



INTERNATIONAL DOCTORAL STUDENTS' LIVED EXPERIENCES OF A CAROUSEL OF EMOTIONS AND RESEARCHER IDENTITY: A NARRATIVE INQUIRY

Tuyen Pham* Texas Tech University, Texas, USA; tuypham@ttu.edu
and
Vietnam National University, pnkimtuyen@hcmussh.edu.vn
Ho Chi Minh City, Vietnam

Jeasik Cho Texas Tech University, Texas, USA Jeasik.Cho@ttu.edu

* Corresponding author

ABSTRACT

Aim/Purpose *Despite growing research on doctoral students' emotions and researcher identity, little is known about those aspects among international doctoral students. To bridge such a gap, this study explored the lived experiences of navigating emotions in relation to the researcher identity of international doctoral students through the working lens of the Perceptual Control Theory, as revised by Burke and Stets (2009).*

Background Understanding how international doctoral students' emotions interplay with their researcher identity can offer significant insights into how they can be supported during their PhD study in international learning environments.

Methodology This study adopted narrative inquiry as the research methodology. Using purposive and convenience sampling, four international doctoral students studying at a US university were selected. Two semi-structured interviews with each participant, supplemented by the researchers' reflective notes and informal discussions, were conducted and analyzed using narrative analysis.

Contribution This study reveals the nature of international doctoral students' lived experiences of a "carousel of emotions" during their research work. However, emotions alone seem not to influence their researcher identity. The proposed framework of the interconnectivity of goals, cognition, motivation, and emotions can enrich our understanding, though possibly not exhaustive, of international doctoral students' lived emotional experiences in relation to their researcher identity.

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Findings	Four diverse and distinctive voices emerge from the narrative analysis of the four participants' interview transcripts. These stories reveal that while two participants (Camilo and Ola) claimed to have a strong sense of researcher identity, one participant (Kofi) said he is only a becoming researcher, and the last participant (Jessica) believed she is still an aspiring researcher. In addition, three participants (Camilo, Kofi, and Jessica) experienced emotional highs and lows throughout their PhD journey. Yet, those experiences, particularly negative ones, did not seem to shape their researcher identity. Meanwhile, the remaining participant (Ola) did not report any negative emotions and sounded confident that he would avoid emotional distress during his study. Last, but not least, all four participants shared their own unique strategies of coping with emotional breakdowns and academic challenges.
Recommendations for Practitioners	First, professors, supervisors, and mentors need to initiate an explicit and guided discussion with their doctoral students about their emotions and researcher identity as early as possible. These discussions are particularly important for international students, who are more prone to challenges in a new learning environment due to their diverse cultural and linguistic backgrounds. Second, the stakeholders involved in doctoral education are encouraged to promote their intercultural awareness and competence to understand better the challenges faced by diverse groups of international doctoral students, so that students can receive timely support, if needed. Finally, doctoral programs are encouraged to offer training workshops, seminars, or informal talks on learned resourcefulness, social-emotional competence, and cultural capital for international doctoral students.
Recommendations for Researchers	Future researchers can apply, test, and refine the proposed framework of the interrelationships among international doctoral students' goals, cognition, motivation, and emotions to further explore (international) doctoral students' researcher identity and doctoral experiences, especially by employing methods beyond narrative inquiry.
Impact on Society	Understanding how researcher identity develops and sustains can assist international doctoral students in learning to persist in doctoral study and yield practical implications for doctoral programs seeking to support their international doctoral students.
Future Research	Future research can investigate other factors that might influence international doctoral students' emotional experiences and researcher identity, such as their countries of origin and associated cultures, individualist cultures, field of study, PhD stage, and gender. In addition, longitudinal research with more data sources can be desirable to further support and expand the interplay between goals, cognition, motivation, and emotions of international doctoral students in influencing their researcher identity.
Keywords	international doctoral students, emotions, researcher identity, perceptual control theory

INTRODUCTION

Given the challenging, demanding, and stressful nature of doctoral education, more attention has been paid to doctoral students' well-being, especially relating to emotional well-being. Research has shown that emotions are "an integral part of learning" (Eynde & Turner, 2006, p. 362), and they are pervasive in the doctoral experience (Cotterall, 2013). When recognized, emotions can motivate,

guide, and improve research (Herman, 2010), but if they are ignored or pushed aside, they can slow or even disrupt the research process (Cotterall, 2013). Much of the existing literature on doctoral students' emotions has focused on documenting academic challenges and the negative emotions associated with them (e.g., Batty et al., 2020; Giudicelli et al., 2024; Usher & McCormack, 2021). Meanwhile, Morrison-Saunders et al. (2010) referred to doctoral study as “riding the emotional roller-coaster,” underscoring the common acknowledgment that emotions are central to students' doctoral experiences and outcomes, success, and well-being (Holbrook et al., 2024). More importantly, doctoral students' emotions critically influence their identification and development as researchers (e.g., Lamar & Helm, 2017; Sinclair et al., 2013; Turner & McAlpine, 2011). Despite growing research on doctoral students' emotions and researcher identity, a critical component in smoothing their doctoral journey and sustaining their research career (Caskey et al., 2020), little is known about those aspects among international doctoral students.

To bridge this gap, this study explored the lived experiences of emotions in relation to the researcher's identity among four international doctoral students studying in the United States through the lens of Perceptual Control Theory, as revised by Burke and Stets (2009, p. 30). The participants' voices, as a result of Polkinghorne's (1995) narrative analysis of their interview transcripts, indicate that international doctoral students experienced supportive resources for researcher identity development, namely research outputs, research activities/experiences, and supportive relationships. The findings also demonstrate that international doctoral students experienced the “rollercoaster of emotions” (Christie et al., 2008) during their research process, yet their emotions alone do not shake their researcher identity.

Despite the claim that “emotion is the ‘glue’ of identity” (Haviland & Kahlbaugh, 1993, p. 328), this study's findings suggest that international doctoral students' emotions do not influence their researcher identity thanks to their manifestations of employing learned resourcefulness, social-emotional competence, and cultural capital. Understanding how international doctoral students' emotions interplay with their researcher identity can offer significant insights into how they can be supported during their PhD studies in international learning environments such as the US.

Based on the stories from a small sample, we proposed a framework to illustrate an open and alternative way of understanding how international doctoral students' emotional experiences, together with their research goals, motivation, and cognition, interplay with their sense of researcher identity. While this framework portrays the interrelationship between all four components and researcher identity, the diverse and evolving paths of researcher identity development regarding when, where, and how those four components emerge among international doctoral students go beyond the scope of this study.

In what follows, we review the key definitions of doctoral students' researcher identity, the factors that contribute to its development, and how emotions can influence it. Then, we introduce the Perceptual Control Theory as the study's working theoretical framework, followed by a description of how we conducted semi-structured interviews with four international doctoral students in a US context and how we developed the four stories for discussion, using Polkinghorne's (1995) narrative analysis. Finally, we provide practical implications for relevant stakeholders involved in doctoral education.

LITERATURE REVIEW

DOCTORAL STUDENTS' RESEARCHER IDENTITY

Identity is shaped by how individuals position themselves and others in social interactions (Bucholtz & Hall, 2005), and by how they are perceived or acknowledged as a particular type of person within specific contexts (Gee, 2000). Throughout doctoral education, doctoral students, irrespective of disciplines, “learn what it means to do research, and learn how to perform as a researcher” (Mantai, 2017,

p. 636). Research has shown researcher identity development is “an essential task for a doctoral student” (Colbeck, 2008, p. 9) because possessing a strong sense of being a researcher helps doctoral students to play a more active role in their academic journey (Sinclair et al., 2013) and to decide whether they pursue their careers as independent researchers (Lamar & Helm, 2017) in the future. Given that a strong identity as researchers is important for doctoral students' professional career (Castelló et al., 2015), Caskey et al. (2020) suggested that “the sooner doctoral students include researcher as an identity, the smoother and more successful their journey will be” (p. 16).

While prior research on doctoral studies uses the terms “researcher identity, academic identity, scholarly identity” interchangeably (e.g., Choi et al., 2021; Inouye & McAlpine, 2019), we adopted the concept of *researcher identity* in this study, as doctoral students' identity construction is chiefly shaped by their participation in multiple research activities, such as academic publishing, conference networking, and scholarly presentations (Hoang & Pretorius, 2019; Lu et al., 2025).

