

Students communicate with their instructors outside of class for various reasons, including (a) relational (to develop a relationship), (b) functional (to ask for clarification), (c) excuse making (to explain late work or absences), (d) sycophantic (to make a favorable impression), and (e) participatory (to demonstrate curiosity; see Denker et al., 2018; Young et al., 2011). When email is the choice of extra-class communication, Waldeck et al. (2001) presented a similar set of reasons for why students were likely to email their instructors which included, in order of preference, (a) procedural or clarification, (b) efficiency (to not waste time), and (c) social or personal (private matters).

Problem Statement

Contact between faculty members and students was one of the *Seven Principles of Good Practice in Undergraduate Education* (Chickering & Gamson, 1987). In fact, Chickering and Gamson (1987) claimed "frequent student-faculty contact in and out of classes is the most important factor in student motivation and involvement" (p. 4). Skidmore et al. (2014) noted that because developmental mathematics faculty reported using email to communicate with students, future studies should "investigate in detail the purpose for their emails" (p. 39). Young et al. (2011), noted that:

There is an array of other computer-mediated modes of communication that both teachers and students can employ to maintain contact outside of the classroom, including texting and instant messaging or using Facebook, Twitter, Linked In, or Skype... Future scholars may wish to cast a wider net in examining how various computer mediated channels for ECC may influence students' likelihood to develop a professional relationship with their instructor. (pp. 385–386)

We answered those calls for future research by investigating extra-class communication in developmental mathematics courses.

Purpose

Because a central role in fostering student motivation and success is student-faculty interactions and developmental mathematics students have a higher-risk for academic failure, determining their students' perceptions of technology-based communication tools for classroom interaction can be informative. The purpose of this study was to extend prior research on how student-teacher relationships develop through extra-class communication by examining faculty members' use of electronic communication from the student viewpoint within the special area of developmental mathematics. The educational significance of this study is two-fold. First, the results can yield information on why students engage in extra-class communication and on the relationship of extra-class communication within the framework of positive outcome value. Second, the results can inform faculty members on how electronic communication tools can improve extra-class communication and help develop relationships that might improve student success.

Research Questions

Given the benefits of student-faculty contact, the convenience of electronic communication, and the low pass rates in developmental mathematics, it is important to examine the use of technology-based communication tools in developmental mathematics classrooms.

The present study is guided by two research questions:

1. To what extent does students' POV of extra-class electronic communication relate to the frequency of (a) student-initiated and (b) instructor-initiated communication with the electronic tool used most often between students and instructors?
2. To what extent does students' perceptions of their instructor's electronic communication immediacy and their own reasons for contacting their instructor predict their POV of extra-class electronic communication?

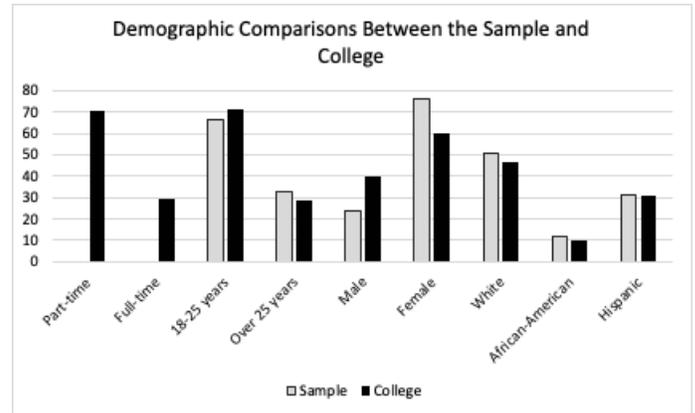
Method

Participants

Participants in this study were students from a large community college system in Texas who were enrolled in two different developmental math courses: college algebra with co-requisite and intermediate algebra. Community college students were the target population because most developmental mathematics courses have been taught at community colleges (Bahr, 2008). The five mathematics instructors who distributed the survey to their students reported their original enrollment numbers for their courses. Response rates for four instructors varied from 12.5% to 82.2% ($n = 68$ students; 16 males, 51 females, 1 unidentified). Calculations of response rates was not possible for one instructor who taught a mixed College Algebra class comprised of both college-ready and College Algebra with co-requisite students. This instructor indicated that nine students were in the co-requisite class but 14 students reported enrollment in the co-requisite class.

As recommended by Wilkinson and Task Force on Statistical Inference (1999), the sample characteristics were compared to the college population characteristics. In the Fall 2018 semester, the participating two-year college enrolled approximately 15,300 students with 989 registered in developmental education. This number did not include students enrolled in co-requisite courses. The majority of the student population was 18 to 25 years old (71.7%), attended part-time (70.6%), and were female (61%). Two ethnic groups had the most representation: White (45.7%) and Hispanic (32%). As seen in Figure 1, the sample was somewhat comparative to the population but there was a larger percentage of females in the sample compared to males. Full-time enrollment status was not available for the sample.

Figure 1
Demographic Comparisons Between Sample and College



Note. Values are in percents. The college data was obtained from the college's website.

Community college students were the target population because most developmental mathematics courses have been taught at community colleges...

Instrumentation

Surveys in the present study were based on instruments administered in previous studies by Waldeck et al. (2001), Bippus et al. (2003), and Young et al. (2011). Prior studies focused on email. In this study, the instrument included additional types of technology-based communication. Students were asked to choose the type of technology-based communication (i.e., email, text messaging, or social media) they used most frequently to communicate with their developmental mathematics instructor. Students were asked to answer subsequent questions from four sections based on that technology tool. Students answered items, which were (a) students' frequency of use, (b) students' reasons for use, (c) students' perceived benefit of use, and (d) instructor immediacy-based communication. Students' frequency of use was measured using a 5-point categorical time scale. Students' reasons for use as well as instructor immediacy were measured using a 7-point Likert scale. Perceived benefit of use was measured using a 7-point semantic differential scale for responding to questions. A semantic differential scale measures a person's attitude towards something using a scale with polar opposite adjectives (Glen, 2016). For example, student participants were asked "interacting with my instructor using technology-based communication is likely to be" and given the scale of (1) positive to (7) negative.

Reasons for Electronic Communication

The measure for students' reasons for using electronic communication was based on an instrument by Waldeck et al. (2001). They conducted

a factor analysis that indicated a three-factor model, “which accounted for 65% of the variance” and defined the three factors as “personal and social reasons, procedural and clarification reasons, and efficiency reasons” (p. 63). Young et al. (2011) used the same instrument and also reported a the same three-factor model, which accounted “for 57.89% of the variance” (p. 379). Both studies computed composite scores for each factor. For this study, we hypothesized some items would not load on the original factor structure by Waldeck et al. (2001) when administered with a sample of developmental mathematics students. Correlations are reported in Table 1. Reliability coefficients were consulted and reliability improved if one communication item was removed. The item “To avoid speaking to the teacher by phone or in person” (R15) was deleted because responses were rated in almost the opposite direction than and were minimally correlated with the two other communication problems. Avoidance to communicate by phone or in person in R15 might occur for reasons other than wasting time such as an intimidation to speak to the teacher asked in R16 and R17. Cronbach’s alpha (α) were acceptable (i.e. above .70) for personal and social reasons ($\alpha = .86$), procedural and clarification reasons ($\alpha = .91$), and efficiency reasons ($\alpha = .73$). Because of the low sample size and possible survey fatigue, composite scores for (a) personal and social reasons and (b) procedural and clarification reasons were calculated by taking the average responses for each construct as long as participants answered all or all but one of the items for each construct.

Instructor Immediacy via Electronic Communication

Instructor immediacy via electronic communication was measured based on a 19-item instrument by Waldeck et al. (2001) that related to verbal and non-verbal “message strategies that simulate immediacy behaviors” (p. 66) such as using first names or including emojis. Waldeck et al. (2001) referred to this instrument as the “Teacher E-Mail Interaction Proficiency Scale” (p. 65). Both factor analyses by Waldeck et al. (2001) and Young et al. (2011) showed a unidimensional measure with a Cronbach alpha reliability of .89 and .95. Instructor immediacy in this study was also considered unidimensional and a composite score was calculated ($\alpha = .934$). Composite scores for instructor immediacy were calculated by taking the average responses for each construct as long as participants answered at least 17 out of the 19 items.

Perceived Outcome Value (POV)

To measure students’ POV of extra-class electronic communication, students in this study completed an instrument by Bippus et al. (2003). In this study, POV relates to their decision to engage in extra-class communication with electronic tools. Young et al. (2011) administered the Bippus et al. (2003) instrument and performed a factor analysis that produced a one-factor model explaining 63.82% of the variance. Young et al. (2011) modified the items to be specific to email and developing a student-teacher relationship; we modified the items to be specific to electronic communication in general. We changed the instructions from “interacting with this

Table 1
Correlations and Descriptive Statistics for Reasons for Electronic Communication

	M	SD	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
R1	3.22	1.91	-															
R2	4.38	1.94	.593	-														
R3	2.74	1.95	.580	.440	-													
R4	2.09	1.53	.445	.262	.550	-												
R5	3.40	1.87	.279	.393	.331	.295	-											
R6	3.24	1.99	.517	.377	.551	.480	.422	-										
R7	2.34	1.92	.559	.376	.526	.572	.494	.550	-									
R8	2.17	1.66	.470	.302	.454	.508	.481	.457	.811	-								
R9	3.97	2.13	.395	.668	.433	.261	.224	.413	.429	.306	-							
R10	5.03	2.04	.290	.578	.385	.157	.308	.456	.091	.102	.460	-						
R11	4.90	2.03	.309	.518	.232	.139	.324	.406	.154	.078	.364	.774	-					
R12	4.66	2.11	.246	.445	.230	.239	.386	.511	.291	.234	.436	.606	.639	-				
R13	4.95	2.06	.346	.470	.197	.068	.323	.363	.200	.213	.395	.762	.781	.621	-			
R14	3.62	2.28	.242	.570	.266	.030	.307	.261	.288	.204	.566	.501	.518	.572	.638	-		
R15	2.38	1.75	.216	.362	.127	.324	.350	.115	.254	.293	.230	.124	.194	.322	.176	.293	-	
R16	3.97	2.25	.047	.378	-.078	.129	.308	.222	.141	.124	.249	.367	.495	.427	.348	.364	.285	-
R17	3.76	2.14	.185	.425	.077	.329	.283	.320	.398	.354	.345	.287	.353	.394	.248	.327	.298	.728

Note. $n = 58$; M = Mean; SD = Standard deviation. The numbers correspond to the questions in the Waldeck et al. (2001) article and the three factors: personal/social reasons (R1–R9), procedural/clarification reasons (R10–R14), and efficiency reasons (R15–R17).

instructor outside of class is likely to be” (Bippus et al., 2003, p. 268) to “interacting with the instructor using electronic communication is likely to be...” Both Bippus et al. (2003) and Young et al. (2011) reported high alpha reliability scores (i.e., .94 and .93). Because of a data collection error, only seven of the nine items were included on the survey. The two items that were omitted were “worth the effort” and “informative.” However, despite this oversight, worth the time and worth the effort were very similar beliefs and informative and valuable were also similar. Future studies should include all nine items. A composite score was calculated for the unidimensional POV ($\alpha = .88$). A composite score for POV was calculated by taking the average responses of POV items as long as participants answered at least 6 of the 7 items.

