An Examination of a Mentoring Culture: Supports and Benefits of Mentorship in a Formal Academic Program

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July 2021

In partial fulfillment of the requirements for the degree of
Doctor of Education in
Leadership and Learning in Organizations
Peabody College of Education and Human Development, Vanderbilt University

Acknowledgments & Gratitude

~ First, I want to acknowledge my advisor, *Professor Erin Henrick*, and *Cohort Four* in the LLO Program. Your combined experience and insight have been incredibly valuable to me while on this doctoral journey. However, more important to me than your professional expertise is that you have become my friends and colleagues. I look forward to serving with you as scholar-practitioners and staying connected for future counsel, advice, & discourse.

~ *Dr. Arthur Langer, mentors & mentees, & the EMSTM Program* ~ thank you for extending your experiences, wisdom, & precious time during this unpredictable, challenging time of our lives. I am forever grateful for the opportunity to better understand, translate, & share your authentic narratives on mentorship.

~ I would be remiss if I did not also acknowledge and thank the faculty of the LLO program. You have challenged my thinking, opened my eyes to many important issues involving learning and education communities, and provided me to ways to utilize my ideas, voice, & skills. Thank you for introducing me to my capabilities, power, strengths, & weaknesses.

~ Last and most importantly, I owe a debt of gratitude to my family. *Michael*, you never say 'no' to any of my crazy ideas (even achieving educational goals). You fill my heart, spirit, and mind — WE would not be here today without your love, humor, & support — the next season of our beautiful life together now begins. To my 'smarter than me' children (yes, you are!), *Ashlee, Chastin, & Lit' Michael*, your love & support is always a source of fuel and provides me with the strength and energy to prevail. To my mother, extended family, & friends, I am now 'free to roam about the country' — I have missed you very much.

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Executive Summary

Mentoring is a mutually beneficial, collaborative learning relationship with the primary goals of providing help for mentees (Metros & Yang, 2006). Importantly, mentoring is one of the most meaningful relationships an individual can have early in their career (Levinson et al., 1978) and has been found to enhance the personal and professional development of individuals throughout their careers (Goodyear, 2006; Kram, 1980; Mullen, 2020).

Columbia University's EMSTM program has been developing technology leaders for over 17 years (Center for Technology Management [CTM], 2020). EMSTM faculty and the mentor cadre guide students by elevating their knowledge, skills, and relational power as regional, national, and global leaders in their respective technology network (CTM, 2020). Mentoring in the EMSTM program aligns well with what Russell and Adams (1997) defined as an "intense interpersonal exchange" within a dyad in which a "mentor provides support, direction, and feedback regarding career plans [referring to career functions] and personal development [referring to psychosocial functions] to the protégé" (p. 2).

The purpose of this research was to examine the mentorship within the EMSTM program to better understand the benefits, investment of resources, and mentor-mentee satisfaction, which provided an opportunity for further exploration based on prior program reviews. To address this purpose, a conceptual investment framework (Eby, 2007) guided the study design, data collection, findings, and recommendations. The conceptual investment framework concentrates on the constructs of individual perspectives for mentors and mentees, illuminating relational factors such as commitment, investments, satisfaction, and stability in the mentor relationship. Four research questions (RQ) provided focus to the study and were the following: (RQ1) How do program stakeholders describe the purpose of the mentoring component of the EMSTM

Program? (RQ2) How do mentors and mentees describe the benefits of mentoring? (RQ3) How are mentors and mentees investing resources? (RQ4) How satisfied are mentors and mentees? Data were collected through survey instruments, semi-structured interviews, document reviews, and observational data from the EMSTM program, administrators, mentors, and mentees. The data collection yielded the following six findings:

Finding 1: The mentoring component is described as a strategy to bridge theory from seminar room learning with real-world experience.

Finding 2: Mentees find the mentoring program to be very beneficial for building professional expertise, gaining useful critiques of individual efforts, and developing motivation to improve work.

Finding 3: Mentors find the mentoring program to be very beneficial for gaining a sense of fulfillment of sharing wisdom and insight, individual creativity, and work rejuvenation.

Finding 4: There are variations in the amount of time allocated to mentoring sessions, the quality of mentoring, and use of technology resources by mentors and mentees.

Finding 5: While the majority of mentors and mentees are satisfied with the mentoring experience, mentors report being more satisfied with the mentoring experience than mentees.

Finding 6: Mentees want more choice in the mentor-mentee matching process.

Three critical recommendations emerged from the six findings that answered the four research questions and are the following:

1. Increase the development of networks through group and peer mentoring,
2. Use continuous improvement mechanisms to foster ongoing program growth, and

3. Develop a shared repository for mentor resources.

Introduction

"A leader takes people where they want to go. A great leader, and mentor, takes people where they don't necessarily want to go, but ought to be."

Rosalynn Carter, First Lady of the United States from 1977 to 1981

The concept of mentoring dates back to Homer's *Odyssey* (Bowie, 2014) from Greek mythology, a well-known story of Odysseus entrusting his friend Mentor to watch and guide his son Telemachus. In the story, goddess of wisdom Athena also takes on the male form of Mentor to guide Telemachus while Odysseus is away at battle. In a more contemporary use, the term mentor refers to someone of more experience who conveys wisdom on an individual of less experience (Fenelon, 2010). For centuries, mentoring has been a vehicle for learning and knowledge transmission.

Most individuals, especially adults, identify with someone who was a major influence on their personal learning and development. These identified mentors have many appearances, such as colleagues, teachers, parents, friends, and supervisors. Many famous mentor–protégé or mentor-mentee duos evolved across many professions. As examples, in science, Harry Harlow mentored Abraham Maslow; in technology industry, Steve Jobs mentored Mark Zuckerberg; in business, Warren Buffett mentored Bill Gates; and in iconic cinema entertainment, Mr. Miyagi mentored Daniel in 1984's *The Karate Kid*, and Yoda mentored Luke Skywalker in 1977's *Star Wars: A New Hope*.

The purpose of this research was to examine mentorship within the Columbia University Executive Master of Science in Technology Management (EMSTM) program to better understand the benefits, investment of resources, and mentor/mentee satisfaction, which had not

been investigated in prior internal program reviews. To address this purpose, a conceptual investment framework (Eby, 2007) guided the study design, data collection, findings, and recommendations. Data were collected through survey instruments, semi-structured interviews, document reviews, and observational data from the EMSTM program, administrators, mentors, and mentees. The presentation of the study begins with the organizational context and continues with added details about the area of inquiry, the literature reviewed, and the conceptual framework. The full design of the study is expressed prior to sharing the findings and subsequent recommendations. The presentation ends with a discussion and conclusion.

Organizational Context

Columbia University's EMSTM program uses mentoring for "preparing tomorrow's technology leaders" because they need "to have the desire to be an executive leader in technology" (A. Langer, personal communication, March 18, 2021). Mentoring can be appreciated as an "intense interpersonal exchange" within a dyad in which a "mentor provides support, direction, and feedback regarding career plans [career functions] and personal development [psychosocial functions] to the protégé" (Russell & Adams, 1997, p. 2). EMSTM faculty and the mentor cadre guide students by elevating their knowledge, skills, and relational power as regional, national, and global leaders in their respective technology network (CTM, 2020). Embedded in EMSTM programming is a mentoring program in which experienced, seasoned technology executives serve as mentors to the program's graduate students. Moreover, EMSTM has been developing leaders through the mentoring program embedded in the formal graduate-level degree conferring program for over 17 years (Center for Technology Management [CTM], 2020).

The EMSTM program emerged in the early 21st century as the pace of technology forced profit-oriented, non-profit, government, and education industries to prioritize and integrate technology to accomplish desired outcomes. The emergence of information technology (IT) as a professional field led to critical professional roles across interdisciplinary domains and industries. The roles included chief information officers, chief technology officers, chief operations officers, chief security officers, and many additional IT roles. The EMSTM program, circa 2004, consequently aimed to prepare students from theory to practice through experiential learning methodology for the technology landscape, for the previously mentioned executive roles, and for leading the future of technology from executive suite positions.

The 16-month EMSTM degree program provides a pathway for technology-focused leaders to gain practical evidence-based skills. Each EMSTM student completes a master's thesis about a technology project or service based on real-world challenges and industry opportunities (CTM, 2020; A. Langer, personal communication, March 18, 2021). The blended on-line and face-to-face design of EMSTM increases the likelihood of graduates successfully attaining and succeeding in executive-level IT roles. Mentoring is a key ingredient in ensuring the program's educational outcomes. The EMSTM mentoring program operates as an experiential learning component using mentors who are active or retired from executive IT roles in technology, government, and non-profit industries and fields. Mentors have held titles such as Chief Executive Officer, Chief Information Officer, Chief Technology Officers, Chief Academic Officers, Chief Operations Officer, Chief Learning Officer, Chief Diversity Officer, Chief of Staff (CTM, 2020). The EMSTM students, traditionally, culminated their mentoring experiences and thesis projects at Columbia University by presenting their projects at one of four in-resident oral defenses. The faculty and mentor cadre served as panelists, guiding students to the

culmination of their master thesis presentations and projects. However, the structure of these residency events changed in 2020 when the national COVID-19 pandemic forced most interactions between faculty, mentors, and students to move online to mitigate disease transmission and ensure health and safety across the higher education industry (Marinoni et al., 2020).

EMSTM Mentor Cadre

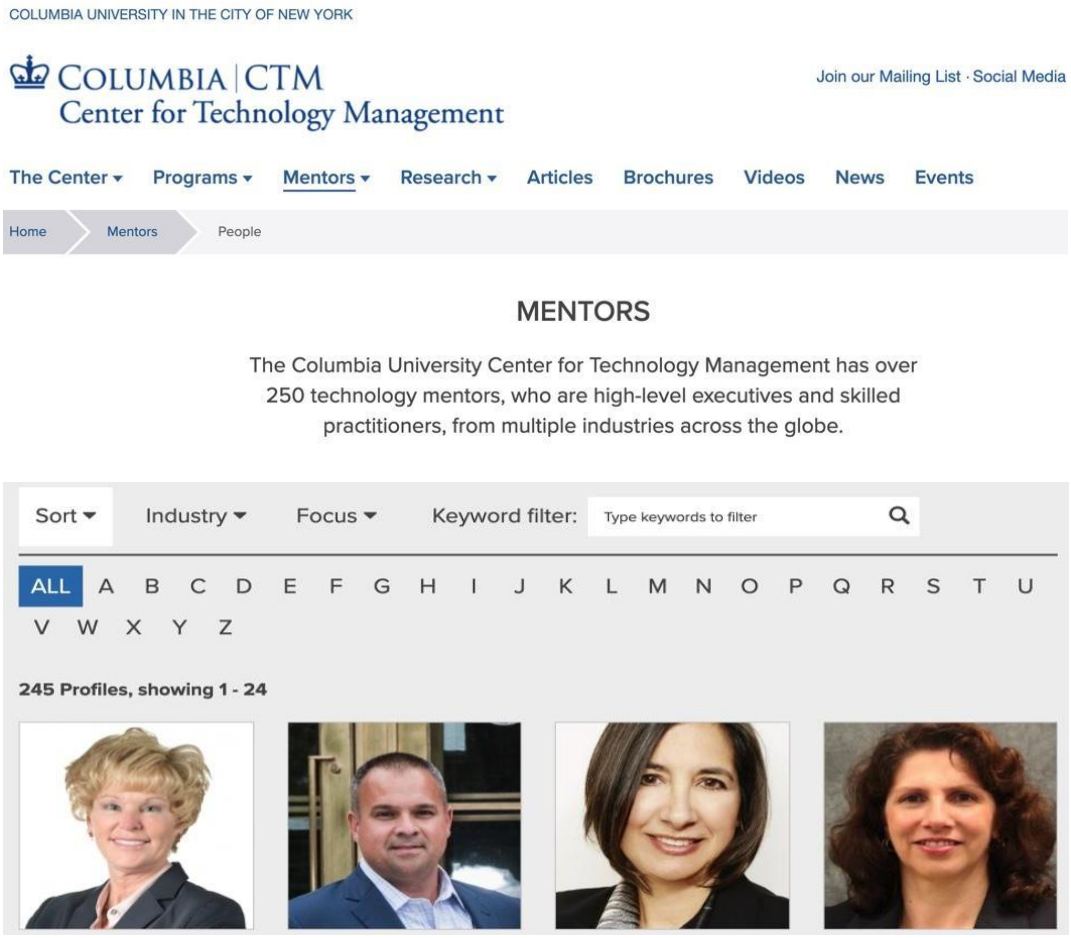
Harmonized by the EMSTM academic director, mentor selection is based on individual experience and commitment to the formal and informal mentoring role. The academic director has utilized a *snowball* relational approach (similar to snowball sampling; Goodman, 1961) to recruiting mentors since the inception of the program to acquire and build the mentor cadre network. CTM has a network of over 250 mentors who form the mentor cadre or network. The mentor cadre spans across various industries, including non-profit and governmental, such as technology, healthcare, finance, logistics, marketing, energy, hospitality, consulting, energy, insurance, and media and entertainment. The mentor cadre's profiles include highly accomplished, seasoned leaders in their respective fields of work. Most mentors hold or have held senior-level positions in their respective industries, as seen in Figure 1.

The mentorship occurs for 1-year to align with the EMSTM students' academic experiences. First, the mentor advises the student on their three-chapter capstone project which includes the design and development of each chapter. Second, mentors serve as panel members for each oral defense (three total) and provide grades and feedback for each chapter. However, mentors do not sit on their mentee's oral defense panel. Lastly, mentors prepare mentees for each of the three oral defenses (CTM, 2020). The academic grades mentors provide for their mentees represent a business lens and are proportionally 33% each mentee's overall grade at each oral

defense residency. Informally, mentors establish expectations and interact with their student mentees at least once a month for coaching on the development of personal and career goals and advancement (A. Langer, personal communication, March 18, 2021).

