Directing a Study Skills Course as a Graduate Student Develops Flexible, Autonomous, Student-Centered Educators

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Directing a Study Skills Course as a Graduate Student Develops Flexible, Autonomous, Student-Centered Educators

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Abstract

The historical dearth of qualified anatomy educators has been thoroughly discussed in the literature. In recent years, several graduate, postdoctoral, and continuing education programs focused on anatomy education have emerged at various institutions specifically designed to meet the growing demand for qualified anatomy faculty. While these programs provide students with courses and experiences that facilitate the transition to faculty, many graduate students do not get the opportunity to be a course director during their time as a graduate student, despite the fact that many of these individuals will enter into teaching-intensive faculty positions upon graduation. This phenomenological study seeks to describe the experiences of individuals who taught a study skills course at a large midwestern university to undergraduate anatomy students. The individuals were interviewed to discuss their experiences directing the course, which ranged anywhere from one to six semesters. The interviews were recorded and transcribed, and thematic analysis of the transcripts revealed four primary themes: flexibility, autonomy, student-centered, and broader pedagogical impacts. This opportunity allowed them to structure their own course, helped them interact and communicate with students better, and allowed them to implement activities in the classroom based on their personal pedagogical and research interests. It also promoted the development of skills and knowledge needed by aspiring educators and better prepared them for their future faculty positions. Such an experience is worth offering graduate students, when possible, to facilitate the transition from student to faculty member. http://doi.org/10.21692/haps.2022.009

Key words: graduate students, phenomenology, thematic analysis, study skills, graduate teaching assistants

Introduction

There is a well-documented dearth of qualified anatomy educators (Blevins and Cahill 1973; Eldred and Eldred 1961; Holden 2003; McCuskey et al. 2005; Schaefer et al. 2019). This lack of trained anatomy educators resulted from an increased emphasis on more research-focused faculty and a decreased emphasis on education-focused faculty (Shortlidge and Eddy 2018). Additionally, in the 1990s, doctoral training programs in neurobiology and anatomy altered their graduate curricula by replacing anatomical science courses with courses in cell and molecular biology (Richardson-Hatcher et al. 2018). As a result, faculty members hired were well-equipped to meet institutions' research expectations, while lacking in preparedness to teach gross anatomy (McCuskey et al. 2005). Because of this heightened focus on researchers, many institutions have failed to adequately invest in their anatomy departments, leading to an aging population of anatomy faculty (Fraher and Evans 2009).

As classically trained anatomists have begun to retire in recent years, academia continues to experience a shortage of qualified educators and an increase in adjunct and sessional instructors (Caruth and Caruth 2013; Doss and Brooks 2016; Halcomb et al. 2010; Rhodes et al. 2018; Schaefer et al. 2019). Furthermore, the growth in graduate and undergraduate health science programs only serves to exacerbate this need for qualified anatomy educators (Doss and Brooks 2016; Wilson et al. 2020a). The pressing demand for anatomists is not isolated to institutions in the United States, but rather, is an issue faced by institutions worldwide (Chia and Oyeniran 2020; Memon 2009).

In recent years, several graduate (Albertine 2008; Brokaw and O'Loughlin 2015; Richardson-Hatcher et al. 2018; Walker and Ward 2007), postdoctoral (Bader et al. 2010; Fraher and Evans 2009), and continuing education (Doss and Brooks 2016) training programs specifically focused on anatomy education have emerged at institutions across the United States, as well as in Canada and Europe (Schaefer et al. 2019; Wilson et al. 2020b). The American Association for Anatomy (2021) offers a comprehensive list of anatomy education programs on their website. Such programs produce a cadre of anatomy-focused educators who are equipped to meet the growing demand for qualified anatomy faculty.

While enrolled in these programs, students typically receive training in a variety of areas including the anatomical sciences (gross anatomy, embryology, histology, and neuroanatomy), educational research, qualitative and quantitative research methods, statistics, health sciences pedagogy, curriculum design, learning theory, and teaching practicums (Brokaw and O'Loughlin 2015; Walker and Ward 2007). These courses begin preparing students to fill the various roles assigned to faculty members, such as lecturer, resource developer, and

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curriculum planner (Harden and Crosby 2000). The teaching practicums allow these students the opportunity to deliver lectures, engage students in active-learning sessions, and create assessment items (Richardson-Hatcher et al. 2018).

