Effects of Interdisciplinary High Fidelity Simulations: A Look at Initial Industry Success in Aviation

by

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ABSTRACT

This study aimed to examine the effectiveness of interdisciplinary team training for aviation students at the collegiate level. As it stands, students in the aviation program are trained in academic silos creating a lack of a shared mental model between team members of different disciplines. Without a shared mental model, students in various disciplines are unaware of other's knowledge and abilities related to their own. This proves problematic once on the job, where aviation students are required to work in teams consisting of members from all disciplines (Swan, Scarbrough, & Newell, 2010). With little to no prior training in teamwork between specializations, newly hired aviation employees may lack the interpositional knowledge, and teamwork skills, and abilities to perform adequately. In order to address this need for teamwork training in the aviation industry, a NASA funded high fidelity flight operation center unified system (FOCUS Lab) was developed to aid in developing aviation students' teamwork skills. The FOCUS Lab simulates the environment in an airline's Flight Operations Center. While studies show that participants of the FOCUS Lab like the training and are learning and improving across simulations despite the increasing difficulty level (Littlepage et al., 2013; Littlepage, Hein, Moffett, Craig, & Georgiou, 2015), there has not been a study looking to see if these skills transfer beyond the simulation. The purpose of the FOCUS Lab is to better prepare students for the workforce; however, if the skills do not transfer, then we cannot truly verify the success of the FOCUS Lab. The Research Question for this study was what are the effects of high fidelity simulation training on initial employment experiences? Participants consisted of aviation graduates from a large Southeastern

University. Additionally, as a control group Industrial and Organizational Psychology graduates were contacted as well. Seven-hundred and three participants were contacted via e-mail and asked to complete an online Qualitrics quiz. Results from the survey suggested that those graduating from the FOCUS Lab had lower turnover intentions and demonstrated more adequate teamwork skills in interdependent work settings. Implications, limitations, and suggestions for future research are discussed.

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INTRODUCTION

This study aims to examine the effectiveness of interdisciplinary team training for aviation students at the collegiate level. The training that students' participate in is job relevant and facilitates the learning of industry relevant teamwork competencies. Prior to this training, students are educated within their specific discipline and have little knowledge about other aviation positions, whom they must communicate and coordinate frequently with on the job. Once in the workforce, the ability to coordinate and communicate effectively with other disciplines leads to numerous benefits including increased safety and productivity, job satisfaction, and faster adjustment to the job (Cohen & Bailey, 1997; Dispatch Resource Management Training, 2005; Falcone, et al., 2008; Paige et al., 2007).

Newcomer Adjustment

Newcomer adjustment is, "The process an individual goes through within the first year at an employing organization to learn how to perform the tasks of the job and develop positive attitudes toward the organization, work environment, and job requirements" (Klemme-Larson & Bell, 2013). In fact, 50%-60% of newcomers leave their new position in the first 7 months (Leibowitz, Schlossberg, & Shore, 1991), which costs organizations over $11 billion dollars a year (Abbasi & Hollman, 2000). Moreover, if an employee does not leave the company, but fails to adjust and consistently performs below par, it becomes even more costly to the organization.

Although all employees go through newcomer adjustment, it is particularly difficult for recent college graduates because of their lack of professional experience (Bauer et al., 2007). Unsuccessful adjustments of recent college graduates can have adverse effects for individuals, organizations, and universities. This lack of professional experience can lead new employees to experience stress, loss of motivation, and loss of confidence initially in their career (Reicherts & Pihet, 2000). These changes have downstream consequences that affect employee's performance and productivity (Holton, 1995; Leibowitz et al., 1991). Furthermore, unsuccessful adjustment can lead new employees to question their job satisfaction, organizational commitment, and ultimately lead to turnover (Holton, 1995; Leibowitz et al., 1991).

Realistic Job Preview

Without prior experience, new hires often lean on previously learned knowledge from their schooling to mitigate the overwhelming nature of information during on-the-job training (Kowrtha, 2011). It has been shown that differences between actual and desired aspects of the job are most prevalent among recent college graduates which creates barriers for the new employee (Pearson, 1982). New employees, and specifically new college graduates, are often not prepared for the work relationships that must be developed to be successful on the job. This lack of preparation often leaves new graduates struggling to relate to their coworkers (Pearson, 1982). Additionally, new graduates may struggle from ambiguity and loss of control in their new job because of the unfamiliarity and uncertainties (Ashford & Black, 1996).

Even with previous experience, employees often have unrealistic expectations about a job based on the interview and socialization process. Unrealistic expectations can be attributed to the nature of recruiters and hiring managers whose job it is to display only the positive characteristics and qualities of the organization. In order to combat this bias, realistic job previews are often utilized. A realistic job preview is a selection approach utilized by organizations to give potential employees a glimpse into the job in order to provide them with realistic expectations (Wanous, 1973). Realistic job previews have previously been shown to lead to positive outcomes such as an increase in job performance, job satisfaction, organizational commitment, self-section (sorting effect), and ultimately increased job survival by decreasing turnover (Buckley, Fedor, Veres, & Wiese, 1998; Premack & Wanous, 1985; Vandenberg & Scarpello, 1990; Wanous, 1973). Since employees' initial expectations are usually inflated, realistic job previews prevent dissatisfaction once a new employee is on the job by mitigating the differences between perceived expectations and actual duties and practices of the job (Wanous, 1973).

Realistic job previews can also provide a glimpse into the working conditions of one's job. Working conditions may include working in undesirable environments, sitting or standing for long periods, or collaborating with others extensively. The current study will focuses on the later example. Working in teams now is almost inevitable (Hackman, 1990). For a group to be successful, group members must be able to work effectively together and exhibit teamwork knowledge skills and abilities (KSA). Team KSAs differ from the KSAs needed to perform successfully as an individual (Aguado, Rico, Sanchez-

Manzanares, & Salas, 2014). In order to successfully work in a team, an individual must possess interpersonal skills such as decision making, setting team goals, evaluation of team process, giving feedback, problem solving, communication, conflict management, self-evaluation, time management, and giving and receiving support (Main, 2010; Stevens & Campion, 1994). If a team is able to develop these KSAs their efforts are often rewarded. Well-functioning work teams have the same situational awareness, the ability to adapt, ability to identify problems, discuss and make decisions, appropriately distribute the work load, communicate effectively, and anticipate needs of their team members (Davies, 2005; Paige, et al., 2007). If a group is able to develop these abilities and become a well-functioning team, this can lead to increased performance, productivity, quality, job satisfaction, trust, and decreased absenteeism and turnover (Cohen & Bailey, 1997).

Teamwork

An ideal place to train individuals on team generic KSA's is during their formal education. In order to prepare students to work in teams in industry, teams are used in university settings to prepare students by improving teamwork skills and replication of interactions in the workplace (Mutch, 1998). However, while this is the intention, it has not been shown that group projects are actually preparing students to function effectively in teams outside of the classroom (Ettington & Camp, 2002). Much of the group work that occurs in universities teaches the content of working in a team as opposed to teaching the *process*. Because of this, students often have to teach themselves teamwork

skills (McKendall, 2000; Vik, 2001). This proves problematic. Without formal instruction on teamwork competencies, students do not receive information or practice on specific group work processes or skills even after being forced to work in groups for four or more years. Additionally, there is typically no formal assessment of their group work process or skills, only of the content learned (Main, 2010). This lack of feedback does not allow the student to learn from their successes and failures of the teamwork process. In addition, even when members of a group learn teamwork skills during participation in a project, it is often not translated into practices in the larger organizational context. In fact, most of what is learned during a group project is not transferred to subsequent work projects (Swan, Scarbrough, & Newell, 2010).

Once out of college, organizations expect recent graduates to be ready to enter the workforce (Klemme-Larson & Bell, 2013; SHRM, 2012). Employers are seeking to hire team players with relevant work experience and the ability to communicate and work in a team structure. However, students often do not meet these expectations. In part, this is due to lack of experience. Previous studies have shown that new employees who have some knowledge and skills related to the job, or whose education/training is directly related to the job are able to learn faster than their counterpart (Dokko, Wilk, & Rothbard, 2009). Possessing team KSA's has been shown to arise from previous experience collaborating in teams (Morgeson, Reider, & Campion, 2005). This could mean that students who receive a better foundation during their undergraduate training will be better prepared to learn on the job (Wanberg & Kammeyer-Mueller, 2000).

Training

Once on the job, it can take up to ten years for an employee to be fully trained in their position (Gladwell, 2008). Lack of job relevant knowledge and ability can be extremely costly both in training and in errors that employees make during this time (Ball et al., 2010). To rectify this, companies spend upwards of 135 billion dollars per year on training employees in the United States alone (Patel, 2010; Smith-Jentch, Salas, & Brannick, 2001).

While training may be costly to conduct and evaluate, it is necessary and allows organizations to adapt and compete in demanding and evolving markets (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012). Facilitating this competitive advantage, training reduces errors and is necessary in high-risk fields such as aviation (Salas et al., 2012). Training in cooperation and teamwork is necessary for efficient and safe operation of airlines; specifically when non-routine events occur (DeChurch & Marks, 2006; Marks, Mathieu & Zacarro, 2001; Salas, Sims, & Burke, 2005). Teams need to learn how to synchronize effectively to ensure the safety and efficiency of their airline. Specifically, quality training leads to increased performance during stress and high workloads and can prevent aviation accidents by improving coordination and communication between different aviation disciplines (Dispatch Resource Management Training, 2005; Salas et al., 2012).

However, even with team training, problems that arise in the aviation industry are often complex, time sensitive, and must utilize group interaction to be solved. These

unforeseen problems often cannot be solved by routine and procedure. To rectify unforeseen problems, team members must rely on their previous training to solve the unanticipated occurrence (Dahlstrom, Dekker, Winsen, & Nyce, 2009). In cutthroat industries, such as aviation, where profit margins are slim and competition is high, effective training can make or break an organization (Baldwin & Ford, 1988; Dispatch Resource Management Training, 2005).

Transfer of Training and After-Action Review

Not only does training need to be effective, but the knowledge and skills learned during training need to be transferred back to the job in order to reap the benefits. Due to the expense of training, it is vital that the resources spent on training are transferred back to the job. Debriefing, or after-action reviews (AAR) have been shown to be successful in the aviation industry and facilitate the transfer of training (Morris & Moore, 2000; Salas et al., 2012). Research has shown that what participants' learn from a simulation and take back to the job is highly dependent on the AAR that follows their training (Dismukes, McDonnell, & Jobe, 2000). After-action reviews benefit in three ways including self-explanation (participants analyze their behaviors as they relate to the successes and failures), data verification (looking at the data from different points of view, which decreases bias), and feedback (Salas et al., 2012). Taken as a whole, participants are better able to understand their behaviors and outcomes individually and as a team. This is particularly useful in high-risk industries such as aviation where mistakes can be costly and fatal (Ellis, Carette, Anseel, & Lievens, 2014).

Scholars have shown that teams that go through AARs develop a more accurate mental model of teamwork, have greater teamwork processes, and increased performance, as compared to their counterparts who did not receive AARs (Smith-Jentsch, Cannon-Bowers, Tannenbaum, & Salas, 2008). Specifically, a study by Tannenbaum & Cerasoli (2013) showed that AARs improved participant's effectiveness by 25% and team performance by 38% leading them to suggest that AARs should be incorporated into simulated team training.

Another benefit of AARs is they facilitate transfer of training. Although companies spend millions of dollars on training annually, only about 10% of this is training is transferred back to the job (Georgenson, 1982). The aviation industry is not exempt from this, often spending a large part of its revenue to train employees upon hire (Ball, et al., 2010). Without transfer of training, the money spent on training employees is not beneficial to the individual or the company (Salas et al., 2012).

