Training and Development for Faculty New to Teaching and Academia

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Abstract

The Department of Mathematical Sciences at the United States Air Force Academy has been recognized across the institution for their outstanding work in preparing new and less experienced instructors to be successful teachers. The department makes an intentional investment over the summer to orient and prepare new faculty members prior to their first instructional class with students. This strategy of integrating new faculty into the institution and of developing a classroom training environment has paid dividends with instructors having greater success during their first semester of teaching. New faculty members are given the opportunity to understand their role in the larger institutional outcomes, to learn best practices and techniques, and to practice teach with their peers and mentors, allowing for refinement, before their first class. The department's faculty development strategy has been recognized by the Dean and shared with other departments as an exemplary approach to preparing faculty to teach. Written and presented from the perspective of a new faculty member in 2016, this paper provides an overview of the new faculty development and orientation in the Department of Mathematical Sciences at the United States Air Force Academy and recommends key strategies for implementation at other institutions.

Introduction

The pace of a military lifestyle is often intense. For career officers, there are several moves around the world with each duty location generally stable for only a two- to three-year assignment. Family structures as well as the work environment are stressed by the high demands placed on our military leaders. For officers with advanced academic degrees, many spend several years outside of their academic specialty while serving in various military occupations. Following several tours of operational, support and staff assignments, some military members with the appropriate academic credentials are given an opportunity to teach at one of the military service academies.

In 2016, I was assigned, along with six other new and three returning faculty members, to serve in the Department of Mathematical Sciences at the United States Air Force Academy (USAFA). As a career engineer that had served a number of roles in the test and evaluation community and most recently 5 years in military staff and leadership roles, I proudly welcomed the opportunity to return to the academic milieu even though all of my undergraduate and graduate majors were in engineering, not math (note: I am not implying a lack of qualifications. All faculty members

at USAFA meet the faculty roles and qualifications of the Higher Learning Commission). Moreover, I had initiated the request to serve as a faculty member at USAFA. Therefore, I had little hesitation in saying yes to the assignment and opportunity to be an assistant professor of mathematical sciences. Shortly after the initial excitement, the reality sank in that I had not had a dedicated calculus class in over 18 years. With some anxiety about being out of currency with formal mathematical academic courses, it was with great excitement that I learned USAFA and the Department of Mathematical Sciences held a summer new faculty orientation and new faculty development program. For the summer of 2016, there were a grand total of 121 new faculty and staff from across all divisions of the institution, to include athletics and academics. While not all incoming faculty were new to teaching, there were many that this was their first teaching experience. The purpose of this paper is to present an overview of the new faculty orientation and initial development at USAFA and the Department of Mathematical Sciences and to offer recommendations that other institutions may find useful in their desire to acclimate new faculty to the institution and gain early success in the classroom environment.

New Faculty Orientation

Beginning in July, a faculty orientation commenced for all new and returning faculty and staff. This institution-wide orientation was organized by USAFA's Center for Educational Innovation. The centralization of one office to organize and facilitate the institution-wide orientation was an efficient way to focus major efforts across the academic departments that were common to all new faculty members. The new faculty orientation was divided into two parts. The first part was a five-day program, consisting of presentations, workshops, tours and discussions. The second part of the faculty orientation took place throughout the academic year by participating in one of several faculty learning communities. Each day of the five-day program was linked to a Faculty Learning Outcome. Likewise, the academic yearlong learning community was directly linked to a sixth outcome. These Faculty Learning Outcomes were designed for the new faculty to be able to:

1. Describe the distinctive context of USAFA, to include its mission, organizations, and personnel.
2. Fulfill the professional responsibilities associated with being a USAFA faculty member.
3. Create a respectful and engaging learning environment in their classes.
4. Utilize evidence-based, learning-focused teaching practices in their classes.
5. Value positive restlessness and innovation in their teaching.
6. Build a community of colleagues from across the faculty.

In support of learning the distinctive context of USAFA, senior leadership welcomed and addressed the new faculty members. Following the senior leaders, the various organizations of the institution provided insight into their areas of responsibilities and how we as faculty support

their missions. The admissions office provided a cross section of our current students and details on how to apply to USAFA. A senior student presented an overview of a day-in-the-life of a cadet, and a tour of the campus closed out the first day of orientation. This collection of first day activities provided a broad overview of the institution and an opportunity for new faculty to begin building connections.