Although a teaching credential for anatomy educators has been discussed at Experimental Biology annual meetings, no credential or accreditation has been established. However, anatomists agree that pedagogy and educational research are extremely important to the development of future educators (Rizzolo and Drake 2008). Similarly, in a survey distributed by Wilson and colleagues (2020b), researchers found that departmental chairs seeking to hire anatomy educators ranked teaching experience as the most valuable experience in a candidate, followed by teaching experience in multiple anatomy disciplines and pedagogy. These courses and teaching practicums are valuable experiences that contribute to doctoral students' training in becoming professors.

In teaching practicums students generally take on an integral role within the laboratory, while also being assigned a lecture or two to present. Their duties are focused on tasks pertaining to session implementation and examination development, proctoring, and grading. However, many students do not gain experience as a course director until they enter the realm of faculty. The term "course director" refers to individuals who design a course, develop the course syllabus and content, lead class sessions, and oversee administrative tasks (i.e. student accommodations, development of the learning management system, issuing grades). Many of the graduates from these programs will enter teaching-intensive positions upon graduating, potentially beginning their careers in a course director position. Furthermore, even fewer individuals gain experience teaching a study skills course, even though such teaching savvy would be indispensable to educators, as most instructors do not have ample time to dedicate to teaching study skills in addition to the content in a typical anatomy course.

The purpose of this phenomenological study is to describe the experience of graduate students who taught a study skills course during their time as a graduate student. This 1-credit-hour study skills course is offered at a large midwestern university to undergraduate students who are concurrently enrolled in a 200-level undergraduate anatomy course. Enrollment in the course has varied over the years, with as low as 15 students and up to 50 students enrolled in a semester. Undergraduate students are taught an array of study strategies designed to better their learning of anatomy and improve their overall study approaches. The impact of this course on student outcomes has been previously documented by one of the authors (A.S.) (Schutte 2013).

The study skills course was created by graduate students and has been offered nearly every semester for over a decade. The design of this course is unique in that is led predominately by graduate students enrolled in an anatomy education PhD program, providing them with the opportunity to run their own course as a graduate student. Over the years, the focus of the course has remained consistent; its structure is rooted in metacognition by encouraging students to examine their own learning while introducing them to research-supported study skills. These study skills are taught in the context of anatomy, and an additional goal of the course is to emphasize the transferability of these skills to other subject areas. While the theoretical framework of the course has remained the same, instructors have structured the course as they desired from semester to semester and implemented pedagogical tools based upon their personal teaching interests.

Materials and Methods

Participants

Since the study skills course was first instituted in the summer of 2010 it has been offered to students enrolled in anatomy nearly every semester. During each semester, one graduate student in the anatomy education PhD program was given the opportunity to oversee the course, taking on the responsibility of course design and instruction throughout the term. In any given year there are, on average, 8 students enrolled in this doctoral program, and the students who are given the opportunity to oversee the study skills course have already gained some teaching experience and have typically completed a fair amount of their education coursework. Graduate students are given the chance to prioritize the courses they feel qualified to teach and would like to teach, and this is factored into the decision of who will teach the course.

Until the fall 2012 semester, the course was taught by one of the authors (A.S.). From the fall 2012 semester until the fall 2021 semester there were nine graduate students who each taught the course. All nine individuals were invited to participate in interviews, and eight individuals completed an interview. While most of the participants expressed a desire to teach the study skills course at some point, there were two participants who were rather unfamiliar with the course when asked to teach it. In order to support students who are typically taking on their first experience of being the instructor of record, syllabi from most semesters have been collected so they may be shared with future instructors. New instructors for the course are also encouraged to talk with past instructors to *"pick their brains,"* while also making the course their own. Additionally, the doctoral program director was interviewed, as they offered guidance to the graduate students who developed the course and have observed all of the graduate students as they went through the experience of teaching the course.

All participants were recruited via email. Informed consent was obtained from all participants upon scheduling their interview and reiterated at the start of their interviews. This project was approved by the UMMC Institutional Review Board (protocol #2018-0214).

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Researchers

The interviewer (A.S.) is one of the co-creators of the study skills course and taught the course for several semesters prior to graduating from the anatomy education doctoral program in 2013. They were a graduate student at the same time as two of the interviewees, and, due to the close-knit nature of the anatomy education world, a professional relationship was already established (primarily through conference networking) with all of the study participants.