Lamar and Helm (2017) defined *researcher identity* as “an individual's self-concept as a researcher and ... as a unique concept that possibly includes research self-efficacy and interest” (p. 4). This definition focuses on doctoral students' self-perception as researchers and on the need to possess this identity: they must have a research interest and demonstrate confidence in their ability to conduct research. In addition, Choi et al.'s (2021) conceptualization of *scholar identity* is worth considering, as it was derived from a synthesis of 36 empirical studies on doctoral students' scholarly, researcher, academic, and doctoral student identity conducted between 2006 and 2018. Unlike Lamar and Helm (2017), Choi et al. (2021) defined doctoral students' *scholar identity* as “recognition by self and others of possessing and exhibiting adequate levels of competence, confidence, autonomy, and agency with respect to scholarly activities, products, and communities” (p. 90). This conceptualization emphasizes doctoral students' self-recognition and others' recognition of the scholarly abilities that build their sense of competence, confidence, autonomy, and agency as scholars. In this paper, drawing on Lamar and Helm (2017) and Choi et al. (2021), we defined *doctoral students' researcher identity* as their self-concept as researchers, which is recognized by themselves and others regarding their competence, confidence, autonomy, and agency in research activities, products, and communities, and which is strengthened by their interest in research.

Prior research has shown that doctoral students can develop their research identity at any point during their PhD study (Lamar & Helm, 2017; Limberg et al., 2020). Some previous studies have emphasized specific stages in a doctoral program, such as the confirmation stage (Heron et al., 2023), the PhD candidacy (Mantai, 2017), after a summer course (Polanco-Lahoz et al., 2023), or after a research methods course (Call-Cummings et al., 2019), when doctoral students' researcher identity is developed. For example, Heron et al. (2023) reported that the confirmation stage, i.e., passing the qualifying or confirmation exam, serves as a turning point that helps eight international PhD students in the UK feel like researchers by providing those students with external validation, recognition, and a sense of legitimacy.

Further, the related literature has identified three main resources offered by doctoral programs, which are influential in the development of doctoral students' researcher identity. These resources include: (a) research outputs (e.g., conference proposals and presentations, publications) (Lamar & Helm, 2017; Mantai, 2017); (b) research skills practice activities and experiences (e.g., reading articles, writing research proposals, conducting literature reviews, joining authentic and collaborative research projects) (Buss, 2022; Call-Cummings et al., 2019; Caskey et al., 2020; Kirk & Lipscombe, 2019; Lamar & Helm, 2017; Mantai, 2017; Marvasi et al., 2019); and (c) supportive relationships, mentorship, and supervision (Bao et al., 2025; Boncori & Smith, 2020; Chen et al., 2023; Donaghue & Adams, 2025; Inouye & McAlpine, 2017; Kirk & Lipscombe, 2019; B. Li et al., 2023).

EMOTIONS AND DOCTORAL STUDENTS' RESEARCHER IDENTITY

Emotions play a central role in all human actions. They influence how people see the world, impact their thoughts, affect how they communicate, and drive their behavior (Lupton, 1998). In educational

settings, emotions help individuals respond to significant events and conditions by providing motivation and physical energy, directing their focus, adjusting their thoughts, and activating desires and intentions to act (Pekrun et al., 2002). Because this study focuses on international doctoral students' lived experiences of emotions during their PhD journey and how those emotional experiences influence their researcher identity, Schutz et al.'s (2006) conceptualization of emotions in education was adopted.

Schutz et al. (2006) defined *emotions* as “socially constructed, personally enacted ways of being that emerge from conscious and/or unconscious judgments regarding perceived successes at attaining goals or maintaining standards or beliefs during transactions as part of social-historical contexts” (p. 344). Four key components of this definition informed this study's analysis of international doctoral students' lived emotional experiences.

First, emotions are “socially constructed, personally enacted,” emphasizing that emotions are fundamentally relational and emerge from person-environment transactions or interactions and are enacted individually through expression and regulation.

Second, emotions are “ways of being,” emphasizing the holistic nature of emotional experiences that involve physical responses, mental processes, and actions or behaviors. Emotional experiences as ways of being are characterized by: (a) levels of involved consciousness; (b) the direction of attention; and (c) action readiness (Frijda, 2005; Lambie & Marcel, 2002). Each emotional experience has two levels of consciousness. A first-order emotional experience refers to individuals' full engagement or complete immersion, in which they are unaware of the world and their existing way of being. A second-order emotional experience builds on the first-order one by adding a level of awareness, enabling individuals to recognize, label, and discuss the emotion they are feeling. In addition, while experiencing an emotion, a person may focus either outward (on external objects/situations) or inward (on their own thoughts and feelings) (Frijda, 2005; Lambie & Marcel, 2002). Furthermore, emotions can generate a person's readiness to respond by taking some specific actions.

The third component of emotions involves individuals' appraisals or judgments of how they meet their goals or maintain their standards or beliefs. These appraisals depend on how important individuals view their goal-meeting and how confident they are in being able to deal with a situation (Lazarus, 1991). These judgments will determine what emotions individuals experience.

The last component of emotions, “transactions as part of social-historical contexts,” means that emotions can be understood as relational processes embedded within social and historical contexts. From this standpoint, both individuals' goals and their emotional experiences are shaped by, and arise within, specific socio-historical conditions. For instance, an event that provokes anger in one socio-historical context may not elicit the same response in another (Schutz et al., 2006).

Apart from the above components of emotional experiences, Kellam et al. (2018) compiled a common classification of emotions based on the intersection of their high versus low activation (i.e., requiring high or low energy, respectively) and valence (i.e., positive or negative emotions). Accordingly, anger and anxiety can be classified as negative with high activation, boredom and hopelessness as negative with low activation, enjoyment and hope as positive with high activation, and relief and contentment as positive with low activation (Kellam et al., 2018). While acknowledging a wide range of emotions as well as the complexity of emotional experiences that doctoral students go through during their PhD journey (e.g., Batty et al., 2020; Lee & Citron, 2025), we followed the lines of research emphasizing positive emotions versus negative emotions (e.g., Anttila et al., 2021; Geng & Yu, 2022; Lamar & Helm, 2017; Mantai, 2017; Mura & Wijesinghe, 2022).

Throughout related literature, some research has investigated doctoral students' emotional experiences and their researcher identity. For example, the studies reported by Lamar and Helm (2017) and Mantai (2017) suggest that emotional experiences serve as a lens through which doctoral students interpret their researcher identity. Specifically, the more positive emotions they identify when engaging

with research work, the more connected they feel to their researcher identity (Lamar & Helm, 2017), and the more they feel validated, both by themselves and others, as researchers (Mantai, 2017). Despite significant contributions of prior research, what remains to be explored is how international doctoral students' emotional experiences interplay with their researcher identity, which is therefore the focus of this study. Prior research on doctoral education also reveals that doctoral students overcome their challenges, particularly through emotional regulation, in different ways, using different techniques and resources.

DOCTORAL STUDENTS' EMOTIONAL REGULATION

Prior research has shown that international doctoral students encounter their own distinct challenges, such as separation from family, language barriers, and adapting to a new academic culture (Gao, 2021; Ingleton & Cadman, 2002), department politics, financial strains, and advisor conflicts (e.g., Goode, 2007; Ma & Ni, 2022; Moffett, 2006). Additionally, Cotterall's (2015) study suggests that doctoral students' international status contributes to their difficulties in forming research relationships and accessing local research networks. Many international doctoral students feel "invisible" in their departments (Ingleton & Cadman, 2002) and feel "unable to match up to an ideal researcher image gleaned from (commonly white and male) academic role models" (Heron et al., 2023, pp. 2-3). Further, overseas study experiences can cause negative emotions such as loneliness, anxiety, isolation, and frustration (M. Li, 2016; Russell-Pinson & Harris, 2019) among international doctoral students. Additionally, the neoliberal conditions of present-day academia – marked by intensifying competition and personal accountability – exacerbate fear and anxiety among doctoral students in general, which in turn are associated with increased stress and depression (Mura & Wijesinghe, 2022). Therefore, a brief review of how those negative emotions and other challenges can be overcome is worth considering.

Existing literature has indicated three main resources that can help doctoral and graduate students cope not only with emotional but also with academic challenges. The first resource is known as learned resourcefulness. Rosenbaum (1990) proposed the framework of *learned resourcefulness* as "a set of well-learned behaviors and skills by which a person self-controls [their] behavior" (Rosenbaum, 1990, p. 4). Kennett et al. (2009) defined *learned resourcefulness* as "the basic self-regulatory skills needed to handle everyday life challenges" (p. 815). In other words, *learned resourcefulness* refers to a set of skills or habits of mind that help manage emotions to reach a target goal or outcome. Learned resourcefulness is characterized by four strategies that support emotional regulation when facing challenges (Kennett et al., 2009; Rosenbaum, 1990).

The first strategy is using cognitive self-reinforcement, such as positive self-talk, to manage emotional and physical reactions. Another strategy entails applying problem-solving techniques to reach goals despite difficulties. Besides, individuals can employ delayed gratification, i.e., practicing self-discipline by postponing immediate rewards to complete less enjoyable tasks. Finally, they can maintain their self-efficacy, or confidence in their ability to succeed. These four behavioral responses provide individuals with tools to persist in achieving their goals even under pressure.