In learning the professional responsibilities of a faculty member at USAFA, the Dean of Faculty emphasized a key connection between our roles as faculty and the overall institutional mission. Our jobs at USAFA are not simply educators of our disciplines, but we are a key component in the mission to develop military officers as leaders of character. This theme permeated throughout the entire orientation and was a key takeaway from the new faculty orientation. Additionally, our orientation focused on learning to navigate the local rhythms, culture, and language of USAFA. Additional topics regarding our professional responsibilities included understanding the honor code, religious respect, cadet standards, and classroom expectations. While some of these aspects seem specific to a military academy, these are in fact closely related to the role all educators share in preparing students to be responsible citizens and highly productive members of their vocations.

The third Faculty Learning Outcome focused on various ideas of creating respectful learning environments in the classroom. The keynote presentation was led by the Department Head of Behavioral Science and Leadership. This session included definitions and the motivation for diversity and inclusion, as well as ideas for creating a more inclusive learning environment. One of the main themes of this outcome was that diversity and inclusion leads to solutions to complex problems. This session also included ideas of how to foster an inclusive classroom. Topics included creating a sense of belonging and recognizing different learning styles and backgrounds. Another main focus was for faculty members to model a respectful dialogue of diversity and inclusion. In addition to the keynote, resources were provided to aid in instructional practices and student-instructor interactions. A separate session was focused on preventing sexual assault and discrimination on campus. The day concluded with small breakout group discussions, which were led by senior faculty members to foster more discussions on creating respectful learning environments. These same small groups were carried over to the next learning outcome of effective teaching practices.

The Associate Dean for Academics led the fourth Faculty Learning Outcome with a session entitled "Start with the Ending," in which we were instructed on the outcome based curriculum at USAFA and then challenged to think about how our courses and even individual lessons support the various educational outcomes. The recently revised USAFA Outcomes are:
- Critical Thinking
- Clear Communication
- Application of Engineering Methods

- Warrior Ethos as Airmen and Citizens
- Ethics and Respect for Human Dignity
- The Human Condition, Cultures, and Societies
- Scientific Reasoning and the Principles of Science
- Leadership, Teamwork, and Organizational Management
- National Security of the American Republic in a Complex Global Environment

While two of these outcomes are specific to the military culture, the others are universal, and many university and colleges have similar outcomes. Making sure new faculty understand the institutional outcomes is a critical element of any orientation program. This Faculty Learning Outcome on effective teaching practices included a session on outcome based lesson planning and concluded with another small group session to further discuss a variety of effective teaching practices.

The fifth Faculty Learning Outcome on positive restlessness and innovation in academics began with two panels. One of the panels consisted of senior faculty members that have been recognized as academic award recipients, and the other panel consisted of current students. The senior faculty panel promoted proven ideas that work well in the classroom; whereas, the student panel focused on what students wished their instructors had known about USAFA and cadet life. Before breaking into our small group sessions again to discuss ideas around this learning outcome, a lightening round of faculty resources was presented covering a wide variety of practical information such as the student academic resources, advising, library resources, educational resources, and counseling.

The final goal for the new faculty orientation connected the final Faculty Learning Outcome to build a community of colleagues from across the faculty to the fifth Faculty Learning Outcome to value positive restlessness and innovation in our teaching. Learning communities, comprised of faculty across multiple academic disciplines, met throughout the academic calendar year to study effective teaching and learning. These communities were facilitated by an experienced USAFA faculty member. Each group centered on a book to read and discuss over the academic year, as well as enabled the members to build a network of colleagues not limited to each academic discipline. Communities created their own schedule and met to discuss the book chapters and any other pedagogical topics of interest to the group. For 2016-17, the book options were:
- *The Culturally Inclusive Educator*, by Dena Samuels
- *Teaching with Your Mouth Shut*, by Donald Finkel
- *How Learning Works*, by Susan Ambrose, et al.
- *The Innovators: How a Group of Hackers, Geniuses, and Geeks Created the Digital Revolution*, by Walter Isaacson
- *Making it Stick: The Science of Successful Learning*, by Peter Brown, et al.

- *Learning and Motivation in the Postsecondary Classroom*, by Marilla Svinicki
- *Engaging Ideas: the Professor's Guide to Integrating Writing, Critical Thinking and Active Learning in the Classroom*, by John Bean
- *Mindset: The New Psychology of Success*, by Carol Dweck
- *Learner-Centered Teaching: Putting the Research on Learning into Practice*, by Terry Doyle
- *The Masters*, by CP Snow
- *Good to Great*, by Jim Collins
- *Facilitating Seven Ways of Learning: A Resource for More Purposeful, Effective, and Enjoyable College Teaching*, by James Davis and Bridget Arend

Department's New Faculty Development

In addition to the institution's new faculty orientation, the Department of Mathematical Sciences held a summer new faculty development program across several weeks. This new faculty development program consisted of three main blocks: a calculus refresher course, department particulars, and practice teaching.