The existing relationship between A.S. and the participants and A.S.'s familiarity with the doctoral program, the study skills course, and the undergraduate anatomy course were viewed as assets during data collection as they allowed for the analysis team (A.S. and C.B.) to better understand jargon and program-specific references used by participants. A.S. is not presently affiliated with the anatomy education doctoral program in this study in any formal capacity besides being an alumna. C.B. is a doctoral student in an anatomy education program different from the one included in the present study. Other than brief online encounters between the two doctoral programs, they had not met any of the study participants prior to becoming involved in this study. They had no involvement with the study skills course and are unfamiliar with the specific program/departmental/institutional practices about which the participants spoke.

Data collection

Semi-structured interviews were conducted as video conferences through Zoom®, and all interviews were recorded to enable transcription of the interviews. The interviewer (A.S.) conducted nine individual semi-structured interviews. Due to the nature of semi-structured interviews, the interview schedule provided a framework for each interview, while allowing the interviewer flexibility to ask questions in a different order or with modified phrasing. It also allowed the interviewer to investigate areas of interest as they emerged during the interviews that may not have been a part of the initial interview schedule. Overall, each participant was asked to discuss the following:

- current position (graduate student, faculty member, etc.)
- when and how often they taught the study skills course in their graduate career
- motivation for teaching the study skills course
- course goals and course design
- lessons learned from the experience of teaching the study skills course
- impacts of the experience of teaching the study skills course on current teaching philosophy and practices

Upon completion of the interviews, the audio recordings were transcribed verbatim to allow for thematic analysis.

Data analysis

Thematic analysis was conducted to discover themes across interviews. Thematic analysis, as outlined by Kiger and Varpio (2020), is an iterative process of analyzing qualitative data with the goal of describing and understanding shared experiences across a set of data.

This process began with both of the authors working independently to familiarize themselves with the transcribed interviews and then generate initial codes, which are simply descriptive words or short phrases used to indicate meaningful segments of text. Next, the authors discussed their individual codes to find areas of overlap and discrepancies, ultimately coming to agreement on an overall coding framework. After establishing the framework, both researchers re-coded the data with the agreed upon framework and then compared coding patterns to ensure consistency in the application of codes. Coded statements were then extracted and examined for the generation of themes. A theme is built from the comparing, combining and mapping of how codes relate to one another. This is again an iterative process involving the researchers working independently to describe themes, and then discussing themes together to assess and reach agreement on the themes that most clearly describe the relationships among the codes.

Upon establishing themes, the authors sought to engage the participants in member checking, which is a common procedure in qualitative research that allows participants in a study to review the researcher findings and offer additional input if they see fit. All interviewees were provided with a draft of this manuscript via email and provided with ample time to review and respond to indicate agreement/disagreement and provide any supplementary contributions. One of the nine interviewees responded and offered suggested changes; three other interviewees responded with no suggested changes.

Results

At the time of their interview, three participants were faculty at the instructor or assistant professor level, and five participants were graduate students. Currently, a total of five participants have completed their doctorates and are currently faculty members at either medical or undergraduate institutions in the United States. The remaining three participants are still graduate students; two are enrolled in the anatomy education PhD program and one, who received their Master's in anatomy, is an anthropology PhD student.

Half of the participants taught the study skills course twice, although the participants taught the study skills course anywhere from one to six semesters. As participants described their experiences and the various impacts of being a course director for the study skills course, four primary

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themes were discovered during the analysis: autonomy, flexibility, student-centered, and broader pedagogical impacts. Additionally, the interview with the doctoral program director was useful for reinforcing these themes, as well as shedding light on other facets of the study skills course.

