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Abstract

This article examines teacher induction in the military undergraduate education context. The U.S. Air Force Academy relies on approximately 520 military and civilian instructors to educate nearly 4000 future military officers each year. These educators must be highly skilled and unquestionably capable in their abilities to teach these future leaders. Many of these instructors derive from highly technical active duty operational career fields (such as pilot, missile operator, etc.). This article reveals how Collins', Brown's, and Newman's (1989) theory of cognitive apprenticeship is manifested within teacher induction experiences at the U.S. Air Force Academy. Using a qualitative multiple-case study approach, this research integrated data from observations, interviews, and participant journals to reveal how the six methods of cognitive apprenticeship (modeling, coaching, scaffolding, articulating, reflecting, and exploring) are facilitated in the individual operator-to-educator transition experience. The findings from this study inform faculty orientation and faculty development policies and processes within the U.S. Air Force Academy and bear implications for civilian post-secondary educator induction processes as well.

Keywords

Cognitive Apprenticeship, Military, Educator, Academy, Qualitative Case Study

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Facilitating the Transition from Military Instructor to Academic Educator: Cognitive Apprenticeship in Teacher Induction at the United States Air Force Academy

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This article examines teacher induction in the military undergraduate education context. The U.S. Air Force Academy relies on approximately 520 military and civilian instructors to educate nearly 4000 future military officers each year. These educators must be highly skilled and unquestionably capable in their abilities to teach these future leaders. Many of these instructors derive from highly technical active duty operational career fields (such as pilot, missile operator, etc.). This article reveals how Collins', Brown's, and Newman's (1989) theory of cognitive apprenticeship is manifested within teacher induction experiences at the U.S. Air Force Academy. Using a qualitative multiple-case study approach, this research integrated data from observations, interviews, and participant journals to reveal how the six methods of cognitive apprenticeship (modeling, coaching, scaffolding, articulating, reflecting, and exploring) are facilitated in the individual operator-to-educator transition experience. The findings from this study inform faculty orientation and faculty development policies and processes within the U.S. Air Force Academy and bear implications for civilian post-secondary educator induction processes as well. Keywords: Cognitive Apprenticeship, Military, Educator, Academy, Qualitative Case Study

The United States is defended by approximately 1.5 million active duty military members serving in four armed service branches (Office of the Secretary of Defense, 2011). U.S. soldiers, sailors, airmen, and marines have answered their country's call for action in 13 major wars and dozens of smaller armed conflicts since the nation's founding in 1776 (Evans, 1987). For generations, these men and women have dutifully carried out the tasks assigned them by the United States' civilian political leadership, often in foreign lands and often under circumstances of hardship and personal danger (Bland, 1999). Still today, U.S. military service members risk their lives to secure their nation's interests, conducting a variety of missions throughout all regions of the globe.

However, unlike their predecessors who endured limited transportation capabilities, short-range and minimally effective weapons, and obscured visibility of both friendly and enemy actions, modern combatants operate in a markedly advanced, fast-paced, and technologically specialized combat environment that demands persistent rapid assessment and immediate judgment. Today's near real-time communications technology, both audio and visual, has resulted in a vast and complicated networked operations environment. Often, even actors at the lowest tactical levels of the military hierarchy find themselves in high-stress, time-critical situations where their near-term choices and actions can have wide-ranging long-term effects. These "strategic lieutenants" find themselves as principal agents in the determination and execution of national policy through military strategy (MacLean, 2005; McCausland & Martin, 2001; Teachman, 2007). With such immense demands placed on them, it is imperative that those entering this demanding profession receive the highest caliber of training and education available; a foundation of skills and knowledge upon which to base their high-cost and often high-risk decisions. They must be taught by credible, confident, and experienced

educators who are well-equipped and fully capable of guiding these future warrior-scholar-leaders into the art and science of warfare. The complex and challenging tasks their nation asks of them demand it.

This study emerged from this requirement; the need to have quality educators preparing our nation's next generation of officers to efficiently and ethically lead their troops in a complex, high-risk world environment. The research undertaken here sought to examine how a military service academy, specifically, the United States Air Force Academy (USAFA) in Colorado Springs, Colorado, creates and maintains high-quality military educators responsible for facilitating robust, timely, and pertinent learning for its service's rising Second Lieutenants. Using a qualitative multiple-case study methodology, this research followed four diverse active duty military officers through their first semester of teaching duties at USAFA. Through observations, interviews, and journaling, I gathered a rich portfolio of qualitative data with which to explore how a high-profile and specialized post-secondary educational institution facilitates the transition of highly trained technical experts from the realm of combat operations into the very different arena of academic education.

Although a considerable amount of research has been conducted exploring the importance of teacher induction and faculty development, little has been addressed toward the unique yet critically significant arena of the military educator. Findings from this study will begin to fill this gap, making contributions at three levels. First, insights into the processes of faculty induction and development as experienced by new operator instructors and their mentors will illuminate valuable firsthand perspectives for USAFA leadership, providing insight into the characteristics and effectiveness of their faculty programs and informing policy development, implementation, and assessment. Second, by incorporating Collins, Brown and Newman's (1989) theory of cognitive apprenticeship as a theoretical framework guiding this study, this research promises valuable contributions to the existing literature of cognitive learning and teaching principles. Finally, although USAFA is a relatively small, and certainly specialized, post-secondary education institution, the concept of recruiting highly specialized experts, many with little teaching experience, from their professional fields into the halls of academic education is certainly a focus area with broad applicability to all post-secondary institutions, military and civilian alike.

How, then, does a service academy make great teachers; what learning concepts best facilitate the transition from warfighter-instructor to faculty educator? This article reveals how the tenets of cognitive apprenticeship theory are incorporated into the USAFA educator induction experience.

Literature Review

This study was framed by the educational theory of cognitive apprenticeship in order to better understand how new Air Force Academy instructors transition from their previous roles as war fighter-operators to their new roles as academic educators. Positioned within a larger conceptual framework that includes broader variables and influencing factors, the methods of cognitive apprenticeship provided a precise instrument with which to examine this individual transition from operator to educator (Collins, Brown, & Newman, 1989). The theory of cognitive apprenticeship was used throughout the research process—design, data collection, and analysis—as an analytical lens through which to examine critical program elements and individual experiences of teacher orientation and indoctrination within the U.S. Air Force Academy.

The theory of cognitive apprenticeship was proposed by Collins, Brown, and Newman in 1989 in their seminal work *Cognitive Apprenticeship: Teaching the Craft of Reading, Writing, and Mathematics*. It is rooted in the premises of constructivist learning theory that

propose learners create their own knowledge largely through experience and individual interpretation of reality (Duffy & Cunningham, 1996; Duffy & Jonassen, 1992; Prawat, 1992). Cognitive apprenticeship theory is centered on the premise that individuals learn best in a contextualized instructional environment where the cognitive activities involved in the teaching-learning process very closely associate with or replicate the actual tasks they will ultimately be required to perform (Collins et al., 1989). Using the concept of traditional apprenticeship, Collins et al. delved deeper to propose six instructional methods critical to teacher-student apprenticeship at the cognitive level versus the more mundane physical task level.

Cognitive apprenticeship theory is deeply rooted in the conceptual foundation of constructivism. It emphasizes the criticality of situated, student-derived learning. Cognitive apprenticeship theory stems from the assumption that students learn best by seeing things and doing things “in the field” and working closely with a mentor, guide, or coach. Collins et al. (1989) proposed that the 20th century formal schooling common to industrialized nations was a departure from the cultural tradition of apprenticeship. Traditional apprenticeship, they argued, involved methods other than didactic teaching. Apprenticeship relies upon observation, coaching, and successive approximation (Brown, 1988; Brown, Collins, & Duguid, 1989; Collins, Brown, & Holum, 1991; Collins, Brown, & Newman, 1989). Specifically, Collins et al. stated, “apprenticeship embeds the learning of skills and knowledge in the social and functional context of their use” (p. 1). The concept of traditional apprenticeship is familiar to many through the image of medieval tradesman progressing from apprentice to journeyman to master craftsman, where skills were developed through successive stages of complexity and diminishing instructional oversight (Snell, 2006).