Procedures

Students were invited to participate through email communication with developmental mathematics instructors from the community college system. Thus, the sample for this study was a voluntary and convenience sample because it included participants who were easily recruited and willing to participate (Johnson & Christensen, 2014). After submitting an application to the Institutional Review Board, the study was approved and granted an exemption from a full-board review. Emails were sent to developmental mathematics faculty from the college. Faculty members were asked to distribute the electronic surveys to their developmental mathematics students. All 78 faculty members at the participating college were sent an email requesting participation. Six of the faculty members (7.7%) agreed to distribute the survey to their students, but only five distributed the survey. Participants had to give their consent before they were granted access to the survey instrument. Data collection took place during the sixth and seventh weeks of the semester. This time period provided time for students to have experienced the behaviors being studied, but not too close to finals that would have added more stress. As an incentive, participants were offered an opportunity to enter their email for a chance to win a gift card.

Data Analysis

Survey results were sorted according to students’ preferred method of communication: email, text messaging, social media, or other. If students chose “other”, they were asked to list the method they preferred. Initial data formatting and analyses were conducted in SPSS. Matrix summaries

were provided, which allow for secondary analyses and encourage meta-analytic thinking. Correlation coefficients (Pearson r) were calculated to measure the relationships between perceived outcome, students’ reasons, and instructor immediacy. Spearman’s rho (ρ) measures the magnitude and direction of relationships between at least one interval-scaled variable and at least one ordinal-scaled variable. Spearman’s ρ was calculated to measure the relationship between perceived outcome and frequency of use.

Multiple regression was used because we wanted to predict the value of the dependent variable based on two or more independent variables (Thompson, 2006). We conducted a multiple regression analysis and commonality analysis in R (Nimon, 2015) to determine the extent to which students’ reasons for communicating with their instructors (i.e., three constructs) and perceived immediacy behaviors of instructors (i.e., one construct) explained variance in POV of electronic communication (i.e., dependent variable). Multicollinearity was investigated with variance inflation factors. A commonality analysis was conducted to determine the unique contributions variables made to the model and possible suppressor effects (see Kraha et al., 2012).

Results

Students first reported the electronic communication that they used most frequently to communicate with their developmental mathematics teacher and how often they used that particular technology and for what purposes. Of the 58 students who reported most common type of communication, email was chosen most often (63.8%; $n = 37$). Text messaging, including *Remind*, was second at 24.1% ($n = 14$) followed by *other* at 6.9% ($n = 4$) and social media at 5.2% ($n = 3$). No specific social media platform was specified. All 4 students who chose “other” listed *Remind*, which is an application that allows participants to send and receive text messages without sharing personal contact information. The use of *Remind* might have been prevalent because one instructor introduced the use of this messaging service to their students.

All subsequent survey responses were answered based on the students’ most frequently used technology ($n = 64$) that they reportedly used to communicate with their instructor. Students rated their frequency of the technology they used most often to communicate with their instructor for the purposes of (a) school, work, and/or personal communication,

Survey results
were sorted
according to
students’
preferred
method of
communication:
email, text
messaging,
social media,
or other.

Table 2
Students' Frequency of Electronic Communication Most Often Used by Students to Communicate With Their Developmental Mathematics Instructors in Percentages

Frequency	General student use of electronic communication	Student initiated contact with their instructors	Instructor-initiated mass communication	Instructor-initiated individual communication
Never	4.7	6.3	1.6	14.1
Rarely	25.0	45.3	17.2	37.5
Monthly	0.0	0.0	0.0	0.0
Twice/Month	7.8	23.4	25.0	20.3
Weekly	29.7	20.3	46.9	23.4
Daily	32.8	4.7	9.4	4.7

Note. *n* = 64.

(b) initiating communication with their instructors, (c) instructor-initiated communication to the whole class, and (d) instructor-initiated communication to individual students. Frequencies are provided in Table 2. About a third of the students (32.8%) reported that they communicated daily with their instructors using the self-reported most frequently used technology, with weekly (29.7%) and rarely (25%) having the next most responses. In regards to personal communication, we want to emphasize that we believe students used electronic communication daily, but just not necessarily to communicate with their instructor. When students were asked about their frequency of electronic communication to initiate contact with their instructors, 45.3% reported that they rarely initiated communication with their instructors. In reference to the technology of students' preference, students reported that their instructors initiated electronic communication to communicate with their class (i.e., mass communication) weekly (*n* = 30, 46.9%) but that the instructors were less likely to initiate weekly individual communication (*n* = 24, 37.5%).

Research Question 1

Spearman's rho (ρ) correlations were computed to examine to what extent frequency of electronic communication relates to students' POV of extra-class communication. Spearman's rho (ρ) correlations indicated that POV had a moderately positive relationship with student-initiated communication ($\rho(59) = .354, p = .006, \rho^2 = 12.53\%$). No statistically significant relationship existed between POV and the frequency of teacher-initiated mass ($\rho(59) = .128, p = .335, \rho^2 = 1.63\%$) or individual electronic communication ($\rho(59) = .215, p = .102, \rho^2 = 4.62\%$).

Research Question 2

A multiple regression was conducted to determine the extent to which students' reasons (i.e., personal/social, procedural/clarification, and efficiency) and instructors' immediacy behaviors pre-

dicted students' POV of electronic communication with their instructors. Correlations and descriptive statistics are provided in Table 3. Collectively, the three reasons selected by students (i.e., procedural/clarification, personal/social, and efficiency) and instructors' immediacy behaviors explained 34.4% of the variance in students' POV ($F [4, 55] = 7.20, p < .001, R^2 = .343, R^2_{Adjusted} = .296$). As seen in Table 4, beta (β) weights were largest in magnitude for procedural/clarification and personal/social reasons followed by immediacy behaviors. Squared structure coefficients (r_s^2) supported the importance of students' procedural/clarification efficiency reasons and instructors' immediacy behaviors, which suggests that interpretation of β weights alone would have denied efficiency reasons some explanatory credit (Thompson, 2006). The variance inflation factors was less than 2.6, which suggested that multicollinearity was not a concern. As seen in Table 3, the POV of extra-class electronic communication had a somewhat weak positive relationship with instructors' immediacy behaviors ($r(60) = .291, p = .024, r^2 = 8.47\%$), a moderate positive relationship with students' procedural/clarification reasons ($r(60) = .404, p = .001, r^2 = 16.32\%$), a somewhat weak positive relationship with students' efficiency reasons ($r(60) = .331, p = .010, r^2 = 10.96\%$), and no statistically significant relationship with students' personal/social reasons ($r(60) = -.030, p = .820, r^2 = 0.09\%$).

Table 3
Pearson's R Correlation Coefficients and Descriptive Statistics for Regression Variables

	POV	Proc/Clar	Pers/Soc	Eff	Imm
Proc/Clar	.404				
Pers/Soc	-.030	0.561			
Eff	.331	0.451	0.383		
Imm	.291	0.544	0.594	0.475	
<i>M</i>	5.463	4.630	3.078	3.808	3.356
<i>SD</i>	1.247	1.843	1.381	2.109	1.500

Note. *n* = 60; POV = students' perceived outcome value of extra-class technology-based communication; Proc/Clar = Procedural/clarification reasons; Pers = Personal/social reasons; Eff = Efficiency reasons; Imm = Instructor's immediacy behaviors

Table 4
Multiple Regression Results

IV	B	r_s^2 (%)	Unique (%)	Common (%)
Procedural/clarification	0.469	47.5	12.9	3.5
Personal/social	-0.517	0.30	15.1	-15.0
Efficiency	0.200	31.90	2.9	8.1
Immediacy	0.248	24.70	3.3	5.1

Note. *n* = 60; Dependent variable = Perceived outcome value (POV) of electronic communication.

Personal/social reasons was not statistically significantly correlated with the dependent variable (POV), but was correlated at a noteworthy level with the other three independent variables (see Table 3). The large β weight and relatively low r_s^2 supports that Personal/social reasons was a possible suppressor. According to Nathans et al. (2012), “an independent variable [with] a near-zero or negligible zero-order correlation with the dependent variable and a large and statistically significant β weight” suggest “that the variable is a suppressor” (p. 4). Pandey and Elliott (2010) added that a suppressor “improves the overall predictive power of the model” (p. 28). Lo (2012) stated that classical suppression occurs when a suppressor variable “(1) is uncorrelated or slightly correlated to the dependent variable, (2) is correlated to the other predictors (which it suppresses), and (3) increases the R^2 ” (p. 15). Per these definitions, students’ personal/social reasons appears to be a classical suppressor with this sample of students. The classic suppressor variable is able to increase the model’s predictability by removing irrelevant predictive variance from other predictive variables and increasing the predictors’ weight (Pandey & Elliott, 2010).

Commonality analysis results provided in Table 5 further support the regression results, in particular the suppressor effect (Nimon, 2015; Thompson, 2006). Commonality analysis first “takes all possible subsets further and divides all of the explained variance in the criterion into unique and common (or shared) parts” (Kraha et al., 2012, p. 6). All of the predictor variables uniquely contributed variance. Students’ procedural/clarification reasons uniquely accounted for 12.9% of the variance or rather 37.61% of the explained variance of the students’ POV (i.e. $U_{Clar}/R^2 = 12.9\%/34.3\% = 37.61\%$, and students’ personal/social reasons uniquely accounted for 15.1% of the variance or rather 44.02% of the explained variance of the students’ POV (i.e. $U_{Pers/Soc}/R^2 = 15.1\%/34.3\% = 44.02\%$). The largest shared contribution to variance was made by the combination of three predictor variables: students’ procedural/clarification reasons, efficiency reasons, and instructors’ immediacy behaviors. This combination shared 4.9% of the variance or rather 14.29% of the explained variance (i.e. $C_{Clar, Eff, Imm}/R^2 = 4.9\%/34.3\% = 14.29\%$). The combination of 2 predictors—students’ procedural/clarification reasons and instructors’ immediacy behaviors—shared 4.3% of the variance or rather 12.54% of the explained variance (i.e. $C_{Clar, Imm}/R^2 = 4.3\%/34.3\% = 12.54\%$). The combination of the students’ procedural/clarification reasons and efficiency reasons shared 3.8% of the variance or rather 11.08% of the explained variance (i.e. $C_{Clar, Eff}/R^2 = 3.8\%/34.3\% = 11.08\%$). Even though personal/social reasons provided the largest unique contribution, negative commonality coefficients in

Table 5 support that personal/social reasons was a possible suppressor. All commonality analysis coefficients that included personal/social reasons were negative except for the shared commonality components with immediacy behaviors, which was close to zero.