Theme 1: Autonomy

The role of course director allowed the participants freedom to determine the structure of the course and activities to be implemented in the course based on their own pedagogical interests. By the time they were given the opportunity to direct the study skills course, the participants had completed some or all of their education-focused coursework which covered learning theories and pedagogical approaches. While at least some of past semesters' syllabi were typically shared with a new instructor of record, these were meant to serve as guidance for course development rather than dictating rigid structure required each semester. The opportunity to teach this course provided study participants with the opportunity to explore teaching methods they may not otherwise be in the position to implement in their other teaching assignments. This statement by Subject 4 was reiterated by most other participants in similar manners, ***"I feel like you don't get that much in the other classes we teach. We don't have much freedom in those. I think this class allowed the freedom to say, 'Let's try stuff out,' you know."***

Beyond course structure and content, these individuals were also responsible for administrative duties. While the participants, overall, did not discuss these aspects frequently, the program director described teachable moments with the graduate students who were setting up the course within the institution's online learning management system (LMS) or navigating procedures when a student had disability accommodations. As the course director, participants also found themselves making a myriad of decisions regarding the overall course and individual students' circumstances that they had not previously had to deal with directly as a teaching assistant (TA). Additionally, the program director described consistently seeing students become more confident after being the instructor of record for the study skills course, and that the graduate students gained a fair amount of skill and confidence from the experience. They stated, ***"They move away from that fixed mindset of teaching is an art or talent, and a growth mindset of, oh, I'm learning some skills and I can become better."***

Theme 2: Flexibility

While a commonly expressed sentiment was the desire to have autonomy, with such independence also came a need to be flexible at multiple levels of course implementation. Participants were ready to try approaches they had learned about in their courses and were faced with the logistical challenges that can occur with teaching. Subject 6 described building inherent flexibility into the syllabus from the start and still needing to adjust once the course started. ***"I've had to walk some of it back, because I get--I've gotten a lot of like people not turning in assignments."***

Seemingly basic skills, such as effectively navigating the LMS required more instruction than previously assumed by the instructor. Within an individual session, participants recalled how, if they recognized a particular activity was not working for the students, they would adjust accordingly within that class session or prepare to handle the activity differently in the future. Subject 3 described, ***"…there have definitely been days where I was trying out something new, um, and the students were not responding at all. And so maybe I quit halfway through the class and changed it up or maybe I realized that for when I taught it again maybe the next semester."*** Similarly, in discussing the attempts to have students in the study skills course draw as a method for learning, Subject 1 described the students' resistance to the activity and how they were able to adapt their teaching approach to meet the students where they were. ***"…it surprised me how hard that resistance [to drawing] was to overcome."*** They go on to describe how an assignment in which students were to write out the content (versus draw it) was still a viable option that was more approachable for some students.

As instructors around the world have had to do since the spring of 2020, the participants who have been leading the study skills course most recently have had to convert a class traditionally delivered face-to-face to an online format due to the COVID-19 pandemic. This radical and sudden shift in course format required additional flexibility on behalf of the course directors as they modified assignments and interactions with students. Additionally, they have had to adjust their own preferences regarding the students' use of technology in the course. Subject 7 described a need to be flexible to accommodate student preferences for online resources versus hand-written approaches to develop study tools once the study skills course moved to an online format.

The added layer of students all using different types of devices created a need for flexibility that continues to be present. As Subject 7 said, ***"trying to get formats that everybody can access, things that they can turn in, that I can access, that's remained a generalized problem."*** Learning to engage students in an online environment has required flexibility again, as instructors have to be willing to take different approaches to maintain or increase engagement. Subject 7 stated, ***"But just from the end of last semester to the beginning of this semester, encouraging them to have their videos on Zoom--we use Zoom--has helped. The number of people who actually speak up when their video is on has increased and then also saying that you can also put something in the chat. Like they might not want to actually yell something out, but they will, they will type it into the chat. And that's helped."***

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Theme 3: Student-centered

That the focus for the course was on the students and what the students could gain from this study skills course was perhaps the most prominent thread in all of the interviews. Not only did the participants want the students to better their anatomy knowledge, but they also wanted the students to develop skills that would be transferable to other courses. The exact skills emphasized by each participant varied, although the goal was always improved learning. This sentiment shared by Subject 5 was shared by most study participants, ***"I wanted them to get study skills that could transfer out of [the study skills course] to other classes, but at the same time, really strengthen their anatomy content."***

The participants also shared the desire to assist struggling students. In the process of seeking to help the struggling students, the participants consistently shared that they gained a newfound awareness of what the students truly struggle with and how best to help them. The participants were quite introspective in these discussions, expressing a better understanding and appreciation for how others learn and that this was enabling them to be better teachers in future interactions. Subject 8 said, ***"I think it's just really good experience to really see the vari-- you know--the variability with how students learn, understanding like where their struggles are. Because you pick up on things that, you know, other areas that of anatomy that they're struggling with, and it really challenges you to think about what materials might help them outside of just doing office hours, or that kind of thing."*** Subject 2 is now a faculty member who oversees an anatomy laboratory and said this of their experience teaching the study skills course, ***"I believe it did help inform me on how I talked to the students when I was back in the general anatomy lab courses and how I would talk to them about study strategies. And I would say my experience looking at teaching [study skills] and thinking about how I could help students figure this out has impacted how I now think about redoing our curriculum for anatomy."***

