Impact of Cognitive Functioning on the Mentoring Relationships between International Graduate Students and their Academic Advisors

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Abstract

International study is essential in developing diverse and well-rounded global citizens who will become the next generation of world leaders. International study equips students with the skills to address the world's most pressing and complex problems. An integral factor in the success of international graduate students is the relationship dynamic with their faculty advisor. The faculty-graduate student mentoring relationship is crucial for academic and personal success and professional development (Lim et al., 2021; Woo et al., 2015). The role of faculty advisors with international students has expanded from traditional supervisory roles to include roles as translators, confidants, and pillars for social integration (Marijanovic et al., 2021; Woo et al., 2015). In this study, we hypothesize that cognitive differences, more than cultural differences, affect the productivity of this problem-solving dyad. This study investigated the lived experiences of international graduate students related to the development of and satisfaction with the faculty-student mentoring relationship. Findings show that besides cultural intelligence, clear expectations, mutual respect, and flexibility contributed to international students' perceived satisfaction with the mentoring relationship.

Keywords: Mentorship, advising, faculty, graduate students, problem-solving, emotional intelligence

Introduction

Thousands of students leave their home country each year to pursue graduate education in an attempt to develop their critical thinking skills and ability to employ innovative solutions to today's complex problems impacting global agricultural industries (Baker, Lu, & Lamm, 2021; Institute of International Education, 2021). Nearly one million students come to study at higher education institutions in the United States. In 2020 and 2021, international graduate students made up 36% of all international students in the United States (Institute of International Education, 2021). An important aspect of international graduate student success is the mentoring relationship between the faculty mentor and student (Asempapa, 2019). Given the unique challenges international students face, this student population needs effective advisement and mentorship (Asempapa, 2019; Jeong et al., 2019; Lim et al., 2021).

Numerous studies have found that international students face multidimensional problems while studying abroad, including adjusting to an unfamiliar environment, understanding the host culture, and lacking family support, but these issues often go unnoticed by faculty members (Hong, 2022; Hussain, 2019; Nurudeen et. al., 2022; Vakkai et al., 2020). As a result, international students struggle with social adjustment, academic achievement, and professional growth (Hong, 2022; Nurudeen et. al., 2022; Vakkai et al., 2020). Conversely, studies have identified several factors that impact the successful matriculation and retention of international graduate students, most crediting success to cultural adaptation (Hong, 2022; Jeong et al., 2019; Le et al., 2016; Nurudeen et. al., 2022). One vital factor in cultural adaptation to foreign environments is students' relationship with their faculty advisors (Jeong et al., 2019; Lim et al., 2021). An effective mentoring relationship can create a sense of belonging for the student, which in turn impacts their motivation to learn, engage, and thus performance (Anderson et al., 2019).

Research has shown that diversity when managed properly can make partnerships more productive, more creative, and increase opportunities to expand that diversity (Anderson, 2023). Accordingly, advisors of international students must understand how implicit bias may impact the experience of the international student, specifically as it relates to the social evaluation of ideas created by the student in the classroom and in the research lab. For example, the challenges faced by international students are attributed to cultural gaps, assuming international students are insufficiently integrating both academically and socially to their host institution (Le et al., 2016; Marczuk et al., 2023). Although cultural diversity can be a significant contributor to the perceptions about one's academic and social experiences while abroad, it is only one component of complex human nature and therefore does not tell the complete story about the factors that impact the relationship between the international student and their faculty advisor (Lim et al., 2021; Marijanovic et al., 2021).

As a significant contributor to global development, U.S. higher education institutions accept the charge to educate future global leaders. These institutions should be proactive in addressing the challenges that hinder students' ability to benefit from research, academic, and professional development opportunities (Marijanovic et al., 2021; Vakkai et al., 2020). A useful framework for identifying and addressing barriers to international students' success is Kirton's Cognitive Function Schema. Similar to the triadic reciprocal relationship within Bandura's Social Cognitive Theory, the Schema provides insights into the reciprocal relationship among an individual's cognitive process, their collaborative behaviors, and the environmental feedback they receive (Anderson, 2022; 2023).

Influenced by an interest in connecting leadership with cognitive preferences toward adaption and innovation by Friedel et al. (2016), we hypothesize that cognitive differences related to how individuals process information during the collaborative problem-solving process impacts productivity and satisfaction within the relationship between the academic advisor and graduate student. Exploring the impact of the cognitive process for solving problems on this mentoring relationship is vital to improving the educational experiences of international students.