Table 5
Unique and Common Components of Variance of Dependent Variable POV Extra-Class Technology-Based Communication

Components	Clar(%)	PS (%)	Eff (%)	Imm (%)	Total (%)
U(Clar)	12.9				12.9
U(PS)		15.1			15.1
U(Eff)			2.9		2.9
U(Imm)				3.3	3.3
C(Clar, PS)	-6.9	-6.9			-6.9
C(Clar, Eff)	3.8		3.8		3.8
C(Clar, Imm)	4.3			4.3	4.3
C(PS, Eff)		-0.7	-0.7		-0.7
C(PS, Imm)		-3.2		-3.2	-3.2
C(Eff, Imm)			2.2	2.2	2.2
C(Clar, PS, Eff)	-1.2	-1.2	-1.2		-1.2
C(Clar, PS, Imm)	-2.1	-2.1		-2.1	-2.1
C(Clar, Eff, Imm)	4.9		4.9	4.9	4.9
C(PS, Eff, Imm)		-1.6	-1.6	-1.6	-1.6
C(Clar, PS, Eff, Imm)	0.6	0.6	0.6	0.6	0.6
Total	16.3	<.001	10.9	8.4	34.3

Note. $n = 60$. U = unique; C = common; Clar = Procedural and clarification reasons; PS = Personal and social reasons; Eff = Efficiency reasons; Imm = Immediacy behaviors; Dependent variable = POV of electronic communication. Total columns for dependent variables sum to the r^2_{xy} .

Discussion

While educators understand the importance of student-teacher interactions, an evolving influence on these interactions is the use of technology to communicate outside of the classroom. Electronic communication, such as email and text messaging, have been growing in popularity. Therefore, we can expect that students also model this behavior and choose to communicate using technology. Furthermore, using studies by Waldeck et al. (2001), Bippus et al. (2003), Young et al. (2011), and Predicted Outcome Value (POV theory; Sunnafrank, 1988) as a guide, this study explored developmental mathematics students’ POV of electronic communication through email and other forms of electronic communication (i.e., email, text messaging, and social media). This population has been identified as underprepared for college mathematics and possibly have negative experiences with mathematics. The POV theory was developed around face-to-face communication and “is positively related to amount of verbal

communication, intimacy level of communication content, nonverbal affiliative expressiveness, and liking” (Sunnafrank, 1988, p. 169). Young et al. (2011) examined the theory through email communication with non-communication majors at a university.

POV of Extra-Class Electronic Communication

This study found that (a) student-initiated electronic conversations were correlated with students’ POV of extra-class electronic communication; (b) instructor immediacy behaviors via electronic communication were correlated with students’ reasons for communicating; and (c) students’ reasons for communication and instructor immediacy predicted students’ POV of extra-class electronic-based communication. Furthermore, procedural and clarification reasons contributed a large amount of variance with personal and social reasons serving as a possible suppressor. Although one intent of this study was to compare different modes of electronic communication, due to the small sample size in this study and the fact that most students chose email as the most frequent communication used, it was not possible to separate responses by technology tools. Thus, most of the discussion is in reference to electronic communication by email. Future research could examine the impacts different types of communication have on the frequency of use.

Frequency of Electronic Communication

Young et al. (2011) focused on the relationship between POV of email correspondence and fostering student relationships versus our focus on POV of electronic communication. We hypothesized, based on the findings by Young et al. (2011), that higher POV of electronic communication would correlate with a student’s desire to formulate a teacher-student relationship. Young et al. (2011) found that frequency of instructors’ use of *both* mass and individual emails had a positive correlation with POV “of student-teacher relationship” (p. 380). In contrast, we did not find a relationship between instructors’ frequency of mass or individual instructor-initiated electronic messages and developmental mathematics students’ POV of electronic communication. The differences might be attributed to different measures used in the studies. Developmental mathematics students who exhibited higher levels of POV of extra-class electronic communication initiated electronic conversations more frequently than students with lower POV levels. Also, there was a positively statistically significant correlations with the frequency of electronic-based communication

initiated by the student and instructor-initiated mass (Spearman’s $\rho = .338$) and instructor-initiated individual communications (Spearman’s $\rho = .389$). To summarize, we found that both the frequency of instructor’s individual and mass emails appeared to be related to students’ frequency of communicating electronically and that students with higher POV initiated emails more frequently.

Instructor Immediacy, Reasons For Using, and Predictive Outcome Value Of Electronic Communication

The three reasons students used electronic communication included in this study and instructor immediacy behaviors explained 34.3% of the variance in students’ POV of electronic communication. Using electronic communication for procedural/clarification reasons explained the most variance and might serve as a predictor because many developmental mathematics students struggle in mathematics. Even though personal/social reasons contributed the largest amount of unique variance, the β weight was large and there was a near zero structure coefficient. Furthermore, personal/social reasons was not correlated to POV of electronic communication and the majority of the commonality coefficients associated with personal and social reasons were negative. Collectively, those results indicated that personal/social reasons was important to the model because it suppressed irrelevant information and thus increased the R^2 . Future research should examine the possible suppressor effect across subject matters and academic levels.

Efficiency reasons (i.e. to avoid wasting time) was a predictor. The importance of this reason

for explaining variance in POV of electronic communication might be because the sample was drawn from a community college with a majority of the student population attending part-time while working full-time jobs. Therefore, being able to send and receive messages asynchronously might be advantageous for part-time students to develop relationships with their instructors.

Instructor immediacy behaviors have been linked to students’ POV of extra-class communication (Waldeck et al., 2001). Our findings, based on the corresponding β weight and structure coefficient for immediacy, support that assertion. In order for students to value electronic communication, immediacy behaviors need to be used in extra-class messages to negate the missing non-verbal cues typically employed in a face-to-face course such as

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tone of voice, facial expressions, and body language. Students might see that the manner in which an instructor responds to electronic messages as an indicator of how much the instructor cares.

Reasons for Electronic Communication at the Item Level

We think it is also important to look at some of the reasons students indicated they were or were not communicating. Recall that these responses were in response to the technology they used most often to communicate with their instructor. As seen in Table 1, descriptive statistics suggest that students were not avoiding communicating with their instructor by phone or in person (R15), nor were they communicating to try escape or divert their attention from working on other tasks (R4) or to tell instructors about themselves (R7). Students reported that they mostly were communicating electronically to ask questions about the content (R10) or exam (R12), clarify information from the lecture (R11), or acquire guidance regarding assignments (R13).

Limitations

All studies have limitations, which are important to consider. First, data in this study was self-reported by students about their current instructors. However, their opinions on POV might have been influenced by previous instructors or prior learning experiences, which might have skewed their choices. Another limitation to consider is that the data were collected at one community college within a specific level of courses. These students and instructors might not be representative of all community college students. Additionally, only a few instructors agreed to invite their students, and student participation was voluntary, resulting in a small sample size and possible bias. In particular, bias would be introduced if instructors who chose to participate had a more positive perception of their extra-class participation than those who did not choose to participate. Therefore, the results lack generalizability. Future researchers should consider collecting data from a wide range of schools to obtain a larger sample size and variety in student demographics. This study attempted to examine various types of technology-based communication, but email was the primary mode of communication. Future research, with larger a sample, should examine the prevalence of other modes of technology-based communication and their impact on the development of student-teacher relationships or specific aspects of email that encourages communication.

Implications

Extra-class electronic communication between instructors and students is important, particularly with students enrolled in developmental mathematics at a community college who often have to balance work, life, and school and often

attend college on a part-time basis. Thus, asynchronous technology-based communication provides additional means to promote student-teacher interactions outside of class time. This might be especially beneficial for community college students who attend school part-time and thus have limited opportunities for face-to-face communication when they do not have access to the campus during the day. Using technology means that physical presence is not needed for students to perceive value in communication with their instructors outside of class (Bippus et al., 2003). Another benefit of communication with technology might be that the physical distance presents a number of students with a way to reduce anxiety about communicating in person with their instructor (Waldek et al., 2001).

An implication of this study is that instructors should encourage students to initiate electronic communication for clarification and procedural reasons, help students understand that the electronic communication is not wasting anyone's time, and respond with verbal and non-verbal cues through the use of immediacy behaviors (i.e., emojis and use of names) that show the instructor cares. As noted by Young et al. (2011), extra-class email communication can build student-teacher relationships, and technology-based communication continues to assist in connecting students and instructors both inside and outside of the classroom. Furthermore, positive views of electronic communication can solidify a commitment to student-faculty contact—the latter claimed by Sorcinelli (1991) to be a characteristic of good teaching—and facilitates students' ability to reach their academic goals. We found that the outcome value of electronic communication outside of class was high and was predicted best by students' procedural/ clarification reasons; however, students' personal/social and efficiency reasons and instructors' immediacy behaviors also predicted the value students saw in electronic communication.

Finally, as college classrooms evolve to include more remote-learning options and activity-based learning, electronic communication between students and instructors will become more crucial in the student-teacher relationship. Furthermore, the ability for almost everyone to have access to a mobile phone has increased the ability for electronic communication to flourish. Instant access to email, text messages, social media and other forms of technology-based communication allow students the opportunity to engage with their instructors throughout the day without regard to proximity and the challenge of matching their schedules with instructor office hours. However, communication is not limited to talking; the same immediacy behaviors needed in a traditional face-to-face classroom need to be simulated in the electronic environment.

Conclusion

Electronic communication provides students with the opportunity to build relationships with their instructors outside of the classroom environment. The electronic communication used most often with this sample was email, but faculty members should consider various technology communication tools to facilitate communication between instructors and students. Faculty members should also understand that electronic sources are a viable tool to clarify course materials and assignments.

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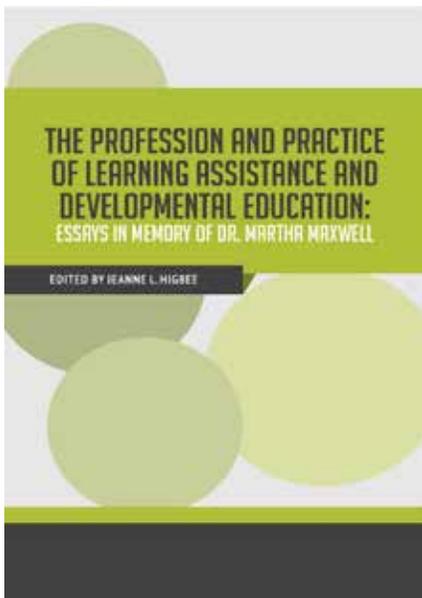
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Virtual Learning Assessment: Practical Strategies for Instructors in Higher Education

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ABSTRACT

Many universities have been designing and implementing online instruction for years, but the COVID-19 pandemic created an unexpected impetus for the expansion of virtual learning. Instructors and students who may not have previously chosen or experienced online instruction found themselves in need of safe, virtual options, and it appears that the general shift to virtual learning is here to stay. Strong, reliable assessment is a major component of virtual instruction, and instructors have several options for structuring student feedback. This article reviews the relevant literature regarding effective online assessment techniques and makes recommendations for the use of examinations and more authentic assessments, including video demonstrations, group projects, and discussion forums. Various data analytics within Learning Management Systems (LMS) are also explored. Discussion includes implications of online assessment and avenues for important research to strengthen response to this growing need.