Theme 4: Broader pedagogical impacts

The impact teaching the study skills course had on these individuals went beyond the scope of this course alone. For Subject 4, in particular, teaching the study skills course changed their trajectory in the PhD program and shaped their dissertation work. Upon reflecting on how the experience of teaching the study skills course led them to their dissertation work Subject 4 stated, ***"It allowed me to, um, see things, think about things, that oftentimes don't happen when you're just teaching anatomy labs or something. You don't sit back and really think as much about the pedagogical practices or something or how students actually learn [in the lab-based courses] … "***

Furthermore, the participants noted that their experiences in teaching the study skills course extended beyond graduate school, impacting the current teaching practices of those in faculty positions. Some individuals are planning to incorporate activities they utilized in the study skills course in their current teaching assignments, while others have already begun to do so. On a weekly basis, Subject 2 would ask students in the study skills course to answer a couple questions in which they described what they'd be learning recently in anatomy and then identify points of difficulty or confusion. They describe wanting to continue something similar in their current faculty role, ***"And I've been thinking about incorporating this into my lecture for the dental and medical students […] where I think I'll have a slide asking them two questions: One—and I've been thinking about how to phrase it—I think I'm going to phrase it something like, "If your parent were to call you today and ask you, 'What did you learn in school today?' what would you tell them?" So what do you—what have you taken away from this lecture today? What is something that is making sense to you that you could take away and be like, "Okay, I understand that"? But question number two: "What is something that you're still struggling with?"***

Simply completing the interview process was a reminder to some participants of the value of their experience directing the study skills course. It was well-stated by Subject 1, ***"Well, having not thought about it from this perspective, but really enlightening in this conversation, is how much of my current teaching was influenced by that, which is pretty cool. And, um, also sort of highlighting some of the things that I should keep up with, and, you know, like old ideas that I just have, you know, forgotten about because of time and stuff that would be worth trying. So yeah, if your goal is to look at it from the instructor's perspective, it was definitely valuable for me to teach it."***

Discussion

The four primary themes that emerged from the data analysis revealed the numerous ways teaching this study skills course contributed to the participants' development as educators and how the themes connected to each other to provide a cohesive explanation of the experiences of these educators. Most of the participants sought out the experience out of a desire to have increased autonomy in their teaching roles and to aid struggling students in their efforts to achieve better academic outcomes. Being course director allowed them to implement methods and design resources based on their own teaching interests and to determine the utility of these tools in a classroom of their own.

Due to institutional factors, few graduate students have the opportunity to direct a course. The opportunity to instruct a study skills course and witness firsthand if students effectively used the study skills suggested by faculty is a unique experience. Implementing learning strategies is a learning process in itself, as there are a variety of factors that influence the success of their delivery. By teaching this course, graduate

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students could use trial and error to learn about the realities of executing these strategies, and their willingness to self-reflect and adapt leads us to the flexibility theme.

These individuals became flexible in both course design and instruction as they sought to foster an effective learning environment for their students. Each interviewee expressed a willingness to adapt the course according to the students' needs, whether it be in the middle of a class session, between iterations of the course, or because of the unforeseen circumstances created by the COVID-19 pandemic.

Despite the fact that many students and faculty were already familiar with utilizing technology at institutions across the world before the pandemic, students and faculty alike had to adapt quickly as the role of technology became critical in the transition to virtual learning (Guppy et al. 2021). In addition, respondents noted that this experience helped them become more student-centered, informing them about how they interacted with students. These interactions taught the participants to listen to their students to determine what study skills they valued and what study skills they were not utilizing as often, helping them further adapt to their students' needs. These attributes have been previously documented as being beneficial to one's teaching (Hortsch 2019).

This shift from teacher-centered to student-centered is not unique to the anatomical sciences, but rather has become an international trend in education (Scheurs and Dumbraveanu 2014). Enhancing their abilities to work with students will, no doubt, benefit them as they pursue faculty positions as anatomy educators, and the broader range of skills developed from this experience are important facets of being an educator in higher education.