Figure 1

Columbia University's CTM Mentor Network (https://ctm.columbia.edu/content/people)



Mentors are not monetarily compensated and volunteer their time. The inclusion in the mentor cadre is highly selective, given the network of approximately 250 individuals is relatively small. Each mentor is matched with one student, leading to a one-to-one mentor-mentee dyad through an internal draft process. The draft process allows for the mentor to select a mentee

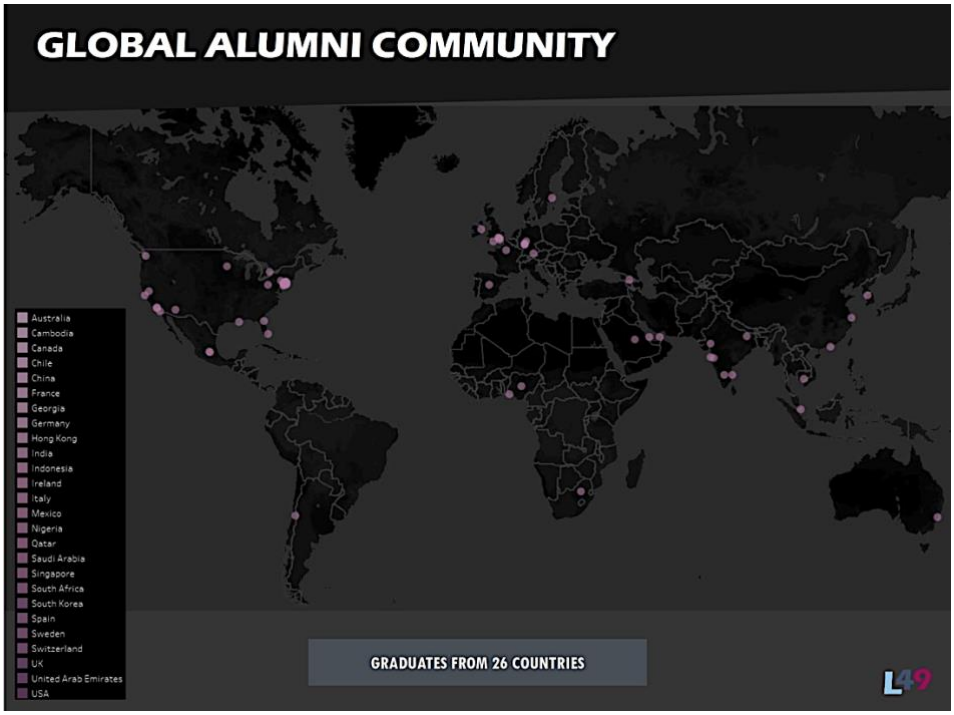
based on information from within the student's Master's thesis project proposal. Mentors negotiate until all students are assigned a mentor. EMSTM mentors commit 12 months to the mentor-mentee dyad relationship, including committing to the program-requested minimum of at least one monthly face-to-face advising session. Because of COVID-19, the meeting requirement was altered in March of 2020 to become one virtual meeting monthly. The virtual meetings continued from March 2020 through at least June of 2021.

Student (Mentee) Profiles

The EMSTM student typically has a minimum of 10-years of experience in an IT-related position and an earned bachelor's degree from a 4-year accredited institution. As seen in Figure 2, EMSTM students are from all over the globe. Recent student and alumni data reveals that 26 countries have active EMSTM students and program alumni.

Figure 2

Global Representation of the EMSTM Alumni Community Reproduced with Permission from L49



Area of Inquiry

The area of inquiry was mentorship within the Columbia University Executive Master of Science in Technology Management (EMSTM) program. The study was conducted to better understand the benefits, investment of resources, and mentor/mentee satisfaction, which had not been investigated in prior internal program reviews. This unique mentorship model could provide illumination and offer opportunities for additional inquiry due to the distinctive structure and sustainability of the overall EMSTM program, which reports 99.4% student graduation rates and less than 1% turnover in the mentor cadre network (A. Langer, personal communication, March 18, 2021). The sustainable mentoring model has basically remained unchanged from its inception in 2004.

Scherer (2010) examined why individuals mentor in the EMSTM program and concluded that individuals with previously well-mentored experiences inspired future mentoring, enjoyed opportunities to convey their insightful experiences and wisdom, and appreciated association with the EMSTM and the university. The January 2020 EMSTM's end-of-program student evaluations indicated that 83% of graduates stated their mentor was significant in the program experience. However, the surveys did not have data to suggest why students valued their mentors, suggesting an opportunity to understand how EMSTM could represent an exemplary model of a best practices mentoring program. This study will be an initial examination of what EMSTM mentors and mentees report as benefits, resource investments, and individual satisfaction from their mentorship experience while involved with the EMSTM program. This information will support EMSTM in any future design, development, and integrations of future programming involving the mentor program.

Literature Review

As noted earlier, mentoring has been documented in history and literature for thousands of years (Fenelon, 2010). Traditionally, and from an academic management lens, mentoring represents an ongoing, "intense interpersonal exchange" within a dyad in which a "mentor provides support, direction, and feedback regarding career plans [career functions] and personal development [psychosocial functions] to the protégé" (Russell & Adams, 1997, p. 2). Bozeman and Feeney (2007) defined mentoring as:

> A process for the informal transmission of knowledge, social capital, and psychosocial support perceived by the recipient as relevant to work, career, or professional development; mentoring entails informal communication, usually face-to-face and during a sustained period of time, between a person who is perceived to have greater relevant knowledge, wisdom, or experience [the mentor] and a person who is perceived to have less the experience [mentee] (p. 731).

Thus, the mentor is the person in the dyad with more experience who conveys wisdom to an individual, the mentee or protégé, of less experience as a trusted advisor or guide tutoring or coaching a newcomer or novice individual (Luckhaupt et al., 2017; Ravitch, 2007; Russell & Adams, 1997). Meanwhile, the mentee (also known as protégé in research and with the EMSTM program) receives guidance or coaching from the mentor (Metros & Yang, 2006; Ravitch, 2007; Smith & Arsenault, 2014).

In seminal mentoring literature, researchers were the benefits of mentoring. Levinson et al. (1978) analyzed 40 males' biographies detailing their evolution from childhood to adulthood, and a common finding was the impact of a mentor in each of their lives. More recently, De Saxe Zerden et al. (2015) interviewed 10-nontenured female social work faculty and revealed the

women benefited from mentoring. Consequently, this literature review addresses the functions of mentoring, qualities of the successful mentoring relationship, digital and electronic mentoring, and empirical research on mentoring in higher education.

The Functions of Mentoring

Mentoring is a mutually beneficial, collaborative learning relationship with the primary goals of providing help for mentees (Metros & Yang, 2006). Importantly, mentoring is one of the most significant relationships an individual can have early in their career (Levinson et al., 1978). Mentorship dyads can represent life-changing relationships that stimulate mutual growth, shared-learning, and development (Eby et al., 2013; Sambunjak et al., 2006; Underhill, 2006). Mentoring has been found to enhance the personal and professional development of individuals throughout their careers (Goodyear, 2006; Kram, 1980; Mullen, 2020). Mentoring relationships' lasting effects on individuals affect the groups, organizations, and communities in which mentees work, live, and lead (Ragins & Kram, 2007).

Kram (1983) showed the value of mentoring because it "is relational and developmental" across career (instrumental) and psychosocial (relational) functions (p. 11). Both functions are relevant to the EMSTM program and mentoring culture. The mentoring relationship is instrumental to career functions because opportunities for the mentoring relationship enhance student learning and preparedness for career advancement (Berk et al., 2005; Fleming et al., 2013, 2015; Kram, 1985). The psychosocial support functions enable the mentoring relationship to develop and enhance a mentee's competence, identity, and efficacy professional roles (Hudson, 2016; Kram, 1985; Smith & Arsenault, 2014). The two major mentoring functions of career and psychosocial are discussed in greater detail.

Career Functions

Career functions in relation to outcomes of career mentoring relationships, as described by Kram (1985), include sponsorship, increased professional exposure and visibility, coaching, and challenging obligations, all of which can improve a mentee's ability to navigate and progress in an organization or academic environment. Researchers describe sponsorship as an activity in support of an individual for advancement in roles and duties such as through promotions (Deichmann & van den Ende, 2014; Kram, 1985; Luckhaupt et al., 2017). Exposure and visibility from the sponsorship allow the protégé to develop key relationships and professional social capital (Kay & Wallace, 2009; Kram, 1985; Simon et al., 2004).

Through coaching, the mentor suggests information on how to navigate productively during the learning intervention (Eby & Robertson, 2020; Kram, 1985; McCann, 2013; Smith & Arsenault, 2014). Challenging assignments allow a protégé to cultivate the necessary competencies (Abedin et al., 2012; Deichmann & van den Ende, 2014; Kram, 1985) and skills (Berk et al., 2005) for succeeding in academic and workplace environments. The career function of mentoring has benefits for the protégé that involve learning about how the culture of an industry or organization works to affect a personal career focus and advancement. In the context of EMSTM, the career function is an aspect of the mentoring students receive and can help orient students to the technology industry from multiple perspectives and learn its unique hierarchical structure and promotion system.

Psychosocial Functions

Psychosocial functions in mentoring relationships support the development of the protégé on a personal level, such as developing a professional identity and gaining a sense of competence, respect, and support. The psychosocial functions operate as role modeling,

acceptance-and-confirmation, counseling, and friendship (Hudson, 2016; Kram, 1985; Ragins & Scandura, 1999; Smith & Arsenault, 2014). Role modeling encompasses a mentor as a seasoned or senior-level professional providing appropriate examples and allowing the protégé or subordinate to reflect on and relate to the learning intervention (Kram, 1985; Luckhaupt et al., 2017; Steele et al., 2013). For acceptance-and-confirmation, the mentor offers supports that include respect and understanding concerning the protégé's competence, and in reciprocity, the protégé provides similar supports to the mentor (Abedin et al., 2012; Kram, 1985; Luckhaupt et al., 2017; Rhodes & Spencer, 2010). Counseling enables a protégé to discuss concerns and anxieties that distract from intended goals with the mentor who provides advice and counsel (Eby & Robertson, 2020; Kram, 1985; Smith & Arsenault, 2014). Lastly, friendship enables the mentor and mentee to build trust (Hudson, 2016) and interact on a social level, resulting in open and honest communication (Kay & Wallace, 2009; Kram, 1985; Mullen & Klimaitis, 2021; Luckhaupt et al., 2017; Webb et al., 2009). Moreover, the psychosocial functions only occur once trust and a sense of relational closeness are achieved between the protégé and mentor (Csikszentmihalyi & Rathunde, 2014; Kram, 1985; Mullen & Klimaitis, 2021; Nakkula & Harris, 2005; Rhodes & Spencer, 2010). In the context of EMSTM, psychosocial and career functions can empower mentors to encourage and mentees to refine mentees' self-concepts over the 12-month academic and mentorship journey together, and more importantly, maximize the mentees' effectiveness as a future technology leader.

Qualities of the Successful Mentoring Relationship

High quality mentoring seems to occur when both individuals of the dyad perceive having greater input into how the dyad forms and the mentor and mentee are matched (Allen et al., 2006). How the mentoring dyad is matched can also impact the effectiveness achieved

between the protégé and mentor. “To avoid both a mentor-mentee mismatch and miscommunication around roles and responsibilities, it is important that expectations are aligned and clearly communicated” (Abedin et al., 2012, p. 275). Different matching aspects can be considered for a mentorship dyad, including alignment of leadership and career objectives, technical skills, gender, and experience level. Importantly, Kram and Bragar (1992) suggested both the protégé and mentor must be able to understand each other to benefit from the psychosocial functions of mentoring. If a dyad is unsuitably matched, negative results may surface such as psychological withdrawal between the members of the mentor dyad or from the organization or program sponsoring the mentorship (Blake-Beard et al., 2011; Hudson, 2016).

A good match supports mentor and mentee commitment, which is important to ensuring effective mentoring and relational stability. According to Abedin et al. (2012), mentor commitment rests with a deep structure to manage and integrate virtues, abilities, and competencies. Commitment does not occur by chance but is fostered by the mentor’s specific skills and experience. Olian et al. (1988) found evidence from a study conducted with 600 University of Maryland undergraduate students which supported their hypothesis that protégés would be more attracted to a mentor with greater interpersonal competence and commitment. Based on their findings, Olian et al. encouraged organizations to “explicitly seek out mentors exhibiting desired behaviors and activities sought by protégés” (p. 34). Notably, mentors with these attributes demonstrate commitment and skills that impact the mentoring relationship, highlighting the importance of experience and mastery for maximizing those skills.

In addition to commitment to the dyad match, matches involving purposeful attention to mentor-mentee ethnicity and gender influence the effectiveness of mentoring because females and individuals from ethnic minority groups experience fewer benefits in traditional mentorship

and learning interventions that do not account for their unique needs (Reddick & Young, 2012; Sedlacek et al., 2007). Interestingly, Luckhaupt et al. (2017) supported racially matched mentor-mentee pairs for undergraduate students with findings showing that mentees persisted in classes longer and overall earned more college credits.

Another aspect of successful mentoring dyads involves fostering the mentor-mentee relationship by developing perceptions of trust, satisfaction, and stability (Leck & Orser, 2013; Young & Perrewe, 2000). Based on research with doctoral students and their professors, Young and Perrewe (2000) concluded that the exhibition of appropriate support behaviors by mentors enabled protégés and mentors to perceive greater trust in their relationships. Consequently, relationship stability is realized through mutual respect, trust, and perceptions of their relationships as satisfying and successful (Kram, 1985; Leck & Orser, 2013; Nakkula & Harris, 2005; Rhodes, 2002; Rhodes & Spencer, 2010; Young & Perrewe, 2000).

In addition, trust in mentoring relationships can be built by mutual sharing of resources and expectations, professional behavior, and active listening during formal and informal mentor sessions (Hudson, 2016; Kram, 1985). These qualities suggest EMSTM might have a unique way of pairing up mentor dyads through its draft process of matching the mentors and mentees based on each mentor's choice for the 1-year mentorship. Mentors have ownership and empowerment for promoting successful dyads this way.

Digital and Electronic Mentoring

Virtual mentoring, also known as e-mentoring, with career and psychological support can be provided in mentor-mentee dyads through multiple channels and technologies. Digital mentoring can be synchronous through video or telephone conversations as well as multimedia and simple messaging services, asynchronous through email and other digital message delivery

platforms, or both (Bierema & Merriam, 2002; Single & Muller, 2001). Mentors can incorporate face-to-face conversations digitally through virtual web-conferencing (Smith-Jentsch et al., 2008). The rapid growth of technology-mediated forms of communication in both formal and informal contexts has grown exponentially in the 21st century and become necessary since March of 2020 and the emergence of the COVID-19 pandemic. For instance, in midst of the COVID pandemic the use of technologies creatively soared in unexpected ways to support communication and collaboration needs (Marinon et al., 2020; Mullen, 2020; Mullen & Klimaitis, 2021). With virtual mentoring the only way to proceed during the global pandemic, mentor dyads had to embrace technology and digital opportunities for sustaining successful mentoring relationships and maintaining cadence of meeting the EMSTM students' project requirements.

Empirical Research on Mentoring in Higher Education

As mentioned previously, there are many career benefits for mentees in industrial and organizational settings (Allen et al., 2004; Sambunjak et al., 2006). Mentoring has been positively associated with mentee career success and interpersonal satisfaction with the mentor dyad relationship. As noted previously, mentoring serves many aspects within a formal academic program and can lead to high satisfaction associated with the program and interpersonal connections, including with peers (Berk et al., 2005; Mullen, 2020). In addition, effective mentoring has also been found in an empirical study to influence how protégés develop as leaders. For instance, at West Point Military Academy, the experiences of cadets in a 6-month semiformal mentoring program were compared to those in a 6-month program of similar content for determining leader efficacy development (Lester et al., 2011). Individuals who participated in

the West Point mentoring program showed heightened efficacy and performance by their supervisors (Lester et al., 2011).

Developing increased effectiveness in a professional role not only positively affects the mentee but also benefits both the mentee and the organization. This development does not need to be formally supported. Griffin et al. (2018) found that graduate students receiving mentorship support from formal relationships with advisors, faculty, or dissertation committee members also benefited from informal mentoring relationships with colleagues, friends, and family. Hughes and Fahy (2009) conducted a peer mentoring study involving rising psychology undergraduate students and concluded the peer mentoring program aligned positively with the program's goals of student retention. However, in a qualitative study, Brown and Kysilka (2005) interviewed 10 undergraduate preservice teachers who had been paired with educator mentors while enrolled in a doctoral classwork. Brown and Kysilka discovered relationship development occurred as mentees valued the expertise of the mentors and relationship challenges that happened when the mentoring lacked opportunities for physical meetings.