The second resource is *social-emotional competence*. Based on Payton et al.'s (2000) and Rose-Krasnor's (1997) work, Denham et al. (2009) proposed a framework of *social-emotional competence*, delineated into emotional competence skills and relational/prosocial skills. The former comprises self-awareness, i.e., understanding self-emotions, self-management or emotional/behavioral regulation, and social awareness, i.e., understanding emotions and having and showing empathy/sympathy (Denham et al., 2009; Humphrey et al., 2011). The latter consists of social problem-solving and relationship skills, such as cooperation, listening, turn-taking, and seeking help (Denham et al., 2009; Humphrey et al., 2011).

The third resource is Bourdieu's (1986) concept of *cultural capital*, which refers to the non-economic resources that might enable social mobility. According to Bourdieu (1986), cultural capital can take three main forms. The "embodied state" of cultural capital includes cultural knowledge, skills, and

dispositions that are internalized over time through socialization. The “objectified state” refers to physical objects such as “pictures, books, dictionaries, instruments, machines, etc.” (Bourdieu, 1986, p. 4), as well as media that represent cultural values and can signal status or competence. The “institutionalized state” refers to recognition of cultural competence through academic qualifications or credentials.

These three resources have been used by doctoral or graduate students to varying degrees to cope with their emotional and academic challenges. For example, Millett’s (2023) study demonstrates that graduate students in an online program employed all four strategies of learned resourcefulness to mitigate their writing apprehension. In addition, Cotterall (2015) suggested that international doctoral students can bring their previous academic experiences, or institutionalized cultural capital, to their PhD program, which facilitates their doctoral learning and scholarly identity development. Finally, both Kokotsaki (2023) and Shur (2024) highlighted doctoral students’ strategies of “networking and seeking external support” and “building supportive relationships,” respectively, the social dimension of social-emotional competence, to overcome their challenges during doctoral learning.

THEORETICAL FRAMEWORK

The Perceptual Control Theory (PCT), revised by Burke and Stets (2009), was used to explore the interplay between international doctoral students’ lived emotional experiences and their researcher identity. Developed by William T. Powers, PCT posits that behavior is not about controlling actions or outcomes directly but about maintaining control over internal perceptions. It describes how individuals continuously adjust their behavior to minimize discrepancies between their desired perceptions and actual experiences in their environment (Powers, 1973). In the revised version of the PCT, Burke and Stets (2009) developed a five-component feedback loop, presented in Figure 1, that represents the connection between researcher identity and emotions and might serve as a potential framework for examining the interplay between international doctoral students’ emotions and their researcher identity in this study.

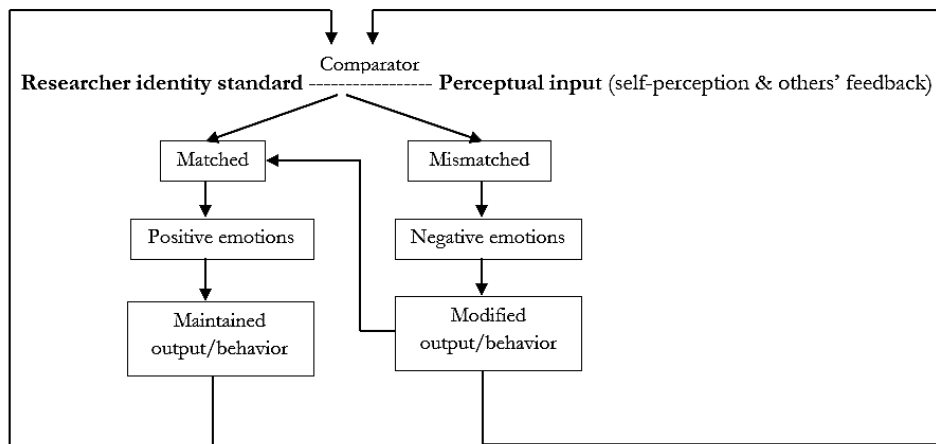


Figure 1. Feedback loop of international doctoral students’ emotions and researcher identity, adapted from Burke and Stets’s (2009, p. 30) revised version of perceptual control theory

The first component, the researcher identity standard, refers to the desired or expected identity of international doctoral students as researchers. The second component, perceptual input, is how they see themselves and how others view them, as reflected in their feedback regarding their enacted researcher identity. The third component is the comparator, the process by which international doctoral students compare their researcher identity standards and perceptual inputs. The resulting emo-

tions, or the fourth component, of such comparison, will signal the degree of correspondence between the first two components. In other words, if the researcher's identity standard is matched or mismatched with the perceptual input, international doctoral students will experience positive or negative emotions, respectively. The last component is international doctoral students' output or behavior, which is maintained or modified depending on whether there is correspondence or not. Given that researcher identity development is a continuous process (Pretorius & Macaulay, 2021) and iterative (Hall & Burns, 2009; Inouye & McAlpine, 2019), international doctoral students are expected to repeatedly compare their researcher identity standards and perceptual inputs for verification and take appropriate actions.

According to the above feedback loop, positive or negative emotions can signal whether international doctoral students verify their researcher identity when their standards are matched or mismatched with their perceptual input (Sharp & Kidder, 2013; Stets & Serpe, 2013). While previous research on doctoral study suggests that positive emotions can enhance and strengthen doctoral students' researcher identity (Lamar & Helm, 2017; Mantai, 2017), how negative emotions influence researcher identity, particularly among under-explored international doctoral students, remains to be investigated. Therefore, this framework can serve as a useful theoretical lens for exploring the interplay of emotions and researcher identity among this group of students in this study.

METHODOLOGY

STUDY DESIGN

This study adopted narrative inquiry as the research methodology. Narrative inquiry is aimed at exploring, understanding, and describing human actions or experiences (Webster & Mertova, 2007) by examining individuals' narratives or stories. According to Polkinghorne (1995), narrative refers to "a discourse form in which events and happenings are configured into a temporal unity by means of a plot" (p. 5), which also characterizes a story. In other words, narrative inquiry is "the study of stories" (Polkinghorne, 2007, p. 471). It produces knowledge about the experiences of individuals that make up lives in a complex, storied landscape (Clandinin & Murphy, 2009).

The stories international doctoral students share about their experiences shape their identities, revealing how they interpret events and how they prefer to see themselves in relation to others. Since narrative is "a fundamental means of making sense of experience [which] ... is simultaneously born out of experience and gives shape to experience" (Ochs & Capps, 1996, p. 19), it was employed in this study to explore international doctoral students' lived experiences of emotions and how those emotional experiences interplay with their researcher identity. This study was framed by two main questions: What are international doctoral students' lived emotional experiences during their PhD program? And how do these emotional experiences inform their researcher identity?

RESEARCH CONTEXT AND PARTICIPANTS

This study was conducted at a public research university in a southern US state. According to the university website, this R1 university attracts approximately 6,000 international graduate students every year. Therefore, this university can be a useful context to investigate international doctoral students.

In this study, international students are defined as those who travel from their home country to study in another nation (Lane & Bhandari, 2014). Using purposive and convenience sampling (Etikan et al., 2016), four participants who met the criteria of being international students in a PhD program were invited to participate in this study. The participants at the end of their first year in the PhD program were purposefully selected, assuming they were more prone to challenges during their first year of study, given their seeming unfamiliarity with a new learning environment, thereby engendering rich emotional experiences. This participant selection aligns with earlier studies, which address both doc-

toral dropout (Glorieux et al., 2025) and well-being (Holbrook et al., 2014), highlighting the importance of institutional support in the early phases of the PhD for maintaining doctoral students' positive emotions. The researchers received the IRB approval from the university where the research was conducted. Table 1 presents details of the participants and their self-selected pseudonyms. Despite comprising a small sample, these international doctoral students, with their distinctive cultural and linguistic backgrounds, can offer unique stories and significant insights into how their lived emotional experiences shape their researcher identity in the US context.

Table 1. Participant details

Pseudonym	Gender	Age	Country of origin	Research experience and qualifications
Camilo	Male	20s	Colombia	Master's, conference presentations, journal publications
Jessica	Female	40s	China	Doctorate, conference presentations, journal publications
Kofi	Male	30s	Ghana	Master's, conference presentations, journal publications
Ola	Male	40s	Nigeria	Doctorate, conference presentations, journal publications

DATA COLLECTION AND ANALYSIS

Data collection

In this narrative inquiry, two semi-structured interviews were conducted with each participant. The first interview lasted about half an hour via Zoom. This interview consisted of eight open-ended questions, guided primarily by the research purpose, research questions, related literature, and theoretical framework. The interview questions mainly covered information such as the participants' ideal image of a researcher (researcher identity standard), their self-perception and others' feedback as a researcher (perceptual input), what experiences made the participant feel like a researcher and associated emotions, what experiences made the participant not feel like a researcher and associated emotions, and differences between the US and their home country doctoral education.