Harden and Crosby (2000) described six key areas of activity for medical educators: the teacher as information provider, role model, facilitator, assessor, planner, resource developer. In the participants' more typical teaching positions in lab-based courses they were typically facilitators or information providers, and to some extent carrying out the activities of role models. While course director for the study skills course, they took on planning, resource development, and assessor roles in addition to their other responsibilities. Developing the skills associated with these roles is important, as graduates from anatomy education doctoral programs are typically hired into faculty positions upon graduation (Brokaw and O'Loughlin 2015; Walker and Ward 2007). Each of the participants who had already begun a faculty position was involved with teaching multiple student populations, and it seems reasonable to suggest that having even a small foundation of skills developed for the array of roles an educator fills is serving recent graduates well as they transition into faculty members.

Across disciplines, graduate students are often utilized as TAs while pursuing their degrees. The participants in this study are unique as they completed coursework in education prior to becoming course directors for the study skills course. However, graduate students in other programs and institutions receive varying levels of training prior to taking on the role of TA, with it often being quite limited.

Throughout the years, research-trained faculty have experienced apprehension regarding their students' time spent researching and teaching, as these faculty felt that their students may exhibit reduced productivity in their research endeavors if more of their time was allocated to teaching responsibilities. However, research suggests that time invested in educational training for graduate students does not negatively impact students' research endeavors, but rather may serve to better prepare them for future faculty positions (Shortlidge and Eddy 2018). Several studies have shown that being a TA resulted in increased self-efficacy, increased confidence, and reduced communication apprehension (Mueller et al. 1997; Prieto and Meyers 1999), and that a positive correlation exists between a students' amount of TA experience and their sense of self-efficacy in effective teaching behaviors (Boman 2013).

TA training sessions may take place in the form of orientations, workshops, or bootcamps lasting anywhere from one hour to several weeks or semester to year-long courses (Bauer and Tanner 1994; Feldon et al. 2017; Gardner and Jones 2011; Piccinin et al. 1993). Despite the fact that students may perceive short-term educational training as beneficial, this training may fall short in adequately preparing these individuals for future faculty positions (Gardner and Jones 2011). These training experiences should be viewed as the start to educational training (Tanner and Allen 2006) and more time needs to be invested in training graduate students in educational practices (Feldon et al. 2017).

The TA experience may be valuable for developing educators (Park 2004), and the results of this study suggest that the value in directing a study skills course seems to far exceed that of a typical teaching assistantship. During the graduate school experience, doctoral students begin to evolve and change (Gravett 2021), and, while graduate school begins the process of socializing students to faculty roles (Gardner 2007; Piccinin et al. 1993), it may not introduce students to all the roles expected of a faculty member (Schaefer et al. 2019). Many professors have difficulty adjusting to their new roles as faculty because graduate school failed to adequately prepare them for the various responsibilities assigned to them (Mueller et al. 1997) and new faculty are often unaware of the roles expected of them beyond teaching and research (Austin 2002).

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Conclusion

The results of this study suggest that being a course director for a study skills class positively impacted the interviewees' development as educators. While the students enrolled in this program receive formal training in learning theory and pedagogy, we conclude that individuals who lack formal training in learning theory and pedagogy would also benefit from a similar opportunity. If course directorship is not an option at an institution, we recommend allowing the student to take on more administrative and teaching responsibilities within a course. Providing students with experiences more authentic to and indicative of the various roles expected of faculty will better prepare them to become future faculty members. To help facilitate the transition from graduate student to faculty member, we suggest offering graduate students opportunities to be more autonomous whenever possible.

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About the Authors

Casey Boothe is a doctoral student in the PhD in Clinical Anatomy Program at the University of Mississippi Medical Center. Her dissertation research focuses on the study strategies, time management, and metacognitive skills of master's students enrolled in graduate anatomy courses. She is a new member of HAPS. Dr. Audra Schaefer earned her PhD from Indiana University in Anatomy and Cell Biology in 2013. She is currently the assistant director of the Clinical Anatomy PhD program and teaches medical neurobiology and histology at the University of Mississippi Medical Center. Her research interests include metacognition, study strategies, and training of educators. Dr. Schaefer has been a member of HAPS since 2009.