Mentoring expectations and outcomes can differ between all parties involved in formal mentor programs, causing challenges affecting mentor-mentee dyads. In a 2010 study on mentoring new teaching faculty, Lai concluded that faculty mentors and the academic institution were focused on the contextual issues of mentoring while the mentees were focused on the relational aspects of the mentorships, causing disconnects between the parties. In examinations of formal mentoring program design (Allen et al., 2006; Lyons & Oppler, 2004; O'Neill, 2005), several common challenges affect the process of matching mentors with mentees. Challenges include dealing with eagerness, ineptness, and nervousness early in the mentor-mentee relationship, underutilization of data and mentee preferences for mentors, costs of a poor

matches, variation of mentoring advice and support, and verifying that actions of mentoring support aligns with the formal program's intent.

While formal mentor programs recognize the importance of improved performance, and mentor-mentee satisfaction, there is a limited body of research showing evidence of effective academic mentoring programs (Glazermen et al., 2010; Reid & Slinger, 2006; Stanulis et al., 2014). Tsevat (2005) identified long-distance or digital mentoring to be less effective, suggesting there are challenges to mentoring dyads that cannot meet in person. I have found research to examine mentor-mentee investment of resources and individual mentorship satisfaction to be lacking in the literature. More research, such as with the EMSTM program, could be used to benefit mentor-mentee dyads operating in a formal mentoring program.

Conceptual Framework

Based on the literature, I utilized a conceptual framework to study the mentoring culture at EMSTM better understand the benefits, investment of resources, and mentor and mentee satisfaction. The conceptual framework concentrates on the constructs of individual perspectives for mentors and mentees in dyad relationships. Figure 3 depicts the elements from Eby's (2007) conceptual investment model of mentoring relationships that were applied in this study. Eby (2007) derived the mentoring relationships investment model from Rusbult's relationship investment model because the investment in relationships is directly pertinent to the relationships that emerge between mentors and mentees (Rusbult, 1980, 1983; Rusbult et al., 2006).

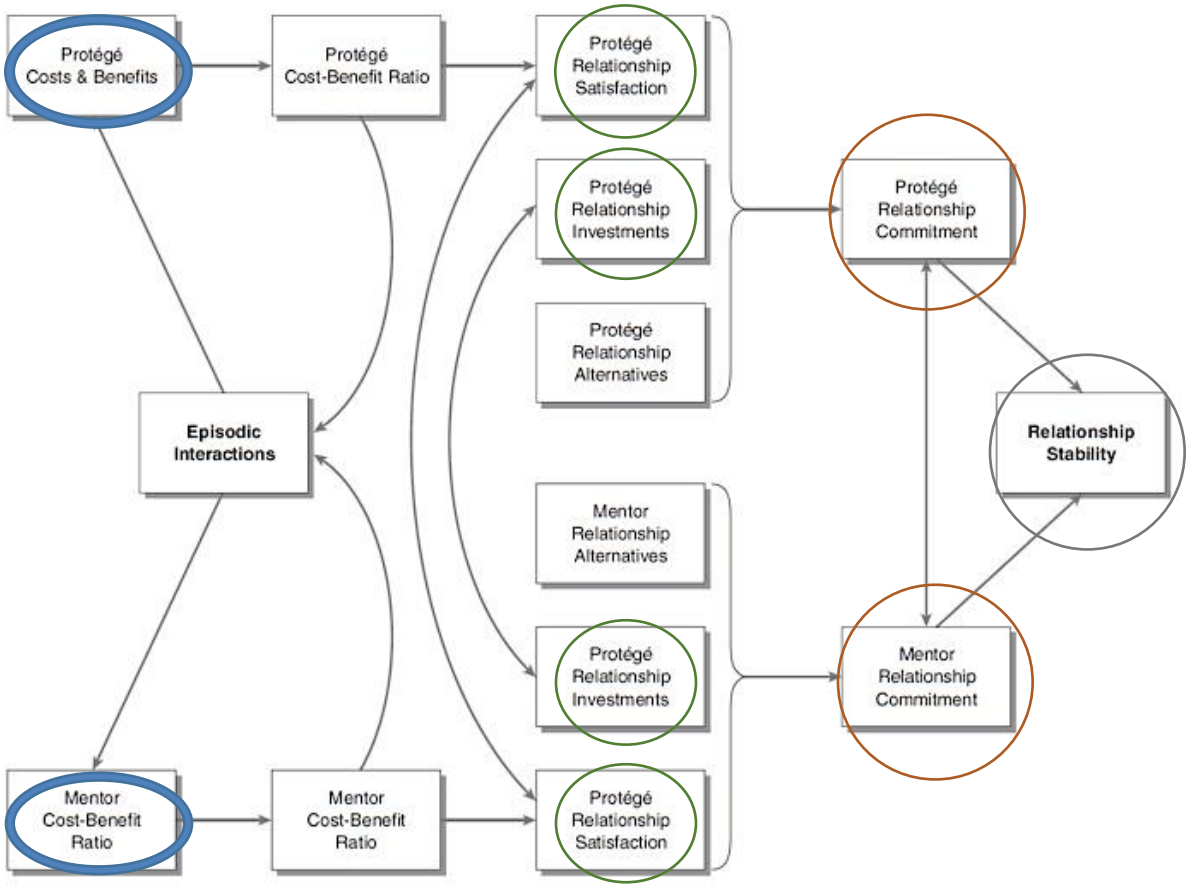
The conceptual framework offers an explanation about the perspectives of both mentors and mentees in dyad relationships, which supports prior mentoring research from pioneering researchers in industrial and organizational psychology (Eby et al., 2006; Ragins & Verbos, 2007). First, the model represents corresponding relationships among conceptual variables for

protégés and mentors respectively (Eby, 2007). For instance, the apparent cost-benefit ratio linked with a mentoring relationship leads to relationship satisfaction for both protégés and mentors. Second, there are the potential overlapping effects that reflect mentor dyad interactions. For example, a protégé's discernments of the cost-benefit ratio accompanied with influences via mentorship through episodic interactions with the mentor, also, affect mentor costs and benefits.

Key factors represent the conceptual model, such as relational commitment, relationship investments, relationship alternatives, relationship satisfaction, and relationship stability (Eby & Robertson, 2020; Eby, 2007). Relationship satisfaction are affective reactions to the mentoring relationship, such as acceptance, belonging, and trust; relationship investments indicate the extent of time, physical and psychological energy, and monetary funds that are invested in the relationship; relationship alternatives involve individuals in one's developmental network (Higgins & Kram, 2001) who could fulfill the role of mentor or mentee as well as other sources/options of developmental support (Eby, 2007). Importantly, the last factor is relationship stability, which involves the robustness or endurance of the relationship and supports (Eby & Robertson, 2020). Focusing on mentor relationships and supports are noteworthy because previous research has found that the level of mentoring provided by a formal mentor is related to consequent mentee benefits (Allen, 2007; Rhodes & Spencer, 2010). An additional study reported similar mentors' benefits of mentoring at the organizational level (Eissner & Gannon, 2018). For this study, I only used the following factors (as circled for emphasis in Figure 3) from the conceptual framework to assist in guiding the study: (a) mentor benefits, investments, satisfaction, and commitment; (b) protégé (mentee) benefits, satisfaction, investments, and commitment; and (c) relationship stability. Relationship alternatives and episodic interactions were not included in the design of this mentorship study.

Figure 3

Conceptual Investment Model of Mentoring Relationships Adapted from Eby (2007) With Circled Concepts Depicting the Focus of the EMSTM Mentorship Study



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Research Questions

The purpose of this research was to examine mentorship within the EMSTM program to better understand the benefits, investment of resources, and mentor/mentee satisfaction, which had not been investigated in prior internal program reviews. Four research questions were used

to examine the mentoring culture at EMSTM based on the conceptual investment model of mentoring relationships (Eby, 2007). The questions that guided the study follow:

1. How do program stakeholders describe the purpose of the mentoring component of the EMSTM program?
2. How do mentors and mentees describe the benefits of mentoring?
3. How are mentors and mentees investing resources?
4. How satisfied are mentors and mentees?

Study Design

The conceptual investment framework by Eby (2007) guided the study design that included data collection through survey instruments, semi-structured interviews, document reviews, and observational data from the EMSTM program, administrators, mentors, and mentees. I utilized a sequential explanatory mixed methods approach that combined quantitative and qualitative methodologies to address the four research questions. The design of this study was centered on the idea of having two phases to the research with the quantitative data collection followed by the qualitative data collection (Creswell & Creswell, 2017; Hanson et al., 2005; Ivankova et al., 2006). Figure 4 visualizes the sequential study design applied in this study. The intent of each phase of the mixed methods study was to build on the other phases as part of following along with design recommendations made by Fetters et al. (2013).

Mentor and mentee survey instruments were adapted from prior mentoring research and the conceptual framework to support data collection (Appendices D, E, F, G, and H). The interview protocols for mentors and mentees were adapted from prior mentoring research and discussed with EMSTM administrators (Appendices B and C). The observational data included watching the mentoring culture at EMSTM through the university-hosted virtual student

(mentee) oral defense sessions and reviewing existing documentation authored by EMSTM's program administrators. Figure 5 displays how I aligned the sequential explanatory mixed methods study design with the research questions.

Figure 4

Sequential Explanatory Mixed Methods Study Design

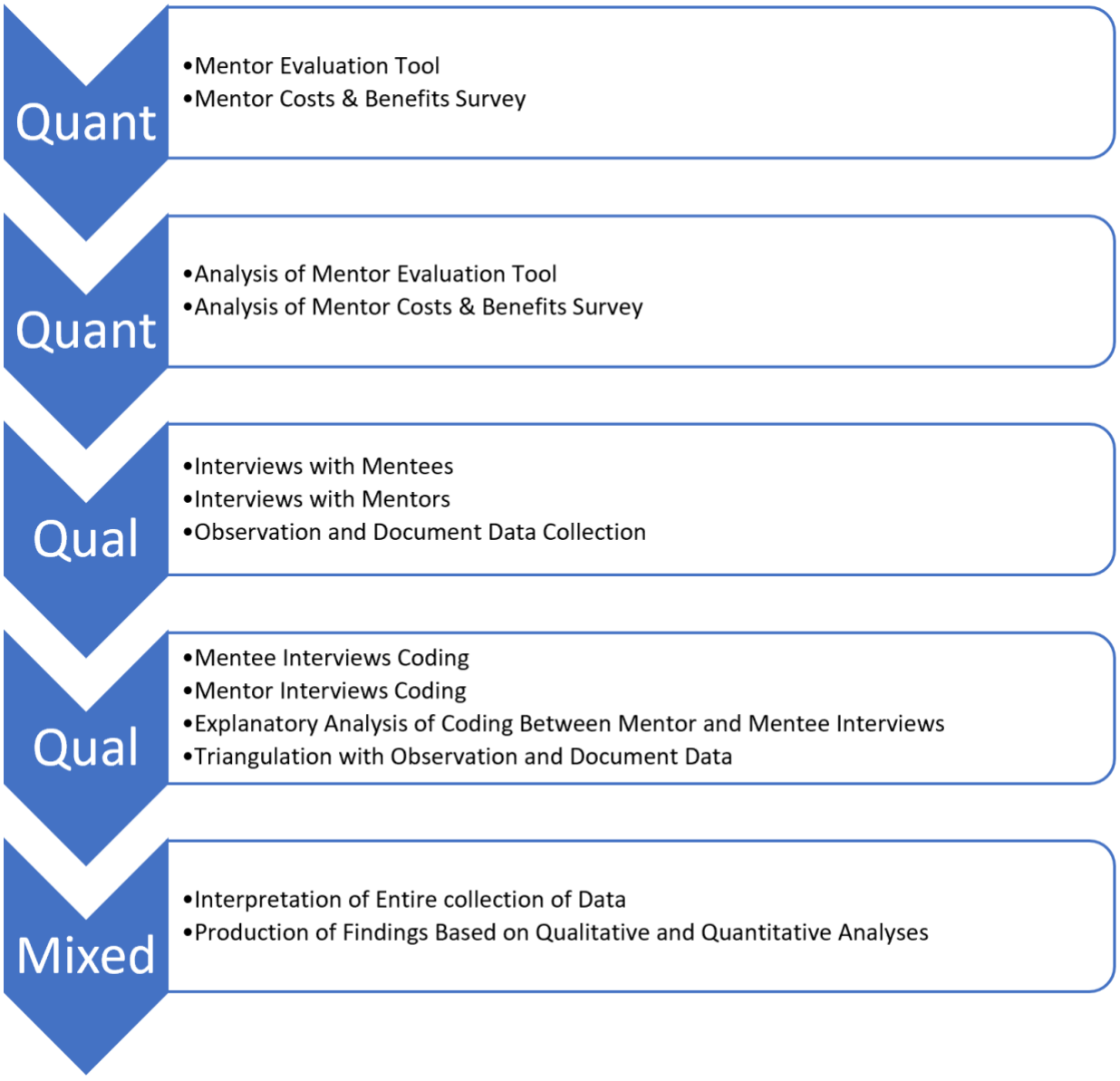
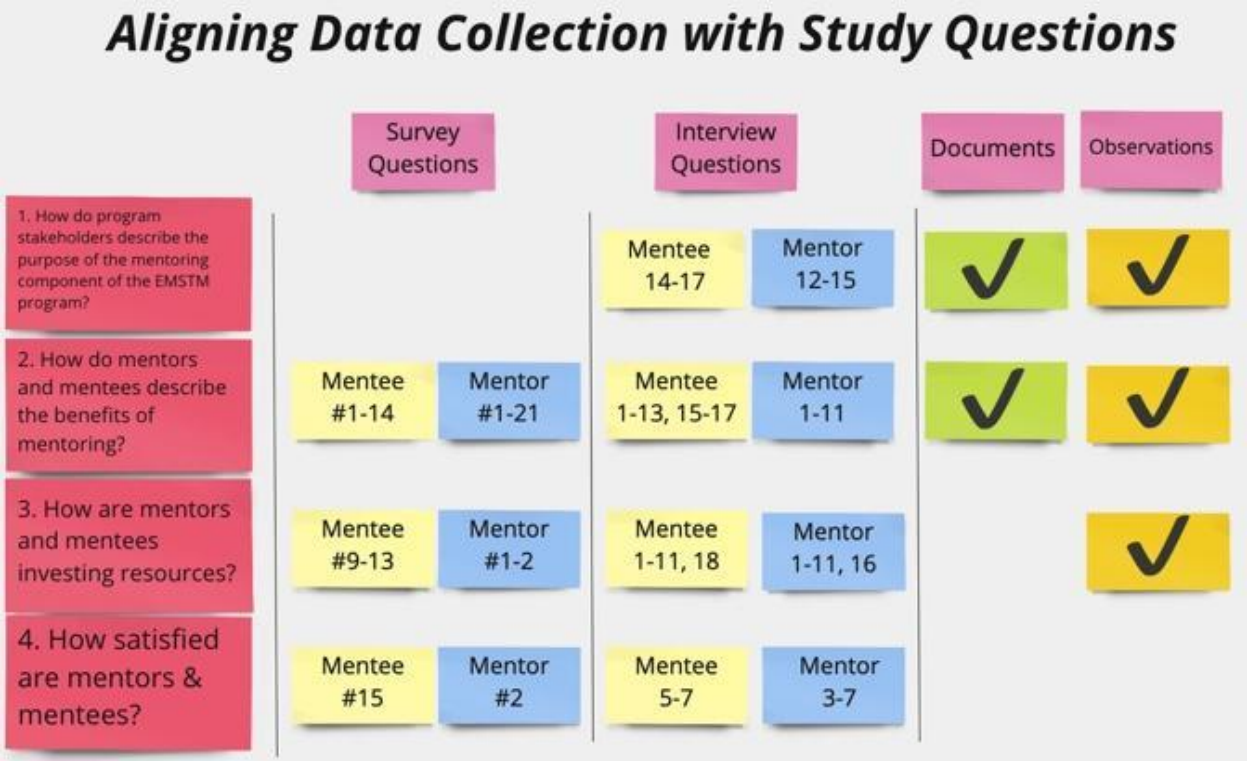


Figure 5

Alignment of Data Collection Tools to the Four Research Questions



Participants

Survey participants were 22 active mentors in the EMSTM mentor network and 20 mentees who recently graduated in December of 2020 and April of 2021 from EMSTM. Interview participants were eight mentors and seven mentees. Overall participant demographic details are provided in Figure 6.