Keywords: virtual learning, virtual instruction, higher education institutions, online assessment

As Spring 2020 arrived, many could not anticipate the challenges on the horizon. The emergence of a pandemic, COVID-19, presented novel situations never before faced: personally, professionally, and economically. Typical, familiar routines were going to change, and education was not spared this new reality. While businesses closed and homes became office spaces and schools for many families, education systems navigated new territory in virtual instructional delivery. Virtual instructional delivery impacted educational settings from kindergarten through university-level institutions (Gonzalez et al., 2020; Marshall et al., 2020). Virtual delivery of instruction at institutes of higher education was not a new concept before COVID-19; however, the widespread transition of a great number of students was unprecedented. In an extremely short time, a vast number of instructors were faced with the challenge of making a novice shift to the use of online learning management systems (LMS) and virtual learning strategies (Perrotta & Bohan, 2020).

Virtual instruction in a higher education

setting is characterized by varied and diverse instructional methods. A review of previous research indicates that the process of learning online is typically categorized by the instructional delivery of content and student feedback (Gaytan & McEwen, 2007; Sieber, 2005). Traditionally, instruction in higher education occurs in a face-to-face setting, whereas online instruction is becoming a more common and widely accepted approach (Barnard-Brak & Shiu, 2010). In light of this rapid and recent demand for the use of virtual instructional technology at institutes of higher education nationwide, this article seeks to offer support to instructors responsible for virtual instructional delivery. The following demonstration of promising strategies for virtual learning assessment emphasizes the critical role assessment plays in postsecondary student performance. The use and modification

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of traditional exams and more authentic assessments, such as video demonstrations, group projects, and discussion forums, are discussed. Authors provide recommendations for practical strategies to incorporate the effective use of online assessment in LMS.

Online Assessment in a Virtual Learning Environment

Varied and diverse instructional methods characterize virtual instruction in the higher education setting. Studies of student perspectives regarding face-to-face versus online instruction indicate that students prefer direct interaction, real-time communication with the instructor, the use of a variety of instructional methods, and responsive learning strategies during the initial delivery of course content (Gaytan & McEwen, 2007; Sieber, 2005). An online learning environment has been relevant and critical across institutes of higher education for more than 10 years (Corey & Ben-Porath, 2020; Gaytan & McEwen, 2007; Sieber, 2005; Young, 2006). Undergraduate and graduate students have previously chosen to engage in online learning due to location, employment schedules, or a preference for online instructional delivery (Gaytan & McEwen, 2007). However, students who may not have selected online learning as a preferred instructional approach previously have been forced into this learning environment due to COVID-19 (Perrotta & Bohan, 2020). This shift necessitates instructor competence in a virtual learning environment. Previous researchers have argued that online assessment can be more challenging than traditional assessment formats due to the demand for innovation and the absence of human interaction. For instance, Gaytan and McEwen (2007) found that “using effective assessment techniques is an essential part of effective teaching and learning in the electronic environment” (p. 118). Therefore, instructors can greatly improve online instruction and learning by developing assessments that encourage reflection and meaningful engagement with materials. The following discussion outlines virtual assessment formats and establishes online assessment guidelines for higher education course integration. See Figure 1 for an outline of helpful strategies for including assessment in online higher education courses. In addition to the thoughtful use of exams and authentic assessment strategies listed, authors encourage instructors to consider leveraging data-collection features embedded in LMS as a part of online assessment.

Figure 1
Tips for Effective Online Assessment

Type of Assessment	Strategies
Exams, General	<ul style="list-style-type: none"> • Limit access to exam items • Use virtual proctoring (i.e., lock-down browsers or video surveillance devices or systems) • Use open-ended essay questions • Consider open-resource exams
Exams, Multiple-Choice/Selection	<ul style="list-style-type: none"> • Use random item pools for exam question selection • Set time restrictions • Allow multiple trials • Reduce the weight of exam grades
Authentic Assessment, Video Demonstrations	<ul style="list-style-type: none"> • Provide structured guidelines for self and peer reflection/feedback • Provide and clearly communicate rubrics prior to submission of assignments
Authentic Assessment, Group Projects	<ul style="list-style-type: none"> • Create collaborative, field-based products • Provide instructor and peer feedback toward goals • Include anonymous or confidential peer reviews of contributions • Provide clear project rubrics
Authentic Assessment, Discussion Forums	<ul style="list-style-type: none"> • Introduce concrete questions • Use field-based examples to generate discussion • Allow students to grapple with questions that may not have an answer • Provide a resource for a common concern in each forum to focus the discussion on collaborative problem-solving • Provide a moderate level of direct feedback regarding discussion posts • Encourage peer responses

Note. Figure 1 adapted from Barry, 2012; Gaytan & McEwen, 2007; Harmon et al., 2010; Salter & Conneely, 2015; Schultz & Quinn, 2014; Sieber, 2005; Talley & Scherer, 2013; Young, 2006.

Exams

Exams and quizzes are often one of the first options considered by instructors for the assessment of knowledge and skills when developing an online course. Historically, student performance in online courses has been evaluated primarily through the use of unproctored, multiple-choice exams (Harmon et al., 2010). Despite the relative objectivity and longstanding history of these exams, instructors should look for ways to provide more authentic and interactive assessments of knowledge and skills (Kim et al., 2008; Shaw, 2019).

A major concern with online exams relates to integrity and academic dishonesty (Harmon et al., 2010). There is an ongoing investigation in the literature regarding cheating in online courses, with differing results when comparing rates, motivations, and types of cheating online as opposed to face-to-face classes (e.g., Stowell & Bennett, 2010; Watson & Sottile, 2010).

Despite these findings, researchers generally agree that online exams present an increased risk of cheating, particularly exams that are not proctored (Harmon et al., 2010; Watson & Sottile, 2010). Several adjustments improve online exams: limiting access to exam items or questions, reducing the weight of exam grades, and virtual proctoring, including the use of lock-down browsers or video surveillance systems. Virtual proctoring strategies are specifically recommended for exam integrity (Harmon et al., 2010) but are not always practical and could conflict with student needs or motivations for enrolling in online courses (Sieber, 2005).

Since unproctored multiple-choice exams are practical and likely to be very prevalent in online courses, instructors might consider three sensible strategies to improve these assessments: random item pool selection, time restrictions, and multiple trials. First, well-developed online question pools can allow for better content validity and comprehensive assessment of knowledge. To further improve this type of assessment, instructors should review item pools and select well-written questions that accurately represent their course objectives; this is especially true when using publisher-provided multiple-choice question pools. In this case, instructors should consider adding self-written questions to meet a predetermined ratio. For example, if a publisher question pool has 40 relevant questions, instructors may add 10 instructor-developed questions to reach a goal of 20% course-specific items. The exam can then be set to randomly select items from the larger question pool (Shuey, 2002, as cited in Harmon et al., 2010). This random selection of questions is a valuable feature in online courses and mimics shuffling strategies proven effective in face-to-face courses (e.g., multiple paper versions, etc.; Harmon et al., 2010).

To further protect exams and ensure a more accurate evaluation of knowledge, instructors should limit exam duration. In most cases, this can reduce cheating opportunities or unauthorized peer collaboration, especially in conjunction with random pool selection. Time limits are not a perfect solution and may be overwhelming to some students. However, Stowell and Bennett (2010) determined that student test anxiety is dependent on

several factors beyond online vs. face-to-face administration and that limited virtual exam administration time may reduce student anxiety, depending upon student course expectations. In addition, allotting more time for exams does not seem to lead to better performance (Portolese et al., 2016). Instead of allowing students an unspecified amount of time to complete exams, instructors are encouraged to allow students to take exams or quizzes multiple times (two or more trials depending on the size of the question pool). Doing so may reduce the burden associated with time restrictions, with the added benefit of encouraging self-regulated learning. Namely, instructors can recommend or require students to take an exam once, early within a module, after exposure to relevant material. Based on initial trial results, students can identify areas of course content weakness, target concept development for the study, and make an additional attempt thus allowing formative evaluation through ongoing progress feedback (Kim et al., 2008).

One further strategy is to shift from selection-based (i.e., multiple-choice, true-false) exams altogether. Open-answer or essay assessments encourage access to higher-order learning and knowledge, which is also more appropriate for open-source administration. Essay or short-answer exam responses allow assessment of writing and concept development beyond more basic recognition tasks, such as analyzing an argument or compare/contrast responses. In addition, writing samples can

be pulled from previous products such as personal journals, online portfolios, or more collaborative, group writing (e.g., Google Docs) to allow for analysis of progress and formative assessment as well (Kim et al., 2008). Myyry and Joutsenvirta (2015) reported that although open-source exams do not directly correlate to learning outcomes, online access to sources (i.e., textbook, web-based) reduces anxiety and improves self-regulated learning. Open-source exams also emulate authentic, field-based scenarios and professional applications. In other words, real-world scenarios more often involve collaboration and collection of sources and information to address questions and problems in the field instead of accurate, in-

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the-moment recall. If instructors have academic integrity concerns, most LMS have the ability to review student feedback through plagiarism-checking software (e.g., Turnitin; Watson & Sottile, 2010).

Authentic Assessment

Shaw (2019) defined authentic assessments as “creative learning experiences to test students’ skills and knowledge in realistic situations,” which require the application of student learning. Authentic assessments bridge student critical thinking capacity and are best used in conjunction with more “traditional” assessment approaches (Kim et al., 2008). As such, authentic assessment can be applied in many creative ways in a virtual setting.

Video Demonstrations

Student-developed video is an authentic assessment strategy that facilitates collaboration and peer-assisted learning. Video demonstrations involve the recording of mock or actual professional skills and are often used in healthcare or mental health fields for clinical skills and psychological assessments (e.g., Roberts & Davis, 2015; Seif et al., 2013). Video presentations challenge students to synthesize and integrate knowledge through field-based applications (Barry, 2012; Talley & Scherer, 2013). LMS and online resources for video recording and collaboration (e.g., Zoom, YouTube, VoiceThread, etc.) are becoming more available and accessible to students and universities. These platforms make it easy for students to create and submit high-quality recordings and presentations with most cell phones or laptops. Both synchronous and asynchronous video delivery increases student engagement through thoughtful review, self and peer evaluation, instructor evaluation, and feedback. When paired with structured guidelines for self and peer reflection, student videos can be an effective strategy for self-regulated learning and improve positive learning behaviors (Barry, 2012; Schultz & Quinn, 2014; Talley & Scherer, 2013). Additionally, assessment of student videos must utilize rubrics that are clearly communicated for both the instructor’s assessment of knowledge and skills as well as for the student’s self- and peer-review (Barry, 2012; Schultz & Quinn, 2014).