Therefore, the purpose of this descriptive, mixed methods study was to investigate the lived experiences of international graduate students in a College of Agriculture and Life Sciences related to the development of mentoring relationships with their faculty advisors. Specifically, what are the perceived cultural and cognitive differences within the mentoring relationship, which differences were more salient for the student in defining the mentoring relationship, and if they believed coping behaviors were employed? The research objectives that guided this study were to 1) Describe characteristics of the student pertinent to the Cognitive Function Schema; and 2) Identify themes consistent with productive versus unproductive advisor-student relationships from the perspective of international graduate students.

Trying to improve the mentoring relationship with incorrect assumptions or partial information does not aid in finding viable solutions. Although a vast body of literature exists related to undergraduate students' evaluation of teacher/advising effectiveness, only a few studies look at supervision at the graduate level (Lee, 2019), with work related to international student supervision and development being limited. Several scholars argue that institutions should focus on the underlying mechanisms that lead to "misalignment" between students and their academic mentors (Husain, 2019; Vakkai et al., 2020). Therefore, insights from such studies as this will aid in the creation of graduate mentor training to encourage a more productive relationship between the faculty advisor and the international graduate student. Research suggests that a more inclusive and supportive environment for international graduate students will prove mutually beneficial for the student, faculty advisor, and the institution (Asempapa, 2019; Hong, 2022; Jeong et al., 2019; Vakkai et al., 2020).

Review of Related Literature

Research has demonstrated that faculty-graduate student relationships play an integral role in shaping graduate students' research training, professional identity, and career dedication, in addition to providing socialization in academia (Lim et al., 2021; Marijanovic et al., 2021). In a healthy student-advisor relationship, the faculty advisor provides direction, motivates the student, and models appropriate professional behaviors that impact the future direction of their respective fields (Lee, 2019). The faculty advisor also helps students make meaningful connections within their field of study, which is essential for creating a strong social support system and continuing academic and professional progress (Lim et al., 2021; Woo et al., 2015).

In the relationship between faculty advisors and international students, the success of this mentoring relationship is more crucial for international students because they are dealing with additional academic and social transition challenges domestic students are not usually faced with (Jeong et al., 2019; Omar et al., 2016). Omar provides examples of graduate mentors inviting students to their homes for family dinners, helping them open bank accounts, and finding grocery stores where they can get culturally appropriate foods (Omar et al., 2016). Understanding that there are emotional elements attached to their relationship with international

students and that students may require more nurturing interactions can help graduate advisors better anticipate the specific needs of this relationship.

Emotional Intelligence in Advising

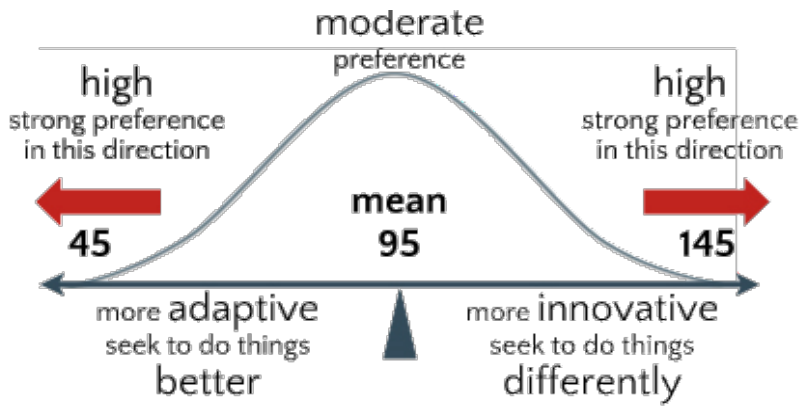
Emotional and social intelligence reflects the ability to recognize and manage your own emotions and recognize and respond effectively to the emotions of others (Johnson, 2022). Emotional intelligence as it relates to advising is significant when there are low levels of communication (Lee, 2019; Lillis, 2011). Characteristics of cross-cultural relationships naturally employ communication barriers, including language and cultural differences. The literature documents that the differences in cultural background between the international student and their faculty advisor may create barriers to meeting expectations for the mentoring relationship (Hong, 2022; Lim et al., 2021).