The follow-up interview, consisting of 10 open-ended questions, was emailed to the participants one week after the first interview. The purpose of this follow-up written interview was to collect the participants' expanded and elaborated responses to the first interview questions. All interview recordings were transcribed and emailed to the participants for member checking before data analysis.

Data analysis

Polkinghorne (1995) proposed two main methods of analyzing narratives: analysis of narratives and narrative analysis. While in the former, "narratives are analyzed into themes and categories" (Clandinin & Murphy, 2007, p. 636), the latter refers to "the procedure through which the researcher organizes the data elements into a coherent developmental account" (Polkinghorne, 1995, p. 15) in the form of a story, and its function is "to answer how and why a particular outcome came about" (p. 19). In this study, narrative analysis was selected because it served as a useful analytic method to explore the participants' past and current experiences, actions, intentions, decisions, and external factors (Polkinghorne, 1995), all of which describe and explain how they experienced their emotions in relation to their researcher identity in a doctoral program in the US.

A four-step procedure, adapted from Emden (1998), Kelly and Howie (2007), and Nguyen (2022), was adopted for the narrative analysis of the participants' interview transcripts. In the first step, we carefully read each interview transcript to grasp and familiarize ourselves with its content. The purpose was to reconnect with each participant's story as closely as possible. In the second step, we

coded each interview transcript, and the purpose was to identify which data segments would be included in the story. We used a priori codes (Saldaña, 2015), informed by the literature review and theoretical framework, such as participants' identity standards, self-perceptions, perceptions of others' feedback about them as researchers, associated emotions, and corresponding behaviors. The codes were also informed by the criteria for the development of a narrative proposed by Polkinghorne (1995). These criteria included: (a) contextual features; (b) time signals for the beginning, middle, and end of the story; (c) the main character's choices, actions, and movement toward an outcome; and (d) factors and other people that influence the main character's actions, goals, and concerns.

The third step was to create the main outline of the story. The product of this step was an outline including a series of subplots and theme fragments, gleaned from groups of similar codes. In the last step, we combined the subplots and theme fragments from the storyline to create a coherent story that reflected each participant's experiences and was useful for addressing the research questions. The coded data segments were kept in the interview transcripts to create the story. Overall, we retained most of the participants' words in the interview transcripts and transposed selected segments to create a coherent story, using Polkinghorne's (1995) aforementioned criteria. While acknowledging participants' natural flow, cultural hesitations, and dysfluencies due to their non-English linguistic backgrounds, we corrected grammatical mistakes and removed many fillers that might have hindered the audience's reading and comprehension.

During the narrative analysis, we employed reflexivity, "a process of critical reflection both on the kind of knowledge produced from research and how that knowledge is generated" (Guillemin & Gillam, 2004, p. 274) to mitigate potential researcher bias, i.e., the researcher's worldview and personal background that might influence how they analyze the information collected from participants, potentially impacting the study findings and conclusions (Kacem & Chaitin, 2006). With that said, the researchers' interpretation of the participants' stories was likely to be influenced by our insider perspectives as an international PhD student and a doctoral education professor, also in the US context, where the study was conducted. To reduce any potential researcher bias, our reflective notes, comments, and informal discussions were recorded in each step of the narrative analysis. Further, the interview transcripts and the reconstructed stories were shared with the participants for member checking (Lincoln & Guba, 1985) to enhance the trustworthiness of the study.

FINDINGS

Four voices emerged from the narrative analysis of the four participants' interview transcripts. These stories represent participants' self-told narratives of their lived emotional experiences and how they navigated their emotions in relation to their researcher identity. The segments in quotation marks refer to what the participants told themselves or what others told them. While two participants (Camilo and Ola) claimed to have a strong sense of researcher identity, one participant (Kofi) said he is only a becoming researcher, and the last participant (Jessica) believed she is still an aspiring researcher. In addition, three participants (Camilo, Kofi, and Jessica) experienced emotional ups and downs during their PhD journey, yet those emotional experiences, particularly negative ones, seem not to shape their researcher identity. Meanwhile, the remaining participant (Ola) did not report any negative emotions and sounded confident to avoid any emotional distress during his study. Last but not least, all four participants shared their own unique strategies of coping with emotional breakdowns and academic challenges.

CAMILO: "I'M AN EXPERIENCED RESEARCHER IN THE INFINITE CYCLE OF RESEARCH LEARNING"

Before the doctoral program, I was a math teacher at different levels – elementary, basic, high school, and university. After undergraduate studies, I felt that I needed more tools for all types of difficulties that students had in the classroom. I'd like to be a researcher to address those problems and disseminate my research in articles and conferences.

Because graduate study in my country is so expensive, I did my master's studies in Mexico for two years. During that time, I participated in various academic and community projects and presented at different conferences both in Spanish and English. I also have some articles already published. I decided to pursue a PhD program in the STEM track to strengthen my math knowledge and create significant educational proposals for the educational field, especially in the STEM field.

The first semester in my doctoral program was so difficult. I felt very stressed, very sad, all kinds of bad emotions. What I learn and do here is not different from what I have done previously, so doctoral education here is not challenging. The biggest challenge I encountered is my limited English. It was not easy to work with other people when I didn't understand them well and couldn't explain what I meant.

Despite my language barrier, I know I'm a good researcher, a good teacher. But my self-recognition as a researcher is not enough. I need others, such as my professors, my supervisor, and my college, to recognize me as a researcher. That's why I'm trying to get very good grades. When my first assignment has a maximum grade, I feel very motivated to work more on my English and try harder to show my better version as a researcher.

During the program, I experienced various research activities, which kept my emotions up and down. I remember when I wrote one proposal for the AERA conference, I felt very stressed, very sad, and very bad because I had to make a lot of corrections and revisions for the proposal. I felt too tired due to lack of sleep to run for the deadline. However, these negative emotions are normal in this research job. They will turn good when you complete your research work. So, when I finished the proposal and it was accepted, I felt really happy because it helped to enrich my research profile. Another time when I received the email from a journal saying "congratulations, your paper was accepted," I felt so good and happy because my contribution was recognized by the journal.

I think every moment you go through during an investigation is meaningful to all researchers. Each of those moments makes me feel like a researcher. And in each of them, you experience very variable feelings. At the beginning, you may feel anxious to propose a solution to the problem that was identified, then you may feel stressed when you see that your proposals have shortcomings, but in the end, you feel satisfaction or happiness with the results obtained. I think that being a researcher implies having a carousel of emotions, where one day you can be very happy and the next experience opposite feelings.

Throughout the program, I have never had any research experiences that made me not feel like a researcher. I consider myself an experienced researcher since I began my master's studies and managed to publish my first article. I don't think there is a model or image of an ideal researcher. I believe that all researchers have their own particularity, which is what makes them special, allowing them to make contributions in their area of research.

I think negative emotions can hinder my productivity and vice versa, and sometimes it's frustrating to try to make modifications to research papers when your paper gets a lot of feedback, although I consider that all recommendations or comments are positive and allow me to grow as a researcher. Yet, with my intention to publish my investigations, my research knowledge, experience, and skills, I believe I can do it.

When faced with negative emotions, I acknowledge them: "Ok, I'm having bad emotions," and I should have negative emotions because they are normal. In those negative moments, I talk to other researchers, like my peers and professors, which helped me to overcome those bad feelings and create more new ideas for my projects. In those moments, you wonder if your skills or competence as a researcher need to be developed further. That's how negative emotions do not hamper my identity as a researcher but instead motivate me: "OK. I need to improve this, this research process."

Further, it is difficult to carry out a research project collaboratively, since sometimes the ideas are contrary between the researchers, making the work a little more tense. But it is precisely that moment

that I consider mutual learning to be, precisely in the interaction with your colleagues, professors, and mentors, where your way of considering a phenomenon or problem is expanded. But this doesn't just apply to the student; it also applies to mentors and other colleagues. Interaction during the process of writing a research paper makes all researchers learn. In this profession of researchers, we are exposed to a carousel of emotions.

I believe that researchers never stop learning; we are always collecting information that helps us improve our practices, but these will never be fully developed. We are always going to need to learn new things; that is, to be a researcher is to be in an infinite cycle of learning.

JESSICA: "I'M NOT A RESEARCHER NOW IN THE RESEARCH CIRCLE"

Before coming here, I was a university teacher in China. I took my master's and my first doctoral program in China, where I already conducted three research projects over seven years of research. I decided to pursue my second doctoral program here because this program is known for its math education, and I share research interests with one professor here. When I was still an elementary teacher in China, I knew that being a researcher was important. Research can be beneficial for my teaching job and can help other people, too.