Group Projects

Group projects, another authentic assessment technique, develop transferable skills in collaboration and communication. Through developing a collaborative product, students share knowledge and provide peer evaluation and feedback. Group projects cultivate self-regulated learning and real-world skills and are most effective when groups are

given ongoing progress feedback (Tsai, 2013). In this way, instructors effectively develop practical, professional skills by designing group collaborations to mimic professional products (e.g., lesson plans for teachers). Additionally, group projects reduce instructor grading demands, which can be especially helpful when providing feedback on lengthy writing assessments. Current and emerging platforms (e.g., Google Docs, Dropbox Paper, Remind or social media) allow student groups to write, edit, comment, and provide dynamic peer assistance to develop papers, essays, and presentations. Instructors can use these same editing and collaborative features to check for understanding and provide more frequent or timely feedback.

Although some students may dislike group assignments, online students generally perceive them as do students in face-to-face classes (Johnson, 2006). Students view the modeling of structured and timely communication and use of meaningful examples as particularly effective practices in online courses (Young, 2006), and these can help to orient students to group expectations as well. Using rubrics for group projects helps instructors set clear expectations and encourages timely feedback on progress (Gaytan & McEwen, 2007). To be effective, rubrics should define the project tasks that are relevant to practice, tie to learning objectives, and clearly state the criteria used for evaluation (Shaw, 2019). Rubrics also ensure common goals and guide the division of responsibilities within groups. Similarly, it is reasonable that student concern could exist regarding the assignment and grading equality among group members. To combat this concern, authors suggest that instructors create opportunities for anonymous or confidential student self and peer feedback regarding their group contributions. If well structured, this feedback may be used as a portion of the project grade or included as a separate course participation grade.

Discussion Forums

Student discussion forums are another common, well-documented strategy to evaluate virtual student progress and knowledge acquisition (Balaji & Chakrabarti, 2010; Kim et al., 2008). Discussion forums are a convenient assessment tool that allows all students to socially engage in course content, which is otherwise difficult in face-to-face classes due to time and space constraints or social dynamics. Student perceptions and engagement levels during online discussion forums are varied; however, it is apparent that structure and clear expectations are critical (Balaji & Chakrabarti, 2010; Salter & Conneely, 2015).

Discussions designed to target student-centered, field-based problem solving improve course performance and learning (Stockwell et al., 2015). Instructors should pose concrete questions, use field-based examples to generate discussion, and, when possible, allow students to grapple with questions that may not have an answer (Salter & Conneely, 2015). Further support may be given by providing a video link or article about a common concern or debate in each forum to help focus the discussion on collaborative problem-solving. Finally, instructors should strive to provide a moderate level of direct feedback regarding discussion posts and encourage peer responses (Balaji & Chakrabarti, 2010; Salter & Conneely, 2015). These strategies have encouraging results, even in courses that are often viewed as involving more technical skills, such as statistics (Everson & Garfield, 2008). When structured in this way, McDougall (2015) found virtual discussion forums encouraged respectful disagreement and conceptual development that students found authentic and beneficial. In addition, discussion forums allow for further assessment of writing development and skills, similar to essay prompts on exams. Importantly, though, discussion forums seem to build writing skills and empowerment through self-reflection and use of peer models in written posts (Salter & Conneely, 2015). Sieber (2005) also recommended that students should be required to write discussion posts in a professional communication style, which will further develop practical writing skills and reinforce the relevance of these assessments.

Leveraging LMS Features for Assessment

It is highly recommended that instructors take advantage of monitoring technology available in many LMS. Metric tracking can be used and reviewed for engagement of course content. You (2016) noted that student self-regulated learning behaviors (e.g., frequency of logins, time spent in content areas, number of assessment attempts, etc.) predicted success in an online course. In contrast to course attendance or participation, instructors can monitor and grade students' self-regulated learning behaviors through LMS evaluation metrics. By doing so, instructors communicate to students the importance of self-regulated

learning and its relationship to successful learning outcomes. As an additional graded metric, students can be asked to self-report reading goals and time spent reading for each course module through a course survey. Student self-reporting strategies evaluate important metrics of student learning and support self-regulated learning and success in all courses.

In direct connection to recent, significant institutional changes due to COVID-19, instructors should consider using LMS features and technology to support students who may be unfamiliar with virtual learning. Student virtual learning experiences vary; student expectations and orientations toward learning drive virtual course outcomes (Johnson, 2006; Yurdugul & Menzi Cetin, 2015). Therefore, it is critical to establish clear student expectations early in the course during the virtual learning process (Sieber, 2005). Additionally, students have expressed a sense of social disconnection from course instructors and classmates in online courses (Plante & Asselin, 2014). Online databases, "copy" options, and other LMS embedded technology features can address perceived communication and social barriers in a virtual learning environment. Instructors are encouraged to develop step-by-step instructions with screenshots/images, aiding student orientation to course assessments. Students report positive reactions toward increased instructor guidance and value the use of LMS features that facilitate efficient and personalized communication, such as the calendar, chat, and notification features (Lonn & Teasley, 2009; Young, 2006).

Conclusion

The current demand for virtual assessment in technology-mediated systems is high. Institutes of higher education can improve students' virtual learning experiences through strategic assessment. Robust assessment does not rely on a single format but rather employs multiple metrics to measure student progress and knowledge acquisition. Instructors should continue to seek authentic assessments that engage students in collaborative problem-solving and provide opportunities for peer-assisted learning and peer evaluation through the development of field-based products (Kim et al., 2008). When instructors provide timely student feedback and continual progress communica-

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research
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feedback and
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on student
performance.

tion throughout a course, students are most successful (Barry, 2012; Tsai, 2013).

Innovative technology and media are continuously being developed and implemented in education. An exhaustive list of innovative assessment strategies is beyond the scope of this article. However, the nature of virtual learning environments, especially in the wake of COVID-19, is of notable significance and elicits additional ethical challenges for privacy, fairness, and equity. Instructors should check with their institution's instructional technology policies when selecting class platforms outside of university-adopted LMS. Many online platforms could present a privacy or security risk, especially when relying on personal accounts. Even with clear instructions, instructors may be unable to monitor access or inappropriate interactions. Additionally, instructors face the challenge of creating virtual content and environments that are accessible for an increasing group of students who may not have otherwise opted for online instruction. Thus, instructors should carefully consider course expectations for assessment strategies based on student population, such as student demographics, access to consistent and stable internet, computer resources, fees for software programs, student ability to reply or respond within designated time frames, etc. Many strategies for online assessment may also make it difficult to provide necessary accommodations for disabilities or cultural and language differences.

Finally, despite these promising strategies for improved assessment methods, there are still avenues for further exploration in virtual instruction. Prompt and supportive feedback is critical (Mann, 2014; Plante & Asselin, 2014); however, future research should provide insight into the best type of feedback and its outcomes on student performance. Also, it is not clear if students provide open, unbiased feedback regarding self and peer contributions and progress in a virtual learning environment, even when the avenue for feedback is anonymous or confidential. It would be helpful to know how feedback improves engagement and performance and how assessment modality impacts these outcomes. For example, a sparsity of data exists concerning the relationship of multiple assessment trials for multiple-choice exams and student performance outcomes, content knowledge, or acquisition of positive self-regulated learning behaviors. Greater exploration of multiple assessment trials in online environments could contribute to improved student outcomes.

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SPECIAL CONTRIBUTION ARTICLE

Staying on Course During the Pandemic Storm: Challenges and Opportunities

Essie Childers, Department of Humanities, Blinn College

<https://doi.org/10.36896/3.2sc1>

ABOUT THE AUTHOR



Essie Childers is the recipient of the CASP 2020 Lifetime Achievement Award. Recipients of this award must have 20 years of experience and made outstanding contributions in the field as well as have contributed significantly to Texas Association of

Developmental Education (TADE) and Texas College Reading and Learning Association (TxCRLA). Childers, having taught for 32 years, is known for mentoring and encouraging students to visualize success to reach their academic and personal goals. For the past 13 years, she has taught learning frameworks and integrated reading and writing courses at Blinn College in Bryan, Texas. Childers is past president of the Texas Community College Teachers Association and in addition to her lifetime achievement accolade, she has received numerous institutional, alumni, community, state and publisher awards for her long-time advocacy and support of students. Childers currently serves on the Quality Enhancement Plan Development Team at Blinn College and is a Senior Fellow of the first Blinn College Future Works Academy. Adapted for J-CASP, her CASP 2020 keynote address focuses on challenges and opportunities during the COVID-19 pandemic.

*"One thing I always say is that learning something new does not require a skill set; it requires a mindset."
—Clara Alan*

I am so honored to participate in the first virtual College Academic Support Programs (CASP) 2020 Conference. I am standing on the shoulder of greatness today, a membership of 2,000 educators, students, administrators, business partnerships, and many other supporters of CASP. Before I share my topic, I would be remiss if I did not recognize President Rachel Hunt of CASP and President Mary Hellen Martinez of TADE. I know that these two outstanding leaders and many CASP members and their respective committees have put in many hours to make this conference a reality. Additionally, the newly revised website for CASP is inviting and informative, and I congratulate and salute the efforts of all involved.

Several months ago, when asked to be a speaker, I immediately examined the website and conference theme, "Discovery and Opportunity." What a timely theme. So, to echo the theme, allow me to tug at your sleeve for a few moments on the topic, "Staying on Course during The Pandemic Storm—Challenges and Opportunities.

Do you remember the story of the *Little Engine That Could*, retold by Watty Piper (a pseudonym), and credited to Mabel C. Bragg for the 1916 version *The Pony Engine*? Published by Platt & Munk, the book has sold millions of copies and been translated into numerous editions since its first printing in 1930 (Plotnick, 2012). A classic tale of optimism and determination, the book was a favorite of my children. As the story goes, when a locomotive engine pulling a train carrying birthday toys and goodies to children on the other side of the mountain breaks down, none of the other locomotives passing by would help. Finally, a little blue switch engine with the mantra "I think I can, I think I can," saves the day by pulling the train over the mountain to reach the children.

Figuratively speaking, I would like to compare higher education as the train, the mountain as COVID-19, and the little blue switch engine as CASP. Hold those thoughts for a moment. The landscape of higher education has changed dramatically amidst the pandemic. We, as a nation have experienced COVID-19 illnesses and deaths. There has been a rise in police brutality with conflict between people of color and the police. For example, consider the deaths of George Floyd and Breonna Taylor. Also, we see crises in the economy and public health sectors, continued segregation in housing and public education, loss of jobs, students moving out of dorms to switch to remote learning, and the list goes on and on. However, life continues to happen, and students must continue their education. It is no wonder our students need our help to navigate through this pandemic.