Preferred Style of Problem Solving

An area within the mentoring relationship that deserves more exploration is the impact of cognitive processing. A difference in cognitive processing, which is operant in this problem solving-focused relationship, may also be a significant factor affecting productivity and satisfaction (Mitra & Anderson, 2016). According to Kirton's Adaption-Innovation (A-I) theory, all people are creative and use this creativity to solve various problems (i.e., decision-making about moving from the current state to a new desired state). However, each person has their preferred cognitive style for solving problems, which is fixed and independent of culture (Kirton, 2011). Kirton (2011) described this preferred style using two descriptors along a continuum measured by a psychometric inventory (see Figure 1). On the adaptive side of the continuum (32 to 95 points), individuals prefer to work within the current structure to "do things better" (Kirton, 2011). Conversely, on the innovative side of the continuum (96 – 160 points), individuals prefer to work outside of the current structure to solve problems by "doing things differently" (Kirton, 2011).

Figure 1

Kirton's Adaption-Innovation Continuum



Cognitive Gap

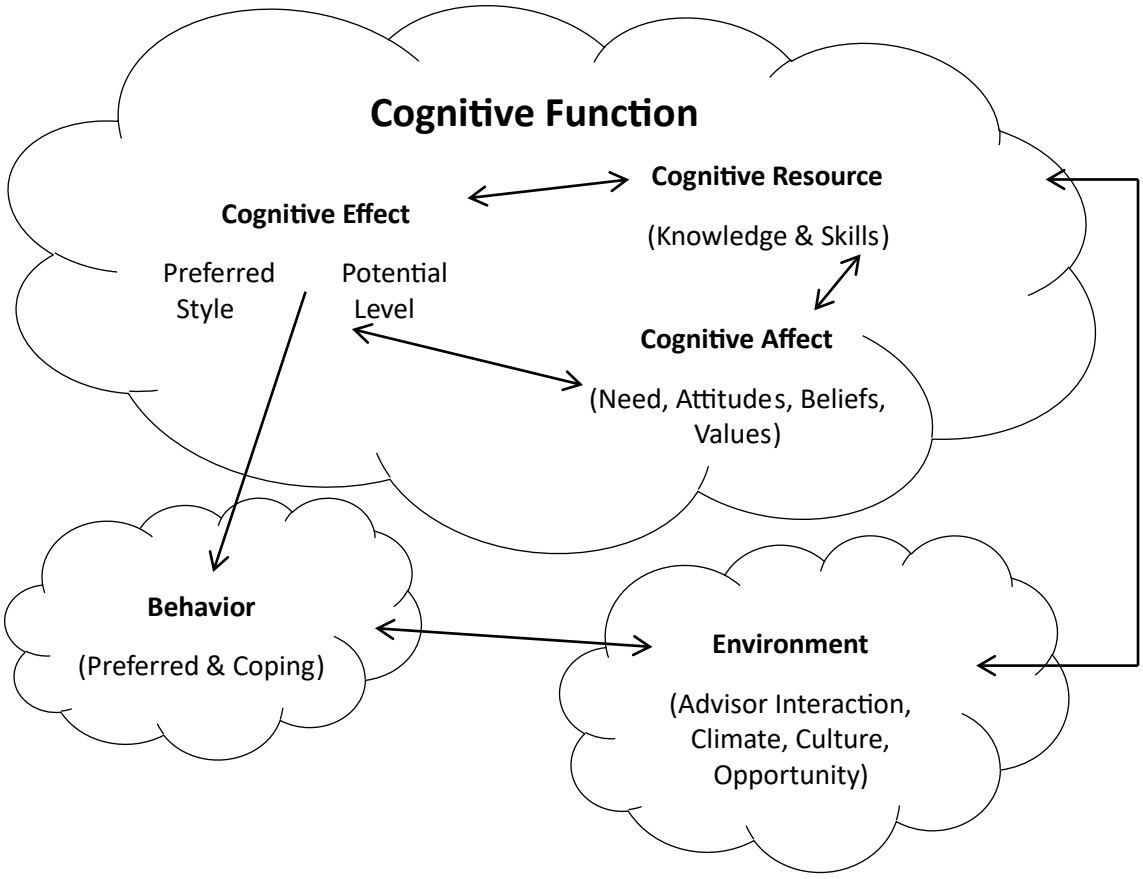
When individuals try to solve a problem collaboratively, they encounter two problems. The first problem is the task identified that will get the individuals to their desired state of being. Kirton (2011) termed this priority problem, Problem A. However, a cognitive gap exists when there is a difference between an individual's preferred style and the style needed to solve Problem A (Kirton, 2011). This gap may cause the focus to move from solving Problem A to bridging the interpersonal differences that arose due to the gap; this second problem is Problem B (Kirton, 2011). Dyads or teams that consist of individuals with significant cognitive gaps may experience miscommunication, high levels of stress, low productivity, and diminished trust (Friedel et al., 2016; Kirton, 2011). Even though the international student and faculty advisor are working towards the same goal of solving the identified Problem A (e.g., conducting research), their approach to processing information and problem-solving may vary, creating noticeable differences in expectations, behavior, and communication about the task at hand. Such cognitive misalignment might create misunderstandings, which can hamper the progress of the work, thus increasing the time spent managing Problem B.