The theory of cognitive apprenticeship then, as opposed to traditional apprenticeship, relates specifically to teaching a student how to think. It goes beyond the teaching strategies employed to teach tacit skills, whether they be trade-vocational, military, clinical, or otherwise. Cognitive apprenticeship delves deeper. Collins et al. (1989) stated that “too little attention is paid to the process that experts engage in to acquire knowledge in carrying out complex or realistic tasks” (p. 2). Cognitive apprenticeship does not teach a student the simple mechanics of accomplishing a task—rather, it teaches a student how to accomplish a task or understand a concept by thinking critically and multi-dimensionally, within a complex social environment (Brown, 1988; Brown, Collins, & Duguid, 1989; Collins, Brown, & Newman, 1989).

Whereas traditional apprenticeship teaches a student sequenced steps in a production process, cognitive apprenticeship emphasizes (a) the thought-processes employed by experts to handle complex tasks, and (b) the non-physical cognitive or meta-cognitive guided-experience (Collins et al., 1989). Basically, cognitive apprenticeship teaches a student “how to *think*” as opposed to “how to *do*.” Collins et al. taught that cognitive apprenticeship accomplishes this through six teaching methods: modeling, coaching, scaffolding, articulating, reflecting, exploring.

Collins et al. (1989) proposed a four-dimensional framework for their theory of cognitive apprenticeship consisting of *content*, *method*, *sequencing*, and *sociology*. They argued that foremost in the teaching-learning enterprise, the teacher must be an expert, a master of domain knowledge. Teachers master their *content* (concepts, facts, and procedures associated with their specialized topic of instruction) using (a) heuristic, (b) metacognitive, and (c) knowledge-learning strategies. The six *methods* of cognitive apprenticeship, discussed in detail below, are described by Collins (2009) as “ways to promote expertise.” These methods provide the structural process for the teacher-student learning relationship and are the specific focus of this research study. The third dimension of cognitive apprenticeship is *sequencing* which includes the principles of (a) increasing complexity, (b) increasing diversity, and (c) imparting global before local skills. Finally, Collins et al., in keeping with their theory’s

constructivist origins, emphasized the importance of *sociology* in the cognitive apprenticeship process. They described the dimension of sociology to include the principles of (a) situated learning, (b) communities of practice, (c) intrinsic motivation, and (d) collaboration.

Methods of Cognitive Apprenticeship

This study specifically used the six methods of cognitive apprenticeship theory as an analytical instrument with which to examine the induction and development of new military educators. Although all four dimensions of cognitive apprenticeship theory are involved in this operator-to-educator formative transition, this study specifically sought to understand the unique methodology by which these new instructors are grown in the military post-secondary pre-commissioning education environment. Table 1 lists the methods of cognitive apprenticeship as categorized into instructional groups by Collins (2009).

Table 1

Cognitive Apprenticeship Methods (Collins, 2009)

Method	Teacher-Student Activity	Collins' Instructional Grouping
Modeling	Teacher performs task; student observes	
Coaching	Teacher observes student; offers hints, challenges, feedback, reminders	<u>Group 1:</u> Core of traditional apprenticeship
Scaffolding	Teacher provides specific physical or verbal supports to student	
Articulation	Student explicates knowledge or reasoning	<u>Group 2:</u> Helps students generalize learning
Reflection	Student compares performance with teacher or peers	
Exploration	Teacher guides student to problem-solving on their own (<i>Fading</i> of teacher support)	<u>Group 3:</u> Encourages learner autonomy

Faculty Orientation

As a foundation to a new Academy instructor's tour as a military educator, each participates in the dean's mandatory New Faculty Orientation program. This comprehensive induction consists of a one week faculty-wide formal program involving large-group presentations, learning community interactions and discussions, interactive panels, and self-paced individual learning assignments (USAFA, 2007). Augmenting this formal faculty-wide series of events are subsequent department-level induction events that range in intensity and duration across the new instructor's first semester of teaching duties. These orientation

activities are designed specifically to induct new Academy instructors into the processes, standards, expectations, and cultural values of the Air Force Academy faculty both at the dean's level and also within the department. These programs indoctrinate new arrivals—training them on the specifics of classroom teaching practices and department administrative requirements while also educating them on the larger field of the scholarship of teaching and learning, an area in which many may have had little previous exposure.

These programs, both formal and informal, are expected to have a significant influence on new instructor experiences (Gansle, Noell, & Burns, 2012; Henry, Bastian, & Fortner, 2011; Ingersoll & Strong, 2011; Kelley, 2004; Plecki, Elfers, & Nakamura, 2012; Wang, Odell, & Schwille, 2008). USAFA's New Faculty Orientation is a formal, policy-driven program specifically designed to do just that (Bartlett & Johnson, 2010; Carr & Evans, 2006; Carver & Feiman-Nemser, 2009; USAFA, 2007). The influences imparted by these induction events, uniquely perceived and experienced by each new Academy instructor, wielded significant influence in answering this study's research questions.

Researcher Context

This research was conducted towards the fulfillment of my doctoral program in educational leadership, research and policy at the University of Colorado, Colorado Springs. I had previously served as an active duty Air Force officer instructor at the U.S. Air Force Academy and had participated in the Academy's New Instructor Orientation program in the summer of 2008. This research was, in large part, a culmination of two complimentary professional paths: my career as a military officer—often serving in roles of trainer and educator—and my advanced academic development as an educational leader and researcher. My goal was to provide insights to the Air Force Academy into the conduct of their teacher induction programs—how their new teachers experience these programs and how the institution might enhance them to better meet their educational objectives.

The Study

This study was predicated on the understanding that effective teacher induction processes are critical to the subsequent performance, satisfaction, and retention of new instructors. Furthermore, based on a diversity of constructivist and cognitive learning research, this study examined the specific influences of cognitive apprenticeship methods as they influenced the teacher induction experiences of new military educators, specifically, novice academic instructors deriving from specialized military operations professional career fields. USAFA's application of the six cognitive apprenticeship methods—modeling, coaching, scaffolding, reflecting, articulating, and exploring—were influenced by peripheral conceptual constructs that illuminated the new Academy instructor experience.

This study was centered on the premise that qualitative exploration, using multiple-case study analysis, was best suited to answering how new military academy instructors develop as confident and credible academic educators. A qualitative research design provided a robust and flexible framework with which to explore the individual new instructor experience at USAFA while also enabling the examination of the wider mentor-mentee dynamics within the macro context of formal policy-driven teacher induction programs and processes.

In this research I used a collective case study design, comparing the teacher induction experiences, or "cases," of four new instructors at the U.S. Air Force Academy (Yin, 2009). By selecting multiple new instructor cases to illustrate cognitive apprenticeship applications within the USAFA educator development experience, this study aimed to enrich the understanding of the transition from operator to educator. Creswell (2007) proposed the case

study approach to be best when “the inquirer has clearly identifiable cases within boundaries and seeks to provide an in-depth understanding of the cases or a comparison of several cases” (p. 74). Case study methodology, then, offered a sophisticated and well-documented means by which to truly examine complex experiential phenomena from a variety of participant actor-agent perspectives.

By implementing a diverse data collection approach that investigated the USAFA teacher induction experience from multiple dimensions, this study employed a case study design comprised of three qualitative methods: observations, interviews, and journal narratives. The conceptualization and operationalization of these research methods, discussed in detail below, resulted in a comprehensive analysis of both unique and diverse perspectives into the operator-to-educator transition experience at USAFA.

Case Selection

This study used a multiple-case study design focusing on a precisely defined cohort of new military teachers to gain a greater depth of understanding about their induction experiences (Miles & Huberman, 1994). By examining the experiences of several diverse participants (as opposed to just one) I gained a robust, multi-dimensional perspective into the USAFA new instructor transition from operator to educator. As Yin (2009) recommended, “Although all designs can lead to successful case studies, when you have the choice (and resources), multiple-case designs may be preferred over single-case designs . . . having at least two cases should be your goal” (p. 60). Yin goes on to propose that a multiple-case study design offers two distinct benefits:

- Replication: Analytic conclusions arriving from two or more cases will be more powerful than those deriving from just one.
- Contrast: Deliberately selecting cases based on diversity vastly strengthens findings compared to those from a single case.