Aviation

In addition to the cost of training airline employees, airlines also have numerous other expenses. Delays cost airlines, passengers, and businesses over 31 billion dollars annually and threaten the competitiveness of the airline system (Ball, et al., 2010). One-third of all flight delays are due to the failure of the airline to handle internal demands (Ball, et al., 2010). In a high-paced and high-stress work environment, well-functioning teams are needed to ensure safety by reducing errors (Falcone, et al., 2008). According to the National Transportation Safety Board, 73% of accidents happen on the first day of

a crew flying together. This is likely due to the lack of communication and cooperation among team members resulting in a dangerous decrease in performance (Ball, et al., 2010). Improved communication has been shown to reduce accidents in the aviation industry (Falcone, et al., 2008). In fact, there was a 24% difference in effective communication between trained and untrained individuals (Smith-Jentch et al., 2001).

In the aviation industry, training works best in the context of an entire airline team. The U.S. Department of Transportation and Federal Aviation Administration has stated that team training enforces communication importance, teaches participants skills to effectively communicate, emphasizes situational awareness, develops decision making, teaches workload management, and prioritization, in addition to improving teamwork, information flow and teaching teams how deal with non-routine and emergency situations (Dispatch Resource Management Training, 2005). Therefore, we must train aviation specialists on various team-related competencies.

One important competency for aviation employees is coordination. Team members must seamlessly coordinate their knowledge and skills in order to ensure efficiency and safety of the airline (Paige, et al., 2007). Teams bring more resources to a company than an individual could, so the sum should equal more than its parts; however, this is often not the case (Hackman, 1998). To combat this, resource management training is recommended for airline employees including dispatch personal and flight crew to teach and practice skills such as teamwork, leadership, situational awareness, decision-making, and communication (O'Connor, et al., 2008).

High-fidelity Simulations

In order to conduct effective team training, high-fidelity simulations are often employed. Scholars have stated that, "Well designed simulations enhance learning, improve performance, and help minimize errors", particularly for dangerous tasks (Salas et al., 2012, p. 88). Simulation training has been shown to successfully promote safety and quality and increase performance (Bartel, 2014). One of the benefits of incorporating high fidelity simulators into training is they have been shown to predict performance (Nobel, 2002). High-fidelity simulations allow employees to train in a safe and ethical environment while remaining effective (Paige, et al., 2007; Sturm, et al., 2008). Because of high fidelity simulations, training for aviation is now more realistic, safe, and cost-effective (Salas, Cannon-Bowers, & Rhodenizer, 1998).

Best Practices

While there are many benefits of incorporating high fidelity simulations into training, just because a simulation is accurate, it does not guarantee learning (Caro, 1988; Salas et al., 1998). Previous research has shown that feedback, measurement, guided practice, scenario design, and systematic approach all need to be incorporated into simulation training (Salas et al., 1998). Specifically, it is recommended that simulation trainings start with an orientation, followed by a multidisciplinary high fidelity simulation, which is then finished with a debriefing that allows contributors to talk over strengths and weaknesses of the simulation (Bartel, 2014).

As mentioned above, if designed correctly, multidisciplinary team training benefits from high-fidelity simulations and leads to improved communication skills, teamwork, group performance and decreased number of errors (Falcone, et al., 2008; Littlepage, et al., 2013; Paige et al., 2007; Sturm et al., 2008). Furthermore, the collaboration allows team members to understand the roles of individuals in other disciplines with whom they are largely unfamiliar (Paige et al., 2007). In order to maximize transfer from these experiences, trainees must perceive the training as relevant, train in a similar context of where they will be performing, and be given ample opportunities to practice. Additionally, after training, trainees should receive adequate feedback such as AARs, and generalize the learned knowledge and behaviors (Baldwin & Ford, 1988; Ettington & Camp, 2002; Locke & Lantham, 1990; Sturm et al., 2008).

FOCUS Lab

Utilizing these best practices, a high-fidelity simulation was incorporated into a senior level aviation capstone course to bridge this gap and prepare students for gainful employment in the aviation industry. As mentioned above, many recent graduates apply for entry-level positions, which require them to apply skills they have learned previously in school. In order to bridge the gap between students' senior year of college and entering the work force many college majors have a senior level capstone course that all students must complete before graduation. During this course, students are able to apply skills and knowledge learned throughout their degree acquisition (Gardner, 1999).

As it stands, students in the aviation program are trained in academic silos creating a lack of a shared mental model between team members of different disciplines. Without a shared mental model, students in various disciplines are unaware of other's knowledge and abilities related to their own. Training in academic silos also creates a lack of interpositional knowledge. Interpositional knowledge is shared knowledge of teammate's knowledge within their trained positions (Cooke et al., 2000). This proves problematic once on the job where aviation students are required to work in teams consisting of members from all disciplines (Swan et al., 2010). With little to no prior training in teamwork between specializations, newly hired aviation employees may lack the KSA's to perform adequately. In order to address this need for teamwork training in the aviation industry, a NASA funded high fidelity flight operation center unified system (FOCUS Lab) was developed to aid in developing aviation students' teamwork skills. The FOCUS Lab simulates the environment in an airline's Flight Operations Center.

The FOCUS Lab is comprised of nine positions including Flight Operation Coordinator, Flight Operations Tracking, Flight Operations Planning, Maintenance Planning, Maintenance Scheduling, Crew Scheduling, Weather, Pseudo Pilot, CRJ Pilot, and Ramp Tower. See Figure 1 for a layout of the FOCUS Lab. Teams include approximately ten students from varying aviation disciplines that go through three simulations each lasting approximately two hours and 40 minutes. During this time, participants take the role of employees of the flight operations of a fictional regional airline, "Universal E-lines". Overall, participants' goals in each simulation are to ensure

that roughly 60 to 80 simulated flights depart and arrive on time carrying the appropriate passengers, cargo, fuel, and crew within Federal Aviation Administration regulations. During the simulation, realistic problems arise such as weather conditions, maintenance problems, and passenger issues that could require the participants to divert, delay or ground planes.

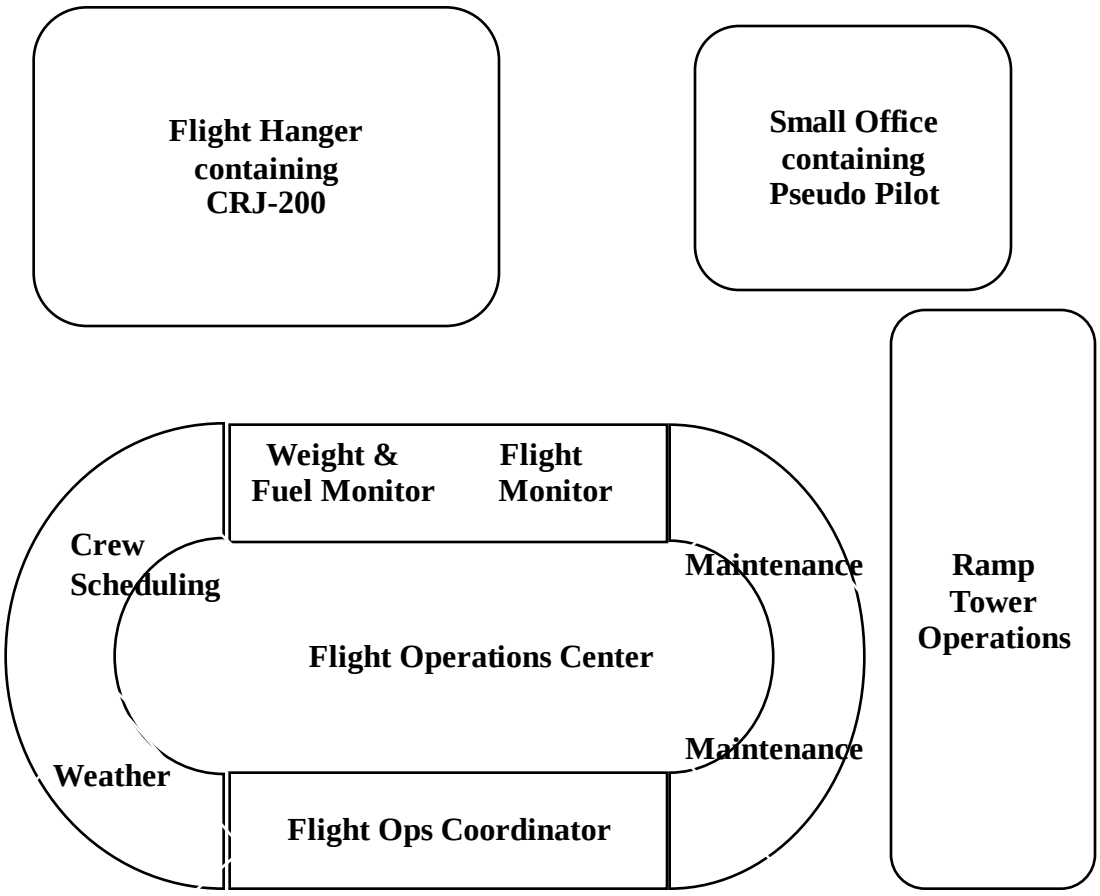

FIGURE 1

FOCUS Lab Layout

The FOCUS Lab as a Training Center

The FOCUS Lab is a prime example of applying these team-training principles. The FOCUS Lab was developed based on collaboration with NASA and with other industry airline centers. This allows students to practice in an environment that is similar to what they can expect to encounter in the workplace. Participants are given a formal orientation where they learn about Universal e-lines values, culture, and policies. Following this, students are given training modules and quizzes to complete in addition to small group hands on training to understand their position and the relevance of the Lab. All positional training was standardized and developed in house according to best practices including talking to SMEs and hands-on training. After positional training, students are ready to participate in their first multidisciplinary high-fidelity simulation. Generally, students participate in three simulations over the course of a semester in order to let them practice and improve based on the feedback they receive. Students receive feedback via AARs. In order to give detailed feedback, the NASA FOCUS Lab staff members observe participants and collect performance data such as individual performance rating and the group's finical performance. Once a week, the FOCUS Lab staff conducts a meeting to discuss the team's behaviors and outcomes. These notes are then compiled and given to a facilitator to conduct an AAR. After-action reviews provide students with the opportunity to set goals, receive feedback from their selves through reflection, team members through formalize group discussions, and staff through team and simulation specific notes.

Research Question

While there have been studies that show that participants of the FOCUS Lab like the training and are learning and improving across simulations regardless of the increase in difficulty, there has not been a study looking to see if these skills transfer beyond the simulation (Littlepage et al., 2013; Littlepage, Hein, Moffett, Craig, & Georgiou, 2015). The purpose of the FOCUS Lab is to better prepare students for the workforce; however, if the skills do not transfer, then we cannot truly verify the success of the FOCUS Lab. This study aims to fill this gap and evaluate participant experiences and behavior once on the job. To date, no one has studied the transferred level of effectiveness of the FOCUS Lab. Therefore, our research examines the effects of high fidelity simulation training on initial employment experiences?

Variables Examined

Individual Performance

Using this knowledge, we identified a variety of variables that reflect the effectiveness of this training once on the job. For the scope of this study, our dependent variables are defined below. *Individual task performance* is formally required duties of an organization such as those specified in an employee's job description. Individual task performance duties can be performed with little or no coordination with other coworkers (Morgeson et al., 2005). Additionally *self-efficacy*, one's belief about their ability to perform the requirements of their job successfully, was examined (Sherer et al., 1982).