Cognitive Functioning

The conceptual framework that guided this study was the Cognitive Function Schema (Kirton, 2011). Triadic reciprocity exists within the cognitive function schema among *cognitive effect, cognitive affect,* and *cognitive resource*, which helps explain the complex process by which the human brain solves problems (Kirton, 2011). The cognitive effect is the processing domain of problem-solving, a fixed part of one's personality. It manages how problems process through intellectual capacity and the preference for solving them through a more structured or unstructured approach (Kirton, 2011). *Cognitive affect* is the motivational domain that triggers engagement and persistence within the problem-solving process. It manages one's emotions and consists of ethics, values, attitudes, beliefs about behavior, proposed solutions to the problem, and environmental factors (Kirton, 2011). Finally, the cognitive resource is the learning domain where knowledge is stored; it is the cognitive repository an individual references to get insights from past experiences on favorable solutions for solving the problem. The whole unit of cognitive functioning interacts heavily with the environment (social effect, opportunities available, climate, and culture) and generates an idea of how to solve a problem. Accordingly, a person shows a specific type of behavior or action to reach the solution (Kirton, 2011). Although the cognitive functioning process is the same for all individuals, variations in how individuals process information leads to diversity that impacts productivity and satisfaction when solving problems (Kirton, 2011). The mechanism by which individuals process information, which is highly resistant to change, is the cognitive level or intellectual potential and cognitive style or preference for solving problems (Kirton, 2011).

Figure 2

Kirton's Cognitive Function Schema



Relevant to cognitive function is the influence of preferred style on behavior, environmental feedback, and the realization of intended and unintended outcomes. Although the preferred cognitive style is fixed, one's behavior related to problem-solving can change based on a cognitive gap (Kirton, 2011). To mitigate the impact of the cognitive gap, individuals may employ coping behaviors based on techniques pulled from one's cognitive resources. Coping allows individuals to behave differently from their preferred style to reach a solution. Although coping behaviors are helpful short-term fixes, they should not be employed as a long-term strategy because it is very costly, both mentally and emotionally, for an individual to maintain (Kirton, 2011). Within this study, the schema helps explain how international graduate students' cognitive functioning, particularly preferred style, cognitive affect, and cognitive resource, impact the development of productive and mutually beneficial mentoring relationships.

Methodology

The target population for this study was international graduate students at U.S. higher education institutions**.** The accessible population was international graduate students at a Mid-Atlantic University enrolled in Colleges of Agriculture, Natural Resources, and Related

Sciences. Due to the Family Education Rights & Privacy Act (FERPA), convenience sampling was done to recruit the participants for the study using information accessible to the public using colleges' websites. The institution's Internal Review Board approved the study prior to data collection.

Ninety-eight international graduate students were recruited for this study via email. Of the 98 students that received the recruitment email, 25 agreed to participate in the study. The participants completed Kirton's Adoption-Innovation (KAI) Inventory online. The psychometric inventory consists of 32 questions on a 5-point Likert scale (i.e., very easy – very hard) about how difficult it is for the individual to consistently present themselves in a certain way under various problem-solving contexts. The KAI inventory was deemed valid and reliable for measuring the dimension of personality related to the preferred style of problem-solving (Kirton, 2006).