In compliance with University of Colorado and U.S. Air Force Academy Institutional Review Board approval guidelines, and to protect the anonymity of participants, each was invited to select a pseudonym by which to be identified throughout this study. Four case participants were identified from an open-source, institutionally-released roster of approximately 90 inbound faculty members. Four were selected based on a researcher-designed matrix created to highlight maximum diversity (Air Force operational career field, commissioning source, previous teaching experience, rank, and gender). All four were Air Force officers from various operations duty specialties. None had served at USAFA before. Trait variability, as was purposefully sought, was strongly demonstrated among these four as they spread widely across the USAFA demographic spectrum in terms of gender, ethnicity, rank, department, and educational background.

George. George was a 34-year-old male, Caucasian, Captain. He was a cyber-operator, meaning his Air Force profession was to design and implement offensive and defensive computer networks and software. The cyber-operations career field is the newest in the Air Force and has received increasing visibility. George was unique among the four as he had joint service experience, having served as an infantry specialist in the U.S. Marine Corps before joining the Air Force as an enlisted intelligence technician and ultimately being commissioned as an officer cyber-operator through the Air Force’s Officer Training School (OTS). He was assigned to the Department of Computer Science and taught core computer programming to first year cadets.

Elly. Elly was the most junior participant. A Caucasian special operations pilot, she is a Major with previous flying training and combat duties. She taught in the Department of Foreign Languages, but served primarily in the Office of International Programs where she coordinated cadet international educational programs and official visits from foreign students and dignitaries to the Air Force Academy. She was also attached to the flying training squadron at USAFA, meaning she divided her schedule between classroom teaching, program administration, and flying training duties. Of the four participants, Elly was the only USAFA graduate. Like George, for Elly, this current assignment to the USAFA faculty would be considered a mid-career duty assignment and both will most likely return to their primary operations specialties after their time on the faculty (typically three years) is complete.

Solomon. Solomon was the most senior participant; a 46-year-old male, Latino, Lieutenant Colonel. He also taught in the Department of Foreign Languages. Solomon served as an enlisted airman before receiving an officer commission through Officer Training School. Solomon was a space and missile operator with previous duties as an Intercontinental Ballistic Missile launch crew member, instructor, and evaluator. He later served in various personnel and space and missile staff positions. Based on his time in service, teaching at USAFA will be his final Air Force duty assignment.

Mark. Finally, Mark provided a unique perspective for this study as he was the only participant with a doctoral level degree, an Ed.D. Mark is a Caucasian Lieutenant Colonel. Like Solomon, Mark was also a Space and Missile operator, however, Mark's duties had ranged more into the space launch field rather than the nuclear weapons arena. Unlike the other three participants, Mark had previous duties in the academic education realm. He was commissioned through the Air Force Reserve Officer Training Corps (ROTC) and later served as an ROTC assistant professor, which provided him with a unique background perspective into both military and civilian education and administration. Mark taught core level Psychology to first year cadets in the Department of Behavioral Science and Leadership. As Mark stated, teaching on the USAFA faculty would most likely be his final Air Force assignment.

Methodologies

This study followed the basic qualitative research steps as outlined by Maxwell (2005) and Patton (2002). Figure 1 illustrates the conceptual flow of this research, specifically designed to investigate how a service academy makes great teachers and what learning concepts best facilitate the transition from warfighter to educator.

Having identified the gap in existing research about military teacher induction and identifying specific research questions, I used a sequential and iterative research model to collect and analyze qualitative data from a variety of sources. These research procedures ensured data saturation through a robust multi-dimensional data collection strategy and through the valued and credible tactic of multi-method data triangulation.

Three methods were employed: Participant interviews, participant journals, and researcher observations of participant teaching. Conceptually, these three avenues of inquiry each target the research question from a unique and exhaustive angle, revealing indicators that inform and illuminate the research question.

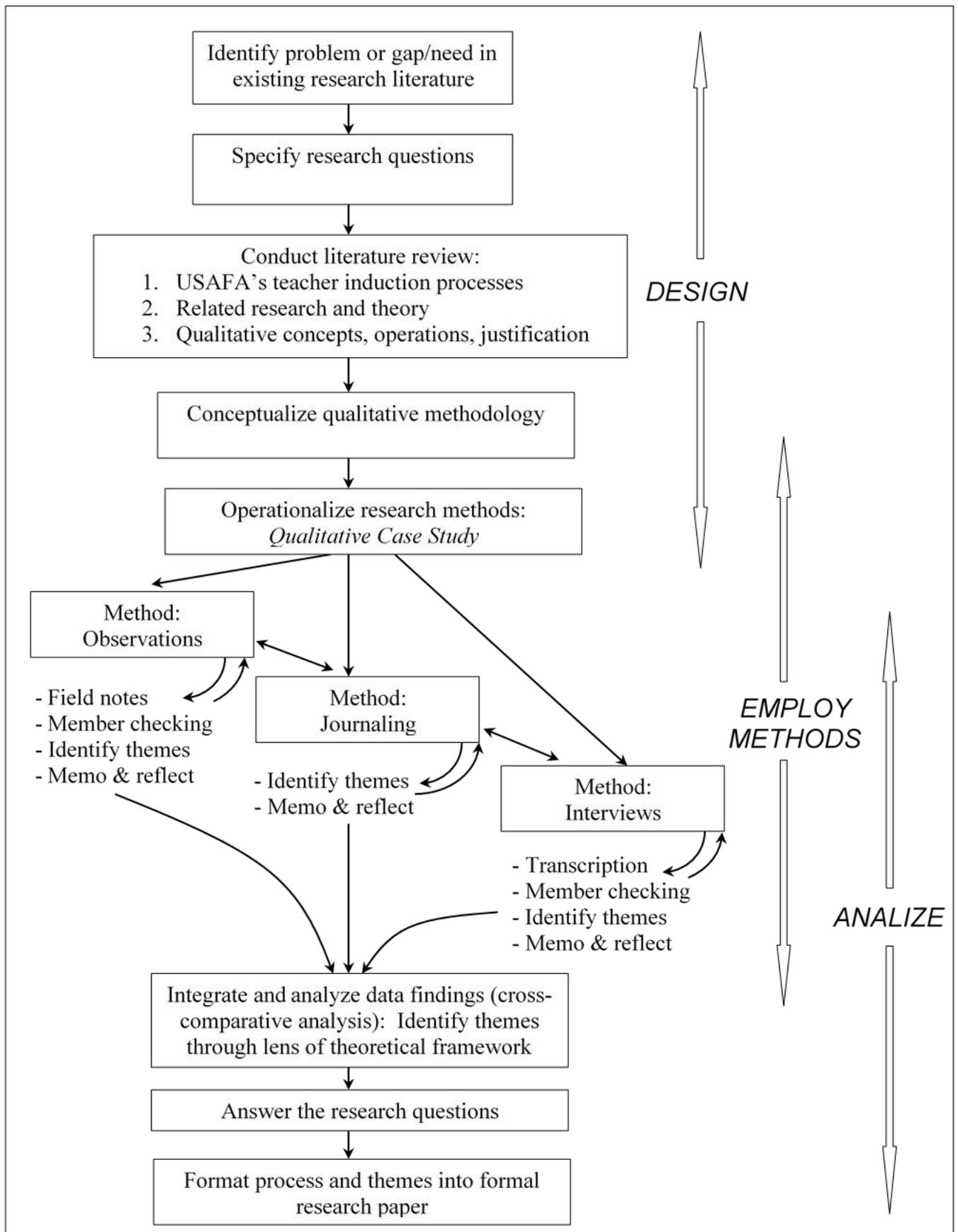


Figure 1. Research process model.

A fundamental component of this multi-dimensional data collection strategy was the incorporation of data triangulation (Figure 2). Data triangulation took advantage of multiple data collection methods to gather a wide range of information from participants through several complimentary investigation mechanisms (Creswell, 2007). Subsequent comparisons of themes across these multiple sources provided focus and precision, lending strength and credibility to both the research plan as well as to the confirmability of the findings. This study used three qualitative collection methods to achieve data triangulation: observations, interviews, and journaling. These activities were sequenced over several months, from July 2012 to April 2013.