Adjustment to the Job

Adjustment to the job occurs after a person enters an organization and is the process of working through task and social transitions including clarification of role demands, social requirements, and organizational knowledge to adjustment to one's new position (Feldman, 1981 & Fisher, 1986). Adjustment to the job is comprised of *organizational knowledge*, *role clarity*, and *social acceptance*. For the purpose of this study, we will define *organizational knowledge* as the knowledge resources within an organization that may or may not be specific to that company. *Role clarity* is the ability for a jobholder to understand the requirements of their job and have the knowledge and ability to guide their behaviors to favorable outcomes (Rizzo, House, & Lirtzman, 1970). Finally, we will define *social acceptance* as becoming familiar with the organization's behaviors, norms, mental maps, inclusion, and culture.

As discussed above, if an individual is unable to adjust successfully into an organization they are likely to have higher turnover intentions. *Turnover intentions* will be measured in this study based on the extent to which an employee plans to leave their current organization (Lacity, Lyer and Rudramuniyaiah, 2008).

Teamwork

The last part of the study focuses on teamwork, or an individual's ability to work with others interdependently through teamwork knowledge, communication, coordination, collaboration, and team-efficacy (Sundstrom, DeMeuse & Futrell, 1990). For the sake of this study, *teamwork knowledge* is an individual's understanding of how

to successfully work with a team. *Communication* is defined as interchanging thoughts, opinions, or information by speech, writing, or signs to team members (Mishra & Mishra, 2009). While many scholars differentiate between coordination and collaboration, due to the overlaps in definitions for this study the two were integrated and collectively defined as the interaction of individuals within a team to achieve a shared goal (Mishra & Mishra, 2009). Lastly, *team-efficacy* is defined as individual's or team's belief that their team can perform effectively.

Hypotheses

Adequate training has been shown to improve adjustment to the job. One way to assess if a training program is aiding in adjustment is to compare persons who received training with those who have not received the training. Assuming that the knowledge, skills, and abilities that students acquire in the FOCUS Lab are retained and transferred to their job, we further predict that there will be differences between the two groups performance on the job.

H1: Participants in the FOCUS Lab will hold higher beliefs about their initial ability to perform their job adequately than those who did not complete the FOCUS Lab.

H2: Participants of the FOCUS Lab will have higher initial self-rated individual performance than those who did not complete the FOCUS Lab.

As mentioned previously, treating students as newly hired members of a regional airline and providing them with a high-fidelity experience, we also believe that during the

semester students are given a more realistic job preview of working in industry. This preview has numerous benefits that we expect to see for those who completed the FOCUS Lab. Therefore, we hypothesize that,

H3: Students who participated in the FOCUS Lab will experience an easier transition into their first job and adjust better to the job overall than graduates who did not complete the FOCUS Lab. Specifically, we predict that those who participated in the FOCUS Lab will report:

H3a: Higher levels of Organizational Knowledge

H3b: Higher levels of Role Clarity

H3c: Higher levels of Social Acceptance

H3d: Lower levels of Turnover Intentions

H4: Students who participated in the FOCUS Lab will report better teamwork skills at the beginning of employment, compared to participants who did not complete the FOCUS Lab. Specifically, we predict that those who participated in the FOCUS Lab will report higher levels of the following:

H4a: Teamwork knowledge

H4b: Teamwork communication

H4c: Teamwork coordination/collaboration

H4d: Team-efficacy

H5: Adjustment to the job will mediate the relationship between FOCUS Lab completion and turnover intentions so that students who completed the FOCUS Lab will have higher

adjustment to the job and therefore lower turnover intentions, compared to students who only received the lecture potion of class.

H6: Participants who perceive role clarity will have lower turnover intentions compared to individuals who do not perceive role clarity.

Additionally, previous research suggests that some of the above measures may be moderated by task interdependence. Therefore, we hypothesize that,

H7: Interdependence will be a moderator of the effect of FOCUS Lab participation on various facets of teamwork. Specifically, stronger effects of the following will be seen for jobs that are highly interdependent.

H7a: Teamwork knowledge

H7b: Teamwork communication

H7c: Teamwork coordination/collaboration

H7d: Team-efficacy

METHOD

Design

For this study, a pretest-posttest non-equivalent group design (2x2) was utilized. One factor included college major of the participant (Aerospace vs. Industrial/ Organizational Psychology) and the second factor was date of graduation. Simple main effect tests for aviation students were utilized to test hypotheses. To test the hypotheses, past aviation graduates were contacted and asked to complete measures about their first six months in a professional job after graduation. Measures asked questions under three broad categories: individual performance, adjustment to the job, and teamwork. These categories are operationally defined above. Comparisons were made between participants who have graduated from the FOCUS Lab vs. graduates who only obtained the lecture portion of the capstone course. Questionnaires were administered via Qualtrics and reminder e-mails were sent to those who did not complete the survey. Responses to each question were rated on a 6-point scale ranging from (1) *strongly disagree* to (6) *strongly agree*.

In order to control for memory distortion due to differing time lapses post-graduation and for different economic conditions at the time of graduation a control group was utilized. The control group consists of Industrial and Organizational Psychology (I/O) undergraduates that served as a control for time-related confounds. Like aviation graduates, I/O graduates are often required to work as a team to achieve group goals. Additionally, the I/O program is relatively consistent across the time period of the study. Results from aviation graduates were compared against results from I/O

graduates to ensure differences between groups were not due to memory or other time-related differences such as the economy or history effects.

Participants

Participants for the target sample were recruited out of a southeastern school's aviation past capstone courses. Additionally, past Industrial and Organizational Psychology graduates were contacted as a comparison sample. Students' enrolled in the aviation capstone course in Fall 2007, Spring 2008, Fall 2008, Spring 2009, Fall 2009, and Spring 2010 did not participate in FOCUS Lab experiences and were contacted as participant's in the lecture only group. Students' in Fall 2011, Spring 2012, Fall 2012, Spring 2013, Fall 2013, and Spring 2014 were recruited as participants in the test group. A total of 703 aerospace alumni students were contacted between the two conditions. Due to the FOCUS Lab starting in low fidelity during Fall 2010 and Spring 2011, these semesters were excluded from the study. Due to the lack of time for graduates to find a job, students who completed the FOCUS Lab in Fall 2014 and Spring 2015 were also excluded. Additionally, participants in summer semesters were not utilized due to substantial differences due to course time constraints.

Students in the lecture only condition completed the aviation capstone course before the FOCUS Lab was implemented and only received the in class portion of the capstone course. Participants in the test condition completed the aviation capstone course post implementation of the FOCUS Lab. Students that participated in the FOCUS Lab completed two or three simulations: once near the beginning of the semester and once

later in the semester or once near the beginning of the semester, once during the middle of the semester, and once later in the semester. Following each simulation, participants took part in an AAR and completed measures regarding teamwork and other performance measures. In addition to participating in the FOCUS Lab, test group students also completed an in-class portion of the aviation capstone class as well.

The comparison group consisted of graduates from the I/O Psychology program. Students' who graduated in Fall 2007, Spring 2008, Fall 2008, Spring 2009, Fall 2009, and Spring 2010 were contacted as the I/O pre condition. Students' in Fall 2011, Spring 2012, Fall 2012, Spring 2013, Fall 2013, and Spring 2014 were contacted as participants in the I/O post condition. A total of 91 I/O undergraduates were contacted. For participants in both the pre and post samples, updated participant contact information was obtained through the university, or other connections such as LinkedIn and Facebook. Surveys were sent out via Qualtrics and asked participants' about their initial job experience.

Measures

Some dependent measures for this study were adapted from previous studies and others were developed from relevant literature. *Individual task performance* measures include items adapted from Ashforth, Sluss & Saks (2007) and Williams & Anderson (1991). *Individual self-efficacy* items were adapted items from Sherer et al. (1982). *Organizational knowledge* uses items from Ashforth et al., (2007) study again. *Role clarity* items were borrowed from Haueter, Macan, & Winter (2003), and Rizzo et al.,

(1970). *Social acceptance* utilized items from Haueter et al. (2003), Morrison (1993), Myers & McPhee (2006), and Riddle, et al. (2000). *Turnover intentions* were adapted from Mowday, et al's. (1979), widely used scale. *Teamwork knowledge* items were adapted from Haueter et al. (2003). *Communication items* were used from Aguado et al., study (2014). Finally, for *coordination/collaboration* Ashforth et al., (2007) scale was again utilized. *Team-efficacy* items were adapted from self-efficacy. Additionally, for each construct, independently developed items were created and tested. Due to the limited number of items per scale that were selected, coefficient alphas for the source scales are not reported, but were conducted on pilot data to ensure internal consistency.

Pilot Test

Before solidifying the measures to send out to Aviation and I/O Psychology graduates, approximately 100 questions were presented to individuals via Qualtrics. See Appendix A. Participants were recruited from undergraduate and graduate psychology classes. Undergraduates were able to receive research participation credit for their time. Additionally, a survey link was posted via Facebook to recruit additional participants. Participants were asked if they currently work for an organization or have previously worked for an organization. If a participant responded "no" to both questions, they were self-selected out of the questionnaire. Quality checks were embedded to ensure quality data. For an example, a participant would read "This is a quality check, please answer 'A'". Results were aggregated and individuals who did not pass the embedded quality checks were removed. A total of 51 participants responded to the survey and 47

participants passed all three quality checks. A range of 31-35 valid responses were completed for each scale.

As part of the pilot test, internal consistencies for each scale were evaluated and items with low internal consistencies were removed from the survey. Once these items were dropped, the final internal consistencies were evaluated. In the individual performance category, *task performance* has an internal consistency of α =.860 with seven items and *self-efficacy* has five items remaining with an internal consistency of α =.845. In the adjustment to the job domain, *organizational knowledge* encompasses nine items with an internal consistency of α =.930, *role clarity* also has nine questions with an internal consistency of α =.916. *Social acceptance* uses six questions with an internal consistency of α =.928. *Turnover intentions*, utilizes three questions with an internal consistency of α =.898. Finally, for the teamwork section, *teamwork knowledge* asks seven questions and has an internal consistency of α =.903. *Communication* uses five questions and has an internal consistency of α =.758. *Coordination/collaboration* has seven questions and internal consistency of α =.890, and *team-efficacy* asks four questions for an internal consistency of α =.949. Participant's answers to "how often did you work as part of a team" and "how often did you work with others from differing specializations or departments" will be used to determine interdependence. See Appendix B for revised scale.

Procedure

Participants were contacted via e-mail from faculty in the Aviation department or I/O department respectively. Participants were asked to complete a program evaluation survey by following the link embedded in the e-mail. Once on the survey, participants were told that participation was voluntary and individual data would be kept confidential. Willing participants checked the informed consent box signifying that they had read the qualifying information and agreed to the terms of the study. Participants then were automatically led to the survey of approximately 70 questions, which took roughly 10 minutes to complete. Only students who had completed the FOCUS Lab were given questions pertaining specifically to the FOCUS Lab. Additionally, discipline specific questions were adapted for I/O Psychology graduates. See Appendix B for the aviation survey and Appendix C for the I/O survey. At the end of the survey, participants were thanked for their time and input and given researcher contact information for any additional questions.