Additionally, 12 of the 25 respondents agreed to participate in a 1-hr semi-structured interview. Efforts to recruit the other students who completed the questionnaire yielded three additional interviews. The data from those interviews were analyzed and was determined that the later respondent responses were consistent with previous interview responses and no additional efforts were taken to recruit more participants. Participants were asked open-ended questions to gather insights about the factors that impact mentoring relationships with their advisors. The interviews were recorded, transcribed, member-checked, coded, and analyzed for themes (Corbin & Strauss, 2015). In addition, an audit trail was maintained and a peer debriefing was conducted with a content expert and qualitative research methodologist.

The scope of this study was the mentoring relationship, which heavily relies on the ability to problem-solve during various tasks; therefore, we hypothesized that this personality trait might contribute to perceptions about the working relationship within the dyad. Accordingly, the KAI scores of the participants were compared to their interview responses to gain insights into the relationship between their preferred cognitive style and their satisfaction with the mentoring relationship.

Findings

Research objective one sought to describe the characteristics of international students related to the cognitive function schema. Of the 15 international graduate students who participated in the interview, nine participants were pursuing a master's degree, while 14 students were pursuing a doctorate, and two participants chose not to disclose their academic classification to the research team. In terms of their places of origin, eight participants came from Asia, six from Africa, and one from North America. Further, almost all the participants had advisors from countries other than their own. According to the 25 initial participants' KAI scores, participants were categorized as highly innovative with a total score of 136 points (n = 1), slightly innovative with a total score of 106-111 points (n = 3), mid-range with scores ranging from 85-105 points (n = 11), slightly adaptive with scores ranging from 75-83 points (n = 6), and highly adaptive with scores ranging from 60-68 points (n = 4).

The international students spoke candidly and expressed a therapeutic feeling while they shared their personal and professional lived experiences studying and working in a U.S. institution of higher education. Participants whose scores were on the innovative side of the continuum did not mind working independently and expressed the need to explore different areas related to their research. Additionally, they welcomed their advisor's constructive criticism

of their work. Individuals who were categorized as mid-range expressed a need to have their advisors acknowledge their ideas. They also mentioned that they liked an open-door policy and preferred immediate communication with their advisor, primarily when issues arose. Those on the more adaptive side of the continuum expressed the need for their advisors to provide them with new ideas and guide them every step of the way. Additionally, the more adaptive students were most concerned with how their advisors viewed them and as a result, took criticism as a personal failure. They expressed the need for a more structured relationship and a closer personal and professional bond with their advisors than the mid-range and more adaptive students.

Research objective two sought to identify themes consistent with positive versus challenged advisor-student relationships from the perspective of international students. According to the participants, both cultural and cognitive differences were present. The way the pair addressed these differences was a major contributor to the success or failure of this mentoring relationship. Six themes emerged from this study based on the experiences reported by international students. The first three emergent themes were related to factors that challenged advisor-student relationships. The themes are:

Theme 1: Language Barriers in U.S. Academic Settings

With English being the dominant and official language in the U.S., it becomes vital for international students to develop a certain level of proficiency to exchange information accurately and effectively. An inability to communicate one's thoughts in English, especially in U.S. academic settings, might lead to a communication gap, creating space for misunderstandings and more time focused on Problem B than Problem A. All participants reported proficiency of the English language as having a significant impact on advising relationships. International students reported issues related to verbal communication in English, particularly related to foreign accents.

A third-year Ph.D. student said, "The language barrier is always there. If you are a foreigner and when you talk, Americans will just look at you and will be like, “Are you talking in English? What are you saying? I don't get it." “You have to sometimes repeat yourself." He further stated, "Some people do it deliberately. Even though they understood, they just want to intimidate you to make you feel inferior." Participants reported negative interactions around their English proficiency made them self-conscious, lowering their self-efficacy for speaking English, especially in academic settings.

International students often have difficulty following American dialects. A sixth-year Ph.D. student pointed out, "Problems related to the language are only if the person has an accent. So, if it is a mid-western or southern accent, then I would not understand. First few years, I could not understand a single thing; I still don't. People with very southern accents, I don't understand that. Even though my English, I would say, is pretty good." A second-year master's student from a French-speaking country also shared a similar experience, "I used to listen to people and try to understand what they're talking about and figure out what they're speaking, and these people talk really fast." A fifth-year Ph.D. student shared his experience communicating with his research team. He stated, "English, I wish I could speak like my American colleagues. But I just can't. Sometimes I have some ideas in my head, but I just can't speak it. If I have 100s of ideas in my head, I can speak 10. My lab mate may have less than ten

ideas, but she can just speak about all of them. My language problem might make me look stupid or dumb."