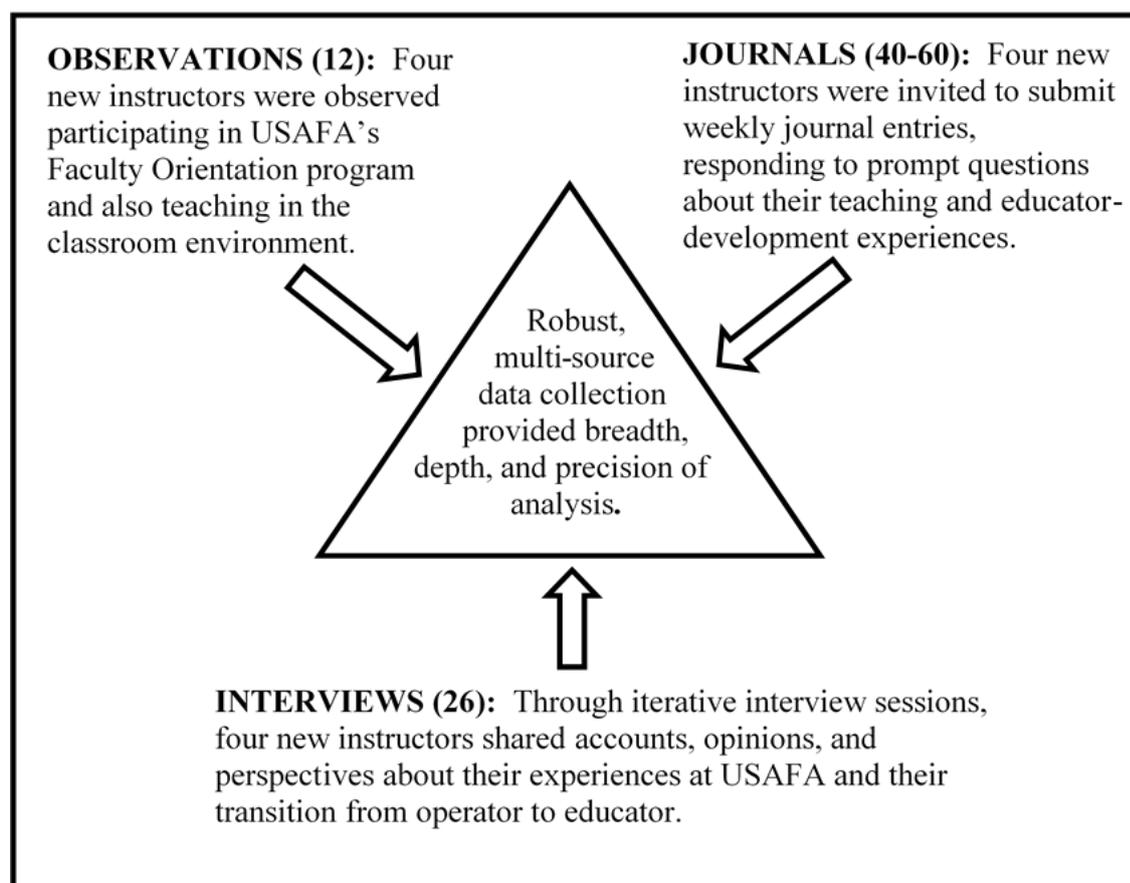


Figure 2. Data triangulation.

Data collection focused on the four purposefully selected cases: George, Elly, Solomon, and Mark. They were the core of this research. As Creswell (2007) recommended, "In a case study, I prefer to . . . employ maximum variation as a sampling strategy to represent diverse cases and to fully describe multiple perspectives about the cases" (p. 129).

Observations. I conducted approximately 12 observations during the course of this study. These provided a contextualized examination of participant actions and experiences. Observations occurred in two phases. In July, during the formal New Faculty Orientation events, I observed each participant as they were involved in various aspects of this first week of their induction experience. I witnessed the interaction between the case participants with new faculty peers as well as their initial engagements with formal organization-level Faculty Orientation facilitators. A second phase of observations was conducted in November and December when I observed each new teacher in their classroom environment.

These two phases of observations served as bookends to the other data collection activities, offering a visual snapshot of the participants as they “walked in the door” and then at the culmination of their first semester’s teaching experiences. These observations provided stimuli for interview and journal prompt questions. They presented potential areas for investigation and exploration that were not evident in the initial pre-study design phase.

Interviews. 26 interviews served as the backbone of this study. They offered the clearest and most direct path into participant experiences and perspectives. Interviews were the primary means by which to examine intra-case commonalities and deviations.

By far, the largest time and effort in this research was in the conduct and analysis of interviews with the four focal case participants. These interviews were conducted in five waves; roughly once every four weeks, beginning at the completion of their formal Faculty Orientation program in July 2012 and concluding in January 2013. An open interview protocol (Patton, 2002) provided flexibility and was designed to correlate to the study’s research questions.

Case interviews were conducted informally. They proved to be highly informative. Participants were gracious and accommodating in their schedules. Each interview lasted approximately 30 minutes, and subsequent transcription and initial coding required about three hours per interview.

Journals. The third data collection method, journaling, was exceptionally valuable as a window into participant experiences and perceptions. Beginning in July, following the conclusion of the formal New Faculty Orientation program, each of the four case participants was invited to submit weekly journal narratives discussing their perceptions of their growth and development as educators and providing opinions or relating experiences in response to varying prompt questions. These journal entries were sent to me via email. I formatted and categorized each week’s entries into participant-unique electronic journals for subsequent coding.

Journal entries were very useful as a qualitative data gathering instrument, especially when combined with interview data. I frequently used journal prompt questions to seek greater depth of insight into issues or perceptions that were raised in interviews. Conversely, I used participant comments in their journals as stimuli for interview questions. This recursive loop-back investigation process proved to be very valuable in gaining a precise focus into topics of interest or concern to the participants as they progressed through their first semester of teaching.

Documents. Air Force Academy policy and process documents were used as reference sources for this research. Specifically, policy instruction for the administration of the Academy’s New Faculty Orientation program was used to inform my writing about the scope and nature of these events. Additionally, multiple documents (text narrative and Power Point slides) were used to build an understanding of the specific goals and content areas involved in USAFA’s Faculty Orientation program. Although these documents were critical as references, they were not specifically coded and thematically assessed as part of the data analysis process.

Data Analysis

For this study, observations, interviews, and journaling were used to create a detailed description of the cases and their setting (Creswell, 2007). Yin (2005) wrote that “in qualitative research, the goal is not to count things, but to ‘fracture’ (Strauss, 1987, p. 29) the data and rearrange them into categories that facilitate comparison . . . and that aid in the development of theoretical concepts” (p. 96). To this end, I implemented Stake’s (1995) four case study data analysis and interpretation forms:

1. *Categorical aggregation.* I sought issue-relevant meaning from *multiple* instances within the data. Data coding, as depicted below was a critical tool with which to accomplish this.
2. *Direct interpretation.* In some instances, *single* impactful or precisely illustrative comments or observations identified a key issue or theme relating to my research questions.
3. *Establishing patterns.* Both Stake (1995) and Yin (2009) emphasized the merit of identifying patterns within data. Data coding of interview transcriptions was especially beneficial in this analysis.
4. *Developing naturalistic generalizations.* Finally, analysis of the data allowed me to make “generalizations that people can learn from the case either for themselves or to apply to a population of cases” (Creswell, 2007, p. 163). This final aspect was essential to answering the research questions.

Analytical codes were developed in correlation to the study’s research questions, and served as the primary data analysis tool (Miles & Huberman, 1994).

I chose to incorporate an intimate and comprehensive analysis strategy: I personally transcribed all interviews and journal submissions and hand-wrote, scanned, and saved all observation field notes. I did not use a data analysis program, rather, I personally read, coded, re-read, and re-coded data recursively to ensure that a thorough and intricate exploration of all perspectives was accomplished.

I initially categorized codes into six teacher induction concepts, later adding two more (Table 1). These codes remained flexible throughout the data analysis process. Through a process of persistently re-visiting the data and re-assessing my interpretations of these data, recursive coding was used throughout the data examination process to continuously refine meaning (Creswell, 2007; Weston et al., 2001). As new thematic categories, concepts, or theoretical applications became evident, additional codes or sub-codes could be added to this list to best identify and organize significant details within the observation, interview, and journal data.