As previously mentioned, in order to attempt to increase response rates, discipline specific e-mail inquiries were sent on behalf of professors via Qualtics. See Appendix D for an example of the initial e-mail contact. The survey opened on Tuesday, October 6th, 2015 at 8:00am CST and was open through Tuesday November 3rd, 2015 at 5:00pm CST. During this time, two reminder e-mails were sent to subjects who had yet to take or finish the survey. These reminders were sent via Qualtrics on Monday, October 19th, 2015 and Thursday, October 29th, 2015 at 8:00am CST. See Appendix E and Appendix F respectively.

Due to the small population size of both the pre and post I/O Psychology conditions, additional attempts were taken to contact subjects after the initial closing of the survey. Participants were located via LinkedIn or Facebook by the researchers and contacted again enlisting participation in the survey. See example communication in Appendix G below. The survey was reopened for this group between November 9th, 2015 and November 20th, 2015.

RESULTS

Sending Surveys

A total of 703 e-mails were initially sent in the aerospace condition, with 659 being deliverable. Of the deliverable contacts in the aerospace condition, 341 were in the pre-condition and 318 in the post-condition. Due to outdated or incorrect contact information, 19 emails could not be delivered in the aerospace pre-condition and 23 emails were undeliverable in the aerospace post-condition. Of the 91 subjects in the I/O Psychology condition 47 were in the pre-condition and 44 were in the post-condition. Two e-mails were undeliverable in the pre-condition and three e-mails were undeliverable in the post-condition. Ultimately, there were 322 viable potential respondents in the aerospace pre-condition, 295 potential respondents in the aerospace post-condition, 45 potential respondents in the I/O Psychology pre-condition, and 41 potential respondents in the I/O Psychology post-condition.

Response Rates

A total of 165 subjects responded to the survey. Of the 165 responses, 69 participants were from the aerospace pre-condition and 71 participants were from the aerospace post-condition for a response rate of 21.43% and 24.07% respectively. A total of seven participants responded in the I/O Psychology pre-condition and 18 participants in the I/O Psychology post condition for a response rate of 15.56% and 43.90% respectively. With this being said, please note that there are fluctuating response rates on individual items due to failure to respond, responses indicating N/A, and participant dropout.

Cleaning Data

Results from all participants were collected and aggregated into a single SPSS file. The data were cleaned to remove identifying information. All respondents were checked to ensure they passed two out of the three quality checkpoints. No participant's answers were removed based on the quality checks. Reverse worded items were recoded and variables were combined into their respective 10 scales (task performance, self-efficacy, organizational knowledge, role clarity, social acceptance, turnover intentions, teamwork knowledge, communication, coordination, and team-efficacy). Due to all turnover intention items being recoded, they will be referred to as continuation intentions in the results and discussion section from hereon after. All scale responses of (7) *N/A* were excluded from further analyses. Participants were coded into their respective discipline (Aerospace or I/O Psychology) and timeframe (pre or post). Initial descriptive statistics were conducted between the conditions and can be seen for Aerospace participants in Table 1 and I/O Psychology participants in Table 2. Responses ranges from (1) *Strongly Disagree* to (6) *Strongly Agree*.

TABLE 1

Descriptive Statistics for Aerospace

Variable	Condition	*M*	*SD*	*N*
Task Performance	Pre	4.09	0.85	62
	Post	4.08	0.89	67
Self-Efficacy	Pre	5.24	0.60	65
	Post	5.23	0.88	63
Organizational Knowledge	Pre	4.78	0.75	60
	Post	4.86	0.91	62
Role Clarity	Pre	5.12	0.68	61
	Post	5.11	0.78	64
Social Acceptance	Pre	4.85	0.83	62
	Post	4.97	0.96	62
Continuous Intentions	Pre	3.05	1.73	61
	Post	3.93	1.59	64
Teamwork Knowledge	Pre	4.98	0.63	48
	Post	5.03	0.89	50
Communication	Pre	4.83	0.71	47
	Post	4.71	1.01	49
Coordination	Pre	4.59	0.68	47
	Post	4.67	0.76	48
Team-Efficacy	Pre	5.11	0.51	49
	Post	5.17	0.82	49

TABLE 2

Descriptive Statistics for Industrial and Organizational Psychology

Variable	Condition	*M*	*SD*	*N*
Task Performance	Pre	4.21	0.44	6
	Post	4.10	0.90	16
Self-Efficacy	Pre	5.28	0.59	5
	Post	5.26	0.54	17
Organizational Knowledge	Pre	4.89	0.67	4
	Post	4.70	0.65	15
Role Clarity	Pre	4.80	0.87	5
	Post	5.08	0.56	15
Social Acceptance	Pre	4.77	1.71	5
	Post	4.86	0.75	15
Continuous Intentions	Pre	3.80	1.50	5
	Post	3.19	1.89	14
Teamwork Knowledge	Pre	4.60	1.05	5
	Post	5.00	0.26	11
Communication	Pre	4.70	0.58	4
	Post	4.62	0.70	13
Coordination	Pre	3.96	1.00	4
	Post	4.56	0.74	10
Team-Efficacy	Pre	4.38	0.66	4
	Post	5.23	0.58	11

To test the hypotheses, additional variables were created. An adjustment to the job variable was created by averaging respondent's ratings from organizational knowledge, role clarity, and social acceptance. Additionally, an interdependence variable was computed by averaging participant's reported time working as part of a team and time working with others from differing departments.

Internal Consistencies

Scales were reanalyzed for internal consistencies using Cronbach's alpha with the new sample. All internal consistencies were within good limits ranging from α = .810-.939. Specifically, the seven *task performance* items had an internal consistency of α = .810. The five *self-efficacy* items had an internal consistency of α = .863. The nine *organizational knowledge* items had an internal consistency of α = .900. The nine *role clarity* items had an internal consistency of α = .928. The six *social acceptance* items had an internal consistency of α = .904. The three *continuation intentions* items showed an internal consistency of α = .918. The seven *teamwork knowledge* items had an internal consistency of α = .915. The five *communication* items had an internal consistency of α = .840. The seven *coordination and collaboration* items had an internal consistency of α = .813. Finally, the four *team-efficacy* items had an internal consistency of α = .939. Due to the high internal consistencies of each scale, no items were removed.

2x2 ANOVAs

Individual Performance

2x2 ANOVAs were conducted for each of the ten scales based on time and major. Results from *task-performance* indicated that there were no significant main effects between major, F (1,147) = 0.11, p = .744; time, F (1,147) = 0.09, p = .765; or the interaction major*time, F (1,147) = 0.05, p = .819. Results from *self-efficacy* indicated that there were no significant main effects between major, F (1,146) = 0.03, p = .858; time, F (1,146) = 0.01, p = .946; or the interaction major*time, F (1,146) = 0.01, p = .967.

Adjustment to the Job

Additionally, results from *organizational knowledge* indicated that there were no significant main effects between major, F (1,137) = 0.01, p = .916; time, F (1,137) = 0.05, p = .817; or the interaction major*time, F (1,137) = 0.32, p = .572. Results from *role clarity* indicated that there were no significant main effects between major, F (1,141) = 0.82, p = .368; time, F (1,141) = 0.49, p = .487; or the interaction major*time, F (1,141) = 0.54, p = .464. Results from *social acceptance* indicated that there were no significant main effects between major, F (1,140) = 0.16, p = .686; time, F (1,140) = 0.18, p = .676; or the interaction major*time, F (1,140) = 0.01, p = .949. Results from *continuation intentions* indicated that there were no significant main effects between major, F (1,140) < 0.00, p = .997; time, F (1,140) = 0.08, p = .772; or the interaction major*time, F (1,140) = 2.59, p = .109.

Teamwork

Results from *teamwork knowledge* indicated that there were no significant main effects between major, F (1,110) = 0.89, p = .348; time, F (1,110) = 1.08, p = .302; or the interaction major*time, F (1,110) = 0.66, p = .420. Results from *communication* indicated that there were no significant main effects between major, F (1,109) = 0.17, p = .678; time, F (1,109) = 0.16, p = .695; or the interaction major*time, F (1,109) = 0.01, p = .947. Results from *coordination* indicated that there were no significant main effects between major, F (1,105) = 2.57, p = .112; time, F (1,105) = 2.14, p = .146; or the interaction major*time, F (1,105) = 1.24, p = .267. Finally, results from *team-efficacy* indicated that there were no significant main effects between major, F (1,109) = 2.68, p = .105; however, there was a significant main effect for time, F (1,109) = 4.80, p = .031; and the interaction major*time approaching significance, F (1,109) = 3.69, p = .057. The significant main effect for time suggests that those in the post conditions (M = 5.18, SD = 0.78) reported higher ratings on team-efficacy than those in the pre-condition (M = 5.06, SD = 0.55). Furthermore, the interaction approaching significance suggests that those who participated in the FOCUS Lab were slightly more likely to rate team-efficacy positively (M=5.17, SD = 0.82) than those in the aerospace pre condition (M = 5.11, SD = 0.51), while the pre-post difference was greater for I/O participants (post M = 5.23, SD = 0.58 vs. M = 4.38, SD = 0.66 for pre). See Table 3.

TABLE 3

2x2 ANOVA Between Major and Time

		F	*p*
Major			
	Self-Efficacy	0.03	.858
	Task-Performance	0.11	.744
	Teamwork Knowledge	0.89	.348
	Communication	0.17	.678
	Coordination	2.57	.112
	Team-Efficacy	2.68	.105
	Social Acceptance	0.16	.686
	Organizational Knowledge	0.01	.916
	Continuous Intentions	<0.01	.997
	Role Clarity	0.82	.368
Time			
	Self-Efficacy	0.01	.946
	Task-Performance	0.09	.765
	Teamwork Knowledge	1.08	.302
	Communication	0.16	.695
	Coordination	2.14	.146
	Team-Efficacy	4.80*	.031
	Social Acceptance	0.18	.676
	Organizational Knowledge	0.05	.817
	Continuous Intentions	0.08	.772
	Role Clarity	0.49	.487
Interaction			
	Self-Efficacy	0.01	.967
	Task-Performance	0.05	.819
	Teamwork Knowledge	0.66	.420
	Communication	0.01	.947
	Coordination	1.24	.267
	Team-Efficacy	3.69	.057
	Social Acceptance	0.01	.949
	Organizational Knowledge	0.32	.572
	Continuous Intentions	2.59	.109
	Role Clarity	0.54	.464

* $p<.05$

Independent t-tests

Although there was little significance found for pre post main effects and interactions, which suggests little support for the hypotheses, analyses of only the aerospace discipline provides a more precise evaluation. As a follow up, independent t-tests for pre and post Aerospace and pre and post I/O Psychology were run. See Table 4 and Table 5 respectively. Largely, the results from the independent t-test confirm initial findings. Hypothesis 1 indicated that participants in the FOCUS Lab would hold higher beliefs about their initial ability to perform their job adequately than those who did not complete the FOCUS Lab. No significance was found for self-efficacy in either Aerospace, t (126, 109.10) = 0.04, p = .969 or I/O Psychology, t (20, 6.15) = 0.07, p = .945. These results are not in support of hypothesis 1.