Figure 6

Depiction of Survey and Interview Participants' Demographics

Mentors	**Mentees**
● Survey (*n* = 22): 95% male; 5% female ● Interview (*n* = 8): 100% male ● 86% > 21 years of experience in current field ● Mentee: 77% male, 23% female	● Survey (*n* = 20): 90% male, 10% female ● Interview (*n* = 7): 100% male ● 100% = 10+ years of IT-related experience ● Mentors: 100% male

• Mentor Age: 36% 41-55; 51% 56-65; 13% 66+	• Mentee Age: 10% 31-35; 15% 35-40; 65% 41-55; 10% no response

Data Collection

All quantitative and qualitative data were collected through survey instruments, semi-structured interviews, document reviews, and observational data of the EMSTM program, administrators, mentors, and mentees. All participants provided their permission prior to participating in surveys or interviews after I shared with them the informed consent information (Appendix A). I also conformed to all the ethical conduct of study procedures and obtained permission to conduct the capstone project from the partner site and Vanderbilt University's Institutional Research Board. All participant interview data were masked by the use of pseudonyms such as Mentee 1 and Mentor 2. All survey data were anonymously provided so masking of identities was not necessary.

Survey Instruments

To increase the understanding of the mentoring culture, I employed two surveys. The first was a mentor costs and benefits survey (Appendix D). The second was the mentee survey that involved mentees responding to the mentor evaluation tool (Appendix E). Both surveys are summarized in Figure 7 and were distributed online using Google Forms. First the participants consented to participate after reading the informed consent information that noted there were no incentives or rewards connected to survey participation. Then, each survey proceeded with demographic questions and an option to self-select for participating in the interview portion of the study. The remainder of each survey involved participants responding to the closed-ended five-point Likert-type items and the open-ended questions.

Figure 7

Summaries of the Survey Instruments' Designs

Mentor Survey: Expected Costs and Benefits to Being a Mentor	Mentee Survey: Adapted Mentor Evaluation Tool
• Anonymous • Google Forms • 21 five-point Likert-type items • 2 open-ended questions • Likert-type items adapted from Expected Costs and Benefits to Being a Mentor Survey by Ragins and Scandura (1999) • Survey link sent via email from the EMSTM Academic Director to the repository of 200 mentors with and without active mentees • Return rate = 11% (*n* = 22)	• Anonymous • Google Forms • 14 five-point Likert-type items • 2 open-ended questions • Likert-type items adapted as the Mentor Evaluation Tool from Anderson et al. (2012) • Survey link sent via email from the EMSTM Academic Director to the 80 students in mentoring dyads • Return rate = 25% (*n* = 20)

Google Forms were utilized to create the mentor and mentee surveys. Both survey links were sent out via email by the EMSTM Academic Director in January and February of 2021, respectively. The recruitment emails were sent to the EMSTM mentor network of over 200 mentors with approximately 80 active mentors. Active mentors were defined as mentors currently assigned and actively engaging in a mentor dyad.

Recruitment emails were also sent out to 80 precent EMSTM graduates (i.e., December of 2020 and April of 2021) who maintained a mentoring relationship for at least 1 full year and successfully completed all academic requirements. All mentor and mentee survey participants responded to close-ended Likert-scaled questions. Each survey contained two open-ended items. On the mentee survey, 14 items were designed with the five-point Likert-type structure as *strongly disagree* = 1; *disagree* = 2; *neutral* = 0; *agree* = 4; *strongly agree* = 5. On the mentor survey, 21 items were presented with a 5-point Likert scale with the responses representing the following: *strongly disagree* = 1; *disagree* = 2; *neutral* = 0; *agree* = 4; *strongly agree* = 5. There were several unanswered demographic questions as well as open-ended items on both surveys.

Semi-Structured Interview Protocols

Next, I conducted semi-structured interviews with questions adapted from an existing protocol from previous mentor-mentee research that I utilized as a framework for dialogue (Ragins & Scandura, 1999). The drive for interviewing the mentors and mentees sequentially learning in-depth about their experiences following the quantitative survey and soliciting additional data to examine the mentoring culture and understand the supports and benefits of the EMSTM mentoring program. The interview questions appear in Appendices B and C.

Throughout the semi-structured interview process, the interview guides offered focus on the conversation with each mentor and mentee interview participant to ensure that there was a level of consistency. Interviews were coordinated and conducted with mentors and mentees between March and May of 2021. All interviews were conducted via the Zoom web conferencing application. As seen in Figure 8, eight male mentors and seven male mentees participated in interviews. Each interview lasted approximately 30 to 45 minutes. I spent 10 hours interviewing the 15 participants.

Figure 8

Summary of the Semi-Structured Interview Protocols Used for Mentors and Mentees

Mentor Interview Protocol	Mentee Interview Protocol
● 16 questions open-ended questions ● Conducted March – May 2021 ● Adapted from Ragins and Scandura (1999) ● Conducted 8 mentor interviews ● Participation was self-selected ● Interviewees volunteered using an external link from a prompt embedded in the anonymous survey link emailed by EMSTM Academic Director ● Interviews scheduled via email in coordination with the Mentor's schedule	● 18 questions open-ended questions ● Conducted March – May 2021 ● Adapted from Ragins and Scandura (1999) ● Conducted 7 mentee interviews ● Participation was self-selected ● Interviewees volunteered using an external link from a prompt embedded in the anonymous survey link emailed by EMSTM Academic Director ● Interviews scheduled via email in coordination with the Mentee's schedule

Non-probability participant sampling (similar to Fowler & O'Gorman, 2005) was used to enlist participants for the semi-structured interviews. The sample was acquired from individuals who responded "yes" to the Google Forms survey question, "Are you interested in participating further in this [mentoring] research, such as being interviewed and sharing your [mentee/mentor] experience?" Once survey respondents responded "yes," they were directed by a prompt to another Google Form that requested name and contact information. I used this information to contact interested survey participants and coordinate their interview appointments. I reminded the interview participants that there were no incentives or rewards promised or provided for participation in either the survey or the interview.

Document Review

Document review and analysis was aimed to gain insight into the context of both the area of inquiry and the EMSTM Program. The data provided information on the entire EMSTM program and details of the embedded mentoring program. My initial focus was on the information presented on the Columbia University CTM and School of Professional Studies (SPS) websites. CTM houses the EMSTM Program, and its website provided the program information, potential and current student profiles, and aspects of the mentoring program. The SPS website provided the EMSTM Program details and represented the institutional body awarding the Master of Science degrees to EMSTM graduates. The CTM and SPS websites' information aligned.

Next, I was given EMSTM program outcomes and the CTM 5-year strategic plan to review. Both documents provided in-depth insights into the mentoring program and the mentor network. Program outcome data from 2019 revealed 30% of graduates as reaching their career goals of chief officer level roles and 83% of graduates as satisfied with their mentorship

experiences (CTM, 2020). And lastly, I gained a deeper understanding from the described documents, shaping my impressions of the highly accomplished professionals in the mentor network.

Observation Notes

Online web conferences for student (mentee) oral defense sessions were scheduled on 09/12/2020, 09/26/2020, 01/26/2021, and 01/23/2021. I was invited to attend these defense sessions. Each virtual session lasted approximately 4 hours, which led to a total of 16 hours of virtual observations, all of which were hosted via Zoom web conferencing.

Each respective session was similarly organized and executed as depicted in the following description of the flow of an oral defense session. The group of mentors and EMSTM faculty selected to sit as panelists met for 1 hour prior to the start of the scheduled oral defense session. The Academic Director provided general remarks. Next, in round-robin fashion, all the mentors one-by-one introduced themselves, who they were, what they did, and how long they were associated with EMSTM. In short order, the tech assistants transported each subgroup to its appointed Zoom virtual breakout room, into which individual students (mentees) followed in rhythmic fashion. Each oral defense date supported approximately 13 to 14 breakout rooms with three to four scheduled student (mentee) presentations in each room. The panelist in each breakout room consisted of two to three mentors and one EMSTM faculty member. The presentation framework allowed each student 25-minutes to present, broken into 10 minutes of presentation, 10 minutes of questions and answers from panel members, and a final five minutes for feedback from the panelists. Once the student (mentee) was excused, the panelists populated the student's grades and feedback in a digital rubric form. At the conclusion of the defense session, all the panelists (mentors and EMSTM faculty) joined another breakout room where the

Academic Director asked for feedback on the presentations and prompted much discussion. After the discussion, the Academic Director shared his gratitude for everyone's time, expertise, and commitment to the program.

During the breakout sessions, my observations were narrowed to one breakout room with three to four students (mentees) and the panels composed of the two mentors and one faculty member on each of the four dates. I wrote field notes throughout all the sessions I observed for the purpose of using the narrative as insight to the oral defense session construct of the EMSTM program, the student (mentee) oral briefing experience, and behaviors of mentors and faculty in their panelist roles. I summarized notes to organize initial perceptions about the data related to the four research questions as part of triangulating the observations with the survey and interview data.

Data Analysis

The study design was a sequential explanatory mixed methods approach (Ivankova et al., 2006). Not only did the data collection have two phases to the research with the quantitative data collection followed by the qualitative data collection, but also the analysis of the quantitative and qualitative data was also sequential (Creswell & Creswell, 2017; Fetters et al., 2013; Hanson et al., 2005). Each analysis was focused and specific to answering the four research questions.

Quantitative Analysis

In preparing the two surveys' data for analyses, I exported all raw data from Google Forms into Excel. The focus of the quantitative analysis was on the close-ended Likert-type items' data. The frequencies for each item's responses were calculated. Because the samples for each survey were small, only descriptive item by item analysis was utilized. The identified

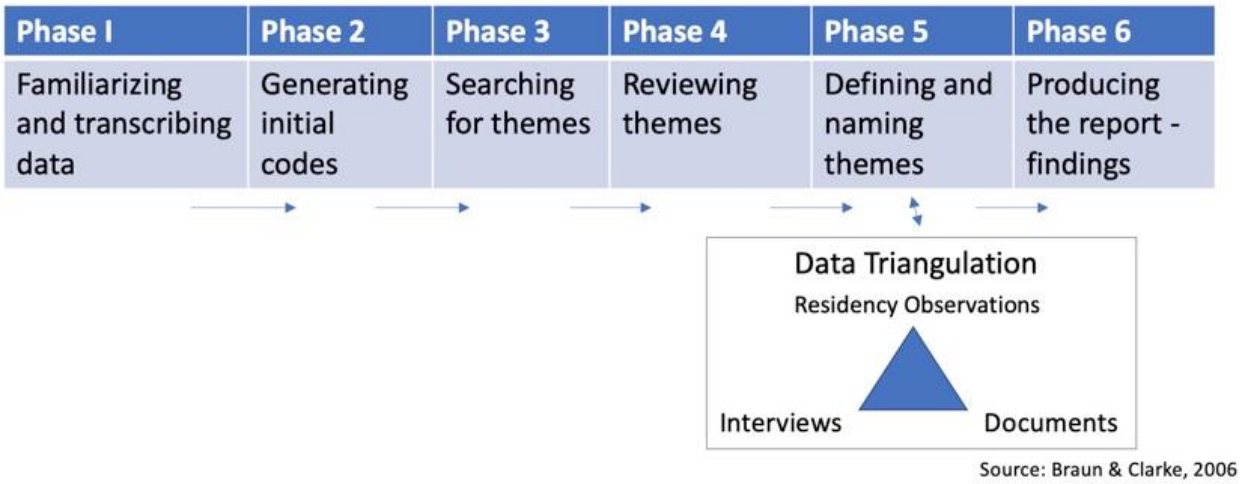
survey items provided data oriented to answer the corresponding research questions. Based on these groupings, I applied the items' frequencies to the four research questions the data best answered. This approach to research question alignment enabled me to examine the data holistically and eventually make connections across the mentor and mentee survey datasets.

Qualitative Analysis

According to Braun and Clarke (2006), thematic analysis is a qualitative research method that can be used across a wide range of research questions, used for identifying, analyzing, organizing, describing, and reporting themes found within a dataset. Each survey had two open-ended items, and the mentors' and mentees' responses to those items were coded using the same coding scheme employed for analyzing the data collected during the semi-structured interviews (see Figure 9). This thematic analysis with deductive coding occurred in six phases (Braun & Clarke, 2006). Phase 1 involved familiarizing myself with the data and transcribing the data. In Phase 2, I generated the initial codes during the initial rounds of data coding. Next, Phase 3 involved searching for themes based on the patterns that began to emerge. In Phase 4, the emerging themes were reviewed. I organized the data to discover recurrent themes across the different data types and with triangulation of interview data, document reviews, and observation notes defining and naming the themes became apparent. In Phase 5, I defined and named the themes and used data triangulation with the survey data and the observation and document data to ensure trustworthiness. Patton (1999) refers to triangulation as the use of multiple methods or data sources to reduce inherent bias associated with a single source, method, or researcher. With qualitative analysis, triangulation tests validity through convergence of the data collection (Fusch et al., 2018). Phase 6 produced the report findings.