This flexibility facilitated the inclusion of two new codes towards the end of the data analysis process. Code “CLD” was added in November to identify examples of character and leadership development training in the new educator experience. As I assessed the transcripts, journal entries, and observational notes, statements arose remarking on the desire for more training about how to be an effective teacher and role model in the classroom for cadets in regard to character and leadership development.

Table 1
Qualitative Data Coding

Codes and Sub-Codes	Category
IB	Individual background: Instructor military experiences, teaching and education background, world view, perspective on education and USAFA
IB-E	Individual background-Education: Personal recollections or influences of previous education/student experiences.
IC	Institutional climate: Military and academy environment, facilities,

discipline, structure, standardization, accountability, codification, and regulation

- FO** Faculty Orientation program: Process, procedures, formal documentation, goals, metrics, schedule, training topics
- M** Mentor: Teaching background and perspectives, academic specialty, coaching/mentoring philosophy
- IG** Individual growth: instructor expectations and goals, NIO experiences, mentor relationships, lesson preparation, classroom teaching experiences, grading and evaluation experiences, personal reflection on growth/development as an educator
- RP** Researcher perspective: researcher background and potential areas for bias
- CA** Cognitive Apprenticeship (General)
- CA-M Cognitive Apprenticeship-Modeling: Experienced educators providing examples or demonstrations to new instructors about how to think about teaching and education
- CA-C Cognitive Apprenticeship-Coaching: Experienced educators providing hints and feedback to new instructors about how to think about teaching and education
- CA-S Cognitive Apprenticeship-Scaffolding: Experienced educators providing physical or conceptual prompts or cues to new instructors about how to think about teaching and education
- CA-A Cognitive Apprenticeship-Articulating: Experienced educators providing structures or opportunities for new instructors to express their thoughts about teaching and education
- CA-R Cognitive Apprenticeship-Reflecting: Experienced educators encouraging and providing a mechanism by which new instructors can think about teaching and education
- CA-E Cognitive Apprenticeship-Exploring (Fading): Experienced educators removing themselves from the training process and encouraging new instructors to pursue new ways of thinking about teaching and education
- CLD** Character and Leadership development training: New instructors lack or desire more specific training in how to be a leader or role model for character development
-

Likewise, the code “IB-E” (individual background-education) was added late in the analysis process. Recursive coding and continuous re-assessment of the data indicated a consistent theme of personal educational experiences as being a key influencing variable in the operator-instructor growth experience. I added a sub-code within the individual background category to better capture and catalog these data items.

Reliability and Validity

Throughout this study, I sought to ensure replicability and confirmability (Creswell & Miller, 2000). Data collection and analysis methods were specifically selected to maximize trustworthiness; that is, to ensure that what was reported was a factual good-faith representation of the observations and a credible interpretation of the findings and themes revealed from the data.

This trustworthiness and credibility was accomplished in five ways (Creswell, 2007). First, in the research design and subsequent data collection, I employed data triangulation through three collection methods (observations, interviews, and journals). This strategy provided precision and ensured that multiple data perspectives could be coalesced into consolidated, confirmable findings. Member checking was fully incorporated by asking participants to review field notes, transcriptions, and research writing drafts and to provide amplifying or corrective inputs through follow-up interviews or email correspondence. I remained open to pursue negative cases, when evident, and sought alternative explanations to outlying data events or atypical participant perspectives. Additionally, throughout the research writing, I endeavored to use thick, rich descriptions to allow the reader to assess transferability and applicability to other situations or scenarios (Creswell, 2007).

Ethical Research

I was exceptionally attentive to my own potential for bias, acknowledging the threat for misperception and oversight based on the fact that I had previously served as a member of the USAFA faculty as an instructor, assistant professor, scheduler, course director, and personnel officer. As a doctoral student conducting inquiries into USAFA teacher induction processes, and as a former participant in this process, I was persistently cautious in seeking objectivity. To mitigate any potential for bias I incorporated a uniform interview protocol, utilized specific and standardized coding procedures, and involved case study participants throughout the analysis process to ensure accurate documentation of their perspectives and experiences.

This study was conducted with integrity, respect, and honesty in accordance with Miles and Huberman’s (1994) discussion of ethical issues in analysis. At every point in this research, the confidentiality of participants was ensured through the use of non-attributable pseudonyms. I ensured privacy. Personal demographic information was de-identified to the maximum extent possible, and participants were afforded complete visibility of the data collection, data analysis, and research writing phases of this study. Participants were involved in the final write-up of the research results and discussion and all were satisfied with the narrative and the extent to which their identity and potentially attributable comments were documented.

Findings

Over the course of nine months, data were collected through interviews, observations, and journaling from the four case study participants. Iterative analysis through transcription and coding subsequently revealed three major themes tied to the theory of cognitive

apprenticeship. These themes primarily centered on the cognitive apprenticeship tenets of modeling, coaching, and scaffolding.

Finding 1—Early Emphasis on Modeling

The Academy's New Faculty Orientation program provides new instructors their first immersion into the policies and culture of the Air Force Academy's military-education environment. New instructors are provided tools and techniques for course preparation and classroom execution. New instructors are assigned to small Learning Communities, each facilitated by an experienced Academy faculty member.

Faculty Orientation persistently utilizes modeling to prepare new instructors for their teaching duties. The cognitive apprenticeship method of modeling was pervasive throughout the participants' first experiences in USAFA's New Faculty Orientation program. In interviews and journals, participants commented on modeling within the departments and in the larger faculty-wide events. I consistently observed repeated examples of more experienced Academy teachers providing demonstrations for the new instructors, both physically and cognitively.

Physical modeling was clearly incorporated into both of the Faculty Orientation mini-lesson demonstrations that the participants attended, but cognitive modeling was pervasive throughout the week—both from learning community seminar facilitators, and also from learning community participants who had previously served on the Academy faculty. Repeatedly, I would observe comments such as “here's what I do; here's why.”

From my observations and from subsequent comments from George, Elly, Solomon, and Mark, I found the new instructors to be remarkably receptive to modeling styles of teaching. They were attentive, quick to embrace the points being offered, and consistently thereafter recalled the modeling-type orientation events in a favorable light. George stated, “I think some of the most beneficial sessions during the Faculty Orientation were the ones with cadets and first year faculty. These sessions provided insights into the minds of the cadets we would be teaching in the future.” Elly commented, “they had the aero guy come up and demo a lesson, and I thought that was great! It was really great to see an example!” Solomon wrote, “we had the opportunity to see one of our very own, some of the more proficient instructors, give a class and then we had the opportunity to give our own and that's what we're doing here, that's what we're all about!”

Of particular interest to me were comments by the case participants where they indicated the influence modeling imparted on their personal teaching styles. A conversation with Elly:

[Researcher] *So how'd you come up with that technique?*

[Elly] “Um, I guess I've just seen it kinda work. You know?”

[Researcher] *Did you hear about it or see another teacher do it, or was it just something you thought of?*

[Elly] I guess, yeah, I think we talked about it a little in instructor orientation. And I kind of adopted it from them and having us do stuff as a group initially. So I just adopted that and deviated a little with the stuff I already knew. And my course director, he explained frontal teaching and doing group work and the various techniques.

Participants consistently commented on the importance of seeing more experienced teachers in action, and added that it was also immensely helpful to them when these senior

instructors explained what they were doing and why they were doing it. This freely-shared visibility into the thinking of their exemplars was highly valued.

Additionally, experienced instructors and department leaders would incorporate multiple methods of scaffolding that blended with their modeling. For example, lesson slides, course syllabi, case studies, instructional checklists, and instructor lesson guides were freely and frequently shared with new instructors. New instructors were encouraged to use existing teaching artifacts as a foundation from which to refine and develop their own lesson materials.

Finding 2—Importance of Mentorship

Mentoring is a blend of modeling, scaffolding and, primarily, coaching. Mentoring within the construct of the USAFA military educator induction experience occurred exclusively within each new instructor's departmental working environment and involved regular coaching-type of interactions, primarily at the initiation of the new instructor. These ranged from simple administrative questions and answers to more theoretical and ideological discussions about teaching strategies and methodologies.