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Challenges and Opportunities

The smooth mountain became uneven, rocky, and stormy, leaving many eyebrows raised in disbelief. However, the mission of CASP has not changed. During this rocky period, CASP continued to create learning and training environments to address the call of “Help!” from students and faculty. There were many challenges created by the pandemic storm rolling over the mountain. Some Texas postsecondary institutions remained open with social distancing guidelines in place, and some decided to go entirely online. Regardless of the circumstance, there was a need for immediate faculty training in online pedagogy and technology, communication with students, and social distancing.

National Survey of Faculty

Remote learning last spring enhanced educators’ views of how faculty can use technology for student learning and opened growth opportunities. According to a survey report titled, *Time for Class COVID-19, Part 2: A National Survey of Faculty During COVID-19* (Fox, et al., 2020), in which I was a participant, faculty redesigned their courses from spring to fall to achieve those goals. More than half of the instructors said they had updated their learning objectives, assessments, and activities (61%) and integrated the use of new digital tools (60%). In comparison, nearly half (46%) said they had embedded more active learning elements (e.g., group discussion) to enhance student learning and engagement. About three-quarters of those who were preparing to teach online (74%) and those who were preparing to teach fully in-person (73%) agreed with the statement, “I am prepared to deliver a high-quality learning experience to my students this fall,” while about 10% disagreed.

Informal Survey of Texas Postsecondary Educators

I also surveyed faculty members throughout our state with this question, “As a result of COVID-19, what new programs or changes has your institution created to help students succeed?” The myriad of responses included institutions establishing protocols for self-reporting illness/symptoms, mandating social distancing, the wearing of masks, cleaning and sanitizing desks, and establishing hand sanitization stations. COVID-19 websites were created with resources, information, and contacts to guide students through the pandemic. Institutions have amended academic calendars and remodeled classrooms by knocking out walls to create more social distance for face-to-face classes. Administrators have also offered faculty training for online pedagogy and assisted them with equipment needed to create home offices.

Institutions have amended attendance policies for COVID-19-related absences and created 4- and 8-week classes to improve student retention. Regarding technology support, institutions have posted frequently asked questions and answers on their websites and used platforms such as Blackboard Collaborate, Microsoft Teams, Zoom, and CircleIn.

Support has included offering Chrome Books and laptops to students in need. Colleges have utilized success coaches, virtual and recorded simulation labs, virtual advising, and virtual office hours. Supplemental Instruction and tutoring have been offered as free services in both online and in-person formats. Additionally, several institutions have formed diversity councils.

Administrators, faculty, and staff were able to find solutions for the many challenges they faced to ensure that the facilitation of learning continued. There were many doubts and questions in planning and revising programs and procedures, questioning if the new format or changes would work. But somewhere, confidence grew, and I can hear someone say, “I think we can, I think we can, I think we can.”

Can you see opportunities arising from the result of COVID-19? Absolutely! One can conclude that the programs and changes are a work in progress. Teaching and learning are always under construction. Burger and Starbird (2012), in their book, *The 5 Elements of Effective Thinking*, stated that the fifth element is the simplest and most difficult as the title of their chapter suggests: “Engaging Change: Transform Yourself” (p. 119). COVID-19 caused many of us to change or adjust our thinking about online learning.

Conclusion

As educators prepare for the upcoming semester, the mountain has not moved. There are still some rocky paths to climb. However, it is a comfort to know that educators have been resilient in creating solutions during the pandemic, learning new active-learning strategies, and seeking ways to continue our mission of serving students. I may compare CASP to a little switch engine, but anything is possible when great minds collaborate. Educators keep the steam rising, and instead of saying, “I Think I Can,” Let’s say, “I Can.” Let us embrace change and rise over the mountain, elevating academic support programs to help all students reach excellence on their educational journey.

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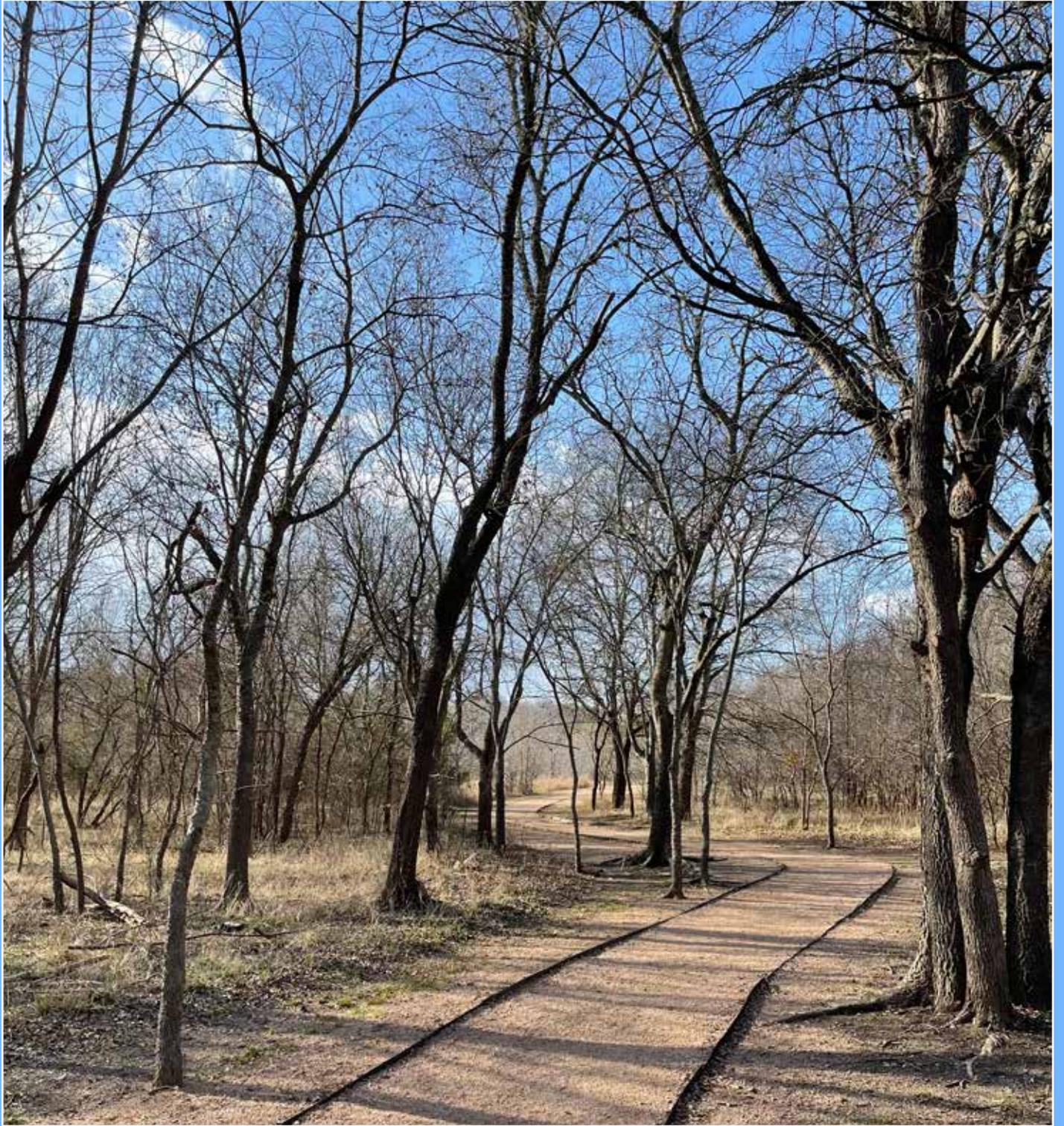
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PROMISING PRACTICE

Harnessing Talent: A Tiered, Accelerated Leadership Model for Academic Support Programs

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<https://doi.org/10.36896/3.2pp1>

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Lindley Workman Alyea has been working at Texas State University since 2005 and is currently the associate director of the Student Learning Assistance Center (SLAC) where she coordinates the Supplemental Instruction (SI) program and oversees SLAC's outreach and public relations components. Alyea is also a long-time instructor and faculty mentor of University Seminar 1100. She holds a BA in radio, television, & film and an MA in English from the University of North Texas.

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Samantha Allred is the new learning resource coordinator at Montana State University Billings where she oversees SI and STEM tutoring. Allred received her BS in psychology from Louisiana State University, in Baton Rouge, Louisiana. She is currently working on receiving her MA in student affairs in higher education at Texas State University.

Student Learning Assistance Center (SLAC) houses several academic support programs, including the SI program, a Learning Lab (walk-in tutoring), a Veteran Academic Success Center (a holistic academic and social integration program for student veterans and military connected students), and an Online Writing Lab. With only 7.5 full time staff members and two graduate assistants supervising a staff of more than 110, each of SLAC's components espouses similar leadership structure and development among its undergraduate and graduate student personnel. Texas State SI is accredited by the International Center for Supplemental Instruction.

While student-leadership models are not uncommon among Supplemental Instruction (SI) programs, Texas State University has developed a tiered leadership model providing real-world paraprofessional experience to the undergraduates and graduates who serve as its leadership (Skalicky & Caney, 2010; The International Center for Supplemental Instruction at the University of Missouri-Kansas City, n.d.). The intention of this model is to increase the responsibility of each tier, creating more marketable new professionals while allowing full-time staff members to focus on larger programmatic objectives. Under Texas State's tiered SI leadership model, undergraduate student leadership is primarily responsible for front-line program coordination while graduate student leadership functions as a half-time professional, coordinating personnel management from recruitment to onboarding and managing initial program assessment each semester. Professional staff members closely monitor and concentrate on the work and development of the student leadership through weekly team meetings, individual bi-weekly meetings, and annual leadership retreats focused on needs assessment and larger program goals. The outcome is a heightened professional development experience for student leadership with greater ability of full-time staff members to better allocate time to other administrative tasks, metaphorically creating "hours" in the workday.

Leadership Pyramid & Position Responsibilities

Supplemental Instruction (SI) leaders form the foundation of the Texas State program's personnel pyramid and begin facilitating collaborative group study sessions after completing 20 hours of pre-semester training. During each long semester, SI leaders attend monthly 2-hour training meetings for the purpose of continuing professional development, receiving updates or reminders, and tackling relevant discussion items. SIs attend one special topic training each fall semester with topics ranging from Active Shooter to ALLY training. SIs also participate in the annual Student Academic Support Programs (SASP) training conference for personnel from various centers across campus each spring. Pre-semester and monthly trainings are prepared and facilitated by "upper" leadership comprised of team leaders, senior leaders, and a graduate assistant.

The first tier of the leadership team consists of 4 to 6 team leaders. A team leader possesses the dual roles of SI and SI mentor, having applied for and been selected to take on additional responsibilities while continuing to serve as an SI. These additional responsibilities include designing and leading

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components of pre-semester and ongoing training and performing SI session observations, which increases the number of times an SI leader is observed facilitating study groups and ensures consistent, timely, growth-oriented feedback to SIs.