Figure 9

Six Phases of Thematic Analysis



Source: Braun & Clarke, 2006

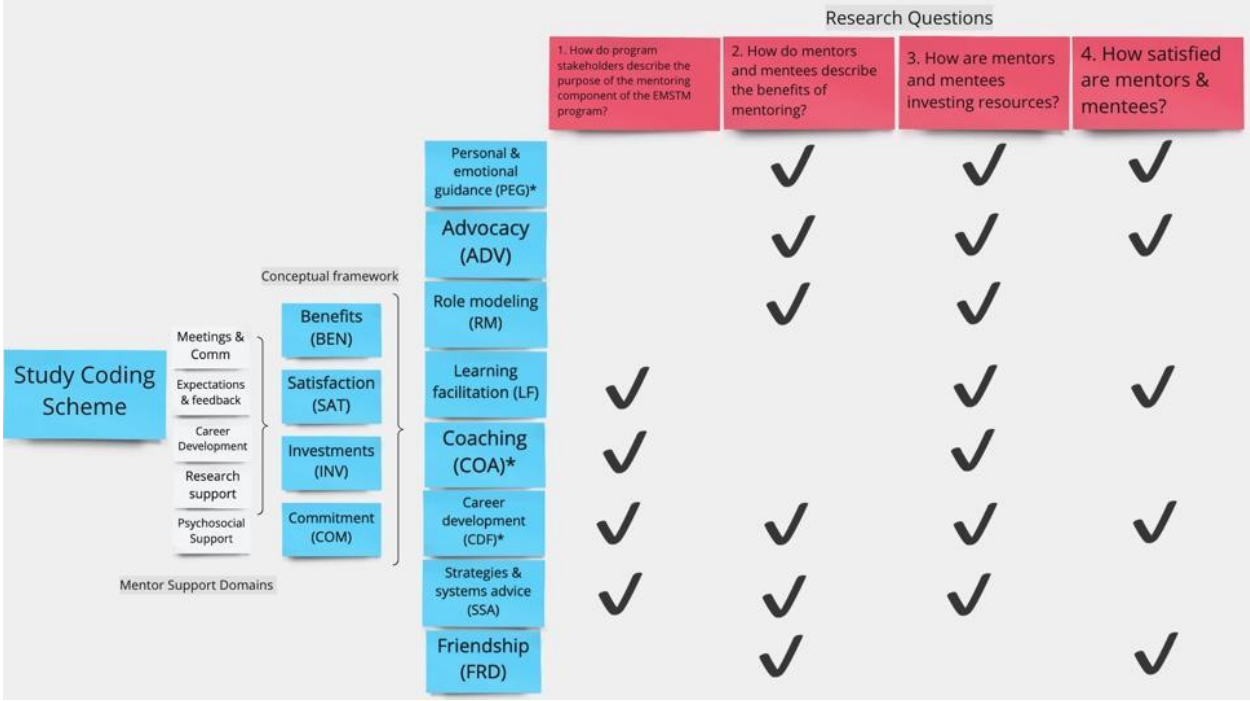
Throughout the phases of the thematic analysis, I utilized the rigorous coding scheme. This was necessary to analyze the 10 hours of semi-structured interview data in triangulation with observational notes, document review notes, and open-ended survey question responses. I leveraged NVivo to code the transcribed interviews and identify trends based on the following codes: personal and emotional guidance; coaching; advocacy; career development; role modeling; strategies and systems advice; learning facilitation; friendship; cost, benefits, commitments, satisfaction, and investments.

For the systemic review of collected digital materials and documents, I devised initial coding supporting four categories of the EMSTM program: (1) program academics (classes), (2) mentoring program, (3) oral defenses, and (4) master's capstone project. The mentoring program added additional codes, which involved investments (time), coaching, career development and learning facilitation. Mentor domains illuminated by Berk et al. (2005) and Fleming et al. (2013) provided a useful tool to capture mentor evaluation survey data and shape the coding scheme, which created concrete linkages for this study's conceptual framework of conceptual investment

model of mentoring relationships (Eby, 2007) and for generating connections and refining the overall codes and categories for answering the research questions. The resulting coding theme that was based on following the six-phase thematic analysis plan (Braun & Clarke, 2006) is illustrated in Figure 10.

Figure 10

Coding Scheme for Qualitative Analysis of Interviews and Observations



Findings

Six primary findings emerged from the thematic data analysis. A snapshot of the six findings follow:

Finding 1: The mentoring component is described as a strategy to bridge theory from seminar room learning with real world experience.

Finding 2: Mentees find the mentoring program to be very beneficial for building professional expertise, gaining useful critiques of individual efforts, and developing motivation to improve work.

Finding 3: Mentors find the mentoring program to be very beneficial for gaining a sense of fulfillment of sharing wisdom and insight, individual creativity, and work rejuvenation.

Finding 4: There are variations in the amount of time allocated to mentoring sessions, the quality of mentoring, and use of technology resources by mentors and mentees.

Finding 5: While the majority of mentors and mentees are satisfied with the mentoring experience, mentors report being more satisfied with the mentoring experience than mentees.

Finding 6: Mentees want more choice in the mentor-mentee matching process.

Findings Aligned to the Four Research Questions

The evidence supporting the alignment of the finding to the research questions are presented in this section. Additionally, the surveys' item frequencies are provided in Appendices I and J in support of the alignment between the findings and the research questions.

RQ 1: How do program stakeholders describe the purpose of the mentoring component of the EMSTM program?

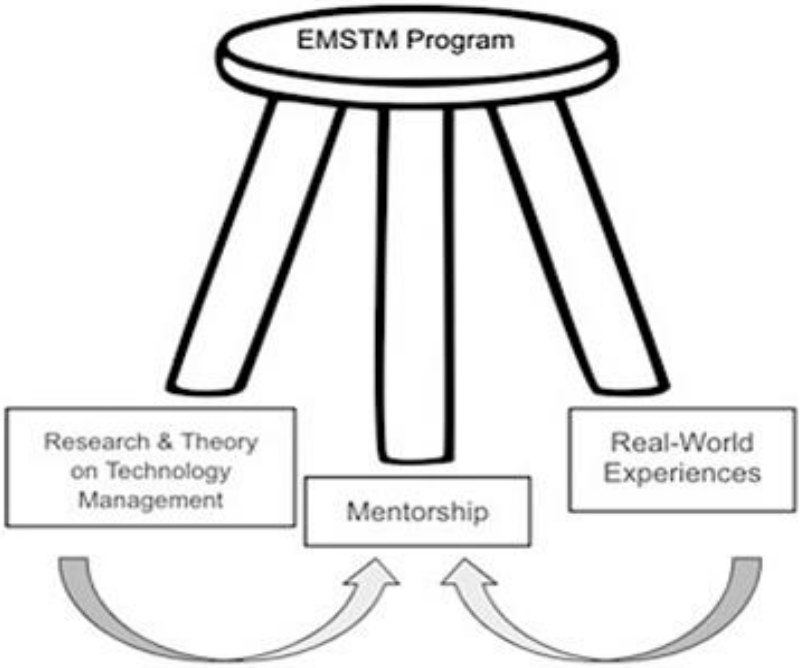
Finding 1 answered this research question. The evidence is presented.

Finding 1: The mentoring component is described as a strategy to bridge theory from seminar room learning with real world experience.

Similar to a three-legged stool, which provides support and stability to any particular entity resting on it. EMSTM leadership described the mentoring program as a connection between research and theory and what happens in the real world. Importantly, the data illuminated critical relational connections that bridge the gap between technology management's research and theory and the practice of technology management. Figure 11 provides a representation. Most of the mentors described how the program provided an opportunity for students to apply what they learned in the seminar classroom. Though there are existing barriers in trying to evaluate mentoring relationships (Anderson et al., 2012), EMSTM mentor-mentees shared common perceptions on how the mentoring program provided positive, successful outcomes as mentees (students) matriculate toward graduation.

Figure 11

The Connection Between Seminar Room Learning and Real-World Experience



The mentoring program serves as a bridge of dependence in support of EMSTM program outcomes, practice within technology management, and effective mentoring relations. Dependence on relationships reveals many factors, such as relationship commitment, relationship benefits exceed costs, and relationship investments as these are salient factors of effective relationships (Rusbult et al., 2006). Eby and Robertson (2020) included satisfaction as a factor, because the commitment to a relationship enhances relationship satisfaction and a greater level of investment benefits overall relations. Mentee Interviewee 7 explained, “My other academics [programs] did not transfer knowledge and information like this one has [for me] … I gained more industry [credibility] here than in my last two jobs.” Mentor Interviewee 5 offered an excellent example of this idea: “Students need more than academic lessons, to be successful professionally, they need experiences and [to] know what to do with the information.”

RQ 2: How do mentors and mentees describe the benefits of mentoring?

Findings 2 and 3 answered this research question. The evidence is presented.

Finding 2: Mentees find the mentoring program to be very beneficial for building professional expertise, gaining useful critiques of individual efforts, and developing motivation to improve work.

EMSTM mentoring effects can be noteworthy, profound, and enduring for mentees. Because of their mentors providing both academic guidance and professional expertise in their respective technology field, mentees found the mentoring program to be very beneficial. Survey data, summarized in Figure 12, indicated that the majority of mentees report their mentors benefitted them:

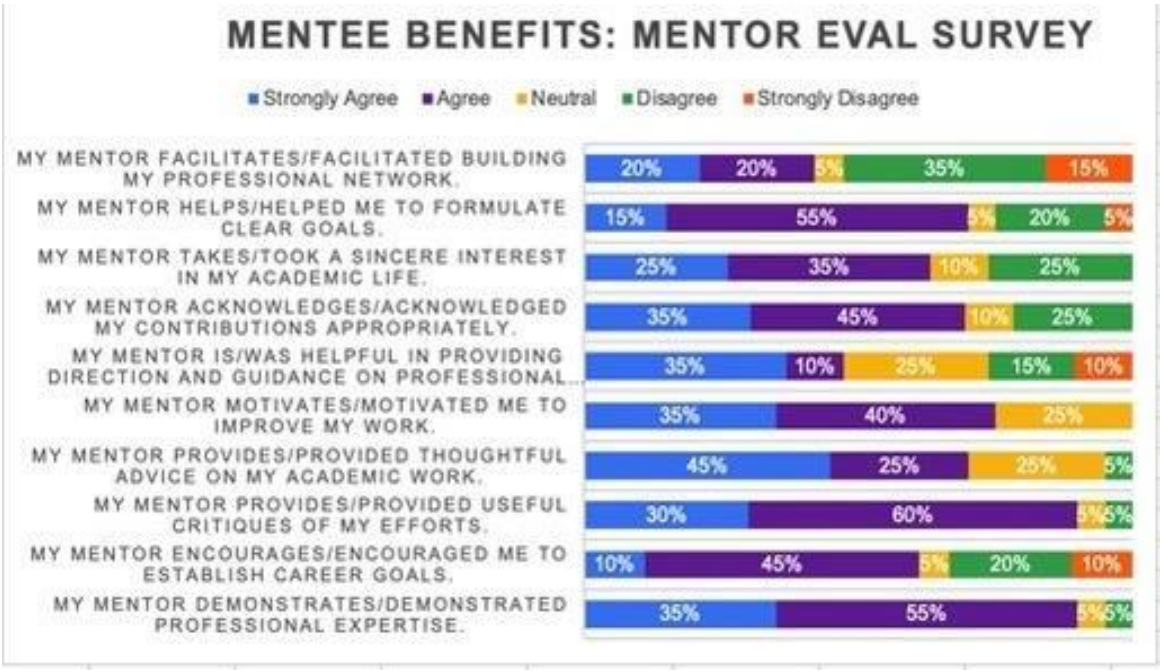
- 90% strongly agreed and agreed that mentors provided professional expertise.
- 90% strongly agreed and agreed that mentors provided direction, guidance, and critiques of professional efforts.
- 80% strongly agreed and agreed that mentors acknowledged contributions appropriately.
- 75% strongly agreed and agreed that mentors provided motivation to improve.
- 70% strongly agreed and agreed that mentors provided industry credibility.

In interview data, the mentoring benefit theme surfaced from the mentee data. Mentee Interviewee 6 noted the importance of investing in the relationship: “Mentoring is really more than just two people talking to each other. It’s a[n] investment into each other.... Sometimes I [mentee] benefit more but in the end, I see that we both gain a lot out of the time together.” Mentee Interviewee 7 framed the motivational benefit in the following illustrative comment,

“My mentor gave me [the] support to think bigger and [help me] translate my goals into actions at my job.”

Figure 12

Selected Mentee Survey Items



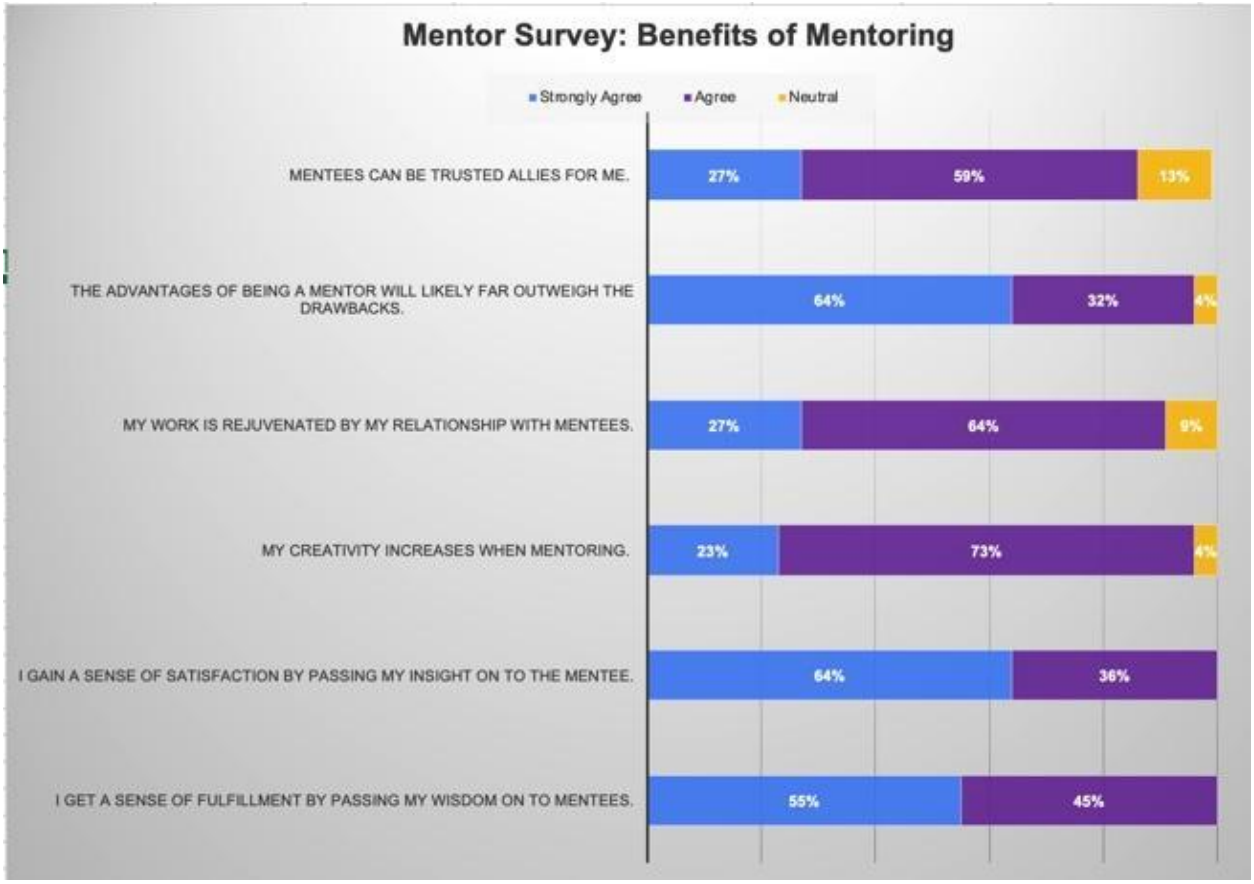
Finding 3: Mentors find the mentoring program to be very beneficial for gaining a sense of fulfillment of sharing wisdom and insight, individual creativity, and work rejuvenation.