The calculus refresher course took place over a two-week period in June prior to USAFA-wide New Faculty Orientation. Since all students at USAFA are required to take or validate the first two semesters of calculus, these required courses demand the most instructors. Therefore, it is common practice at USAFA for new math faculty to teach these calculus courses during their first year as a new faculty member. Additionally as I mentioned in the introduction, many of the new faculty members have been away from the academic environment for several years. Thus, one of the main purposes of the refresher course was to review the course material for calculus in an attempt to prepare faculty to teach the same course in the fall semester. Another major purpose of the refresher course was to demonstrate and then discuss different teaching styles and techniques. Fifteen different faculty members taught the various lessons of the refresher course. Following each lesson, we debriefed the style and techniques used. Thus not only was the material presented as a refresher for teaching the course, but additionally many different instructional styles and techniques were observed and discussed. A common thread throughout this refresher was to discuss common student misconceptions and pedagogical techniques to address them. Effective use of technology was also discussed.

Following the refresher course, the department hosted a series of presentations and discussions that served to prepare new faculty by increasing our knowledge on a variety of practical and pedagogical topics. These meetings spanned two weeks. However, the first week was in parallel with the previously described USAFA-wide new faculty orientation. During this first week, the mornings were occupied with the new faculty orientation; whereas, the Department of

Mathematical Sciences filled in particulars in the afternoons. These sessions within the department continued into the early half of the following week and were concluded by social functions.

The department head and other senior department members began this phase of the new faculty development by welcoming us to the department and providing us with their vision and expectations. To increase our understanding of departmental operations, informational sessions included topics on personnel matters, technology, and the USAFA Honor Code. Additionally, there were insightful tours of the library and academic facilities. Furthermore, topics were presented and discussed on a variety of pedagogical fronts. These topics included: grading, effective communication, best teaching practices, classroom management, and how students learn. Concluding this phase on department particulars, a few social opportunities were created for department members to build comradery, including a picnic, hike, and professional baseball game.

The final phase of the department's new faculty development was a two-week practice teaching workshop in late July. Each new faculty member was assigned two lessons from the refresher course that we attended during the initial phase of the new faculty development. The new faculty members had an active role in every lesson. For the lessons that we were assigned to teach, we began with the first lesson preparation utilizing ideas from the beginning refresher course. For the lessons that we were observing we were tasked to take notes and provide peer feedback to the new faculty presenting the lesson. Likewise, a number of experienced faculty members also provided immediate feedback following the practice lesson. This allowed all of the new faculty members to continue to refine and hone skills prior to our first class with students. Following the first round of lessons from each new faculty, we prepared our second lesson for the following week after having the opportunity to practice teach and provide observational feedback to our peers. The new faculty members were then assigned a teaching mentor that observed a few classes through the first semester. The teaching mentors also served as a consulting role for the new faculty members in the beginning stages of their teaching careers.

Recommendations

Transitioning to academic life will contain a number of challenges especially for new faculty members that have been away from the educational environment for a season of life. Sorcinelli reviews several key factors that contribute to stresses for new faculty (Sorcinelli, 1994). Similarly, Kam Jugdev (2007) identifies that the "key sources of stress for new faculty members relate to finding time for research, effective teaching, the lack of collegial relationships, inadequate feedback/recognition, unrealistic expectations, insufficient resources, the lack of mentors, technology, isolation, and little work-life balance." From my observations as a new

faculty member returning to the academic environment following several years away, I propose that many of these stresses can be addressed with some investment into developing new faculty members. Kam Jugdev (2007) concludes that universities or departments that fail to prioritize faculty development "risk isolating valuable resources."

As I reflected on the USAFA-wide orientation, the theme that faculty members are an instrumental component to a vision much larger than teaching our particular disciplines had evident commitment from every organizational area. At USAFA, the entire institution is focused on developing students to become officers of character. This theme and vision are held in the highest regard across all USAFA organizations. Every institution should have an overarching purpose that begins at the highest levels of the institution and permeate through every facet. There have been numerous times that I have observed my students in class and reflected that these are the next generation of men and women who will lead the United States military. My part is not just to teach calculus, but rather my job is to develop leaders of character. Every instructor at every academic institution should have a vision for their role as an educator that is greater than the academic subjects they are teaching.