A team leader also becomes a member of one of four committees tasked with meaningful work on behalf of the department. Current committees include the Social Committee (tasked with creating social engagement opportunities and an inclusive work environment), the Social Media and Marketing Committee (tasked with generating social media content for multiple platforms and marketing services to students), the Recruitment Committee (charged with targeting and contacting potential employees), and the Care Committee (charged with identifying community service opportunities for personnel). A team leader commits 3 to 5 hours per week of work in addition to their 8 hours of SI leader responsibilities.

Senior leaders (or seniors) comprise the next tier of leadership in the pyramid. These former SI leaders apply for and are selected as an undergraduate supervisor (Stone & Jacobs, 2008). Each of the 3 to 5 seniors work in an entirely administrative capacity for 20 hours each week and provide supervision to an assigned cohort of 12 to 20 SI leaders for the semester. Seniors perform a weekly review of job duty completion for each SI in their cohort (submission of session plans, attendance at office hours or other meetings, etc.), inquire as to missing items, and resolve performance concerns from the straightforward conversations to the more complex creation of performance improvement plans. Familiarity with the work of their cohort members allows a senior leader to provide a holistic performance overview of each and then make recommendations to the leadership team about re-hire for subsequent semesters. Seniors assist the graduate assistant in recruitment and selection of SIs, conduct session observations, plan and facilitate training, and assist with compiling program statistics at the end of each semester.

The program's graduate assistant (GA) has the opportunity to tailor job duties based on existing skillsets and what they hope to gain from the one to two-year appointment. Target skills and tasks are identified by the GA and SI coordinators at the beginning of each academic year. All GAs, regardless of previous experience, oversee the program's hiring process, a 1- to 2-day selection conference requiring the GA to vet candidates, collect references, schedule group and individual interviews, assign interviewers

from the leadership, and participate in the interview process before overseeing selection decisions. Additionally, the GA creates and compiles the results from beginning-of-term scheduling surveys and end-of-term qualitative feedback surveys, as well as supervises the team's completion of quantitative and qualitative data compilation at the semester's end.

Professional Benefits of Leadership Positions

SI leaders attain knowledge through trainings about topics such as academic self-efficacy, the information processing model, multicultural and diversity topics, continuous partial attention, and more. As a result of this work, SIs frequently report gains in self-confidence, communication, and facilitation (Congos & Stout, 2003). Facilitating sessions provides practice in classroom management, public speaking, and course content while post-observation meetings provide opportunities for self-evaluation followed by processing and implementing the constructive feedback received (Lockie & Van Lanen, 2008).

Team leaders gain experience assessing performance and delivering constructive feedback to peers. They also receive presentation and public speaking experience by delivering components of trainings known as Discipline Specific Training, and their refined skills are demonstrated in an end-of-semester presentation to the SI leadership team. Team leaders grow in ability to function as a team member working toward a common goal through committee work and may volunteer to gain interview experience by conducting SI selection interviews.

Senior leaders leave their positions with managerial and supervision skills uncommon in most part-time college positions (Campbell et al., 2012). In addition to assisting with evaluation and assessment, senior leaders learn to manage conflict and resolve concerns while being provided guidance from professional staff during team and individual meetings. Each senior receives extensive supervision experience with a cohort of 12 to 20 SI leaders directly reporting to them, thereby learning what it means to handle small (e.g., finding a session a substitute for a sick SI leader) and large (e.g., managing interpersonal conflict) common within academic programs. Skills necessary for successful program management such as organization, prioritization, time management, and attention to detail are ingrained in all aspects of the senior leaders' position. The experience of being a senior leader holistically prepares students for graduate school, internships, and professional jobs.

Graduate assistants gain experience in recruitment, interviewing, and large-scale programming. They receive

Supplemental
Instruction (SI)
leaders
form the
foundation
of the Texas
State program's
personnel
pyramid...

additional event planning experience by helping plan departmental events such as the SASP Conference and bi-annual recognition and appreciation banquets. Planning and executing trainings are two additional skills reinforced through this position. Classroom outreach presentations, recruitment, and training help GAs develop strong communication and presentation skills. This paraprofessional position serves the SI program and SLAC while directly preparing the GA for the job search process (Campbell et al., 2012).

All levels of program leadership gain practice in logistics and procurement of the often small but vital items necessary for staff to work effectively (e.g., spiral notebooks, index cards, or bottles of hand sanitizer); this provides the most accurate understanding of “what it takes” to handle day to day needs of 60-plus members of a staff. All levels of leadership practice setting goals and objectives, as well as the need to review roles and responsibilities regularly. Senior leadership and graduates frequently conduct needs assessments, focusing on program policies and procedures and what can and should be improved. Seniors, the GA, and the program coordinators design training protocols while team leaders participate in the process by presenting selected topics at various meetings. Each training component conducted by the leadership team benefits the individual, and the program benefits from a more involved, connected program of student leaders (Kiersch & Peters, 2017).

The seniors and graduate assistant often propose and complete major program initiatives during the summer months. Examples of previous projects include the creation of online training modules, a custom SI leader training manual, and procedures for selecting senior and team leaders. Program coordinators also encourage and mentor seniors and the GA through the process of proposing concurrent sessions for professional conferences, and members of leadership have presented at SASP, Texas A&Ms Regional Conference on Supplemental Instruction, University of Northern Georgia’s Virtual Conference on Supplemental Instruction, and the International Conference on Supplemental Instruction.

Conclusion

The accelerated leadership model implemented within Texas State’s SI program creates an environment rich for meaningful professional growth and nurtures skills aimed at making its membership workforce ready upon graduation. Each tier of leadership has meaningful and unique facets of responsibilities that contribute to the health and efficacy of the organization as a whole. This model only requires that rather than relying solely on their own abilities, professional staff have a willingness to harness the strength and talent of a staff ripe with high achievers and individuals who strive to excel (Bardou et al., 2003).

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PROMISING PRACTICE

#CampusScavengerHunt: A Professional Development Workshop Using Digital Literacy to Build Student's Self- Efficacy and Sense of Belonging on Campus

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<https://doi.org/10.36896/3.2pp2>

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College bound students are faced with not only navigating a new environment but also faced with finding their “place” in a new community. Educators have a role to support students’ academic growth, self-efficacy (Schunk & DiBenedetto, 2020; Bandura, 1977), and sense of belonging (Brady et al., 2020; Hurtado & Carter, 1997) on campus. However, many educators are only explicitly taught about the need to support students’ academic needs. These practitioners need professional development to build their understanding of the importance of increasing students’ self-efficacy and fostering a sense of belonging on campus. Professional development in these two areas provides support for instructors as they extend their hand to students. In this paper we describe a short professional development workshop designed for teaching university seminar instructors about the importance of actively increasing their students’ self-efficacy and sense of belonging on campus by utilizing digital literacies (Andres, 2020; Gee, 2012) as a way to build campus community and classroom engagement (Clarke & Wilson, 2016) via Instagram Stories in their class assignments.

This professional development workshop is motivated by the reality that many students arrive on campus uncertain about their ability to succeed in college and are at a loss for how to navigate the vast university systems (Araujo et al., 2014). Student’s questions surrounding accessing financial aid, registration, and student housing often add to the stress of academic coursework. For most incoming freshmen, the move to campus is their first foray into true independence, and while it is definitely exciting, it can also be daunting.

We created a professional development workshop geared towards university seminar instructors because this low-stakes course is usually required of all incoming freshmen and thus provides a great opportunity to develop student’s self-efficacy and sense of belonging early on in their academic career. University seminar courses are typically designed as small classes so instructors can foster community building while teaching first-year college students about how to “do college.” Frequently, university seminar instructors include lessons centered on time-management, navigating university services, exploring career interests, and helping students find their academic home

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including organizations where they feel they belong. University seminar instructors represent a diverse mix of professors, graduate students, and staff members from every discipline on campus. Our workshop is aimed at helping university seminar instructors understand the importance of building students' self-efficacy and sense of belonging on their campus and finding purposeful ways to facilitate developing these sociocognitive constructs in their assigned coursework.

Theoretical Framework

This professional development workshop is framed by three sociocognitive theories including self-efficacy, sense of belonging, and d/Discourse communities. Each of these three frameworks offer research and theory that can help students find their way through the university systems and begin to find themselves as scholars and full members of their academic community.

Self-Efficacy

The first component of our theoretical framework is self-efficacy (Bandura, 1977). Self-efficacy is a student's belief in her ability to succeed, in this case both within the university system, and within her academic coursework (Bandura, 1991). While students are adapting to a new school setting, many other factors, such as self-esteem, motivation and perseverance will influence a student's choice, actions, and abilities to succeed both personally and academically (van Dinther et al., 2020). As students are learning to overcome academic obstacles, the skills utilized within self-efficacy development will entail the ways students are able to handle college learning and self-regulation (Barrows et al., 2013). While self-efficacy has been studied through a variety of constructs, student engagement both in school identity and academic motivation is needed in order for students to thrive in their relationship with their educational goals (Dogan, 2015). Furthermore, when educators are able to connect with students, positive outcomes are discovered (Dogan, 2015). Educator effectiveness is defined with expectations, strategies and ultimately the metacognitive skills required to enforce proper learning in the classroom (Bray-Clark & Bates, 2003). Peiffer et al. (2020) examined student's

self-efficacy in multiple settings. Researchers found students in higher education are focusing on specialized study-related domains, which not only influenced their skills and transfer of knowledge, but also motivated students to learn. With increased self-efficacy, students are able to apply effort and understand challenges, which acts to influence student motivation (Andres, 2020). Therefore, the impact educators have on improving self-efficacy within student learning stems from the skills and strategies educators continue to learn and apply to their instruction (see Appendix A). The second component of our theoretical framework is sense of belonging (Hurtado & Carter, 1997).

Sense of Belonging

The second theoretical framework focuses on students' sense of belonging. This framework is grounded on Astin's 1984 theory of student involvement. Sense of belonging is a feeling of being supported by, and respected within, a certain group. Yuval-Davis (2004) stated, "Belonging is a deep emotional need of people" (p. 215). Incoming freshmen are vulnerable to feelings of isolation and liminality, and frequently question if they are up for the tasks that college demands, and if they truly belong. Developing a sense of belonging is critical to the success of first-year college students, a sense of belonging is positively associated with greater academic achievement and skill development. In college, feeling a sense of belonging may lead students to engage more deeply with their studies, leading to persistence and success. A study by O'Keeffe (2013) found developing

a students' sense of belonging is critical to their college success. This study found students who report higher levels of belongingness in their educational environment have overall better psychological outcomes than students who demonstrate a lower sense of belonging. A long-term social-belonging intervention study by Brady et al. (2020) found a positive correlation between a brief first year of college intervention and future career satisfaction and success, psychological well-being, and community involvement and leadership. By focusing on ways to increase students' self-efficacy and sense of belonging (see Appendix B), university seminar instructors can help mitigate the self-doubt that moves into students' minds.