Literature Cited

American Association for Anatomy. 2021. Graduate programs in anatomy. American Association of Anatomists, Bethesda, MD. https://www.anatomy.org/AAA/Career/Graduate-Programs-in-Anatomy.aspx

Albertine K. 2008. Creating a teacher-scholar training program for anatomy at the University of Utah School of Medicine. *The FASEB J* 22(1):241.4. https://doi.org/10.1096/fasebj.22.1_supplement.241.4

Austin AE. 2002. Preparing the next generation of faculty: Graduate school as socialization to the academic career. *J High Educ 73*(1):94-122. https://doi.org/10.1080/00221546.2002.11777132

Bader D, Dalley AF, Norden JJ, Nanney LB, Pettepher CC, Richmond AW et al. 2010. Development of a scientist-educator program. *The FASEB J:*24(S1):827.7. https://doi.org/10.1096/fasebj.24.1_supplement.827.7

Bauer G, Tanner M. (Eds.) 1994. Current approaches to international TA preparation in higher education: A collection of program descriptions. Seattle (WA): Center for Instructional Development and Research, University of Washington.

Blevins CE, Cahill DR. 1973. Gross anatomy: Current courses, training programs, and prospective needs. *J Med Educ* 48(3):264-70.

Boman JS. 2013. Graduate student teaching development: Evaluating the effectiveness of training in relation to graduate student characteristics. *Can J High Educ 43*(1):100-114. https://doi.org/10.47678/cjhe.v43i1.2072

Brokaw JJ, O'Loughlin VD. 2015. Implementation of an education-focused PhD program in anatomy and cell biology at Indiana University: Lessons learned and future challenges. *Anat Sci Educ 8*(3):258-265. https://doi.org/10.1002/ase.1482

Caruth GD, Caruth, DL. 2013. Adjunct faculty: Who are these unsung heroes of academe? *Curr Issues Educ* 16(3):1-11.

Chia TI, Oyeniran OI. 2020. Determining the anatomy of anatomy educators. *J Taibah U Med Sci* 15(2):102-109. https://doi.org/10.1016/j.jtumed.2020.03.001

Doss AA, Brooks WS. 2016. Gross anatomy for teacher education (GATE): Educating the anatomy educator. *HAPS Educ* 20(2):46-50. https://doi.org/10.21692/haps.2016.006

Eldred E, Eldred B. 1961. Supply and demand for faculty in anatomy. *J Med Educ* 36:134-147.

Feldon DF, Jeong S, Peugh J, Roksa J, Maahs-Fladung C, Shenoy A, Oliva M. 2017. Null effects of boot camps and short-format training for PhD students in life sciences. *PNAS* 114(37), 9854-9858. https://doi.org/10.1073/pnas.1705783114

Fraher JP, Evans DJ. 2009. Training tomorrow's anatomists today: A partnership approach. *Anat Sci Educ* 2(3):119-125. https://doi.org/10.1002/ase.81

Gardner GE, Jones MG. 2011. Pedagogical preparation of the science graduate teaching assistant: Challenges and implications. *Sci Educ* 20(2):31-41.

Gardner SK. 2007. "I Heard it through the grapevine": Doctoral student socialization in chemistry and history. *High Educ* 54:723–740. https://doi.org/10.1007/s10734-006-9020-x

Gravett K. 2021. Disrupting the doctoral journey: re-imagining doctoral pedagogies and temporal practices in higher education. *Teach High* Educ 26(30):293-305. https://doi.org/10.1080/13562517.2020.1853694

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Guppy N, Boud D, Heap T, Verpoorten D, Matzat U, Tai J et al. 2021. Teaching and learning under COVID-19 public health edicts: the role of household lockdowns and prior technology usage. *High Educ*. https://doi.org/10.1007/s10734-021-00781-w

Halcomb, EJ, Andrew S, Peters K, Salamonson Y, Jackson D. 2010. Casualisation of the teaching workforce: Implications for nursing education. *Nurse Educ Today* 30(6):528-532. https://doi.org/10.1016/j.nedt.2009.10.022

Harden RM, Crosby J. 2000. AMEE Guide No 20: The good teacher is more than a lecturer - the twelve roles of the teacher. *Med Teach:22*(4):334-347. https://doi.org/10.1080/014215900409429