One strategically critical way that departmental leadership maintains the vision of the institution is by promoting faculty development. DiLorenzo and Heppner (1994) describe the role of an academic department in promoting faculty development. The question by the authors to university administrators and faculty "what do you do" resonated as I reflected on my first year as a new faculty. Again, my answer is that I contribute to developing future officers as leaders of character. DiLorenzo and Heppner conclude that faculty development requires investment from the academic departments. This developmental process may vary widely in different departments and institutions, yet faculty development is critical to reaching the goals of the department. Among my colleagues of new faculty at USAFA the overarching feedback was that our summer orientation and new faculty development were a success. Specifically, we were better prepared for our first semester of teaching having the institution's and department's intentional investment in us before the semester began. Departmental investment is absolutely required to prepare and sustain faculty success.

The opportunity that the Department of Mathematical Sciences provided for the new faculty members to observe a wide variety of experienced instructors teaching the same material that most of the new faculty would in turn teach was extremely valuable. Subsequently, the practice teaching with experienced faculty and peer feedback better prepared us prior to our first formal class. This forced us out of our comfort zones and to put into practice the ideas that we had accumulated through our observations. Additional insights of a peer observation program have been described by Hahn and Migotsky (2015). As Hahn and Migotsky likewise concluded, I was much more successful in my first year as a new faculty having refined my teaching techniques through peer and experienced instructor feedback. As I contemplate specifics that helped get the

new faculty members off to a good start at the beginning of the semester, one of the marks that made a difference was building confidence. As we witnessed a number of faculty members teach the various lessons of our core freshman course, not only were we brushing up on the material, but we also discussed and experimented with various methods of delivery. In my first year of teaching, I taught four sections of second semester calculus (i.e. Calculus II) in the fall and four sections of differential equations in the spring. I have used slightly different presentation techniques each semester, and I will continue to refine my techniques as I continue teaching. Nevertheless, it was extremely valuable in boosting our confidence as new faculty members by witnessing and practicing different approaches before the start of the first semester.

In addition to the feedback from practice teaching, the faculty members at USAFA are very generous in helping one another by sharing resources, auditing classes, and mentoring. This spirit of cooperation and mentoring increases the job satisfaction and success for new faculty. It is critical for the university to foster a culture of valuing cooperation and improving pedagogy. Shadowing programs for new faculty and mentoring are proven strategic methods to developing new faculty (Murray, 2009; Williams, 2014). Practical techniques such as auditing and sharing course materials are key factors that fight against the stress of new faculty members and increase new faculty success (Marshall 2013; Williams, 2014; Minerick and Keith, 2005; Sorcinelli, 1994; Kam Jugdev , 2007). In summary, the transparency, feedback, and attitude of sharing resources of all faculty members better prepared us for our first contact with students.

The timeline above for both the USAFA-wide orientation and department's new faculty development begins in June every year and continues into July. I recognize that many institutions are not afforded this same level of time opportunity over the summer. Most of the faculty members at USAFA are on yearlong commitments. Therefore, different approaches are needed at various institutions in order to better prepare new faculty members at the onset of their teaching careers. In fact, the process at USAFA has changed over the years and is continually being modified. I know that for my department the refresher course was added in the recent past, but more importantly, the whole program has shifted from a transmission of information to a more fundamentals of teaching focus. The practical teaching observation, feedback and mentoring has been important in preparing those of us new to teaching for a strong start to our first semester. Many of the other informational particulars have been effective in helping new teachers gain useful skills early as well.

For other institutions, I recommend finding or creating opportunities for the new faculty members to observe and practice before their first contact in a full length course. This could involve auditing and possibly teaching a single lesson or two of a summer course or combining new faculty across disciplines to practice teach with one another in a supervised mentoring relationship. Feedback from mentors with a goal of helping the new faculty member succeed is highly valuable for these practice opportunities. The specifics will vary widely. However, the

intentional survey of teaching methods and any opportunities to practice the teaching methods are very valuable in building confidence and getting the first semester off to a good start. Furthermore, fostering an attitude of sharing ideas and collegial relationships within the department and likewise pedagogical resources across the institution are also extremely valuable to faculty members new to teaching.

The goal of new faculty orientation and development is to prepare the new members to more effectively acclimate, and thus minimize the effect of inexperienced instructors with students. The specific ideas and processes are obviously tailorable to various institutions and even departments within the same university. However, my experience as a new faculty member confirms that intentional development should be of upmost importance to all institutions. Casting the mission and vision for the institution as well as prioritizing practical assistance to new faculty members leads to less stress, boosting confidence, and better effectiveness. New faculty development and orientation are critical to successfully acclimating to the university.

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