Language barriers are not limited to verbal communication. A first-year master's student stated, "I've just studied English two years, but I do my best. I have to work very hard. I face difficulty in reading. Reading is very, very complicated, very hard to understand. Sometimes you see a word which is complex. You try to find the meaning of that word. You will never find the meaning." A second-year Ph.D. student who completed her early education in English reported difficulty with technical writing in English. She said, "The writing problem...That is the problem with me and my advisor. He always tells me, "No, your writing is not that professional. You must change it." Further, she mentioned that American English is different from the English that she learned in her country. A third-year Ph.D. student also expressed similar views in this regard. He said, "So the British educational system is completely different from the American educational system. The English is also different." Experiencing language barriers makes academic life emotionally challenging for them. When identifying the root cause, participants attributed the lack of English proficiency due to insufficient exposure. Participants also mentioned that how their advisors responded to this cognitive gap played a role in the students' motivation to persist in the academic setting.

Theme 2: Lack of Empathy and Support

Empathy due to cultural intelligence is an essential factor for international students during their stay in the U.S. Almost all the participants expressed their desire to have a human connection with their faculty advisor where there was room to share worries and personal concerns. The lack of the faculty advisors' ability to understand and share the feelings of the international student can lead to a level of stress that undermines the productivity of the couple. A second-year Ph.D. student discussed the disrespect he felt from his frustrated advisor, resulting from the student's constant need for guidance. He recalled, "So, once I went into the office, and I was waiting for him for a few minutes, and I was standing there thinking. I just stood there, and he walks in and looks at me, and asks, "Are you standing there waiting for me?" And I said, "Yes." And his response was, "[*expletive*] Pathetic!" And I don't think I have been insulted by anybody like that. And he has done it several times."

A first-year Ph.D. student discussed not feeling understood during a time of emotional stress. He stated, "Initially, it was ok, but during the spring, there was war in my country, and I was really upset. My family was in the country. I was very depressed. My advisor told me that I am not working very hard. I told him that I had a lot of problems back home. My children and my family were wherein a country having war, so that was really a hard time, and I had no options to go to [country]. Things were very, very difficult for me during those days. I talked to my advisor personally and told him about my situation. But to him, I was not doing as he expected, and he was not happy with me. He expected me to get A's in all the subjects. I said, well, I can't do that. I got B or B+ or B-. So, the relationship became somehow strained."

A third-year Ph.D. student found a general lack of warmth in the American culture, especially toward foreigners. He said, "It is actually different. It is different in the sense that in [country] we respect foreigners. If you are a foreigner coming from a different country, they will respect you a lot more than the people of their country. And if you have a problem, then everyone is going to help you. In America, when some people see you, they just want to hurt you, sometimes they are jealous of you. Sometimes they discriminate."

Many of the students expressed a desire to have personal in-person contact with their advisors. A first-year Ph.D. student stated, "My advisor was not available for the meetings. Communication was not that fluent. I felt that if I had communicated with him more than once a week, then I could have understood and tried more. He said, 'Send me emails.' But there are certain things that you can't explain in emails, and you need to talk face-to-face."

Theme 3: Lack of Congruency Between Cognitive Style and Mentoring Approach

Congruency in cognitive styles seemed to be a crucial factor behind the success of a mentoring relationship. Participants reported dissatisfaction with the mentoring relationship when the student's preferred problem-solving style did not match the advisor's approach to mentoring. The student employed an excessive amount of coping to address the cognitive gap that existed. A first-year Ph.D. student on the adaptive side of the KAI continuum with a score of 76 points discussed how his relationship with his advisor worked well. He stated, "I am the kind of person who is very detailed. So, I want things explained to me in detail. 'This is the work I want you to do. These are the steps I want you to follow.' I think I am more comfortable in this way instead of giving me a headline like go work on it or giving me a theory and telling me to solve the puzzle. I am the kind of person who wants steps so that I don't get stranded in the course of completing the work or task. My advisor provides this structure for me." However, this congruency is not always the case.