The data revealed that mentors find the mentoring program to be highly beneficial. Several benefits emerged from the data, and many of these also align with the literature, such as trust (Nakkula & Harris, 2005; Rhodes, 2002), work rejuvenation (Allen et al., 2004; Eby et al., 2013; Kammeyer-Mueller & Judge, 2008), and satisfaction (Eby & Roberston, 2020; Kay & Wallace, 2009) with sharing insights in the aspects of mentoring. Also, 96% of mentor respondents strongly agreed and agreed that the advantages of being a mentor far outweigh the drawbacks. Overwhelmingly, 96% of mentor respondents strongly agreed and agreed that their personal creativity increased while mentoring. This finding fills a gap in the literature because creativity as an outcome for mentors did not reveal itself in the mentoring literature. As seen in Figure 13, mentor survey data indicated that the majority of mentors report the mentorship benefits as follows:

- 100% strongly agreed and agreed to gaining a sense of fulfillment when sharing insights.
- 94% strongly agreed and agreed that mentoring increases personal creativity.
- 91% strongly agreed and agreed that mentoring impacts professional performance (rejuvenates).
- 86% strongly agreed and agreed that mentees are trusted allies.

Figure 13

Mentor Data About the Benefits of Mentoring



Interviews and open-ended survey questions surfaced illustrative quotes supporting Finding 3. Table 1 offers the mentor quotes that assisted in framing how mentorship has provided benefits to mentors.

Table 1

Illustrative Quotes Supporting Finding 3 from Mentor Data.

Participant	Quote
Mentor Interviewee 3	"Everyone [EMSTM] I've mentored have been exceptional students, compared to other(s) [programs]...spending a year with them [mentees] makes for lasting relationships"
Mentor Survey 3	"Mentoring has been a valuable component in my career"

Mentor Survey 4	"If I had a mentor early on, I would have done even better in my career"
Mentor Survey 11	"Connections w/ other mentors … lifetime connections w/ mentees"
Mentor Survey 18	"Maintaining the mentee relationships beyond their graduation from the program. Having one of my mentee's become a mentor in the program"

RQ 3: How are mentors and mentees investing resources?

Finding 4 answered this research question. The evidence is presented.

Finding 4: There are variations in the amount of time allocated to mentoring sessions, the quality of mentoring, and use of technology resources by mentors and mentees.

In multiple instances, throughout the data collection period, September 2020 to May 2021 from program observation notes and mentee and mentor interviews, the data suggested many dyads held weekly mentoring sessions throughout the 1-year commitment. Additionally, many mentor-mentee relationships extended past the formal academic mentoring period, as shared through interviews and seen in observations. Mentor and mentee comments are reflected in Table 2, notable investments from participants include relevant experiences connected to mentor professional experience, time dedicated to mentoring sessions, and utilization of technology to establish presence and reinforce learning interventions. This area is lacking in the mentoring literature because of the level of difficulty to examine mentor-mentee exchanges and outcome as stated by many mentoring researchers (Desimone et al., 2014; Farmer et al., 2009; Hudson, 2016).

Table 2

Quotes from Mentors and Mentees Regarding Variations

Participant	Quote
Mentor Interviewee 1	"Time...need I say more…"

Mentor Interviewee 1	"...technology is what held us, all of us together, and [technology] is still holding us together…"
Mentor Interviewee 4	"Students need more than academic lessons, to be successful professionally, they need experiences and [to] know what to do with the information…"
Mentee Interviewee 2	"We connect by text and email…[he/she] always responds…[he/she] helped me with all the coursework when I asked, …[and] get ready for the orals [defenses]"
Mentee Interviewee 3	"My mentor…prior exec…seemed to be disconnected from the current state of the industry."
Mentee Interviewee 6	"[Classmates] meet with their mentors weekly, I enrolled in the program [because] of the mentoring opportunities…I only meet with my mentor monthly…"
Mentee Interviewee 7	"...COVID [timeframe] was hard for me, I didn't do well, the work [Tech Management Program] is hard, [all the] technologies connected us...but it wasn't enough…"
Mentee Survey 12	"…[I desired more from my mentor] in terms of career guidance or a discernible network to leverage on my behalf."
Mentee Survey 16	"…not meeting weekly with my mentor [compared to classmates]…made me feel like an afterthought"

Six out of seven mentee interviewees reported having weekly mentoring sessions, which surpassed the EMSTM program guidance for a minimum of one mentoring meeting per month. Another resource variation theme that emerged involved mentees receipt of resources, such as the mentees receiving quality and quantity professional advice (Fleming et al., 2013; Lai, 2010; Mullen, 2020), access to professional networks (Berk et al., 2005; Griffin et al., 2018), and relational connections (Eby & Robertson, 2020; Kram, 1985) during mentoring sessions. In survey data, only 40% of mentees strongly agreed and agreed that their mentors helped facilitate a professional network, but 50% disagreed and strongly disagreed that their mentors helped facilitate a professional network. On the survey question, regarding mentor helpfulness in providing direction and guidance on professional issues, 45% of mentees strongly agreed and

agreed, 25% of mentees responded as neutral, and 25% of mentees disagreed and strongly disagreed. The variations could represent challenges affecting mentors and mentees dealing with eagerness, ineptness, and nervousness early in the mentoring relationship, underutilization of data and mentee choice, costs of a poor match, volume of advice, and levels of support (Lyons & Oppler, 2004; O'Neill, 2005; Allen et al., 2006).

There were variations between mentees (Figure 14) and mentors (Figure 15) regarding the technologies they reported using to maintain their mentoring relationships. The Zoom web conferencing was the most widely used by both participating mentors and mentees. Emails was the second most used application. After Zoom and email, however, the variations are visible in the bar graphs in Figures 14 and 15. For example, mentees suggested talking by telephone was the least used technology while faculty ranked talking by telephone over text messaging. The theme that emerged around the variation of resources was reported by mentees as scheduled mentoring sessions and types of resources provided by their mentors. As described by mentors and mentees in interview and open-ended survey responses, the resources likely to show variations throughout the data collection were providing relevant experiences, time, and technology use. In addition, there were variations in resources invested by mentors that included meeting once a week versus monthly and the amounts and types of resources provided. (Note: video conferencing depicted is other than Zoom.)

Figure 14

Mentee Use of Technology to Sustain Mentoring Relations

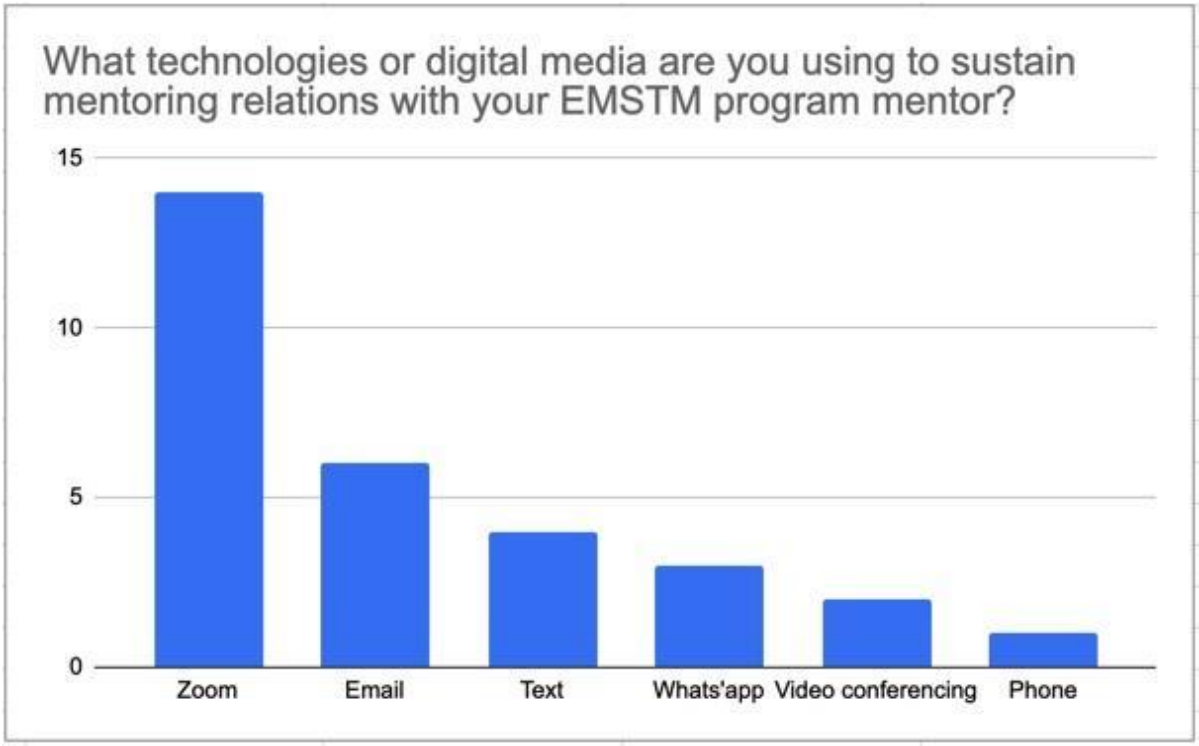
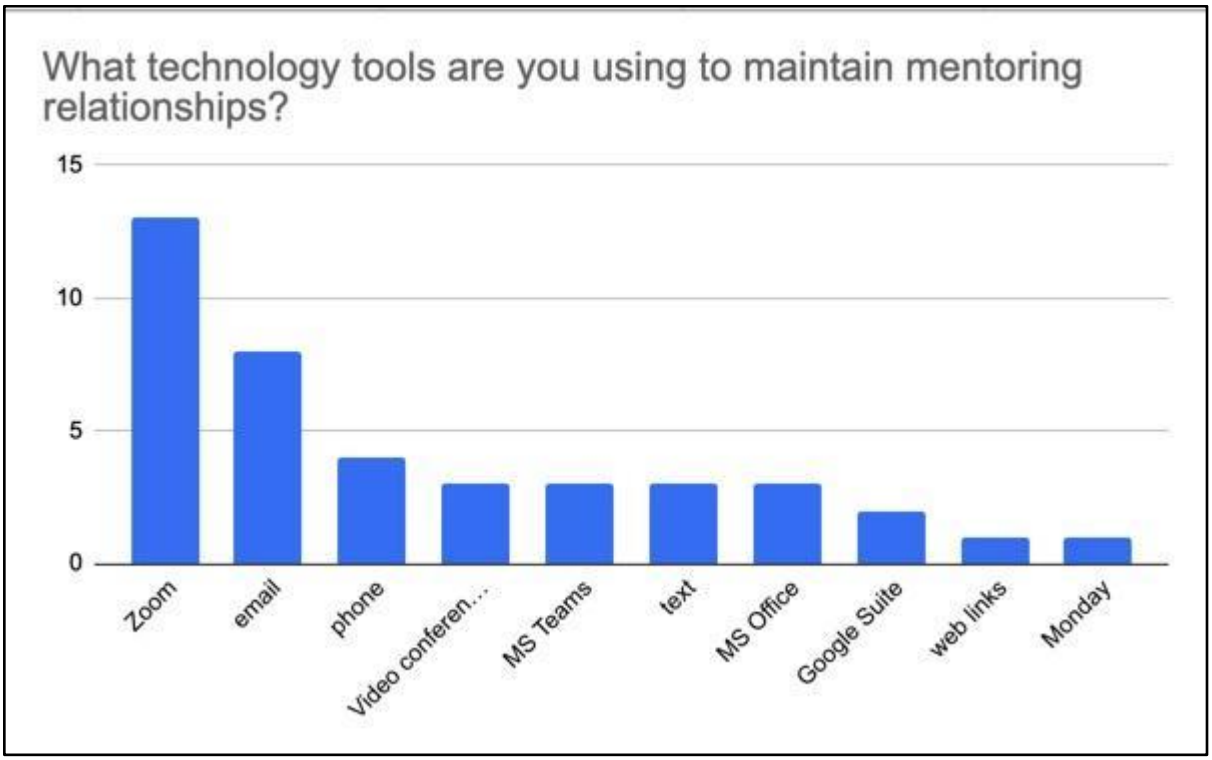


Figure 15

Mentor Use of Technology to Sustain Mentoring Relations



RQ 4: How satisfied are mentors and mentees?

Findings 5 and 6 answered this research question. The evidence is presented.

Finding 5: While the majority of mentors and mentees are satisfied with the mentoring experience, mentors report being more satisfied with the mentoring experience than mentees.

The mentor survey data indicated that 100% of mentors strongly agreed and agreed that they gained a sense of satisfaction when sharing their insight while mentoring. However, on the mentee surveys, 65% of mentees strongly agreed and agreed that they were satisfied with the mentoring experience (Figure 16). This indicates that progress can be made related to mentee satisfaction. According to Eby (2007) in the conceptual investment model of mentoring relationships, satisfaction is a relating factor to relational commitment and stability in mentoring dyads. This investment includes affective reactions connected to the relationship, such as acceptance, belonging, connectedness, and trust (Russell & Adams, 1997; Higgins & Kram, 2001; Leck, & Orser, 2013; Luckhaupt et al., 2017; Lundsford, 2017; Mullen, 2020). The majority of mentor/mentee interview participants expressed positive comments and satisfaction with the mentoring program. In the survey, mentor 11 stated, "Mentoring has been a valuable component in my career, and I am very pleased with the mentees I have worked with at Columbia." In agreement, mentee 15 (survey) shared the following comment, "I had a wonderful experience with my mentor and EMS [EMSTM]. Appreciated." However, in the survey, mentee 17 framed the following details,

> "This was a tough year with covid, so I believe a more difficult time to have a mentorship program. While our meetings were always helpful, they were far and few between. It took several follow-ups to hear from my mentor and [he/she] gave only what was needed …"

Figure 16

Mentor and Mentee Satisfaction Results

Finding 6: Mentees want more choice in the mentor-mentee matching process.

During the course of data collection, six out of seven mentee interviewees (71%) reported wanting more choice in the mentor-mentee matching process. Mentee Interviewee 1 explained the desire for more choice among mentees:

> '[The] Tech Management [program] has been life changing [for me]. I like my mentor - [she/he] picked me because of my project. [You] can't finish the final project and graduate without your mentor … I'd like to have a say in who my mentor was."

Mentee Interviewee 7 framed the choice and potential opportunities to contribute to program success in the following statement:

> "If I could change one thing [in EMSTM] it would be to change how I got my mentor…the program [EMSTM] was great! I learned a lot, but I feel, I feel should have a

voice in who was my mentor, you know [she/he] was supportive…but it's the one thing missing for me."

Mentoring literature broadly addressed the challenges around mentor-mentee matching and overall mentoring program design (Allen et al., 2006; Douglas, 1997; Lyons & Oppler, 2004; O'Neill, 2005). Mentor matching occurs as some of the common challenges that surface when matching mentors with mentees in formal mentoring programs.