Interview, observation, and journaling data from all four participants revealed that department-level mentoring, although beneficial, tended to be very informal and that new faculty members were not appointed one single mentor. Rather, all four (100%) freely canvassed their department based on peer availability and the type of information or guidance they sought. Interviews and journals with the participants consistently indicated that mentoring interactions tended to be of three types. Data coding indicated that new instructors frequently sought out others in their departments to:

1. Determine basic processes or gain pragmatic information (how to access and manipulate instructional programs; how to submit grades; how to operate classroom media devices, etc.). (4 of 4 participants)
2. Find or confirm specific answers to course subject matter questions. (4 of 4 participants)
3. Seek guidance on teaching methods and various strategies to interact with cadets in the classroom. (4 of 4 participants)

Participants all commented or wrote that department-level mentoring was always informal and it was typically initiated by the new instructor. All four case participants indicated that all of their mentoring engagements and relationships were initiated by themselves. They stated that they sought mentoring on a situational basis and rotated among department personnel depending on the type of information and guidance they sought. By mid-semester, all four indicated that they had more or less determined a primary "go-to" peer and that they had selected this individual based on either their subject-matter knowledge or their teaching style. In all cases, the selected mentor tended to be a civilian professor, often with many years of teaching experience. Participants all commented that their primary motivation for seeking civilian mentors was because of their tenure and continuity. Whereas most military faculty rotate out of an Academy assignment every three or four years, civilian faculty tend to serve many years with an exceptionally low turn-over rate. Solomon was most adamant about this, stating that he specifically sought the counsel of senior civilian educators because "they've seen it all and know what works."

Of note, none of the participants described examples of *articulating* with their mentors, where they presented to or affirmed for their mentors their conceptualization of the ideas being shared. They did, however, provide examples of *reflection*, where they would have

opportunities to be evaluated and assessed by older, more experienced teachers in their departments.

All four case participants, in both their journals and interviews, described a partnering style of teacher relationships in their departments and spoke favorably of their mentoring experiences. They were equally pleased at both the informal accessibility of peer support as well as the lack of persistent oversight or authoritative scrutiny. George said, "I haven't met someone who is averse to helping in any circumstance whatsoever . . . these folks are great! Very nice and very willing to help and that sort of thing. Very willing to talk to you whether it's about work or not." Elly wrote, "my colleagues have been very helpful in terms of helping the new instructors get established. They did not micromanage, yet were available any time I needed clarification or direction. They have made it very easy to get assimilated into this environment."

Solomon described his informal mentoring relationships, commenting on his preference of seeking out different department peers based on convenience and accessibility:

I've tapped into several resources. Probably the first one I go to, most times, is the division chief . . . probably because he's the closest to me. Um, second, I'll go to the course director, which is a little further down the hall but I'll go to him. And then third, and I really haven't knocked on his door to ask for help, but, it's been more where we've run into each other and start discussing things and he'll give me some feedback. He's a very experienced doctor who's been in the department for many years, and he's teaching the same class I do, just in different sections, so, um, he has provided some really good insight into some things I can try . . . I found that if I had a question about how to do something I would normally find him. He's been around the block quite a few years here.

Mark was clear in his opinion that formal mentoring programs are not effective, but he was pleased with the informal mentoring resources available to him in his department. He wrote:

I'm not a huge fan of mentor programs. I think that they're contrived and fake. You're assigned to do it and therefore you have to. To me a good mentoring relationship is something you develop. There is a very hands-off approach here. When I need help I know I can ask for it and get good advice. . . I certainly feel that if I need advice I have many people I can go to and feel comfortable doing so. I have no concerns here. It is a good department. I didn't get a whole lot of hand holding and I didn't really want it, nor do I think there's a lot of time for it.

In summary, this second finding clearly illuminated the significance of mentors to the participants. The modelling-scaffolding-coaching behaviors demonstrated by the participants' selected mentors was well received and considered by them to be highly influential to their development as educators.

Finding 3—Influences of Academic and Military Experiences

New operator-instructors are influenced by both their military operations experiences as well as their earlier academic learning experiences. Data consistently revealed that new instructors are not solely influenced by their military backgrounds; their experiences are

likewise and perhaps more so, guided by their previous, and continuing, educational student experiences.

One department mentor I spoke with discussed how he perceived new military instructors as very much a product of their military background:

We get folks who've been in the operational fields: pilots, missileers, or intelligence people . . . they want to have a checklist in front of them: "This is what I need to do next and this is the next thing I need to do"; but not necessarily mechanically oriented. They're very meticulous about how they do things . . . I think the operational folks require or demand more of a "okay, can you show me a regulation, can you tell me what I need to do here, where's it say that?" That sort of thing.

Conversely, another senior mentor felt that new operator-instructors were most influenced by their early previous experiences as students themselves. He told me:

The backgrounds that [military instructors] bring vary a lot, but it's our anecdotal assessment that what drives their behavior more than anything is the way they were taught. They're not driven so much by what they've experienced in the Air Force. . . I've interacted with faculty across all the disciplines and the number one driver appears to be, anecdotally, is 'what did you experience as a student?'

The case participants offered their perceptions that, in fact, their new experiences were very much influenced by both their military and student experiences. George said:

There's so much from growing up that affects me, even the Marine Corps. There are things from the Marine Corps that still bound me. I would say [it is about] just being able to take what you know, past education and experience and what not, and being able to transition that into teaching.

Likewise, Elly answered that her experiences learning to be an Academy educator were influenced by both her student and her Air Force operator experiences. She said:

I think a lot [of learning to be an instructor here] stems from when I was a student here. I kinda knew the mentality that students have. I knew what worked for me as a student here. I knew what didn't work for me as a student here . . . and my operational experience probably to a certain degree because I know what's going to be required of them out in the Air Force. Um. I mean, my operational experience helps because I realize what's going to be expected of them and how they'll be expected to perform and react to certain things.

From my observations, it was apparent in the teaching style of each of the study participants that they definitely preferred to engage with their students in a coaching style. All were exceptionally approachable and patient. I observed no indication that any chose to apply the more direct, authoritative instructional style that each had witnessed and, at times, employed, during their previous duties as more technically focused military instructors. It was clear to me through their observed teaching styles that they preferred a climate of collegial discussion and exploration. Students were encouraged to take risks and fail; definitely not a teaching style encouraged or even tolerated in a high risk military training environment.

Discussion

Research Answers

How are the tenets of cognitive apprenticeship theory incorporated into the USAFA educator induction experience?

Answer: The core cognitive apprenticeship methods of modeling, scaffolding, and coaching are thoroughly integrated into USAFA's educator induction experience through organizational and department-level orientation processes, but the learning generalization and autonomy cognitive apprenticeship methods (articulating, reflecting, and exploring) are under-utilized in subsequent educator development. Figure 3 illustrates the relative scarcity of articulating, reflecting, and exploring events compared to modeling, coaching, and scaffolding.

As the underlying theoretical framework for this research, Collins' et al. (1989) theory of cognitive apprenticeship served as a precise analytical instrument through which to focus on the unique environment of military educator induction. The six methods of cognitive apprenticeship—modeling, coaching, scaffolding, articulating, reflecting, and exploring—outline a proven sequence of developmental tools for enhancing the student-teacher learning relationship. In the case of this study, the focal student-teacher relationships were those between experienced USAFA faculty members and military operator-instructors new to both the military service academy educator arena and academic teaching in general. Although Collins, Brown, and Newman (1989) made significant strides studying cognitive apprenticeship methods as part of their inquiries into effective teaching and teacher induction in the civilian education sphere, this is the first study that analyzes the utility and implementation of these methods specific to the military educator post-secondary academic environment. As the study's three findings indicate, indeed, the methods of cognitive apprenticeship are certainly applicable to the USAFA military educator induction experience.

Cognitive Apprenticeship—Core Methods. Collins et al. (1989) categorized their six methods of cognitive apprenticeship into three groups. The first group they termed “the core of traditional apprenticeship.” It consisted of *modeling*, *scaffolding*, and *coaching*. These three are the most common in instructional activities (both physical and cognitive), are the easiest to employ for the teacher, and are the easiest for a student to engage in and respond to.