TABLE 4

Independent t-test for Aerospace

				95% CI	
Variable	*n*	*t*	*p*	Llmt	Ulmt
Task Performance	129	0.10	.920	-0.29	0.32
Self-Efficacy	128	0.04	.969	-0.26	0.27
Organizational Knowledge	122	-0.53	.594	-0.38	0.22
Role Clarity	125	0.06	.954	-0.25	0.27
Social Acceptance	124	-0.75	.454	-0.44	0.20
Continuous Intentions	125	-2.95*	.004	-1.47	-0.29
Teamwork Knowledge	98	-0.32	.750	-0.36	0.26
Communication	96	0.67	.505	-0.23	0.47
Coordination	95	-0.54	.591	-0.37	0.21
Team-Efficacy	98	-0.41	.684	-0.33	0.22

*p<.05

TABLE 5

Independent t-test for Industrial and Organizational Psychology

				95% CI	
Variable	*n*	*t*	*p*	Llmt	Ulmt
Task Performance	22	0.40	.691	-0.49	0.72
Self-Efficacy	22	0.07	.945	-0.70	0.74
Organizational Knowledge	19	0.51	.632	-0.80	1.18
Role Clarity	20	-0.68	.528	-1.34	0.78
Social Acceptance	20	-0.11	.915	-2.18	2.01
Continuous Intentions	19	0.73	.487	-1.29	2.51
Teamwork Knowledge	16	-0.84	.445	-1.69	0.89
Communication	17	0.24	.816	-0.77	0.94
Coordination	14	-1.08	.338	-2.07	0.89
Team-Efficacy	15	-2.28	.074	-1.82	0.12

*$p<.05$

Hypothesis 2 indicated that participants of the FOCUS Lab would have higher initial self-rated individual performance than those who did not complete the FOCUS Lab training. No significance was found for task performance in either Aerospace, t (127, 126.89) = 0.10, p = .920 or I/O Psychology, t (20, 18.08) = .40, p = .691. These results are not in support hypothesis 2.

Hypothesis 3 stated that students who participated in the FOCUS Lab would experience an easier transition into their first job and adjust better to the job overall than graduates who did not complete the FOCUS Lab. No significance was found for organizational knowledge in either Aerospace, t (120, 117.34) = -0.53, p = .594 or I/O

Psychology, t (17, 4.60) = 0.51, p = .632. These results are not in support of hypothesis 3a. No significance was found for role clarity in either Aerospace, t (123, 122.09) = 0.06, p = .954 or I/O Psychology, t (18, 5.15) = -0.68, p = .528. These results are not in support of hypothesis 3b. No significance was found for social acceptance in either Aerospace, t (122, 119.61) = -0.75, p = .454 or I/O Psychology, t (18, 4.53) = -0.11, p = .915. These results are not in support of hypothesis 3c. Significance was shown between pre and post Aerospace conditions for continuation intentions, t (123,120.92) = -2.95, p = .004, but not among I/O Psychology, t (17, 8.94) = 0.73, p = .487. These findings indicate that continuation intentions were higher among those in the aerospace post condition. These results are in support of hypothesis 3d.

Hypothesis 4 indicated that students who participated in the FOCUS Lab would report better teamwork skills at the beginning of employment, compared to participants who did not complete the FOCUS Lab. No significance was found for *teamwork knowledge* in either Aerospace, t (96, 88.31) = -0.32, p = .750 or I/O Psychology, t (14, 4.23) = -0.84, p = .445. These results are not in support of hypothesis 4a. No significance was found for *communication* in either Aerospace, t (94, 86.47) = 0.67, p = .505 or I/O Psychology, t (15, 6.06) = 0.24, p = .816. These results are not in support of hypothesis 4b. No significance was found for *coordination* in either Aerospace, t (93, 92.22) = -0.54, p = .591 or I/O Psychology, t (12, 4.38) = -1.08, p = .338. These results are not in support of 4c. No significance was found for *team-efficacy* in either

Aerospace, t (96, 79.94) = -0.41, p = .684 or I/O Psychology, t (13, 4.77) = -2.28, p = .074. These results are not in support of 4d.

Mediation

Hypothesis 5 indicated that adjustment to the job would mediate the relationship between FOCUS Lab completion and continuation intentions so that students who completed the FOCUS Lab would have higher adjustment to the job and therefore higher continuation intentions compared to student who only received the lecture portion of class. Again, an adjustment to the job variable was created by averaging respondent's ratings from *organizational knowledge*, *role clarity,* and *social acceptance*. As shown above, FOCUS Lab training is a significant predictor of continuation intentions so that those who participated in the FOCUS Lab are more likely to report intentions to stay at their current job, t = 2.96, p = .004. When the relationship between FOCUS Lab training and adjustment to the job was explored it was shown to be non-significant t(1,136) = 0.58, p = .562. Mediation is not plausible due to the lack of significance between FOCUS Lab training and adjustment to the job. Hypothesis 5 is not supported by these results.

Regression

Hypothesis 6 indicated that participants who perceived role clarity would have higher continuation intentions compared to individuals who did not perceive role clarity. A regression analysis was conducted to see if there was a relationship between role clarity and continuation intentions for participants who had the FOCUS Lab training.

Results indicated that there was not a significant relationship for aerospace pre, $r(1,58) = .234$, $t = 1.83$, $p = .072$, aerospace post, $r(1,61) = .096$, $t = -0.75$, $p = .454$, I/O Psychology pre, $r(1,3) = .300$, $t = -0.54$, $p = .624$, or I/O Psychology post, $r(1,12) = .318$, $t = 1.16$, $p = .270$. These results do not support hypothesis 6.

Moderation

Hypothesis 7 indicated that task interdependence would be a moderator of the effect of the FOCUS Lab participation on various facets of teamwork. Again, an interdependence variable was computed by averaging participant's reported time working as part of a team and time working with others from differing departments. Hierarchical regression analyses were used to assess interdependence as a moderator of the relationship between FOCUS Lab participation and teamwork knowledge, communication, coordination, and team-efficacy while controlling for FOCUS Lab training and interdependence as main effects. FOCUS Lab training and interdependence were entered at step 1 and the interaction term was entered in step 2. Results can be seen in Table 6. The interaction was significant for *teamwork knowledge*, $t = 3.05$ $p = .003$, c*ommunication*, $t = 3.60$, $p = .001$, and *team-efficacy*, $t = 3.48$, $p = .001$. The interaction was approaching significance for *coordination/collaboration*, $t = 1.92$, $p = .058$. These results suggest for participants who had FOCUS Lab training, there is a relationship between interdependence and teamwork knowledge, communication, coordination/collaboration, and team-efficacy. Specifically, as the amount of interdependence that is required in the first six months on the job increases, so do positive

outcomes such as *teamwork knowledge, r* = .60, *p* < .001, *communication, r* = .64, *p* < .001, *coordination/collaboration, r* = .42, p = .003 and *team-efficacy, r* = .57, *p* < .001. Conversely, aerospace respondents that partook in only the lecture portion of the capstone course do not show a relationship between interdependence and *teamwork knowledge, r* = .22, *p* = .129, *communication, r* = .19, *p* = .193, *coordination/collaboration, r* = .10, *p* = .502, or *team-efficacy, r* = .16, *p* = .271. These results are in support of Hypotheses 7a, 7b. 7c and 7d. Correlations can be seen in Table 7.

TABLE 6

Hierarchical Linear Regression for Interdependence

		t	*p*
Teamwork Knowledge			
	FOCUS Training	0.04	.969
	Interdependence	4.63	<.001
	FOCUS Training *Interdependence	3.05*	.003
Communication			
	FOCUS Training	-1.05	.296
	Interdependence	4.72*	<.001
	FOCUS Training *Interdependence	3.60*	.001
Coordination			
	FOCUS Training	0.33	.743
	Interdependence	2.57*	.012
	FOCUS Training *Interdependence	1.92	.058
Team-Efficacy			
	FOCUS Training	<0.01	.999
	Interdependence	3.96	<.001
	FOCUS Training *Interdependence	3.48*	.001

*p<.05

TABLE 7

Pearson Correlations Among the Variables

		Pearson Correlations			
		2	3	4	5
Pre					
	1. Interdependence	.22	.19	.10	.16
	2. Teamwork Knowledge		.60**	.48**	.47**
	3. Teamwork Communication			.47**	.46**
	4. Teamwork Coordination and Collaboration				.57**
	5. Team Efficacy				
Post					
	1. Interdependence	.60**	.64**	.42**	.57**
	2. Teamwork Knowledge		.86**	.34**	.76**
	3. Teamwork Communication			.39**	.68**
	4. Teamwork Coordination and Collaboration				.44**
	5. Team Efficacy				

*$p<.05$
**$p<.001$

To get a more complete understanding, the two components of interdependence, (time working as part of a team and time working with differing specializations) were examined individually. Because interdependence was rated on a four category response scale, the interaction of FOCUS Lab participation and interdependence was examined using a series of two by four ANOVAs. Separate analyses were conducted for each of the four teamwork dependent variables (*teamwork knowledge, communication, coordination, and team-efficacy*). For the aerospace post condition, there was a significant increase in teamwork with interdependence, that was not found in the aerospace pre condition. Specifically, results showed that for the interaction of how often respondents worked in a

team and FOCUS Lab training there was significance for *teamwork knowledge*, F (3, 98) = 4.19, p = .008, *communication*, F (3, 96) = 11.81, p < .001, and *team-efficacy*, F (3, 98) = 6.27 p = .001. For Aerospace participants with FOCUS Lab training, these facets of teamwork tended to increase with higher levels of task interdependence while this pattern was not observed in Aerospace participants without FOCUS Lab training. Results were not significant for *coordination*, F (3, 95) = 1.92, p = .133. Additionally, results showed that for the interaction of how often respondents worked with differing departments and FOCUS Lab training there was significance for *teamwork knowledge*, F (3, 98) = 3.04, p = .033. Focus Lab participants indicated higher levels of teamwork knowledge as task interdependence increased while this pattern was not observed for Aerospace graduates without FOCUS Lab training. Results were not significant for *communication*, F (3, 96) = 1.81, p = .152, *coordination*, F (3, 95) = 0.515, p = .673, and approached significance for *team-efficacy*, F (3, 98) = 2.43 p = .070. See Tables 8, 9, 10, and 11 for descriptive statistics.

TABLE 8

Descriptive Statistics for Interdependence and Teamwork Knowledge

		M	*SD*	*n*
How often respondents worked as part of a team				
Pre				
	0%-25%	4.66	0.87	5
	26%-50%	4.84	0.81	9
	51%-75%	4.88	0.48	6
	76%-100%	5.10	0.54	28
Post				
	0%-25%	3.21	1.93	4
	26%-50%	4.73	0.67	7
	51%-75%	5.23	0.42	10
	76%-100%	5.28	0.51	29
How often respondents worked with others from differing specializations				
Pre				
	0%-25%	4.85	0.64	14
	26%-50%	5.14	0.70	5
	51%-75%	4.91	0.72	11
	76%-100%	5.08	0.56	18
Post				
	0%-25%	4.04	1.66	8
	26%-50%	5.04	0.48	8
	51%-75%	5.12	0.32	18
	76%-100%	5.42	0.61	16

TABLE 9

Descriptive Statistics for Interdependence and Communication

		M	*SD*	*n*
How often respondents worked as part of a team				
Pre				
	0%-25%	5.27	0.71	6
	26%-50%	4.43	0.70	7
	51%-75%	4.37	0.91	6
	76%-100%	4.93	0.61	28
Post				
	0%-25%	2.55	1.24	4
	26%-50%	4.27	1.09	6
	51%-75%	4.88	0.46	10
	76%-100%	5.03	0.70	29
How often respondents worked with others from differing specializations				
Pre				
	0%-25%	4.56	0.85	14
	26%-50%	5.00	0.58	5
	51%-75%	4.56	0.79	10
	76%-100%	5.13	0.45	18
Post				
	0%-25%	3.82	1.49	9
	26%-50%	4.51	1.15	7
	51%-75%	4.73	0.57	17
	76%-100%	5.26	0.64	16