Recommendations

Based on the findings and conceptual framework involving mentorship benefits, investments, and satisfaction, three recommendations emerge for EMSTM as it maintains and evolves a successful and unique master's level mentoring program. The education landscape is always changing, as evidenced by the effect of COVID-19 on higher education environments. The recommendations are the following: (1) Increase the development of networks through group and peer mentoring, (2) Use of continuous improvement mechanisms to foster ongoing program growth, and (3) Develop a shared repository for mentor resources.

Recommendation 1: Increase the Development of Networks Through Group and Peer Mentoring

Findings 1, 2, 3, and 4 lead to the first recommendation. Finding 1 involved mentoring bridging the gap of research and theory to practice, suggesting that the adoption of group and peer mentoring could promote growth in the mentoring program to strengthen the connections occurring between research and theory with practice. Findings 2 and 3 focused on mentorship benefits, suggesting that mentors-mentees might identify with mentoring beyond the currently

applied dyad model. Finding 4 related to resource investments, suggesting the extent of time and energy (physical and psychological) may change within mentor-mentee relationships.

EMSTM has been a long running, successful program, since 2004. Student and mentor learning can evolve over time to change what mentees and mentors perceive as benefits, investments of resources, and satisfaction with their mentoring relationships. Thus, the first recommendation is to increase EMSTM developmental networks through formal group and peer mentoring. EMSTM is encouraged to consider integrating a group mentoring component to expand the academic mentoring benefits and supports.

Group and/or peer mentoring has the potential to reach across various types of individual personalities and preferences for learning in support of mutual support time (Darwin, 2000; Huizing, 2012). Currently, the mentor dyad model is effective based on the evidence from the mentors and mentees (students), but it is a one-size fits all model (Desimone et al., 2014). Effective mentorship structures may include triads (Berk et al., 2005; Higgins & Kram, 2001), collective or group mentoring (Huizing, 2012; Mullen & Klimaitis, 2021), mentoring networks and online and e-mentoring communities (Higgins & Kram, 2001; Mullen, 2020; Smith-Jentsch et al., 2008). The integration of program sponsored group and/or peer mentoring models (Berk et al., 2005) offers extended opportunities for all participants in the EMSTM and its formal mentoring program to learn, share, and contribute. Additional synergy could emerge with increased and realized social capital through expanded mentoring networks (Kay & Wallace, 2009; Webb et al., 2009), increasing the mentorship benefits for both mentees and mentors as well as the options for choice in how mentoring is accomplished based on individual preferences.

Recommendation 2: Use of Continuous Improvement Mechanisms to Foster Ongoing Program Growth

All six findings framed the second recommendation. Finding 1 suggested mentoring dyads bridge the gap between research and theory with real-world experiences, suggesting that continuous improvement mechanisms can provide support and sustain ever changing gaps between education and practice. Findings 2 and 3 identified the benefits of mentor dyads, suggesting continuous improvement mechanisms could benefit from the mentor-mentee voice when pinpointing needs from the mentoring program. Finding 4 relating to resource investments indicated that continuous improvement mechanisms could support EMSTM in determining mentor-mentee investments as connected to mentorship and the academic program. Finding 5 addressed the mentor-mentee gap in satisfaction with the mentoring culture, suggesting continuing improvement mechanisms can offer program participants conduit to share experiences. Finding 6 indicated that mentees desire more choice in the mentor matching process, suggesting continuous improvement mechanisms may offer desired cross talks in this process. Recommendation 2 is to consider the use of continuous improvement mechanisms to foster ongoing program growth.

Examples of continuous improvement mechanisms are informal surveys of mentees and mentors about the program and collection of data to address traditional career and psychosocial supports (satisfaction, investments, and commitments) received by students (mentees), and the complexities pertaining to gender and students from historically marginalized communities and institutional cultures. Additional forms of continuous improvement activities include focus groups and check-in interactions (virtual or physical) by program coordinators to provide mentors and mentees a conduit for supporting and validating programmatic updates and changes.

This study's findings emerged from the contributions from participants of the program mentorship community. By providing participants opportunities to provide information through appropriate improvement mechanisms, EMSTM increases the understanding of student (mentee) and mentor perspectives, improves the health of the mentorship program, and tightens the linkage between the mentorship culture and the larger EMSTM program (Fleming et al., 2013; Nakkula & Harris, 2005; Struyk & Haddaway, 2012). Readily organized data can aid in mentoring program growth and sustainment (Allen et al., 2006).

Recommendation 3: Develop a Shared Repository for Mentor Resources

Finding 3 identified the mentor benefits, suggesting a specific mentor repository could be practical for EMSTM mentors. Finding 4 demonstrated mentor investments in resources could be maximized by developing a shared mentor repository to support connections of resources between mentors and the EMSTM administration for ultimately, effectively leveraging mentor resources to reduce mentors' time and physical investments each semester. Thus, the third recommendation is to develop a shared repository for mentor resources. The repository could be a library, virtual or physical, that operates as a shared space for program materials and artifacts and serves as a go-to repository for seasoned and new mentors. Added features could be tutorials to support mentor expectations (Farmer et al., 2009; Struyk & Haddaway, 2012) and mentor training materials (Eissner & Gannon, 2018), which may be valued to support just-in-time learning experiences. As the library grows, EMSTM could curate and consolidate resources to align with best practices and increase the power of the resource investments in benefiting the mentees. As the mentors are a quasi-community of practice, a shared repository could enhance mentoring benefits for mentees in addition to ensuring ongoing mentor satisfaction.

Discussion

I aimed to examine the mentoring culture in a formal academic program with a focus given to the supports and benefits of mentorship. Four research questions shaped the area of inquiry, which was to understand the benefits, investment of resources, and mentor/mentee satisfaction. These concepts had not been investigated in prior internal program reviews. The words of Oliver Wendell Holmes, Jr., were prophetic for the findings of this mentoring study: "A mind that is stretched by a new experience can never go back to its old dimensions."

The six findings illuminated the mentor dyad experience of the EMSTM program from both mentor and mentee perspectives and indicated growth areas for the program's mentor-mentee relationships. Within each element, evidence emerged on the mentoring program as mentors and mentees repeatedly shared through the qualitative data about the uniqueness and high-quality standards of across the formal and informal mentoring EMSTM culture. The students, who were current technology professionals and future technology leaders, recognized that the designs of learning environments must evolve to support learners. In this case, mentorship in a formal academic program needs to evolve to maintain its critical stable structure in support of the larger EMSTM program. The three recommendations can enable that to happen.

Limitations existed across the study timeline. Data collection during a global pandemic resulted in minimal participation with low response rates, suggesting the sample might have been biased and not generalizable to all EMSTM mentors and mentees. Also, the pandemic affected the opportunity to make observations in physical environments, reducing opportunities to view nonverbal language during students' project defense presentations. Lack of nonverbal interactions in the Zoom web conferencing application could have affected what the participants shared during their interviews.

The three recommendations may yield incremental growth opportunities that lead to strategic implications in support of constant change across education and technology environments that benefit EMSTM learners (mentees) and educators (mentors and faculty). Increasing the development of networks through group and peer mentoring, using continuous improvement mechanisms to foster ongoing program growth, and curating a shared repository for mentor resources could further propel Columbia University's EMSTM to greater heights.

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Appendix A: Informed Consent for Interview

Principal Researcher: Toni L. Hawkins-Scribner

Research Title: An Examination of Mentoring Culture: Supports and Benefits of Mentorship in a Formal Academic Program

You are invited to participate in a research study that explores how mentee-mentor relationships develop successfully through an investment model illuminating the supports and benefits within Columbia University's Executive Master of Science in Technology Management (EMSTM) program. Your participation is completely voluntary. Your participation in this study requires an interview during which you will be asked questions about your meaningful mentor / mentee experiences. The duration of the interview will be approximately 30-40 minutes. With your permission, the interview will be digitally recorded and transcribed in order to capture and maintain an accurate record of our discussion. Your name will not be used. On all transcripts and data analysis, you will be referred to by a pseudonym. This study will be conducted by the researcher, Toni Hawkins-Scribner, a doctoral student at Vanderbilt University, Peabody College. The interview will be conducted at a time and location that is mutually suitable.

Risks and Benefits:
This research will hopefully contribute to the understanding of support and benefit characteristics of mentor/mentee relations. Participation in this study carries the same amount of risk that individuals will encounter during a usual meeting of colleagues.

Data Storage to Protect Confidentiality:
Under no circumstances whatsoever will you be identified by name in this research study. Every effort will be made that all information provided by you will be treated as strictly confidential. All data will be coded and securely stored and will be used for professional purposes only.

How the Results Will Be Used:
This research study is to be submitted in partial fulfillment of requirements for the degree of Doctor of Education at Vanderbilt University, Peabody College Nashville, TN. The results of this study will be published as a capstone project. In addition, information may be used for educational purposes in professional presentations and/or publications.

Participant's Rights

- I have read and discussed the research description with the researcher. I have had the opportunity to ask questions about the purposes and procedures regarding this study.
- My participation in the research is voluntary. I may refuse to participate or withdraw from participation at any time.
- The researcher may withdraw me from the research at her professional discretion.
- Any information derived from the research that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- If at any time I have questions regarding the research or my participation, I can

contact the researcher, Toni Hawkins-Scribner who will answer my questions. The researcher's phone number is ### and email is: toni.hawkins-scribner@vanderbilt.edu. I may also contact the researcher's faculty advisor, Dr. Erin Henrick, at erin.henrick@vanderbilt.edu.

- If at any time I have comments or concerns regarding the conduct of the research, or for questions about my rights as a research subject, I should contact the Vanderbilt Institutional Review Board (IRB) at (615) 322-2918.
  I should receive a copy of this document.
- Digital recording is part of this research. Only the principal researcher and the a transcriptionist will have access to written and taped materials. Please check one:

( ) I consent to be audio taped.
( ) I DO NOT consent to be audio taped.

My signature indicates that I agree to participate in this study.
Participant's signature: Date: / /
Name (Please print):

Investigator's Verification of Explanation

I, Toni Hawkins-Scribner, certify that I have carefully explained the purpose and nature or this research to _____ (Participant's name). She/he has had the opportunity to discuss it with me in detail. I have answered all his questions and she has provided the affirmative agreement to participate in the research.
Researcher's signature: Date: / /

Appendix B: Interview Questions EMSTM Mentees

The interview questions were adapted from Ragins and Scandura (1999):

1. What forms of knowledge or skill sets do you think your mentor can offer you? Probe: Give specific examples and expand on any characteristics.

2. What forms of knowledge or skill sets do you think you can offer your mentor? Probe: Give specific examples and expand on any characteristics.

3. Describe the forms of knowledge and skill sets you need to know to be successful in college. Probe: Give specific examples of academic and social skills.

4. Describe how your mentor teaches you the forms of knowledge and skill sets you need to know in order to succeed in the program. Probe: Give specific examples of academic and social skills.

5. Describe your expectations of your mentor. Probe: Give specific examples.

6. Describe your obligations to your mentor. Probe: Give specific examples.

7. Describe the level of trust between you and your mentor. Probe: Give specific examples.

8. Describe some of the things you have received from your mentor. Probe: Give specific examples of material and nonmaterial things.

9. Describe some of the things you have given to your mentor. Probe: Give specific examples of material and nonmaterial things.

10. Describe the norms you and your mentor follow when you interact with each other. Probe: Give specific examples.

11. Describe how these norms change depending on the topic of your conversation. Probe: Give specific examples.

12. Describe the consequences for you if these norms are not followed in your mentoring relationship. Probe: Give specific examples.

13. Describe the consequences for your mentor if these norms are not followed in your mentoring relationship. Probe: Give specific examples.

14. How would you describe the academic culture of the program? Give specific examples.

15. Describe your typical academic advising session with your mentor. Probe: Give specific examples.

16. In your opinion, what is the best academic advice you received from your mentor? Probe: Give specific examples.

17. Describe at least three academic/industry resources that your mentor has discussed with you. Probe: Give specific examples.

18. Describe the mediums and methods you and mentor use to conduct time together. Probe: Give specific examples and list specific technologies. What is different between now and prior to March 2020?

Appendix C: Interview Questions EMSTM Mentors

The interview questions were adapted from Ragins and Scandura (1999):

1. What forms of knowledge or skill sets do you think you can offer your mentee in your mentor role? Probe: Give specific examples.

2. What forms of knowledge or skill sets do you think you can offer your mentee? Probe: Give specific examples.

3. Describe your expectations of your mentee. Probe: Give specific examples.

4. Describe your obligations to your mentee. Probe: Give specific examples.

5. Describe the level of trust between you and your mentee. Probe: Give specific examples.

6. Describe some of the things you have received from your mentee. Probe: Give specific examples of material and nonmaterial things.

7. Describe some of the things you have given to your mentee. Probe: Give specific examples of material and nonmaterial things.

8. Describe the norms you and your mentee follow when you interact with each other. Probe: Give specific examples.

9. Describe how these norms change depending on the topic of your conversation. Probe: Give specific examples.

10. Describe the consequences for you if these norms are not followed in your mentoring relationship. Probe: Give specific examples.

11. Describe the consequences for your mentee if these norms are not followed in your mentoring relationship. Probe: Give specific examples.

12. How would you describe the academic culture of the university? Give specific examples.

13. Describe your typical academic advising session with your mentee. Probe: Give specific examples.

14. Describe the relationship between your mentee and other program faculty who interact with you on a regular basis. Probe: Give specific examples.

15. How often do you think your mentee interacts with them?

16. Describe the mediums and methods you and mentee use to conduct time together. Probe: Give specific examples and list specific technologies. What is different between now and prior to March 2020?

Appendix D: Alignment of the Mentor Evaluation Tool Items Development to the References, Research Questions, and Conceptual Framework

Survey Question	References	Research Question	Mentor domains / conceptual framework
1.My mentor is accessible	Berk et al., 2005 Fleming et al., 2013	1, 2, 3	Meeting and communication / investments
2.My mentor is an active listener	Berk et al., 2005 Fleming et al., 2013	2, 3, 4	Expectations and feedback / investments
3.My mentor demonstrates professional expertise	Berk et al., 2005 Fleming et al., 2013	2, 3, 4	Research support / investments and satisfaction
4.My mentor encourages me to establish career goals	Fleming et al., 2013	1, 2, 3	Career development / investments, satisfaction, & benefits
5.My mentor provides useful critiques of my efforts	Berk et al.,2005 Fleming et al., 2013	1, 2, 3, 4	Expectations and feedback Research support / investments, satisfaction, & benefits
6.My mentor motivates me to improve my work	Berk et al., 2005 Fleming et al., 2013	1, 2, 3, 4	Research support / investments and satisfaction
7.My mentor is helpful in providing direction and guidance on professional issues	Berk et al., 2005 Fleming et al., 2013	1, 2, 3, 4	Career development / investments, satisfaction, & benefits
8.My mentor acknowledges my contributions appropriately	Berk et al., 2005 Fleming et al., 2013	1, 3, 4	Expectations and feedback / Investments and satisfaction
9.My mentor takes a sincere interest in my academic life	Fleming et al., 2013	1, 2, 3, 4	Psychosocial support / investments, satisfaction, & benefits
10.My mentor helps me to formulate clear goals	Fleming et al., 2013	1, 2, 3, 4	Career development / investments, satisfaction, & benefits
11.My mentor facilitates building my professional network	Berk et al., 2005 Fleming et al., 2013	2	Career development / investments, satisfaction, & benefits
12.My mentor provides thoughtful advice on my academic work	Berk et al., 2005 Fleming et al., 2013	3	Research support / investments, satisfaction, & benefits
13.My mentor is supportive of work-life balance	Fleming et al., 2013	4	Psychosocial support / satisfaction
14.Overall, I'm satisfied with my mentoring experience	Berk et al., 2005 Fleming et al., 2013	4	All / investments, satisfaction, & benefits
15.Please share your top challenges as a mentee.	Reid & Slinger, 2006	1, 3, 4	Benefits vs. Costs / investments, satisfaction, & benefits
16.Other: Please share any additional thoughts involving your mentoring relationship.	Allen, T. D., 2007	1, 2. 3, 4	Investments, satisfaction, & benefits
17.What technologies or digital media are you using to sustain mentoring relations with your EMSTM program mentor?	Single & Muller, 2001	3	NA / investments

Note. Mentee survey instrument was the Mentor Evaluation Tool that was adapted from Anderson et al. (2012) and crafted from the mentor support domains of meetings and communication, expectations and feedback, career development, research support and psychosocial support (Anderson et al., 2012; Berk et al., 2005; Fleming et al., 2013).