When I started the doctoral program here in the US, I noticed some minor differences. For example, here we have a lot of discussions with peers on a learning management system like Blackboard, while in China, we only submit paperwork and don't have to submit our assignments to a system. Also, the program in the US tends to focus more on the methods, while Chinese programs pay more attention to theory. Despite the differences, becoming a researcher is equally difficult in both China and the US. You need to figure out what your research area and interests are, focus on them, and talk with your advisor about them.

Since I entered the program, I have experienced both good and bad feelings when doing research work. I feel good when I can find a theory that can explain a phenomenon I'm studying, when I'm done with a project, or when my teamwork with peers goes well. However, sometimes, I don't feel good or happy when I get stuck with my research work. For example, I couldn't find a theoretical framework for a project on pre-service teachers, or when I couldn't recruit the participants for my project, who refused my request for interviews.

Particularly in the first semester, the biggest challenge for me, like other international students, is language. I need to read English papers, learn everything, such as methodologies and theoretical frameworks in English, and write my research in English. Yet, with more practice in discussion groups, I think my English is getting better.

As regards my challenges in research, I know that the research process is very hard, and I don't really feel happy when doing it. I do it as a professional thing, a job, or a duty, not for fun. But when I finish a project, I feel happy. Because I know research is hard, I think I need to persist. When challenges arise, I find ways to address them. For example, when I was stuck with a theory, I focused on solving it by searching the literature for about two days or so, setting my family stuff aside.

I can also talk to my peers and professors for help. Like in China, here I join a group with peers led by my supervisor. We hold regular meetings, twice per month, to exchange our research progress, challenges, feedback, and suggestions, with the mutual goal of pushing ourselves to meet the target of our project. I like this kind of working and research group, which provides me with support and training in research.

Moreover, I am an emotionally stable person. So, every time I encounter something difficult, I just think about how to solve it. I'm not too emotional about problems. Sometimes when I don't feel good because of challenges, such as when someone doesn't want me to interview them, I find that normal, as a fact of things. Bad emotion is just a moment, and I am the person who is positive, so I

need to quickly find a way to figure it out and move on. I know I just need time to practice to move on, so it's okay.

When I get stuck or don't feel so good, maybe I will stop working and relax, like going outside a little bit or going to the campus gym to exercise. After one or two days, I will continue to figure out how to solve the problems facing me.

For me, research is like a circle in which the researcher builds a beautiful framework, proves it, applies it, and comes back to review and revise it. The researcher cannot use one stable theory and use it for their life. In the future, I hope I can be a teacher, as well as a problem-solving researcher who can build some theoretical frameworks, address some problems, and apply them in my future teaching. I don't want to be a researcher in a half circle, without applying anything in practice.

Right now, I'm not a researcher yet because I feel I still have a lot to learn about the professional area to get more familiar with the field, its theory, and methodology. I think I'm not good enough, but I want to be a researcher whose research can contribute to solving some problems in the field.

I don't think that emotions influence my research work or my identity as an aspiring researcher. While doing research, I just focus on it. I never connect my emotions and who I am, or whether I am a researcher or not. Let's say my identity is a chair. When I do things well, I am a chair, but when I don't do them well, I'm not a chair. No, it's not like that. I just focus on doing my research. Now I can do it well, but next time, I can do it badly, or vice versa; "who knows."

KOFI: RESEARCH AS A JOURNEY TO BECOMING, AND "I'M NOT THERE YET"

Before I attended the doctoral program, I worked for about six months as a research assistant for a UK-registered charity organization. We worked on a school health and well-being project in the Northern region of Ghana. We organized medical screening for students and their immediate families, constructed water and sanitation facilities, provided other school-related facilities, and conducted disease surveillance among students.

I was happy because I felt part of something important. The joy and excitement on the faces of our clients motivated me and made me happy. Such an experience makes me feel like a researcher. A researcher to me is someone who identifies a problem and works to find solutions, or at least contributes towards finding solutions, to the problem.

I began my doctoral program last year, and that is when I attended a quantitative methods course in the very first semester. I felt lost because everything was new to me. I talked to some people who had already taken the course for advice and experience. I also joined one or two research teams. That's when I began to realize that I don't really feel like I'm there yet, but I'm on my way to that place. Since then, what I have done in my courses is reading, writing, reading, writing, more like doing assignments in response to my professors' questions or exercises.

At that time, I didn't count conducting literature as research per se. I felt a bit left out, maybe even frustrated, because I felt I was doing something rigorous, especially for the sake of class assignments, compared to my friends' or peers' sharing about how they got IRB approval, how they're collecting data, how they worked as research assistants for their supervisors, helping with analyzing data, etc. At those moments, I felt left out and didn't feel like a researcher.

However, I had a chance to take part in a Pioneer Research Group's project. We carried out a study that investigated high school students' STEM beliefs and contextual factors such as the influence of parents, teachers, other adults, job prospects, and associated salaries. I practically did everything as my group members kept ghosting me.

But it was also a fun moment as I learnt a lot from that experience. Because I saw it as a learning experience, I was motivated and somewhat happy that I was able to do most of the research work.

Also, we have a draft manuscript ready for submission and a proposal accepted for next year's AERA.

During my doctoral program, I have received a lot of encouragement from friends and professors, including my former dissertation supervisor in the UK. Particularly, conversations with my professors made me realize that systematic reviews and theoretical/conceptual papers are also research. Interactions with my peers and professors make me feel that being a researcher isn't really a destination. It is always a journey to becoming. You don't just arrive there and say, "I am now a researcher." I think there's always something to improve upon. Even my professors sometimes read their own publications and couldn't believe they used to write those papers with such low quality.

So far, one big challenge I have encountered is working with people. I always like working collaboratively with people, yet one time when I worked on a group project, I kept receiving an array of calls, texts, messages, and excuses from my teammates. I'm someone who likes to get to the final product. If you give me a task, I want to just get it done. I don't want any delays. I don't want it to also get in the way of other aspects of my life. Finally, I ended up doing most of the work to complete the project. Though I didn't express my strong emotional responses in those cases, I did get frustrated because doing most of the group work adds to my already heavy workload, stressing me out when it interferes with my personal life.

The reason why I don't usually show or feel strongly emotional is that I tell myself, "Well, we are all in the process." I understand that my friends, just like me, apart from their academic work, also have their own lives to live, and so I just give them some grace. Besides empathy for my friends, I tend to keep my emotions in check by disengaging and disconnecting from things that might get on my nerves and doing something non-academic, such as watching movies or soccer. Doing that can prevent me from reacting too strongly, emotionally, to challenges such as working with other people during my doctoral studies.

For now, I believe my cultural background makes me different from some of my domestic friends. While domestic students in the US prefer an individualistic and independent working style, I appreciate a communal way of living, working, and thinking. That communal perspective also shapes my view of research. I am someone who wants to research not on, but with people, my participants. I don't want to be someone who goes to a community and collects data and then leaves without the community benefiting from the knowledge they share with me. I feel that's exploitative, and it reeks of colonialism – basically the same template. I also don't want to treat my research sites and participants like data mining sites – the way natural resources are mined from the ground.

In addition, my positive interactions and collaboration with my mentor and peers strengthen my belief in this communal spirit. I guess this communal way of living leads me to put myself in others' situations, thus overcoming my frustration caused by working with my teammates. Overall, I think it's important to become a researcher. Yet, we need to see the path to becoming researchers as a way of living, beyond just the academic work. We need to enjoy the journey, think about ourselves, and our well-being. Just chill out, relax, take a break, disengage, and have fun.

OLA: "I'M AN EXPERIENCED RESEARCHER, AT BOTH NATIONAL AND INTERNATIONAL LEVELS"

My first experience with research dates back to my tertiary education in Nigeria. I already earned my master's and doctorate and got involved in various research projects, using qualitative, quantitative, and mixed methods research approaches. Working at a university system, I have a strong network of academic staff, professors, and PhD holders. Such an environment, a community of research practice, is favorable for my research. I decided to pursue a second doctoral degree in education to seek productive and innovative knowledge and skills that will boost my professional competencies and networking worldwide.

I'm no longer a novice. I'm an experienced researcher, and when I entered the doctoral program in the US, I became a researcher at the international level. I have leveraged my prior research experience in my home country to transfer it into my doctoral education here.

When I was still an amateur as an undergraduate, I used to face a lot of problems. For example, I was frustrated when I didn't have money to buy a computer or a phone that would facilitate my research. I was also frustrated because my supervisor was not accessible. Or when I wanted to conduct a questionnaire for a case study, the participants did not welcome me, which used to discourage me from being a researcher.

What kept me motivated was my intention of achieving excellent results and meeting my target. When I succeeded, my emotions improved. I motivated myself to develop and keep moving on. After all, I didn't feel bad at all because I put behind me what belongs to the past and look into the future to acquire what I'm here to do.