TABLE 10

Descriptive Statistics for Interdependence and Coordination

		M	*SD*	*n*
How often respondents worked as part of a team				
Pre				
	0%-25%	4.46	0.89	5
	26%-50%	4.67	0.67	9
	51%-75%	4.45	0.41	6
	76%-100%	4.62	0.72	27
Post				
	0%-25%	3.57	0.94	3
	26%-50%	4.40	0.49	6
	51%-75%	4.49	0.88	11
	76%-100%	4.91	0.63	28
How often respondents worked with others from differing specializations				
Pre				
	0%-25%	4.52	0.63	13
	26%-50%	4.51	0.39	5
	51%-75%	4.49	0.97	11
	76%-100%	4.72	0.60	18
Post				
	0%-25%	4.25	0.93	8
	26%-50%	4.74	0.57	6
	51%-75%	4.60	0.84	18
	76%-100%	4.94	0.58	16

TABLE 11

Descriptive Statistics for Interdependence and Team-Efficacy

		M	SD	n
How often respondents worked as part of a team				
Pre				
	0%-25%	5.14	0.38	7
	26%-50%	4.97	0.73	8
	51%-75%	4.88	0.49	6
	76%-100%	5.20	0.46	28
Post				
	0%-25%	3.50	2.18	3
	26%-50%	4.82	0.77	7
	51%-75%	5.23	0.45	11
	76%-100%	5.41	0.48	28
How often respondents worked with others from differing specializations				
Pre				
	0%-25%	5.01	0.43	15
	26%-50%	5.13	0.21	6
	51%-75%	5.05	0.71	10
	76%-100%	5.22	0.52	18
Post				
	0%-25%	4.41	1.51	8
	26%-50%	5.07	0.64	7
	51%-75%	5.21	0.40	18
	76%-100%	5.55	0.51	16

DISCUSSION

The FOCUS Lab was implemented to train aerospace students in a realistic aviation setting. While previous studies have shown that participants of the FOCUS Lab like the training they receive in the FOCUS Lab and are learning and improving across simulations regardless of the increase in difficulty, there had not been a study looking to see if these skills transfer beyond the simulations (Littlepage et al., 2013; Littlepage, Hein, Moffett, Craig, & Georgiou, 2015). Current results provide support that teamwork skills learned in the FOCUS Lab transfer to respondent's first job post-graduation so that respondents are more likely to report continuation intentions. In addition, FOCUS Lab participants tended to report greater teamwork competencies when their jobs required a high level or interdependence while other Aerospace graduates did not display this pattern.

Hypothesis one stated that participants in the FOCUS Lab would hold higher beliefs about their initial ability to perform their job adequately than those who did not complete the FOCUS Lab. Similarly, hypothesis two stated that participants of the FOCUS Lab would have higher initial self-rated individual performance than those who did not complete the FOCUS Lab. There was no support that FOCUS Lab training had any significant benefits on these variables. The lack of reported significance may be due to the type of training that is conducted in the FOCUS Lab. Specifically, the FOCUS Lab trains participants on team competencies which are shown to differ than the competencies needed to perform individually (Aguado et al., 2014). Therefore, if a graduate were hired

onto a job that does not require those teamwork competencies the teamwork knowledge, skills, and abilities they learned would not be applicable.

Hypothesis three stated that students who participated in the FOCUS Lab would experience an easier transition into their first job and adjust better to the job overall than graduates who did not complete the FOCUS Lab. Specifically, we predicted that those who participated in the FOCUS Lab would report higher levels of organizational knowledge, higher levels of role clarity, higher levels of social acceptance, and lower levels of turnover intentions. There was no support that FOCUS Lab training had any significant benefits overall except for decreasing turnover intentions (increasing continuation intentions). The reduction in turnover intentions is thought to be because of the realistic job preview that students receive by participating in the FOCUS Lab. A realistic job preview gives potential employees, in our case students, a realistic look at the job's duties and expectations (Wanous, 1973). Furthermore, realistic job previews can also provide a glimpse into the working conditions of one's job such as collaborating with others extensively. Realistic job previews lead to organizational commitment and increased job survival by decreasing turnover (Buckley et al., 1998; Premack & Wanous, 1985; Vandenberg & Scarpello, 1990; Wanous, 1973).

Hypothesis four stated that students who participated in the FOCUS Lab would report better teamwork skills at the beginning of employment, including teamwork knowledge, communication, coordination, and team-efficacy, compared to participants who did not complete the FOCUS Lab. There was no support that FOCUS Lab training

had any significant benefits on teamwork knowledge, communication, coordination, or team-efficacy. However as discussed below in hypothesis seven, interdependence was shown to moderate the relationship.

Hypothesis five stated that adjustment to the job would mediate the relationship between FOCUS Lab completion and turnover intentions so that students who completed the FOCUS Lab would have higher adjustment to the job and therefore lower turnover intentions, compared to students who only received the lecture potion of class. Results from the 2x2 ANOVA indicated that continuation intentions were higher among participants in the aerospace post condition. This suggests that those who graduated after receiving the FOCUS Lab training were more likely to report intentions to stay in their job within the first six months of employment. Again, these results are thought to be due to the effects of the realistic job preview that student's receive in the FOCUS Lab. Realistic job previous have been shown to decrease turnover intentions in addition to other positive outcomes (Buckley, Fedor, Veres, & Wiese, 1998; Premack & Wanous, 1985; Vandenberg & Scarpello, 1990; Wanous, 1973). It was further predicted in hypothesis six that participants who perceive role clarity would have lower turnover intentions compared to individuals who do not perceive role clarity. Again, while significant results for the relationship between FOCUS Lab training and increasing continuation intentions was found, the presence of role clarity was not shown to strengthen this relationship.

Finally, hypothesis seven stated that interdependence would be a moderator of the effect of FOCUS Lab participation on various facets of teamwork including teamwork knowledge, communication, coordination, and team-efficacy. As mentioned above, there was no support that FOCUS Lab training had any significant benefits overall; however, the intent of the FOCUS Lab is to train student on interdependent job requirements in aviation. Results indicated that when respondents who had participated in the FOCUS Lab and reported higher levels of interdependence on the job were more likely to understand how to successfully work with a team, interchange information between team members, interact within a team to achieve a shared goal, and believe that their team can perform effectively. These results are consistent with previous team training research which suggest quality training leads to increased performance particularly when individuals are required to work with others during stress and high workloads (Dispatch Resource Management Training, 2005; Salas et al., 2012). This also supports the notion that the teamwork knowledge and skills that students receive in the FOCUS Lab are translated to their first job post-graduation when interdependence is required on the job.

While best practices were applied for this study and within the design and operation of the FOCUS Lab, there are still shortcomings that may have led to the lack of significance in the first six hypotheses. Limitations include problems with participant's memory, inadequacies of the FOCUS Lab, lack of cross training, and training in teams that do not perform together once on the job. These possible limitations are discussed further below.

Memory/Self-report

As numerous studies have shown, human memory does not accurately depict what actually occurred (Winkelspecht, & Mowler, 1999). Individuals tend to reconstruct the past in a more positive light (Cowley, 2008). This is often done subconsciously by selecting positive moments of a past event to remember and recall (Cowley, 2008). Research has shown that when people evaluate experiences in the past, they do not sum all of the past information that makes up their actual experiences. Instead, when recalling past experiences, individuals only pull a few major experiences to memory that are then combined into an overall memory of that experience (Ariely & Carmon, 2000; Cowley, 2008). To fill in the gaps, a person may even inflate past positive memories or create new positive moments that did not previously occur (Cowley, 2008).

Additionally, when individuals acquire new information after an event has passed, the new information often alters their recollection of that past event when they are asked to recall it (MacLeod & Saunders, 2008; Winkelspecht, & Mowler, 1999). This leads to misleading post event information contaminating the original material that makes up a past event (MacLeod & Saunders, 2008). For the current study, the time overlap between graduation and self-reporting initial performance on the job was not the same for those who did not complete the FOCUS Lab vs. those who did. Participants who did not complete the FOCUS Lab were asked to think back to experiences from 5 years ago to 8 years ago. On the other hand, participants who completed the FOCUS Lab are recalling information from 1 year ago to 4 years ago. By asking participants to self-report on

memories so far into the past we are likely measuring some degree of error in their responses. Additionally, since we only were able to ask participants to report information via self-ratings we were not able to confirm these responses with supervisors to cross check with employee ratings.

Cross Training

In addition to memory issues, the FOCUS Lab might not do an adequate job of training participants on other's positions. While FOCUS Lab participants are able to learn their positions well and learn how to communicate and coordinate in a simulated flight operation center, they do not get the chance to experience the other positions in the Lab first hand due to time constrains within the semester. Research has shown that cross training is a critical component in training highly interdependent teams (Marks, Sabella, Burke, & Zaccaro, 2002). Cross training involves team members rotating positions throughout training in order to better understand the knowledge, skills, and abilities required of each team member in each position (Salas, Nichols, & Driskell, 2007).

Previous research has shown that cross-trained teams outperformed teams that were not cross-trained on team tasks when measured on objective performance measures (Volpe, Cannon-Bowers, & Salas, 1996). Additionally, cross training team members has been shown to improve team's processes, ability to coordinate, communicate, and predict the needs of other teammates (Volpe et al., 1996). While cross training is shown to be effective across all teams, it is particularly critical for action teams, or teams that are highly interdependent, such as flight operation centers (Marks et al., 2002).

Environment

As mentioned above, there are a number of different factors that affect overall team performance including the organizational context and team composition (Volpe et al., 1996). Research has shown that training is most effective in the context where individuals will be performing. If this is not available, a similar environment is recommended. Although the FOCUS Lab was created based off Delta's operation center, this does not mean that it is a similar context to all airline industries operation center that participants enter after graduation.

Team Composition

In addition to organizational context, team composition also plays a role in a successful performance. Correctly composing a team is complex and members must be assembled and trained purposefully (Mathieu, Tannenbaum, Donsbach, & Alliger, 2013). In environments where individuals are required to coordinate quickly, teams that are familiar with each other and able to anticipate each other's needs are better able to perform effectively (Salas et al., 2007). Specifically, familiar teams have higher success rates, better accuracy, and shorter response times (Espevik, Johnsen, & Eid, 2011). For this reason, the use of intact teams is recommended for training (Salas et al., 2007). It is widely accepted in the literature that optimal team training occurs best in already intact teams that will be performing together (Guzzo & Salas, 1995; Salas et al., 2007). Training teams together allows members to learn how to communicate together and improves performance (Moreland & Myaskovsky, 2000). Intact team training is

especially important for teams that will be performing in dynamic environments such as aviation (Marks, Zaccaro, & Mathieu, 2000).

By training in intact teams, team members are also able to familiarize themselves with those they will be performing with. Familiar teams have been shown to have more implied and unspoken communication that is well understood among team members (Espevik et al., 2011). In situations that are unfamiliar, teams where members have previously worked together outperform unfamiliar teams (Espevik et al., 2011; Moreland & Myaskovsky, 2000). Teams where team members were familiar with one another showed greater performance compared to their unfamiliar counterparts (Espevik et al., 2011). While the FOCUS Lab is able to acquaint participants and train in familiar teams throughout the semester, once on the job participants will no longer be working with the same familiar teams. This lack of team familiarity and not being able to train in intact team may be a reason that not all of the hypothesized competencies transferred to the job.