Appendix E: EMSTM Mentor Evaluation Tool Items

Item	Mentor Domains	Type of Item
1.My mentor is accessible	Meeting and communication	5-point Likert
2.My mentor is an active listener	Expectations and feedback Meeting and communication	5-point Likert
3.My mentor demonstrates professional expertise	Research support	5-point Likert
4.My mentor encourages me to establish career goals	Career development	5-point Likert
5.My mentor provides useful critiques of my efforts	Expectations and feedback Research support	5-point Likert
6.My mentor motivates me to improve my work	Research support	5-point Likert
7.My mentor is helpful in providing direction and guidance on professional issues	Career development	5-point Likert
8.My mentor acknowledges my contributions appropriately	Expectations and feedback Career development	5-point Likert
9.My mentor takes a sincere interest in my academic life	Psychosocial support	5-point Likert
10.My mentor helps me to formulate clear goals	Career development	5-point Likert
11.My mentor facilitates building my professional network	Career development	5-point Likert
12.My mentor provides thoughtful advice on my academic work	Research support Expectations and feedback	5-point Likert
13.My mentor is supportive of work-life balance	Psychosocial support	5-point Likert
14.Overall, I'm satisfied with my mentoring experience	All	5-point Likert
15. What are your top challenges as a mentee	Expectations and feedback	Open ended text
16. What technologies or digital media are you using to sustain mentoring relations with your EMSTM program mentor?	Career development	Open ended text

Note. Instrument was adapted from Anderson et al. (2012), Berk et al. (2005), and Fleming et al. (2013). All 5-point Likert-type items represented the following forced choice options: *strongly disagree* = 1; *disagree* = 2; *neutral* = 0; *agree* = 4; *strongly agree* = 5.

Appendix F: Alignment of EMSTM Mentor Survey Items to Research Questions and Conceptual Framework

Survey Item	Research Question	Costs and benefits applied to conceptual framework
1.Mentoring will have a positive impact on my job performance.	1, 2, 3	Benefits / Satisfaction, Investments
2.I gain a sense of satisfaction of passing my insight on to the mentee.	2, 3, 4	Benefits / Satisfaction, Investments
3.Mentoring this mentee will be a catalyst for innovation.	2, 3, 4	Benefits / satisfaction, investments
4.My job is rejuvenated by my relationship with mentees.	1, 2, 3	Benefits / investments, satisfaction, & benefits
7.The advantages of being a mentor will likely far outweigh the drawbacks.	1, 2, 3, 4	Benefits / investments, satisfaction, & benefits
9.It is likely my work performance improved when I became a mentor.	1, 2, 3, 4	Benefits / investments and satisfaction
11.Mentoring has a positive impact on my job.	1, 2, 3, 4	Benefits / investments, satisfaction, & benefits
13.Certain mentees can be a positive reflection on my competency.	1, 3, 4	Benefits / investments and satisfaction
14.I get a sense of fulfillment by passing my wisdom on to mentees.	1, 2, 3, 4	Benefits / investments, satisfaction, & benefits
17.Mentees can be trusted allies for me.	1, 2, 3, 4	Benefits / investments, satisfaction, & benefits
18.Choosing a mentee is a positive reflection on my judgement.	2	Benefits / investments, satisfaction, & benefits
19.A mentee is an important source of support for me.	1, 2, 3, 4	Benefits / investments, satisfaction, & benefits Expectations and feedback
20.A mentee can enhance my reputation.	4	Benefits / satisfaction
21.My creativity increases when mentoring.	1, 2, 3, 4	Benefits / investments, satisfaction, & benefits
22.What are your top challenges as a mentor?	1, 3, 4	Benefits vs Costs / investments, satisfaction, & benefits
23.What technology tools are you using to maintain mentoring relationships?	3	Single & Muller (2001) / Investments

Note. The items were adapted from Ragins and Scandura (1999). All 5-point Likert-type items represented the following forced choice options: *strongly disagree* = 1; *disagree* = 2; *neutral* = 0; *agree* = 4; *strongly agree* = 5.

Appendix G: EMTSM Mentor Survey Items

The instructions asked: Please report the extent to which the following items describe you.

Survey Item	Cost or benefit	Type of item
1. Mentoring will have a positive impact on my job performance.	Benefits	5-point Likert
2. I gain a sense of satisfaction by passing my insight on to the mentee.	Benefits	5-point Likert
3. Mentoring this mentee will be a catalyst for innovation.	Benefit	5-point Likert
4. My job is rejuvenated by my relationship with mentees.	Benefit	5-point Likert
5. Mentoring takes too much time away from my own job. (Cost)	Cost	5-point Likert
6. Mentoring is an energy drain.	Cost	5-point Likert
7. The advantages of being a mentor will likely far outweigh the drawbacks.	Benefit	5-point Likert
8. Choosing to mentor particular mentees will be a negative reflection on my judgment.	Cost	5-point Likert
9. It is likely my work performance improved when I became a mentor.	Benefit	5-point Likert
10. Mentoring takes more time than it's worth.	Cost	5-point Likert
11. Mentoring has a positive impact on my job.	Benefit	5-point Likert
12. Certain mentees can be a negative reflection on my competency.	Cost	5-point Likert
13. Certain mentees can be a positive reflection on my competency.	Benefit	5-point Likert
14. I get a sense of fulfillment by passing my wisdom on to mentees.	Benefit	5-point Likert
15. Mentees can end up taking my job.	Cost	5-point Likert
16. I run the risk of being displaced by mentees.	Cost	5-point Likert
17. Mentees can be trusted allies for me.	Benefit	5-point Likert
18. Choosing a mentee is a positive reflection on my judgment.	Benefit	5-point Likert
19. A mentee is an important source of support for me.	Benefit	5-point Likert

20. A mentee can enhance my reputation.	Benefit	5-point Likert
21. My creativity increases when mentoring.	Benefit	5-point Likert
22. What are your top challenges as a mentor?	Cost	Open ended text
23. What technology tools are you using to maintain mentoring relationships?	Cost	Open ended text

Note. The items were adapted from Ragins and Scandura (1999). All 5-point Likert-type items represented the following forced choice options: *strongly disagree* = 1; *disagree* = 2; *neutral* = 0; *agree* = 4; *strongly agree* = 5.

Appendix H: Demographic Items on Both the Mentor and Mentee Survey Instruments

Section 1: This section aims to find out some information about you.

1. What is your gender?
a. Female
b. Male
c. Transgender

2. What is your age?

a. <35 years

b. 36 – 45 years

c. 46 – 55 yrs

d. 56 – 65

e. > 66 yrs

3. Race:

a. Asian

b. Black/African American

c. Hispanic/Latino

d. Middle Eastern

e. Native American

f. White/Caucasian

g. Other

4. What is your highest level of education obtained?

populated field

5. How long have you worked for your current field of business?

a. Less than 1 year

b. 1-3 years

c. 3-5 years

d. 5-10 years

e. Greater than 10 years

6. How long have you worked for your current company?

a. Less than 1 year

b. 1-3 years

c. 3-5 years

d. 5-10 years

e. Greater than 10 years

7. How long have you been involved in the EMSTM program?

a. Less than 1 year

b. 1-3 years

c. 3-5 years

d. 5-10 years

d. Greater than 10 years

8. In a mentoring dyad, which role do you fulfill?

a. Mentor

b. Mentee

9. What is your mentor's/mentee's gender?

a. Female

b. Male

c. Transgender

10. What was your mentor's/mentee's age (approximately)?

a. <35 years

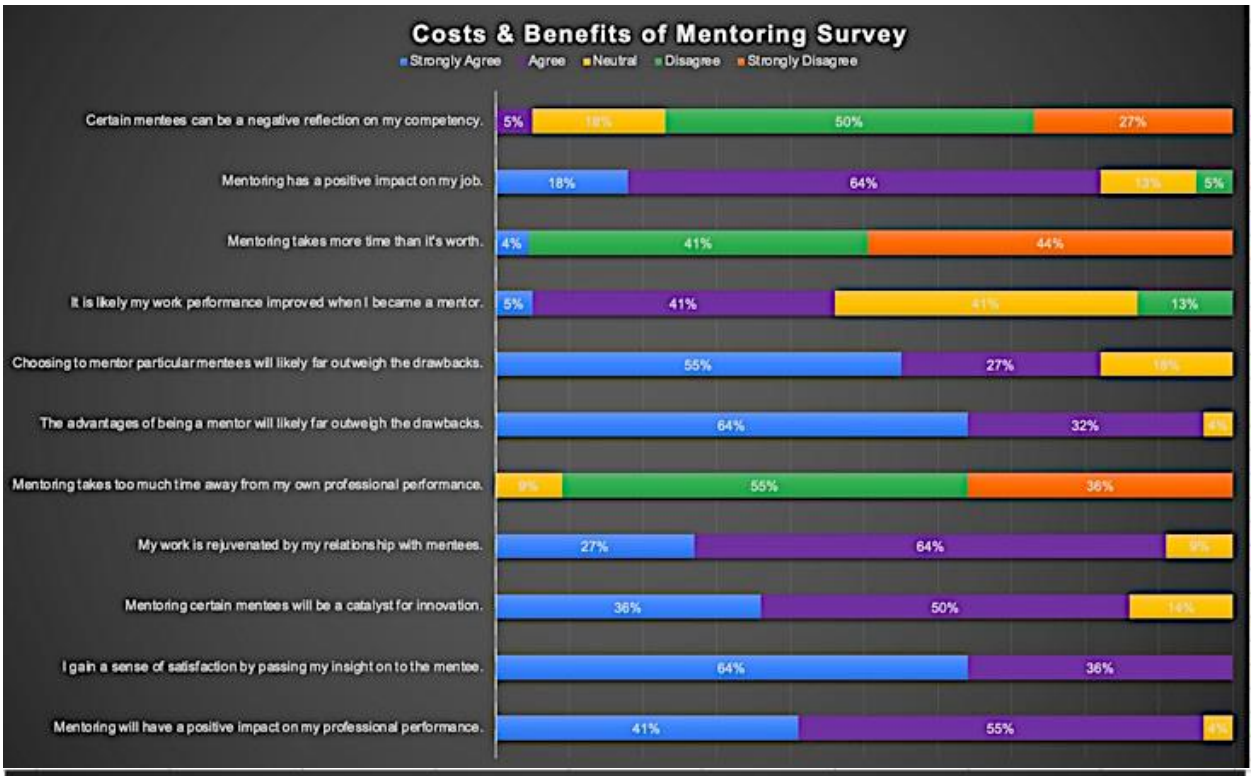
b. 36 – 45 years

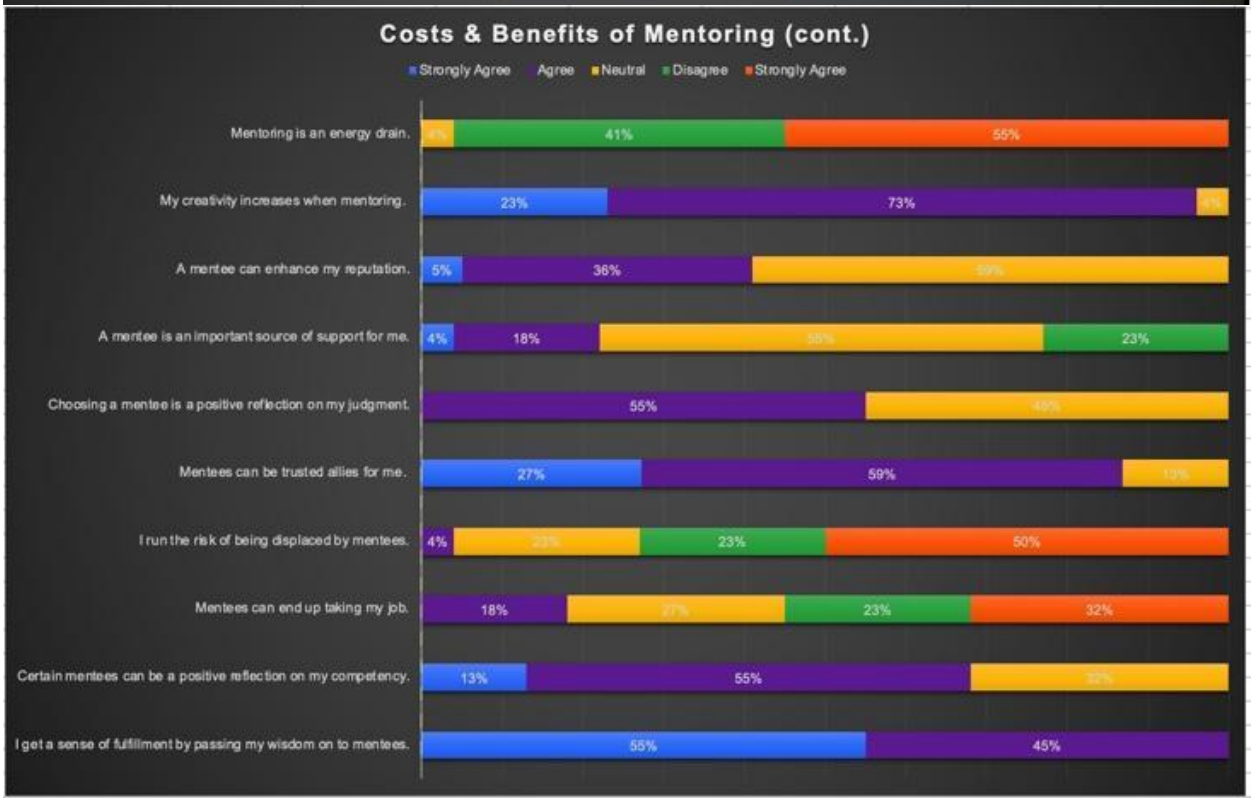
c. 46 – 55 yrs

d. 56 – 65

e. > 66 yrs

Appendix I: Mentor Costs and Benefits Survey Items' Frequencies





Appendix J: Mentees' Item Frequencies on the Mentor Evaluation Tool