When I first came here, I didn't get stable. The first semester was highly challenging for me to familiarize myself with the system and the people here. Yet the biggest challenge was the weather, especially in the winter. I've never been exposed to that sort of cold in my life before. In my first winter here, I had a headache for almost three or four days because of excessive cold. So, I forgot to submit my final assignment. The lecturer agreed to let me submit the final assignment, but he gave me a B for the course in accordance with the number of days of late submission. Though it was hard for me to quickly adjust to the new environment, the next semesters were fantastic.

During the doctoral program, I experienced a lot of research activities, which fostered my sense of being a researcher. For example, I submitted six projects into the STEM family night competition, participated in research exhibitions, and presented one proposal at a conference. However, when I submitted another proposal to the conference, it was rejected because it didn't match the focus of the conference. I resubmitted the proposal to another association and got accepted. Besides, I got involved in a research team led by some of my professors, and we got two other proposals accepted at two other conferences.

In addition to my research experiences and outputs, I have received a lot of commendable feedback from my peers, professors, and mentors that influenced my academic and professional accomplishments positively. My interactions with my peers, professors, and mentors always influenced me academically and professionally as a researcher.

My ideal image of a researcher is one who discovers challenges and carries out research that will offer lasting solutions to the challenges. That is the essence of being a researcher. Definitely, I'm a researcher and also a scholar. I can predict and foresee what problems might arise through reviewing literature. I can provide solutions to those research problems. As researchers face a lot of challenges in all stages of research, I usually carry out a feasibility or pilot study for any project to avoid any emotional distress for me.

That's why I have never been involved in any research activities that made me not feel like a researcher before and during my ongoing doctoral education. Precisely, I have not experienced any challenges because I believe proper preparation, proper performance, and proper planning prevent poor performance. I always think of alternatives when conducting research. For example, if I cannot approach a public school for my research site, I can change the location to a private school. That's how all my projects conducted here were well-performed and well-recognized.

All my hard work and prior experience have led me to be an international researcher now. Each member of our cohort brought different experiences from their own country. That can make us international researchers and scholars. For me, I was taught in a curriculum, an educational system, based on the British standards in Nigeria. And now I'm learning about the American style of research in the US. That makes me an international researcher.

My advice for novice researchers is that they should have a strong passion for whatever they want to do. Surround themselves with experienced and established researchers and scholars around the world, interact with them, emulate and copy them, so that one day they can rise to their positions. They should always be optimistic and positive about anything they want to do, and they are about to do. Always see themselves as an achiever, as a winner, as somebody needed in society. They need to be determined, dedicated, and disciplined. They must have determination to succeed, dedicate themselves to their goals, curtail themselves towards achieving their goals.

That's how I develop my motivation in whatever I do. Everything is based on the intention. If you have the intention to achieve something, you will let your internal motivation overcome external challenges because if the internal resistance is more than your internal motivation, you won't go anywhere. That's what will continue to boost your emotion to proceed, to move forward. I always have options. If I don't see what I like, I will find what is available. If I can't run, I will walk. If I can't walk, I will crawl ... Just to reach the destination would be my target. That's how I have become a national and international researcher.

DISCUSSION

This study explored international doctoral students' lived experiences of emotions in relation to their researcher identity. Analysis of the four participants' voices through Burke and Stets's (2009) feedback loop of researcher identity verification and emotions, predicated on the PCT, yields three main insights.

INTERNATIONAL DOCTORAL STUDENTS VERIFIED THEIR RESEARCHER IDENTITY

First, the participants' narratives show that three participants have their researcher identity standard, and how they compare such a standard and their perceptual input to identify themselves as researchers or not. This finding resonates with Gruber et al.'s (2023) observation that doctoral entrants often begin their PhD journeys with specific assumptions about the meaning and role of being a researcher. For example, two participants (Camilo and Ola) have a strong sense of researcher identity primarily because they are confident about their research competence, which is recognized and validated by others when their "contributions were recognized by the journal" (Camilo) or when they received "a lot of commendable feedback from peers, professors, and mentors" (Ola). What makes these two participants different is that Ola verified his researcher identity based on the correspondence of his standard and perceptual input; Camilo reported no "image of an ideal researcher" to compare with his perceptual input.

Unlike Camilo and Ola, Jessica, despite her seven-year research experience, plus plenty of research experiences, supportive mentorship, and relationships during the doctoral program, did not view herself as a researcher, but aspired to be one to meet her researcher identity standard because she is not confident enough about her "professional area." The last participant, Kofi, is a special case in that his researcher identity trajectory goes from not viewing himself as a researcher to becoming a researcher but never being a researcher in its own sense.

When Kofi first attended his doctoral program, he did not consider what he did, e.g., "reading, writing, conducting literature" as research, yet after conversations with his professors, he changed his view of research. Though Kofi started considering the above activities as research, he still did not think that he could ever be a true researcher because "being a researcher isn't really a destination. It is always a journey to becoming." Kofi's evolving researcher identity trajectory corroborates the complex, dynamic, fluid, and flexible nature of identity across the related literature (e.g., Burke & Stets, 2009; Stets & Serpe, 2013).

Further, whether participants view themselves as researchers or not, their narratives show that they all experienced opportunities for research outputs, ample research experience and activities, and supportive relationships and mentorship during their current doctoral program. These findings align with previous research by, for example, Mantai (2017), Buss (2022), and Chen et al. (2023). Also, the participants' emotional experiences, as illustrated in their stories, do not derive from whether their researcher identity standard is matched or unmatched with their perceptual input. Instead, those emotional experiences mainly relate to their engagement with research work during the doctoral program, aligned with the study findings of Batty et al. (2020), Giudicelli et al. (2024), Usher and McCormack (2021), and the challenges facing them as international students in a new environment such as language barriers and communication styles, echoing prior research results (e.g., Gao, 2021; Ma & Ni, 2022).

INTERNATIONAL DOCTORAL STUDENTS EXPERIENCED EMOTIONAL UPS AND DOWNS IN RELATION TO THEIR RESEARCHER IDENTITY

The participants' narratives demonstrate the key components of Schutz et al.'s (2006) definition of emotions in educational settings. First, participants' emotional experiences, whether positive or negative, emerge from person-environment transactions, i.e., their interactions with the research process. Second, with emotions as "ways of being," all participants, except Ola, share similar qualities of emotional experiences (Frijda, 2005; Lambie & Marcel, 2002), particularly unpleasant ones.

Specifically, Camilo, Jessica, and Kofi were aware of and could label their emotions throughout their narratives, the second-order consciousness of emotional experiences. Further, their attention was paid outward to the external objects or situations rather than inward to their own emotions. Moreover, "action readiness" was manifest in their negative emotional experiences, i.e., a kind of motivational tendency to change those unpleasant emotional experiences through emotional regulation.

Generally, the participants' storied experiences of emotions and their self-perceived researcher identity do not seem to confirm the feedback loop, as adapted from Burke and Stets (2009). For example, in Camilo's and Jessica's cases, despite their matched or unmatched correspondence between their researcher identity standard and perceptual input, respectively, these participants experienced both positive emotions (e.g., happy, motivated, satisfied) and negative ones (e.g., sad, stressed, frustrated, anxious, lost), which they acknowledge as "normal" (Camilo, Jessica), or as "a fact" (Jessica) of a research job and process.

While positive emotions strengthen Camilo's researcher identity, negative emotions do not weaken it, but "motivate" him to try harder, stressing the importance of negative emotions in motivating doctoral students to learn as reported by Anttila et al. (2021). Meanwhile, Jessica reported "never [connecting]" her emotions and identity or "who I am, whether I am a researcher or not" while she was conducting research. For Kofi, who views himself as a becoming researcher, conducting research activities that made him feel like a researcher engendered his positive emotional experiences, like "happy" and "motivated," and negative ones, such as "left out" or "frustrated," when those activities did not make him feel like a researcher. This finding resonates with Lamar and Helm's (2017) and Mantai's (2017) study results. Unlike Camilo, Jessica, and Kofi, Ola is an interesting case when he reported no negative emotional experiences yet emphasized his feeling and being "motivated" during the current doctoral program, mainly because of his strong sense of researcher identity.

Apart from negative emotional experiences faced by Camilo, Jessica, and Kofi during the research process, all participants reported negative emotions associated with the challenges international doctoral students faced, especially in the first semester of their doctoral program. Both Camilo and Jessica faced the language barrier, in keeping with prior studies' findings (e.g., Fazel, 2013; Gao, 2021; Goode, 2007; Kuo, 2011; Ma & Ni, 2022; Moffett, 2006; Rodríguez et al., 2019). Unlike Camilo and Jessica, Ola's "biggest challenge was the weather, especially in the winter," which made him sick and led to a B in one course. This challenge is rarely reported in prior research. Meanwhile, Kofi faced a big challenge when "working with people" in the US, aligned with Gao's (2021) findings.