Limitations & Future Suggestions

The pretest-posttest design utilized is not robust to internal validly threats like maturation and history effect discussed above (Shadish, Cook, & Campbell, 2003). Ideally, this study should have been conducted sooner after the implementation of the FOCUS Lab to mitigate the timeframe since participants had graduated. In the future, to rectify possible confounds surveys should be sent out to graduating classes periodically to track the progress of the FOCUS Lab. As previously mentioned, future research should attempt to utilize methods other than self-report methods such as objective performance

reviews from the employee's initial period on the job. Additionally, although a control group was utilized, the sample turned out to relatively small proving problematic. In the future, other control groups should be examined such as aviation students graduating from other universities. This would allow us to more completely rule out time-related confounding variables.

Furthermore, there are some limitations within the FOCUS Lab itself. The FOCUS Lab is a training lab first and a research lab second, therefore we cannot control and have the standardization typically preferred for a research study. There are also a number of extraneous factors that we were not able to control for that may have influenced this study including participant's previous aviation experience, work environment, student's success in the FOCUS Lab seminar class, and improvements that occurred to the Lab over the last five years.

While there are a number of factors that are out of the FOCUS Lab's control such as the organizational context and team composition of where graduates go work, there are suggestions that might aid in the transfer or training from the Lab (Baldwin & Ford, 1998 & Ettington & Camp, 2002). Transfer of training interventions can occur during three different phases of training: pre-training, during training, and after training. Due to time and practical constraints, the FOCUS Lab can implement transfer of training techniques during the pre-training stage and during training. Pre-training interventions should aim to improve student's motivation to learn, increase student's efficacy prior to training, and demonstrate departmental support for the FOCUS Lab's training (Kraiger, 2002). In

order to accomplish these three interventions, the FOCUS Lab should consider implementing goal setting. Goals set by students before partaking in simulations should focus on participation and learning *not* performance goals. Furthermore, the FOCUS Lab could allow participants to take part in making decisions to help increase motivation. A practical implementation of this in the Lab might include allowing students to choose their top three positions they would like to occupy in the Lab. As it stands, students are assigned positions before the start of the semester and have no say in what role they will take on. Finally, FOCUS Lab staff should help facilitate the development of learning techniques. Throughout college most students are performance oriented (e.g. grades); however, in order to learn effectively we need to teach students how to become learner oriented (e.g. understanding the material). The FOCUS Lab should emphasize learning outcomes of the Lab such as improved teamwork knowledge and deemphasize performance outcomes such as financial penalties.

Transfer of training interventions should also be examined and implemented during the course of student's training. Interventions taken during the course of training should aim to improve student's understanding and adaptive expertise, improve student's intentions to transfer the training, and improve student's reactions to the training (Kraiger, 2002). These aforementioned goals can be achieved by using real-life situations that students are familiar with. Although triggers are pulled from industry experiences from past graduates, experiences from aerospace faculty, and current news stories it does not necessarily mean that students are familiar with these situations. It may prove useful

to start to incorporate FOCUS Lab situations into aviation classes prior to the FOCUS Lab to help students understand the severity and correct responses to the triggers. Additionally, during this time, it may be beneficial to help students develop skills such as planning, monitoring, and evaluation, setting short term and long term goals that facilitates transfer of training. During the rotations from FOCUS Lab, to AAR, there is a class portion where students work on professional development. During this time, students could be taught to develop the above skills. Finally, the FOCUS Lab and its staff should ensure that they are creating a positive training climate. It is important to monitor the team dynamics and ensure that not only are students reporting positive outcomes at an individual level, but are also reporting positive feelings and outcomes with the whole group. This could particularly be addressed in the after action reviews.

Consistent with other scholars, we believe that further research is still needed to best determine how to train team employees in aviation in order to reduce errors and improve performance (Merket, Bergondy, & Salas, 1999).

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APPENDICES

APPENDIX A

Pilot Survey

Individual Performance

The purpose of this section is to determine how you rate your own work performance during the first 3 months on this job. For each of the following areas of performance, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Somewhat Agree (4)	Agree (5)	Strongly Agree (6)

Task Performance

1. I immediately knew how to do the technical aspects of *my job*.
2. It took me some time to learn the details of *my job*.
3. It was easy to step in and do *my job*.
4. From the beginning, I had a good grasp of the requirements of *my job*.
5. I was well prepared to perform my *individual* job duties.
6. Almost immediately, I was good at *my job*.
7. There were many aspects of *my job* that were new to me.
8. I was able to meet the performance requirements of *my* job
    a. Williams & Anderson, 1991
9. I was able to work with limited guidance or supervision.
    a. Ashforth et al., 2007

Self-efficacy (Individual)

1. I felt confident in my ability to perform my individual job duties.
2. I felt I could learn to perform my individual job duties at a high level of performance.
3. I was confident I could quickly learn to perform my individual job duties well.
4. I was confident that I could perform my individual job duties efficiently.
5. If I decided to do something, I went right to work on it.
6. When I was trying to learn something new on the job, I gave up quickly if I was not able to succeed.

7. When unexpected problems occurred, I felt confident I could handle them well
8. When I accepted a task on the job, I was certain I could accomplish it
9. When I set important goals at work I almost always was able to achieve them
10. Even if a task was very complicated, I would work hard to accomplish it
    a. 5-10 Adapted from Sherer et al., 1982

Adjustment

The purpose of this section is to determine how you rate your overall adjustment during the first 3 months on this job. For each of the following areas of performance, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Somewhat Agree (4)	Agree (5)	Strongly Agree (6)

Organizational Knowledge:

1. I knew how to acquire resources needed to perform my job.
2. I understood the operations of my organization.
3. I understood my organization's objectives and goals.
4. I understood how various departments contributed to my organization's goals.
5. I understood what was meant when other employees used organizational and job relevant language.
6. I understood the organizational policies and procedures.
7. I understood the structure of my organization.
8. I understood the financial position and / or performance of my organization.
9. I understood who makes the important decisions in my organization.
10. I understood how to deal with politics at my job.
11. I understood the company's culture and goals.
12. I understood who controls critical resources in my organization.
    a. Ashforth et al., 2007

Role Clarity:

1. I understood how to perform the tasks that make up my job.
2. I understood which job tasks and responsibilities had priority.
3. I knew when to inform my supervisor about work.

    a. Haueter et al., 2003
4. I understood what all the duties of my job entailed.
    a. Chao, O'Leary-Kelly, Wolf, Klein & Gardner, 1994
5. I knew what constituted acceptable job performance.
    a. Hauter et al., 2003
6. I felt certain about how much authority I had within my unit and organization.
7. I understood the performance standards associated with my job position.
8. I understood the responsibilities associated with my job position.
9. I understood what it took to succeed in my organization.
10. I knew exactly what was expected of me in my job.
    a. 9&10 Rizzo, J., House, R.J., & Lirtzman, S.I. (1970). Role conflict and ambiguity in complex organizations.

Social Acceptance

1. I understood how to act to fit in with my organization
    a. Haueter et al, 2003
2. I understood how to get along with people in my organization.
3. I understood the behaviors and personalities of my coworkers.
4. I understood appropriate ways to behave and interact in my organization.
5. I understood the behaviors and attitudes my organization expected.
6. Coworkers involved me in social conversations.
7. My coworkers recognized me as a contributing member of our work team.
8. I quickly gained the trust of my coworkers.
9. I quickly gained the respect of my coworkers.
10. I soon felt I could depend on coworkers for support.
11. Coworkers helped me adjust to the new job.
12. I could talk with some of my coworkers about personal matters.
13. Before long, I felt comfortable around my coworkers.
14. My coworkers quickly accepted me as one of them.
    a. Items 1-4 adapted from Myers & McPhee, 2006; 5-7 adapted from Riddle, et al., 2000; 9 adapted from Morrison, 1993, *JAP*

Turnover Intentions (modified from Mowday, et al., 1979)

1. I seriously thought about looking for another job.
2. I actively tried to find another job.
3. I intended to leave the organization.

Teamwork

The purpose of this section is to determine how you rate your teamwork during the first 3 months on this job. For each of the following areas of performance, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Somewhat Agree (4)	Agree (5)	Strongly Agree (6)

Teamwork Knowledge

1. I was able to understand how my particular work group contributes to the organization's goals.
2. I was able to understand the relationship between my job group and other departments in the organization.
3. I was able to understand the skills and knowledge each member brought to my particular work group.
4. I was able to understand how each member's output contributed to the group's end outcome.
5. When working as a group, I was able to know how to perform tasks according to the group's standards.
    a. Haueter et al., 2003
6. I knew that having knowledge about people's skills and situation requirements is critical to assign tasks properly.
7. From the beginning, I knew what information I needed from coworkers.
8. From the beginning, I knew what information coworkers with different specializations needed from me.

Communication (Teamwork)

1. Information flowed between team members when needed
2. I was able to communicate with peers without confusion
3. I was able to provide my peers with feedback about what their performance.
4. I tried to listen to and seriously consider my peers' opinions without evaluating their positions as good or bad
5. I was able to provide my peers with relevant information on how well I think the team tasks were progressing
    a. Aguado et al., 2014

Coordination and Collaboration (Teamwork)

1. It took me a while to learn to work effectively with coworkers from different specializations.
2. Learning to coordinate with coworkers in other fields was difficult.
3. Initially, I did not understand the best ways to coordinate with coworkers with different job duties.
4. It was difficult for me to know when to discuss work events with coworkers from other specializations.
5. Working with coworkers from different specializations almost always went smoothly.
6. There was a lot of confusion about how my coworkers and I needed to coordinate our activities.
7. There was conflict with other specializations about how to accomplish the job best.
8. I was able to work effectively with others.
    a. (Ashforth et al., 2007)
9. I often helped others in my team to make clear the roles and tasks they needed to perform.
10. When I was involved in a team project, I cared about having clear plans concerning the tasks and the timing to accomplish them.
11. When doing my job, I prioritized the tasks most necessary for my teammates to complete their work.
12. I tried to ensure that my outputs matched the inputs needed by my peers to perform their tasks.
    a. Aguado et al., 2014

Team-efficacy (teamwork)

1. I felt confident in my ability to work with other specializations to complete our team tasks effectively.
2. I felt I could learn to work well with other specializations.
3. I was confident I could quickly learn how to coordinate with other specializations to complete our team tasks.
4. I was confident that I could work effectively with other specializations to perform our team tasks efficiently.

APPENDIX B

Aerospace Survey

This questionnaire is designed to assess your experiences after graduation from MTSU. Your responses will assist the department's program evaluation efforts. You will be asked to complete a measures related to your experiences at your first professional job post graduation. You will be asked to recall your first 6 months on the job and answer questions pertaining to performance, teamwork, adjustment, efficacy, and turnover intentions. *All of the information that you provide will remain confidential and any identifying data will be removed from the surveys*. If at any point in the survey you do not feel comfortable answering a question, please feel free to skip the question and move on. If you have any concerns please feel free to contact the compliance officer at compliance@mtsu.edu. If you agree to these terms, please click accept to continue.

What was your aerospace concentration at MTSU?

- ❍ Aerospace Administration
- ❍ Aerospace Technology
- ❍ Flight Dispatch
- ❍ Maintenance Management
- ❍ Professional Pilot

- Please indicate your current job
- Please indicate your current employer

In what salary range was your first professional job after graduation?

- ❍ Under 30K
- ❍ 30K - 40K
- ❍ 41K - 50K
- ❍ 51K - 60K
- ❍ 60K+

What is your current salary range?

- ❍ Under 30K
- ❍ 30K - 40K
- ❍ 41K - 50K
- ❍ 51K - 60K
- ❍ 61K - 70K
- ❍ 71K - 80K
- ❍ 81K - 90K
- ❍ 90K+

Please think of your first professional job after graduating from the aerospace program at MTSU. For the purpose of this questionnaire, please only consider this one job while answering. Please base your answers on the first 6 months while in this position.