These three methods are effective both in the education realm and are also extensively utilized in the training arena as well. In fact, military operators, regardless of their career specialty (pilot, navigator, etc.) are unquestionably familiar with these three teaching methods. It is how they were trained and how they were trained to train. Military operator training frequently uses the “demo-perf” (demonstration-performance) method, where, first, the instructor demonstrates (*models*) an action; for instance, how to perform a short-distance aircraft take-off. The instructor also shows the student how to use checklists and performance charts to determine required take-off distances, power settings, etc. (*scaffolding*). Finally, when the instructor feels the student is ready, she allows him to perform the action, but the instructor is right there, literally, in the seat beside or behind the student, providing tips, reminders, and ready to intervene if necessary (*coaching*). It is no surprise then that a military academy so easily and pervasively employs these common learning methods as a foundation of its teacher induction processes, both at the organizational and department levels. Figure 3 illustrates how *scaffolding* occurred somewhat less frequently, especially at the organizational level, than did *modeling* and *coaching*.

At the organizational level, through the formal New Faculty Orientation events, modeling was extensively used to prepare new Academy instructors for their specific teaching duties. Repeatedly, in journals, in interviews, and by observation, I collected multiple

examples of modeling where experienced teachers would not only show new instructors what to do, but would think aloud as they did it—providing that critical cognitive apprenticeship component where the student could grasp an intangible thought process, wrestle with the concept, and make it their own through subsequent applied action. This occurred throughout the Faculty Orientation learning community discussions and panel working groups, but also, to a lesser extent, within the departments.

It was the methods of scaffolding and coaching that were exceptionally prevalent within the department atmosphere. Scaffolding was ubiquitous. It was a direct result of the Academy's course director structure. It was formalized, expected, and persistent. A new instructor's primary duties revolve around (a) lesson planning, (b) teaching classes, and (c) grading examinations or papers. However, because of the high-level scaffolding implemented through the course director structure, the individual lesson topics, objectives, and readings were typically provided to the new instructor by the course director. In many cases, lesson slides were also provided. The syllabus, semester schedule, grading matrix, and often the tests themselves, were all provided to the instructor by the course director. From this scaffolding then, each instructor could branch out—take risks, experiment—as they desired. For most, this scaffolding allowed them to apply their planning time towards creatively amplifying the daily lessons, enhancing their instructional methods, and developing new learning-focused teaching approaches.

In addition to modeling and scaffolding, coaching was also common throughout the new instructor experience, most extensively within the departments in the form of mentoring relationships. The case participants sought out either experienced civilian educators or course director near-peers for guidance and support. All expressed a willingness or desire to have others in their department observe their teaching and provide feedback. This acceptance of routine peer observation and critique is, I deduced, a unique characteristic of the military culture where a high standard of accountability, routine mission debriefings, after-action evaluations, and lessons-learned reports are all commonly accepted aspects of the work environment. Several civilian mentors and facilitators commented that this degree of group support and openness to critique was in no way present in any of their previous civilian teaching jobs.

Cognitive Apprenticeship—Learning Generalization and Autonomy Methods.

Whereas the three methods of core traditional apprenticeship were pervasive in the USAFA military educator growth experience, the learning generalization methods of *articulation* and *reflection*, and the learner autonomy method of *exploration* were noticeably less incorporated.

Articulating involves the student explicating reason or knowledge, in short, telling the teacher what they think, know, or understand (Collins et al., 1989). This articulation has a dual purpose: helping to confirm and solidify the student's knowledge, while also giving the teacher visibility into a student's understanding, thus providing an opportunity for correction or reinforcement. There was little articulation in the military educator growth process. Very infrequently were new operator-instructors given the opportunity or expected to express their learning for a teacher. Whereas I observed this method frequently being used by George, Elly, Solomon, and Mark in their own classroom teaching with their cadets, there were few times when first year instructors were in a situation requiring them to voice their understanding of teaching to other teachers. The few times this occurred were either in the Faculty Orientation learning community discussions or mentioned as being part of the informal department-level course topic discussions.

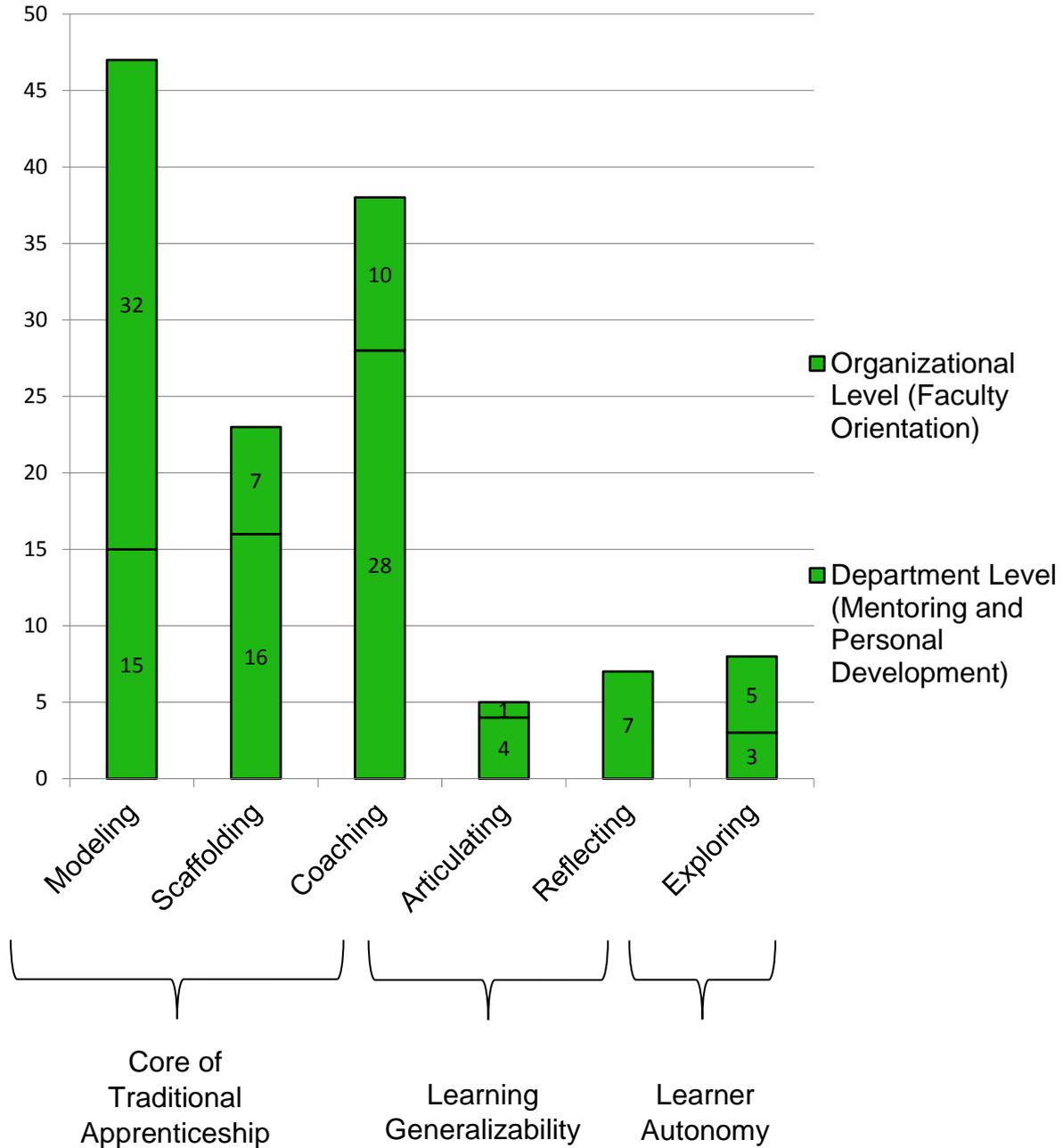
Likewise, the learning generalization method of *reflecting* was seldom incorporated. I find this interesting because I had assumed, prior to this study, that reflection would be very common to the new educator experience. Reflection is not sitting quietly and meditating on the day's learning (as some cadets tend to think of it). Reflection, in the context of cognitive

apprenticeship theory, is when a student compares their performance (or thinking/understanding) with a teacher's (Collins et al., 1989). It is different from *coaching*, where expert and novice interact to accomplish a task. Reflection is more like a student-led mission debriefing—"here's what I saw the instructor do, here's what I did, here's where I succeeded and failed by comparison, here's what I will correct for the next mission."