Despite experiencing various issues from weather, language, to communication in a foreign country, the participants reported very few challenges that are well-documented in the existing literature such as lack of institutional support (Cotterall, 2015; Ingleton & Cadman, 2002), lack of opportunities for research practice (Kirk & Lipscombe, 2019), or misalignment of domestic and cross-border academic cultures (Lu et al., 2025). In addition, what is interesting is that all participants did not strongly express their negative emotions when facing challenges during their research work but kept them “in check.” This does not mean that they suppressed those unpleasant emotions, as reported by Herman (2010) and Manathunga (2005). Their emotional control might reflect their collectivist culture in which too strong emotional display is not encouraged according to the national culture framework (Hofstede et al., 2010). The participants' voices also shed light on how they employed the three main resources, namely learned resourcefulness (Rosenbaum, 1990), social-emotional competence (Denham et al., 2009), and cultural capital (Bourdieu, 1986) for their emotional regulation.

INTERNATIONAL DOCTORAL STUDENTS MANIFESTED THEIR OWN EMOTIONAL REGULATION

Examining the participants' voices reveals that all participants demonstrated all three resources for emotional regulation to varying degrees. Table 2 summarizes the examples in the participants' narratives, illustrating how the participants utilized the above-reviewed strategies to cope with their negative emotional experiences (Camilo, Jessica, and Kofi) or to avoid “emotional distress” (Ola). This finding helps elaborate on what behaviors or actions international doctoral students can modify or take not to verify directly their researcher identity but primarily to cope with negative emotional experiences during the doctoral program.

Table 2. Participants' used strategies and examples in their narratives

Resources	Participants			
	Camilo	Jessica	Kofi	Ola
<i>Self-efficacy</i>	I know I'm a good researcher. I believe I can do it.	Yet, with more time of practice in discussion groups, I think my English is getting better. Bad emotion is just a moment, and I am the person who is positive, so I need to quickly find a way to figure it out and move on.	I don't really feel like I'm there yet, but I'm on my way to that place.	I'm a researcher and also a scholar. I can predict and foresee what problems might arise through reviewing literature. I can provide solutions to those research problems.
<i>Delayed gratification</i>	I felt too tired due to lack of sleep to run for the deadline.	I know research is hard, I think I need to persist. I focused on solving it by searching the literature for about two days or so, setting my family stuff aside. After one or two days, I will continue to work, thinking about how to solve	If you give me a task, I want to just get it done. I don't want any delays.	I always have options. If I don't see what I like, I will find what is available. If I can't run, I will walk. If I can't walk, I will crawl ... Just to reach the destination would be my target.

Resources	Participants			
		the problems facing me.		
<i>Problem-solving</i>	In those negative moments, I talk whatever to other researchers like my peers and professors, which helped me to overcome those bad feelings and create more new ideas for my projects.	Yet, with more time of practice in discussion groups, I think my English is getting better. I can also talk to my peers and professors for help. When I get stuck or not feel so good, maybe I will stop working and relax like going outside a little bit, going to the campus gym to exercise.	I talked to some people who already took the course for advice and experience. I also joined one or two research teams. I tend to keep my emotions in check by disengaging and disconnecting from things that might get on my nerves and doing something not academic such as watching movies or soccer.	However, when I submitted another proposal to a conference, it got rejected because it didn't match the focus of the conference. I re-submitted the proposal to another association and got accepted. I usually carry out a feasibility or pilot study for any project to avoid any emotional distress for me. I always think of alternatives when conducting research.
<i>Cognitive self-reinforcement</i>	I believe I can do it.	I know I just need time to practice to move on, so it's okay.	I don't really feel like I'm there yet, but I'm on my way to that place. The reason why I don't usually show or feel strongly emotional is I tell myself that "Well, we are all in the process." Just chill out, relax, take a break, disengage, and have fun.	Definitely, I'm a researcher and also a scholar.
Resources	Participants			
Social-emotional competence	Camilo	Jessica	Kofi	Ola
<i>Self-awareness</i>	When faced with negative emotions, I acknowledge them: "Ok, I'm having bad emotions"	I don't feel good or happy when I get stuck with my research work. I am an emotionally stable person.	I felt a bit left out, maybe even frustrated because I felt I was doing something rigorous especially for the sake of class assignments ... I tend to keep my emotions in check.	When I succeeded, my emotions improved.
<i>Self-management</i>	In those negative moments, I talk whatever to other	When challenges arise, I find ways to address them.	I tend to keep my emotions in check by disengaging	I motivated myself to develop and keep moving on. After all,

Resources	Participants			
	<p>researchers like my peers and professors, which helped me to overcome those bad feelings and create more new ideas for my projects.</p>	<p>When I get stuck or not feel so good, maybe I will stop working and relax like going outside a little bit, going to the campus gym to exercise.</p>	<p>and disconnecting from things that might get on my nerves and doing something not academic, such as watching movies or soccer. Just chill out, relax, take a break, disengage, and have fun.</p>	<p>I didn't feel bad at all because I put what belongs to the back to the back and look into the front to acquire what I'm here to do.</p>
<i>Social awareness</i>	<p>I should have negative emotions because they are normal. In this profession of researchers, we are exposed to a carousel of emotions.</p>	<p>Sometimes when I don't feel good because of challenges, such as when someone doesn't want me to interview them, I find that normal, as a fact of things.</p>	<p>I understand that my friends, just like me, apart from their academic work, also have their own life to live, and so I just give them some grace. Besides empathy for my friends ...</p>	<p>That's how I develop my motivation in whatever I do. Everything is based on the intention. If you have the intention to achieve something, you will let your internal motivation overcome external challenges because if the internal resistance is more than your internal motivation, you won't go anywhere. That's what will continue to boost your emotion to proceed, to move forward.</p>
<i>Social problem-solving and relationship skills</i>	<p>I consider that all recommendations or comments are positive and allow you to grow as a researcher.</p>	<p>Yet, with more time of practice in discussion groups, I think my English is getting better. I can also talk to my peers and professors for help.</p>	<p>I talked to some people who already took the course for advice and experience. I also joined one or two research teams. During my doctoral program, I have received a lot of encouragement from friends and professors ... Conversations with my professors made me realize that systematic reviews and theoretical/ conceptual papers are also research.</p>	<p>I get involved in a research team led by some of my professors, and we got two other proposals accepted in two other conferences. My interactions with my peers, professors, and mentors always influenced me academically and professionally toward emerging as a researcher.</p>

Resources	Participants			
			... my positive interactions and collaboration with my mentor and peers strengthen my belief in this communal spirit ...	
Cultural capital	Camilo	Jessica	Kofi	Ola
<i>Embodied cultural capital</i>	What I learn and do here is not different from what I have done previously, so doctoral education here is not challenging.	When I started the doctoral program here in the US, I noticed some minor differences ... Despite the differences, to become a researcher is equally difficult in both China and the US. Like in China, here I join a group with peers led by my supervisor.	While domestic students in the US prefer individualistic and independent working style, I appreciate communal way of living, working, and thinking. That communal perspective also shapes my view of research this communal way of living leads me to put my-self in others' situations, thus overcoming my frustration caused by working with my teammates.	I have leveraged my prior research experience in my home country to transfer it into my doctoral education here.
<i>Objectified cultural capital</i>	N/A	N/A	N/A	N/A
<i>Institutionalized cultural capital</i>	I consider myself as an experienced researcher since I began my master's studies and managed to publish my first article.	N/A	N/A	I was taught in a curriculum, an educational system, based on the British standards in Nigeria. And now I'm learning about the American style of research in the US. That makes me an international researcher.

Overall, our modified feedback loop grounded in Perceptual Control Theory seems less well-suited to exploring international doctoral students' lived experiences of emotions in relation to their researcher identity for two reasons. First, although the participants' voices demonstrate that international doctoral students compare their researcher identity standards and perceptual inputs to verify it, researcher identity is not always fixed, as Kofi's case illustrates. Second, the participants' narratives show that three participants experienced emotional ups and downs during their research, not necessarily in line with the correspondence or non-correspondence between their identity standards and perceptual inputs.

Therefore, we proposed the framework of goals, cognition, motivation, and emotions (Figure 2), drawing on the work of Schutz et al. (2006) and the insights from the participants' stories, to illuminate the interrelationship of international doctoral students' goals, cognition, motivation, and emotions in influencing their researcher identity.

As their stories suggest, the participants all have their own goal or intention of becoming researchers. Such a goal/intention boosts their motivation/interest/passion for pursuing a PhD degree and research work. Their perception of their own and of others' recognition, manifest in their perceived levels of research competence, confidence, autonomy, and agency, in comparison with their goal/intention and beliefs about research/researchers, considerably shapes their sense of identity as a researcher. However, a lower sense of researcher identity does not reduce their motivation for research if their research goal is clear and specific, as Jessica's case demonstrates.