Holden C. 2003. Anatomy classes face gross shortage. *Science* 299(5611):1309. https://doi.org/10.1126/science.299.5611.1309c

Hortsch M. 2019. How to make educational lemonade out of a didactic lemon: The benefits of listening to your students. *Anat Sci Educ* 12(5):572-576. https://doi.org/10.1002/ase.1861

Kiger ME, Varpio L. 2020. Thematic analysis of qualitative data: AMEE guide no. 131. *Med Teach* 42(8):846-854. https://doi.org/10.1080/0142159X.2020.1755030

McCuskey RS, Carmichael SW, Kirch DG. 2005. The importance of anatomy in health professions education and the shortage of qualified educators. *Acad Med* 80(4):349-351. https://doi.org/10.1097/00001888-200504000-00008

Memon IK. 2009. Anatomy education faces challenges in Pakistan. *Anat Sci Educ* 2(4):193-194. https://doi.org/10.1002/ase.77

Mueller A, Perlman B, McCann LI, McFadden SH. 1997. A faculty perspective on teaching assistant training. *Teach Psych* 24(3):167-171. https://doi.org/10.1207/s15328023top2403_3

Park C. 2004. The graduate teaching assistant (GTA): Lessons from North American experience. *Teach High Educ* 9(3):349-361. https://doi.org/10.1080/1356251042000216660

Piccinin SJ, Farquharson A, Mihu E. 1993. Teaching assistants in Canadian universities: An unknown resource. *Can J High Educ* 23(2):104-117. https://doi.org/10.47678/cjhe.v23i2.183164

Prieto LR, Meyers SA. 1999. Effects of training and supervision on the self-efficacy of psychology graduate teaching assistants. *Teach Psychol* 26(4):264-266. https://doi.org/10.1207/S15328023TOP260404

Rhodes D, Fogg QA, Lazarus MD. 2018. Dissecting the role of sessional anatomy teachers: A systematic literature review. *Anat Sci Educ* 11(4):410-426. https://doi.org/10.1002/ase.1753

Richardson-Hatcher A, MacPherson B, Gould D, Brueckner-Collins J. 2018. Assessing the impact of the graduate certificate in anatomical sciences instruction: A post-degree survey. *Anat Sci Educ* 11(5):516-524. https://doi.org/10.1002/ase.1786

Rizzolo LJ, Drake RL. 2008. Anatomists debate the value of a teaching credential. *Anat Sci Educ* 1(2):60-67. https://doi.org/10.1002/ase.16

Schaefer AF, Wilson AB, Barger JB, Azim HM, Brokaw JJ, Brooks, WS. 2019. What does a modern anatomist look like? Current trends in the training of anatomy educators. *Anat Sci Educ* 12(3):225-235. https://doi.org/10.1002/ase.1806

Schreurs J, Dumbraveanu R. 2014. A shift from teacher centered to learner centered approach. *iJEP* 4(3):36-41. https://doi.org/10.3991/ijep.v4i3.3395

Schutte, AF. 2013. Remediation trends in an undergraduate anatomy course and assessment of an anatomy supplemental study skills course. Indiana University.

Shortlidge EE, Eddy SL. 2018. The trade-off between graduate student research and teaching: A myth? *PloS One* 13(6):e0199576. https://doi.org/10.1371/journal.pone.0199576

Tanner K, Allen D. 2006. Approaches to biology teaching and learning: On integrating pedagogical training into the graduate experiences of future science faculty. *CBE—Life Sci Educ* 5(1):1-6. https://doi.org/10.1187/cbe.05-12-0132

Walker JJ, Ward, PJ. 2007. Training the next generation of anatomists: Anatomy teaching meets educational research. *The FASEB J* 21(5):A1339-A140. https://doi.org/10.1096/fasebj.21.5.A139-d

Wilson AB, Kaza N, Singpurwalla DJ, Brooks WS. 2020a. Are anatomy PhDs nearing extinction or adapting to change? United States graduate education trends in the anatomical sciences. *Anat Sci Educ* 14(4):432-439. https://doi.org/10.1002/ase.2013

Wilson AB, Notebaert AJ, Schaefer AF, Moxham BJ, Stephens S, Mueller C et al. 2020b. A look at the anatomy educator job market: Anatomists remain in short supply. *Anat Sci Educ* 13(1):91-101. https://doi.org/10.1002/ase.1895

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