Reflecting happened infrequently in the department mentor sphere. When it did occur, it was usually within a semi-structured critique or feedback session following one of the new instructor practice lessons that were required as part of the department-level Faculty Orientation process. Participants recalled their reflection experiences, although few, as being highly beneficial and that these definitely instilled in them a sense of progress and teaching confidence.

The most advanced cognitive apprenticeship method, *exploring*, involves the teacher guiding the student to problem solving on their own (Collins et al., 1989). This semi-autonomous pursuit of advanced scholarship was very infrequent in the military educator growth experience. Although facilitators in the formal Faculty Orientation events encouraged new instructors to pursue additional teaching and learning strategies as part of their personal development, there was no example among the mentors or case participants of departments encouraging or facilitating this. The few department-level instances of exploring were self-initiated by Elly and Mark.

Figure 3, although not a representation of statistically significant quantitative results, is provided to illustrate for the reader the relative occurrence of the six cognitive apprenticeship methods in the organizational-level and department-level military educator growth experience. Modeling was prevalent in the organizational-level Faculty Orientation events, with scaffolding and coaching being more prevalent in the department mentoring relationships. Articulating, reflecting, and exploring were much less frequent.



Impact and Implications

Significance to USAFA. Conclusions from this study bear significant impact for faculty at the U.S. Air Force Academy. This study focused precisely on USAFA teacher induction, so it follows that these findings and proposals will be most relevant and useful to those involved in that process at multiple levels: the dean and dean’s staff, the Directorate of Education, the Center for Educational Excellence, Faculty Orientation facilitators and mentors at the organizational and departmental level, department heads, course directors, and new Academy instructors themselves.

Foremost, the faculty developers at USAFA should take pride in the fact that they have designed and very competently implemented a robust formal Faculty Orientation program. This study confirms that. The professionalism and credibility with which USAFA’s Faculty Orientation program is conducted is a great credit to USAFA’s emphasis on cadet learning and

the importance of providing these students with some of the best prepared and certainly most learning-focused faculty in the nation. The Faculty Orientation program faces a formidable challenge in that it must speak to the needs of a very diverse new instructor audience. It does this through a well-thought-out series of events focused on institutional orientation, teaching theory and preparation, and student emphasis. This is an indisputable institutional strength and this study confirms the effectiveness of both the conduct and the product of this program.

At the department level, Faculty Orientation programs are diverse. They are a product of the department head's emphasis and interests as well as the resources (time and teachers) available to conduct it. Through four case participants and their mentors, this study gained significant insight into the induction programs and processes of three of the Academy's 20 departments. Based on this study's findings, I would propose that USAFA leadership strive to increase sincere and voluntary faculty member engagement in developmental opportunities subsequent to mandatory Faculty Orientation.

Military Service Academy Environment. My previous research into military faculty development has suggested that the three primary U.S. service academies—Army, Navy, and Air Force—share many similarities. They are especially alike in their strong emphasis on cadet learning, hence, the undeniable need for high quality educators on their faculties. To West Point and Annapolis I would suggest: Explore this study and assess its findings. Are there similar themes within your institutions? The findings here are almost certainly exportable to a large extent to other service academies, especially the utilization of the six cognitive apprenticeship methods within a long-term teacher induction program. Incorporate these findings into your faculty induction processes, amending where it suits the institution's particular requirements, culture, or emphasis and work to implement the six cognitive apprenticeship methods towards the precise goal of growing all your new instructors into confident and credible military educators.

Civilian Post-Secondary Educational Institutions. If a civilian college or university does not implement some type of faculty-wide orientation program, I would first and foremost ask: why not? The benefits are undeniable. I believe this study bears considerable implications for civilian institutions in their efforts to build a high quality learning-focused faculty. As a qualitative study, I will stop short of claiming that these findings are "generalizable" to civilian post-secondary education, but I confidently propose that for any institution that may recruit as instructors or professors highly-experienced professionals from the non-academic workforce that this study matters to you.

Even if university leaders choose, for whatever reason, not to prioritize a faculty-wide orientation and development program, I would emphasize the many benefits for doing so on a more limited scale for your new professionals with limited teaching experience. These specialized civilian "operators" will be similar in many ways to Air Force operators in the fact that they have a great deal of specialized job knowledge, possess a high degree of professionalism and a strong work ethic, yet are in dire need of sequenced instruction on how to effectively serve the institution and grow as educators. This study suggests instruments for that undertaking.

Education Theory and Research. Finally, this study offers unprecedented contributions to the field of educational research. For the first time, the methods of Collins' et al. (1989) cognitive apprenticeship theory have been analyzed in the unique military educator induction context. Modeling, scaffolding, and coaching are prevalent. Articulating, reflecting, and exploring are not. This is insightful and introduces a new perspective on the study of teacher development, professional mentorship, teacher first year experience research, and cognitive learning and teaching theory. This study validates the merits of Collins' et al. theory of cognitive apprenticeship as applied in a military educator context. These findings, while in

many ways helping to fill the gap in the application of cognitive apprenticeship theory in the military education sphere, also highlight areas in need of further study.

Recommended Future Research. Themes and findings from this study suggest the need for further research into military educator induction, cognitive apprenticeship theory, and the application of cognitive apprenticeship teaching methods in several educational contexts. Specifically, for the Air Force Academy: How can USAFA best prepare its faculty to be educators of character and leadership development? What faculty orientation and development processes most benefit cadet learning? How can department mentorship be enhanced to most effectively develop educator proficiency?

At the broader military service level, I would suggest an inquiry into the educator development processes at other Air Force education institutions such as the Air Force Institute of Technology (AFIT) or the professional military education (PME) schools within the Air University construct. What are similarities and differences between their programs and the very structured Faculty Orientation program at USAFA? How do these incorporate cognitive apprenticeship methods in their teacher induction processes?

Additionally, within the much broader civilian post-secondary arena, the research potential into teacher induction and cognitive apprenticeship is practically limitless. I believe there would be many benefits from a specific case study comparison between military faculty induction processes and those of a similar civilian school or group of schools. A cross-case comparison would be exceptionally revealing and benefit all institutions involved with unique alternative processes and perspectives on enhancing their educators.

Finally, cognitive apprenticeship theory is a broad and highly diverse framework, ripe for application across a wide range of educational research contexts. I feel the most promising contributions to the field at large would come from more specific investigations into cognitive apprenticeship methods as applied to the less studied arena of adult education teacher training. There have been studies of cognitive apprenticeship addressing teaching adult students, but none focused on building and developing educators working exclusively in the realm of adult education. Specifically, I would recommend research applying cognitive apprenticeship to developing teachers of non-traditional students in the post-secondary and graduate school environments—a study of expert-novice teacher learning processes and relationships as new faculty members learn how to best educate adult non-traditional students.

Conclusion

This study sought answers to how the U.S. Air Force Academy facilitates the transition of its new operator-instructors from their previous duties as highly experienced, technically proficient warrior-operators to their new roles as confident and credible academic educators. Findings from this study's data reveal that the methods of cognitive apprenticeship are most certainly applicable to the military post-secondary educator development context. Modeling, scaffolding, and coaching are significant instructional methods persistently incorporated by USAFA to build its new teachers. However, although the methods of articulating, reflecting, and exploring are critically important to educator development, these were less prevalent and typically exclusive to instructor-initiated developmental processes. External incentives for higher level educator growth were, at best, limited.

As educators of our nation's future military leaders, the faculty members at the U.S. Air Force Academy are tasked with a critical mission and entrusted by our nation with some of our most precious resources—those that will ensure our future security. This study shows that the Academy clearly recognizes this immense responsibility and strives to ensure that these future officers receive the best education possible from a cadre of highly motivated and sincerely enthusiastic military and civilian educators. This research informs this endeavor.

Findings from this study are humbly offered here as both affirmation and challenge to these efforts, proposed to further enhance USAFA's educator induction processes and to contribute to the greater body of knowledge regarding teacher development and the application of cognitive apprenticeship teaching methods within the teacher induction experience.

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