A second-year Ph.D. student with a KAI score of 65 points discussed his advisor's lack of detailed instructions. He recalled, "So, we have the freedom to do things the way we want, but at the same time, he wants things in a certain way. So, it's weird. Oftentimes that's where I run into problems because he wants to imply things and have me pick them up, but I am not that person. With that mentoring, I just feel like I am stumbling in the dark. I feel like I am really launching the wheel every time I go to the lab, so what could take a week takes me a month or sometimes even more. And so yeah, he is constantly implying that we are not doing enough work, we should stop going out, we should stop doing other things, but if somebody properly explained to me how things work, it would not take so long."

Finally, a Ph.D. student in her final year with a KAI score of 64 points said, "The one thing which matters a lot in my field is that we should have publications. The more the number of publications, the more marketable a person is. And I think he is not able to be on time for that. He doesn't push people hard enough. He doesn't have set guidelines or deadlines."

Conversely, the last three themes that emerged related to factors that encouraged positive advisor-student relationships. The themes were:

Theme 4: Clear Expectations about Roles and Responsibilities

Proper communication between the advisor and the advisee is better for understanding each other's expectations for the mentoring relationship. Communication involves feedback from the faculty advisor, discussing research work, solving research problems together, discussing potential barriers and difficulties, providing suggestions and improvements, and more. As a result of varying expectations, the pair must invest time and effort into getting to know one another and clarify each one's roles and responsibilities.

A Ph.D. student in his final year discussed why he switched advisors. He said, "For the whole year, I never got feedback from my previous advisor. Every time I turned in my

assignment, he would say he was busy. When I go to his office, I cannot schedule a meeting time. He is also busy. My experience with him was really horrible." But with my new advisor, whenever I write and turn my work in to him, he will look it over, and he would first look at the ideas that I'm talking about and if the flow of ideas are together. If my ideas are haphazard, then he will tell me this should go here, that should go there."

A third-year Ph.D. student discussed the outcome of being able to express his expectations for his advisor. He stated, "I told my advisor, maybe you will blame it on me, but I cannot work by myself. You have to work with me so that I can move from one step to another." Accordingly, his advisor changed his approach to mentoring and advising. He reflected, "After that, we started meeting weekly if he has time, sometimes twice weekly. So now everything is going ok."

Finally, a first-year master's student shared how her relationship with her advisor developed because of his availability and willingness to get to know her. She said, "He has become my friend. He is my advisor, but also, he is like my family, and he is like a friend to me. We communicate well and have a good relationship." Overwhelmingly, international students reported appreciating advisors' approachability, availability, clarity, and timely feedback.

Theme 5: Mutual Respect for Contribution to the Work

Respect seemed to be an essential factor in strengthening the mentoring relationship because the relationship is between two mature individuals. International students seemed to appreciate when their faculty advisor reciprocated the level of respect the student extended to them, especially regarding the work they did together. A second-year master's student shared, "He gives me his ideas, but he allows me to do what I feel is the right way to do it. When I send it back to him, he will tell me, okay, you are in the right direction, or maybe you can change this to that." A second-year Ph.D. student shared a similar experience with her advisor acknowledging her ideas and taking the time to discuss the pros and cons.

A Ph.D. student in his final year mentioned, "He is extremely cooperative. He is open to all kinds of ideas and research. Even to the point, 90% of my Ph.D. work I have worked on by myself, and he was absolutely fine with that. He did not have any problems like I am taking the lead on this. He actually appreciated when I was designing or taking initiative."

Theme 6: Ability to Employ Coping Behaviors

Theme 3 discussed how a lack of congruency between the student's cognitive style and the faculty advisor's mentoring approach could hinder a positive advising relationship. However, incongruence between style and approach does not negatively affect the relationship if coping behaviors are employed. Participants reported their satisfaction with the mentoring relationship when both parties demonstrated flexibility. Participants felt they had to be more flexible when addressing gaps because there is a power differential between faculty advisor and student. However, this observation could not be validated without confirmation from the faculty advisor or an independent observer. Nevertheless, participants did discuss occurrences where their faculty advisor employed behaviors outside of their preferences.

A second-year Ph.D. student with a KAI score of 136 points discussed how he and his advisor cope. He stated, "He has some rules for the lab. He has something called 'core hours.' Core hours mean the time every day when you need to be on campus. The initial time was 8 to 4,

which was shifted to 9 to 5. But, because I am a night owl, it was shifted to 10 to 6 only for me. He did not agree upon shifting it any further. I see his point of view. But, somehow, I feel comfortable or at peace when I am doing experiments all by myself at night. However, I realize what he wants to see, and I try to come early."