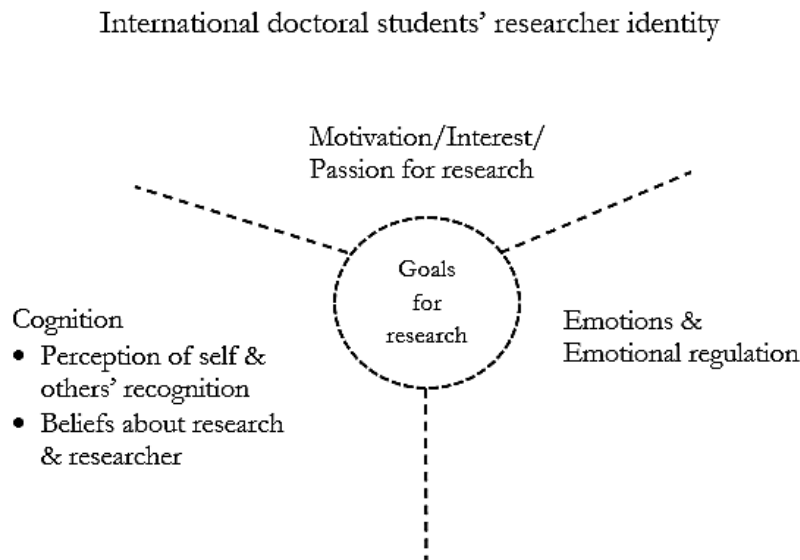


Figure 2. The interconnectivity of international doctoral students' goals, cognition, motivation, and emotions in interaction with their researcher identity

In addition, the narratives show that nearly all participants experienced emotional ups and downs, or “a carousel of emotions,” as Camilo put it. However, the participants' stories suggest that while positive emotions strengthen their researcher identity, negative ones do not weaken it if their goal, cognition, and motivation are explicit and strong. Also, it is important for the participants to leverage their resources for emotional regulation, such as learned resourcefulness, social-emotional competence, and cultural capital, to manage unpleasant emotional experiences and overcome challenges during their doctoral journey.

Analysis of the participants' narratives shows that all participants demonstrate their capacity for emotional regulation with their learned resourcefulness, social-emotional competence, and cultural capital. However, not all viewed themselves as researchers. Considering the suggested framework in Figure 2, both Camilo and Ola exhibited their goals, cognition, motivation, and emotions, all fully aligned with each other, thus establishing their strong sense of researcher identity. Unlike Camilo and Ola, Jessica did not identify herself as a researcher mainly because of her cognition, i.e., lack of self-recognition as a researcher, despite her well-regulated emotions, strong motivation, and goal for research. Meanwhile, Kofi demonstrated his good ability to cope with negative emotions, had a clear goal and motivation for research, yet still considered himself becoming a researcher because of his conviction that “research is a journey to becoming” rather than a destination to reach.

LIMITATIONS AND IMPLICATIONS

This narrative inquiry explored the in-depth insights and perspectives of international doctoral students through their storied experiences of emotion in relation to their researcher identity. Despite the uniqueness and richness of their stories, this study investigated a small sample of participants from the same field of study who come from all collectivist cultures and demonstrate strong self-efficacy and resilience during their PhD studies. All in all, this study leaves more space for future research.

RECOMMENDATIONS FOR RESEARCHERS

Specifically, future researchers can examine other factors that may influence international doctoral students' emotional experiences and researcher identity, including their countries of origin and associated cultures (e.g., individualist ones), field of study, PhD stage, and gender. In addition, longitudinal research across more data sources can be desirable to further support and expand the interplay among the research goals, cognition, motivation, and emotions in shaping international doctoral students' researcher identity. Future researchers can also further explore and advance the proposed framework with a larger sample in other similar international contexts, especially by employing methodologies beyond narrative inquiry.

RECOMMENDATIONS FOR PRACTITIONERS

Besides its contributions to scholarly conversations about international doctoral students' learning and education, this study has significant implications for various stakeholders.

Recommendations for professors, supervisors, and mentors

First, professors, supervisors, and mentors need to initiate an explicit and guided discussion with their doctoral students about their emotions and researcher identity as early as possible. These discussions are particularly important for international students, who are more prone to challenges in a new learning environment due to their diverse cultural and linguistic backgrounds. Although the participants did not explicitly mention a need for such a discussion, their stories demonstrate that a strong sense of researcher identity can engender positive emotions, which, in turn, strengthen that identity. Further, promoting international doctoral students' researcher identity early can help them boost productivity, avoid emotional distress, and deal with research obstacles.

Recommendations for PhD program developers and faculty members

Second, in addition to the three sources of support the participants reported receiving from their PhD program and faculty, it is important that PhD program developers and faculty members pay closer attention to the diverse challenges facing international doctoral students, especially in the early stages of their programs. Though the study's participants seem active and proactive in coping with their cultural challenges, not all international doctoral students have the capacity for emotional regulation. Therefore, the stakeholders involved in doctoral education are encouraged to promote their intercultural awareness and competence to understand better the challenges faced by diverse groups of international doctoral students, so that students can receive timely support, if needed.

Finally, the study reveals that all participants can leverage their learned resourcefulness, social-emotional competence, and cultural capital to overcome negative emotional experiences and cultural challenges. However, whether the participants are aware of those resources is not explicitly mentioned in their narratives. It is therefore crucial for doctoral programs to offer training workshops, seminars, or informal talks on these three resources for international doctoral students. These forms of sharing and learning can equip them with useful, specific tools to manage potential negative emotions and overcome their challenges, fostering their grit and persistence in achieving their targeted goals in doctoral education.

CONCLUSION

This study examined international doctoral students' lived emotional experiences during their PhD programs and how these experiences shape their researcher identity through the lens of Perceptual Control Theory, as revised by Burke and Stets (2009). This research reveals that although all participants reported receiving the three main resources, namely research output, research skills practice activities, and supportive relationships that have been well cited across related literature to support doctoral students' researcher identity development, they verified mixed senses of being a researcher in their early stage of doctoral education.

In addition, three out of four participants experienced a carousel of emotions as a normal and accepted part of their research learning process. These emotional ups and downs, mostly associated with their research work and the challenges faced by international students, seem not to shake their researcher identity verification. While positive emotions were considered strengthening their sense of being a researcher, negative ones could serve as motivation and inspiration for their greater efforts in conducting research and overcoming their challenges. Driven by negative emotions, the international doctoral students in our research have modified their behavior by applying different emotional regulation strategies, including learned resourcefulness, social-emotional competence, and cultural capital, not to verify their researcher identity but to address their emotional breakdowns and other academic challenges.

All things considered, this study extends the existing literature on the influence of positive emotions on researcher identity verification by demonstrating that negative emotions alone do not adversely affect researcher identity among international doctoral students. The study's findings also challenge the claim that "emotion is the 'glue' of identity" (Haviland & Kahlbaugh, 1993, p. 328) as well as the feedback loop informed by the Perceptual Control Theory. The greatest contribution of this study is our proposed framework that highlights the interplay among research goals, motivation, cognition, and emotions in shaping and informing international doctoral students' researcher identity. This framework serves as an alternative way of understanding, as well as a potential way of supporting, not only international doctoral students' sense of being researchers but also domestic students', especially in their early PhD stage, given the widely accepted importance of researcher identity in doctoral education and learning success.

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AUTHORS



Tuyen Pham holds two master's degrees in Applied Linguistics and TESOL. Apart from being a tenured lecturer at the University of Social Sciences & Humanities, Vietnam National University, Ho Chi Minh City, she is currently a PhD candidate in the Department of Curriculum & Instruction, Texas Tech University. Her prior publications focus on English language teachers' lives, TESOL, and technology-assisted language teaching and learning. Her current and future research delves further into curriculum studies, teacher education and well-being, comparative and international education, qualitative and mixed-methods research designs, and doctoral education. She can be contacted via tuypham@ttu.edu or pnkimtuyen@hcmussh.edu.vn.



Jeasik Cho has been serving as department chair in the Department of Curriculum & Instruction at Texas Tech University. His scholarship centers on alternative, holistic, and critical discourses in curriculum theory, qualitative research, and multicultural education, with publications in top-tier journals such as *the Journal of Curriculum Studies*, *Qualitative Inquiry*, and *Multicultural Educational Review*. His book, *Evaluation of Qualitative Research* (Oxford University Press, 2018), reaffirms the importance of engaging intellectually with the evaluation of qualitative research quality and rigor. He has embarked on projects to develop types of wisdom and core principles of curriculum and pedagogy in the spirit of posthumanism and post-qualitative research. He can be reached at Jeasik.Cho@ttu.edu.