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d/Discourse Communities

Our third theoretical framework is d/Discourse communities (Gee, 2012). We suggest that by teaching university seminar instructors how to use Instagram Stories as a tool (see Appendix C), instructors can build on a Discourse—digital literacy—with which most students are familiar. Instagram is used by 1 billion active users per month, with 500 million Instagram users logging on daily to Instagram Stories (Mohsin, 2020). Using a comfortable tool will boost students' self-efficacy and sense of belonging while turning a social skill into an academic one. By utilizing Instagram in a bidirectional model of knowledge demonstration, students and instructors can practice content creation and demonstrate knowledge of the assigned content (Castek & Manderino, 2017). Students will utilize Instagram Stories to create content demonstrating their knowledge in short videos and picture essays in individual and group contexts.

Goals and Expectations for the Professional Development Project

The goal of our professional development workshop is two-fold. First, we aim to instruct instructors about the importance of fostering students' self-efficacy and sense of belonging. This goal will be accomplished via informative group sessions where the basic framework of these constructs is outlined, and the instructors share ways they have seen them demonstrated in their classrooms, and brainstorm ways to facilitate consciously and strategically working to foster students' self-efficacy and sense of belonging. The workshop aims to make these constructs visible within the instructors' praxis. The second goal of the workshop is to engage the university seminar instructors in creating a Campus Scavenger Hunt Instagram activity. The instructors would think of a list of university departments and services that students should know about (e.g., Office of Dean of Students, Office of Disability Services). Then with these types of services in mind, the university seminar instructors would create an assignment description and rubric for a Campus Scavenger Hunt using Instagram stories. We do not want to be prescriptive here or stifle university seminar instructors' creativity, so loosely, the assignment description explains how students create Instagram Stories about how to access the various services included on the scavenger hunt. By including hashtags and sharing their digital stories, students create a web of stories that links them across university seminar courses on campus. Through their Instagram

#CampusScavengerHunt stories, students will be able to read individual narratives (Clarke & Wilson, 2016) in a platform that is more inviting and familiar than a Canvas discussion board or PowerPoint, and with their university seminar instructor's foundational support, students can begin the process of finding not only the academic services they need, but the collegiate community they want.

Conclusion

This workshop extends university seminar instructors' understanding of self-efficacy and the importance of increasing students' self-efficacy on campus. Furthermore, the workshop explicates "sense of belonging" from a catchphrase to a critical social construct and provides ways for instructors to genuinely support students' sense of belonging on campus and in academia. Finally, the workshop offers an opportunity for university seminar instructors to learn and become comfortable using Instagram Stories as a pedagogical device. Instagram Stories is only an introduction to social media literacies; instructors can expand their use of them, such as assignments utilizing Twitter, Mural, or Padlet. The ultimate goal of this professional development workshop is to help instructors learn new pedagogical ways to increase students' self-efficacy by learning about the various services on campus and increasing students' sense of belonging by utilizing a social media platform in an academic way. Our workshop opens a creative pedagogical door for instructors by showing them how to work with their students in a digital literacy their students already thrive in. This workshop shows both instructors and students that Instagram Stories can be a social as well as "academic" space. Additionally, our workshop girds university seminar instructors in a theoretical understanding of self-efficacy, sense of belonging, and digital literacy as a d/Discourse community. This theoretical foundation will naturally inform their instruction, and more importantly, offer them deeper insight into the sociocognitive needs of their students.

#StudentSuccess #Self-Efficacy #SenseofBelonging

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Appendix A

Self-Efficacy Lesson Plan

Subject/Unit Professional Development		Duration 1-hour
PD Description Professional Development for instructors of first-year students navigating a new college environment. The PD contains three focus points: sense of belonging, self-efficacy, and digital literacy to help instructors learn how to build community for first-year students.		
Topic Self-efficacy		
Aims of Self-Efficacy Lesson Participants will work in cooperative groups to learn the importance of self-efficacy in order to engage students in college culture.		
Lesson Objectives Participants will be able to: <ul style="list-style-type: none"> define and understand self-efficacy and the influence of building motivation and student engagement apply actionable strategies to use in building students self-efficacy implement strategies for future classroom activities that emphasize students’ sense of belonging and self-efficacy in classroom engagement 		
Assumed Prior Knowledge <ul style="list-style-type: none"> course requirements for university seminar students basic understanding of Instagram stories basic understanding of Mural campus layout, resources, and services available 		
Resources <ul style="list-style-type: none"> laptop internet access jigsaw YouTube clip Mural 4 Ways to Improve and Increase Self-Efficacy <ul style="list-style-type: none"> Chowdhury, M. R. (2020). <i>4 ways to improve and increase self-efficacy</i>. Positive Psychology. https://positivepsychology.com/3-ways-build-self-efficacy/ 		
Assessment <ul style="list-style-type: none"> feedback from participants 		
Differentiation Not all participants may be familiar with Instagram Stories and/or Mural. Additional support for these participants may be needed.		
Time Breakdown		
Time	Content & Teacher Activity	Participant Activity
10 min.	<ul style="list-style-type: none"> outline self-efficacy session objectives 	<ul style="list-style-type: none"> participation and small group discussion on self-efficacy
30–40 min.	<ul style="list-style-type: none"> present self-efficacy information 	<ul style="list-style-type: none"> participation in group jigsaw activity using Mural and “4 Ways to Improve and Increase Self-Efficacy” article introduction, overview on how to incorporate jigsaw activities using YouTube video (6 min.) set up Mural accounts to access self-efficacy Jigsaw
10 min.	<ul style="list-style-type: none"> recap of PD session; answer questions 	

Appendix B

Sense of Belonging Lesson Plan

Subject/Unit Professional Development		Duration 1-hour
PD Description Professional Development for instructors of first-year students navigating a new college environment. The PD contains three focus points: sense of belonging, self-efficacy, and digital literacy to help instructors learn how to build community for first-year students.		
Topic Sense of belonging		
Aims of Sense of Belonging Lesson Participants will work in cooperative groups to learn the importance of a sense of belonging in order to increase students' sense of belonging.		
Lesson Objectives Participants will be able to: <ul style="list-style-type: none"> • define sense of belonging • describe how sense of belonging influences student academic success • explain several key strategies for fostering students' sense of belonging • implement at least one new strategy to foster students' sense of belonging in one or more of your courses 		
Assumed Prior Knowledge <ul style="list-style-type: none"> • course requirements for university seminar students • basic understanding of Google Slides • campus layout, resources, and services available 		
Resources <ul style="list-style-type: none"> • device with internet access (Zoom, Google Slides) 		
Assessment <ul style="list-style-type: none"> • feedback and data collection from participants 		
Differentiation Not all participants may be familiar with Google Slides. Additional support for these participants may be needed.		
Time Breakdown		
Time	Content & Teacher Activity	Participant Activity
5 min.	<ul style="list-style-type: none"> • outline aims of session 	<ul style="list-style-type: none"> • introduction, overview on how to incorporate scavenger hunt activities to support students sense of belonging
20 min.	<ul style="list-style-type: none"> • present sense of belonging information 	<ul style="list-style-type: none"> • participation and small group discussion on self-efficacy
20 min.	<ul style="list-style-type: none"> • provide example of Scavenger Hunt by facilitating small group Educator Edition sample hunt-sessions in-person or Zoom breakout sessions 	<ul style="list-style-type: none"> • participation in small groups during Educator Edition sample hunt (discussion, locating information, contributing to Google Slides)
15 min.	<ul style="list-style-type: none"> • recap of PD session; answer clarifying questions from participants 	<ul style="list-style-type: none"> • provide information for further information, support, contact information

Appendix C

Digital Literacy Lesson Plan

Subject/Unit Professional Development		Duration 1-hour
PD Description Professional Development for instructors of first-year students navigating a new college environment. The PD contains three focus points: sense of belonging, self-efficacy, and digital literacy to help instructors learn how to build community for first-year students.		
Topic Digital Literacy		
Aims of Digital Literacy Lesson Provide a 1-hour, professional development workshop for teaching university seminar instructors about how to implement Instagram Stories in their class assignments as a way of engagement and content creation.		
Lesson Objectives Participants will be able to: <ul style="list-style-type: none"> utilize Instagram Stories model how to convert to Google Slides implement at least one new project using Instagram to foster belonging 		
Assumed Prior Knowledge <ul style="list-style-type: none"> course requirements for university seminar students basic understanding of Instagram Stories campus layout, resources, and services available 		
Resources <ul style="list-style-type: none"> laptop with internet access (Zoom, Google Slides) phone with Instagram application introductory preparation video for novice users: <ul style="list-style-type: none"> Read, A. (n.d.). <i>Instagram stories: The complete guide to creating standout stories</i>. Buffer. https://buffer.com/library/instagram-stories/ 		
Assessment <ul style="list-style-type: none"> feedback from participants mini-project showing understanding with one picture posted in a favorite campus location 		
Differentiation Not all participants may be familiar with Instagram Stories and/or Google Slides. Additional support for these participants may be needed.		
Time Breakdown		
Time	Content & Teacher Activity	Participant Activity
10 min.	<ul style="list-style-type: none"> outline digital literacy session objectives 	<ul style="list-style-type: none"> participation and small group discussion on digital literacy
30–40 min.	<ul style="list-style-type: none"> present digital literacy information 	<ul style="list-style-type: none"> participation in group Instagram Stories creation with collaboration
10 min.	<ul style="list-style-type: none"> recap of PD session; answer questions 	

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To provide professional development and networking opportunities for our members through conferences, publications, and discussion forums to advance our effectiveness as educators.

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Supported by the Texas Association for Developmental Education (TADE), the Texas Chapter of the College Reading and Learning Association (TxCRLA), and Texas State University's Graduate Program in Developmental Education, the *Journal of College Academic Support Programs (J-CASP)*—a double-masked, peer-reviewed, biannual scholarly journal relevant to Texas developmental education and learning assistance professionals—seeks juried *feature articles* and non-juried *promising practices* and *exploratory pieces* for upcoming issues. Please contact JCASP_Editor@txstate.edu for further information.

For double-masked peer review, the *J-CASP* seeks scholarly research articles, research-to-practice articles, theory-to-practice articles, and reviews of literature that include recommendations and implications. Appropriate articles that are not write-ups of empirical research studies will be considered for double-masked peer review based on scholarly rigor. More reflective, practitioner-based articles and op-ed articles or opinion pieces will be considered for publication as non-peer-reviewed promising practices. These articles should be roughly 1,000-2,500 words with at least 5 or more references cited in the text; however, please contact the editor if the article will be longer. Exploratory pieces should introduce a conversation and generate implications for future research and practice. Whereas a promising practice can be considered a steppingstone toward further scholarly rigor, an exploratory piece can be considered as opening the door for further inquiry.

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