A second-year master's student discussed how his advisor coped when the research subject he wanted to do was outside of the advisor's expertise, causing a gap in knowledge for the advisor. He stated, "For my master's project, he told me to do something, and I wanted to work on another thing. I know he chose to give my choice priority because I am the one who is going to work on it. He is not the one who is going to do the work. That is the only time we got into an argument. It wasn't an area he was familiar with, but ultimately he compromised."

Conclusion

Linkages between participants' cognitive styles, perceived environmental support of their behavior, and satisfaction with the mentoring relationship were observed. Most of the participants spent their time discussing how work was done within the mentoring relationship. A reoccurring sentiment by the participants was that differences in cultural or ethnic backgrounds with their faculty advisors did not affect their academic progress as much as cognitive style. This observation supports our hypothesis that factors beyond cultural differences hinder mentoring relationships. The characteristics that the international students appreciated most in their advisors were their abilities to communicate clear expectations, mutual respect, and flexibility or willingness to employ coping behavior when necessary.

Perceived effectiveness in communicating expectations about roles and responsibilities depended on the student's cognitive style, a finding consistent with A-I theory (Kirton, 2011). Individuals on the adoptive side of the continuum reported being more comfortable working under well-defined parameters and expected the advisor to define roles and responsibilities and maintain those boundaries. Conversely, students on the more adaptive side of the continuum were comfortable defining roles and responsibilities as needed and reported more satisfaction when the advisor gave the student more autonomy.

Similarly, faculty advisors' type and amount of support varied from student to student based on cognitive effect, cognitive affect, and available cognitive resources. All students expressed a need to feel supported by their advisors, mainly related to helping them identify appropriate coping behavior when faced with cognitive gaps. Most often, students operationalized faculty advisor support as showing respect. Students expected their advisors to value their perspectives and consider their needs, beliefs, and interests during the decision-making process.

Finally, participants expressed satisfaction when their advisors were flexible. When further probed, they discussed the ability of the advisor to work outside of their preferred cognitive style or the ability to employ coping behavior (Kirton, 2011). According to A-I theory, a difference in KAI scores of more than 20 points between two individuals working together is likely to create some level of conflict while working together due to preferences in approaching problems (Friedel et al., 2016). Students and advisors can avoid conflicting situations if both individuals show flexibility in adjusting to each other (Kirton, 2011). Despite having completely different cultural backgrounds, there were instances where international students had strong bonds with their academic mentors due to both working together to resolve problems. Students spoke of more satisfaction when they could see that their faculty advisor was accommodating.

As a result, students expressed more willingness to be more accommodating with their advisors. The amount of stress one endures when coping is a function of time and intensity. The more intense the coping behavior, the less time the individual can maintain that behavior before succumbing to stress (Kirton, 2011). Therefore, both individuals should employ coping behaviors appropriate for the situation to mitigate the effects of stress felt by both the advisor and the student.

Recommendations

Overall, the study results support the anticipated outcome that differences in cognitive style, as described by A-I theory, impact the mentoring relationship between academic advisors and international students. Understanding the role that cognitive processing plays in the productivity of a graduate student advising relationship will help decrease the effort needed to resolve Problem B. By communicating more effectively and addressing issues that stem from cognitive diversity, the pair can focus more time on Problem A's like academic achievement, scholarly productivity, and establishing professional networks. Formal training in KAI is recommended for faculty involved with graduate mentoring so they are informed of their preferred problem-solving style and how to work with those with different cognitive preferences.

We acknowledge that some of the issues discussed by the graduate students are related to cultural perceptions. Therefore, it is recommended that faculty advisors receive training associated with cultural intelligence and mentoring across cultural differences, along with training in KAI. Well-designed trainings associated with the constructs of the cognitive function schema will guide mentors and students on how to make thoughtful decisions related to interpersonal relationships and mitigate conflict solely ascribed to cultural differences. A notable limitation of the study is that the findings are only from the graduate student's perspective. Accordingly, a final recommendation is to replicate the study using matched pairs of faculty advisors and their international students to glean insights into the mentoring experience from a balanced perspective.

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