How often did you work as part of a team?

- ❍ 0%-25%
- ❍ 26%-50%
- ❍ 51%-75%
- ❍ 76%-100%

How often did you work with others from differing specializations or departments?

- ❍ 0%-25%
- ❍ 26%-50%
- ❍ 51%-75%
- ❍ 76%-100%

How related was your job related to aviation or aerospace

- ❍ Not Related
- ❍ Slightly Related
- ❍ Somewhat Related
- ❍ Strongly Related

Please continue to only think of your first professional job after graduation while answering the following questions. Answer the following questions based on your experiences within the first 6 months of that job. For each of the following areas of performance, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Task-Performance

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I immediately knew how to do the technical aspects of my job	❍	❍	❍	❍	❍	❍	❍
It took me some time to learn the details of my job	❍	❍	❍	❍	❍	❍	❍
It was easy to step in and do my job	❍	❍	❍	❍	❍	❍	❍
I was well prepared to perform my	❍	❍	❍	❍	❍	❍	❍

individual job duties							
Almost immediately, I was good at my job	❍	❍	❍	❍	❍	❍	❍
There were many aspects of my job that were new to me	❍	❍	❍	❍	❍	❍	❍
I was able to meet the performance requirements of my job	❍	❍	❍	❍	❍	❍	❍

Self-Efficacy

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I felt confident in my ability to perform my individual job duties	❍	❍	❍	❍	❍	❍	❍
I felt I could learn to perform my individual job duties at a high level	❍	❍	❍	❍	❍	❍	❍

of performance							
I was confident I could quickly learn to perform my individual job duties well	❍	❍	❍	❍	❍	❍	❍
I was confident that I could perform my individual job duties efficiently	❍	❍	❍	❍	❍	❍	❍
This is a quality check please answer "strongly disagree"	❍	❍	❍	❍	❍	❍	❍
When I set important goals at work I almost always was able to achieve them	❍	❍	❍	❍	❍	❍	❍

The purpose of this section is to determine how you rate your overall adjustment during the first 6 months on this job. For each of the following areas of adjustment, please

indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Organizational Knowledge

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I knew how to acquire resources needed to perform my job	❍	❍	❍	❍	❍	❍	❍
I understood the operations of my organization	❍	❍	❍	❍	❍	❍	❍
I understood my organization's objectives and goals	❍	❍	❍	❍	❍	❍	❍
I understood how various departments contributed to my organization's goals	❍	❍	❍	❍	❍	❍	❍
I understood what was meant when other employees used organizationa	❍	❍	❍	❍	❍	❍	❍

l and job relevant language							
I understood the organizational policies and procedures	❍	❍	❍	❍	❍	❍	❍
I understood the structure of my organization	❍	❍	❍	❍	❍	❍	❍
I understood the financial position of my organization	❍	❍	❍	❍	❍	❍	❍
I understood who controls critical resources in my organization	❍	❍	❍	❍	❍	❍	❍

Role Clarity

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I understood how to perform the tasks that make up my job	❍	❍	❍	❍	❍	❍	❍

I understood which job tasks and responsibilities had priority	❍	❍	❍	❍	❍	❍	❍
I knew when to inform my supervisor about work	❍	❍	❍	❍	❍	❍	❍
I understood what all the duties of my job entailed	❍	❍	❍	❍	❍	❍	❍
I knew what constituted as acceptable job performance	❍	❍	❍	❍	❍	❍	❍
I understood the performance standards associated with my job position	❍	❍	❍	❍	❍	❍	❍
I understood the responsibilities associated with my job position	❍	❍	❍	❍	❍	❍	❍
I understood what it took to succeed in my organization	❍	❍	❍	❍	❍	❍	❍
I knew exactly what was	❍	❍	❍	❍	❍	❍	❍

expected of me in my job

Social Acceptance

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I understood how to act to fit in with my organization	❍	❍	❍	❍	❍	❍	❍
This is a quality check please answer "Agree"	❍	❍	❍	❍	❍	❍	❍
I soon felt I could depend on coworkers for support	❍	❍	❍	❍	❍	❍	❍
Coworkers helped me adjust to the new job	❍	❍	❍	❍	❍	❍	❍
I could talk with some of my coworkers about personal matters	❍	❍	❍	❍	❍	❍	❍

Before long, I felt comfortable around my coworkers	❍	❍	❍	❍	❍	❍	❍
My coworkers quickly accepted me as one of them	❍	❍	❍	❍	❍	❍	❍

Turnover Intentions

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I seriously thought about looking for another job	❍	❍	❍	❍	❍	❍	❍
I actively tried to find another job	❍	❍	❍	❍	❍	❍	❍
I intended to leave the organization	❍	❍	❍	❍	❍	❍	❍

The purpose of this section is to determine how you rate your teamwork during the first 6 months on this job. For each of the following areas of teamwork, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Teamwork Knowledge

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I was able to understand how my particular work group contributed to the organization's goals	❍	❍	❍	❍	❍	❍	❍
I was able to understand the relationship between my job group and other departments in the organization	❍	❍	❍	❍	❍	❍	❍
I was able to understand the skills and knowledge each member brought to my particular work group	❍	❍	❍	❍	❍	❍	❍
I was able to understand how each member's output contributed to	❍	❍	❍	❍	❍	❍	❍

the group's end outcome							
When working as a group, I was able to know how to perform tasks according to the group's standards	❍	❍	❍	❍	❍	❍	❍
From the beginning, I knew what information I needed from coworkers	❍	❍	❍	❍	❍	❍	❍
From the beginning, I knew what information coworkers with different specializations needed from me	❍	❍	❍	❍	❍	❍	❍

Communication Teamwork

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
Information flowed between team members when needed	❍	❍	❍	❍	❍	❍	❍

I was able to communicate with peers without confusion	❍	❍	❍	❍	❍	❍	❍
I was able to provide my peers with feedback about their performance	❍	❍	❍	❍	❍	❍	❍
I tried to listen to and seriously consider my peers' opinions without evaluating their positions as good or bad	❍	❍	❍	❍	❍	❍	❍
I was able to provide my peers with relevant information on how well I thought the team's tasks were progressing	❍	❍	❍	❍	❍	❍	❍

Coordination/Collaboration Teamwork

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
It took me a while to learn to work effectively with coworkers from different specializations	❍	❍	❍	❍	❍	❍	❍
Learning to coordinate with coworkers in other fields was difficult	❍	❍	❍	❍	❍	❍	❍
Initially, I did not understand the best ways to coordinate with coworkers with different job duties	❍	❍	❍	❍	❍	❍	❍
It was difficult for me to know when to discuss work events with coworkers from other specializations	❍	❍	❍	❍	❍	❍	❍

Working with coworkers from different specializations almost always went smoothly	❍	❍	❍	❍	❍	❍	❍
There was a lot of confusion about how my coworkers and I needed to coordinate our activities	❍	❍	❍	❍	❍	❍	❍
I was able to work effectively with others	❍	❍	❍	❍	❍	❍	❍
This is a quality check, please answer "strongly agree"	❍	❍	❍	❍	❍	❍	❍

Team-Efficacy Teamwork

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I felt confident in my ability to work with other specializations to complete	❍	❍	❍	❍	❍	❍	❍

our team tasks effectively							
I felt I could learn to work well with other specializations	❍	❍	❍	❍	❍	❍	❍
I was confident I could quickly learn how to coordinate with other specializations to complete our team tasks	❍	❍	❍	❍	❍	❍	❍
I was confident that I could work effectively with other specializations to perform our team tasks efficiently	❍	❍	❍	❍	❍	❍	❍

Please specify your graduation term and year below

	Term			Year							
	Fall	Spring	Summer	07	08	09	10	11	12	13	14
When did you graduate from MTSU?	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

Were you a traditional student? (For the purposes of this study, a traditional student is considered anyone who enrolls in college immediately after graduation from high school and pursues college studies on a continuous full-time basis)

- ❍ Yes
- ❍ No

Did you have previous aviation or aerospace experience?

- ❍ Yes
- ❍ No

Since graduation, have you pursued any additional schooling or certification?

- ❑ No
- ❑ Additional Undergraduate Degree
- ❑ Graduate Degree
- ❑ Other

Have you completed your additional schooling or certification?

- ❍ Yes
- ❍ No

Since graduation, what percentage of your time have you been employed in a job which utilizes your aerospace degree?

- ❍ 0%-25%
- ❍ 26%-50%
- ❍ 51%-75%
- ❍ 76%-100%

Following graduation, how long did it take you to get your first professional job?

- ❍ Had prior to graduation
- ❍ Under 2 months
- ❍ 3 months - 5 months
- ❍ 6 months - 8 months
- ❍ 9 months - 11 months
- ❍ 1 year+

How did you locate your first professional job after graduation?

- ❑ Internship
- ❑ Aerospace program assistance
- ❑ University assistance
- ❑ Job fair
- ❑ Working in professional job while in school
- ❑ Other

  Answer If How did you locate your first professional job after graduation? Other Is Selected…Please specify

Please indicate the level of preparation for your career provided by your coursework in the Aerospace Department

- ❍ Very Inadequate
- ❍ Inadequate
- ❍ Neutral
- ❍ Good
- ❍ Outstanding
- ❍ N/A

For the following statements, please rate the extent to which you agree or disagree with each statement

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A
The Aerospace curriculum offered the courses necessary to become a professional in an aviation-related field	❍	❍	❍	❍	❍	❍
The knowledge acquired through the Aerospace program is applicable to the aviation environment in which I work	❍	❍	❍	❍	❍	❍
My current occupation is related to the education I received in the Aerospace Department	❍	❍	❍	❍	❍	❍
My Aerospace capstone	❍	❍	❍	❍	❍	❍

course (AERO4040) benefited me as I entered the aviation industry						
I am satisfied with the career I have chosen	❍	❍	❍	❍	❍	❍

- Please specify how your coursework in the Aerospace Department has prepared you for working in the aviation industry
- Since entering the work force, is there anything you have discovered the Aerospace program should have offered additionally to give you a competitive advantage in the field?

For FOCUS Lab Participants ONLY

Please answer the following questions about the FOCUS Lab

	Not Helpful	Slightly Helpful	Neither Helpful or Unhelpful	Helpful	Extremely Helpful
How helpful were your experience in the FOCUS Lab in getting your first job	❍	❍	❍	❍	❍
How helpful were your experiences in the FOCUS Lab as you	❍	❍	❍	❍	❍

entered the
aviation
industry

Did you put your FOCUS Lab experience on your resume?

- ❍ Yes
- ❍ No

Did you discuss your FOCUS Lab experience during your interview?

- ❍ Yes
- ❍ No

- Since entering the work force, is there anything you have discovered the FOCUS Lab should have offered to give you a competitive advantage in the aviation industry?
- Thank-you so much for your time and feedback. If you have any questions or concerns please feel free to contact me at ajb8y@mtmail.mtsu.edu

APPENDIX C

Industrial and Organizational Psychology Survey

This questionnaire is designed to assess your experiences after graduation from MTSU. Your responses will assist the department's program evaluation efforts. You will be asked to complete a measures related to your experiences at your first professional job post graduation. You will be asked to recall your first 6 months on the job and answer questions pertaining to performance, teamwork, adjustment, efficacy, and turnover intentions. *All of the information that you provide will remain confidential and any identifying data will be removed from the surveys*. If at any point in the survey you do not feel comfortable answering a question, please feel free to skip the question and move on. If you have any concerns please feel free to contact the compliance officer at compliance@mtsu.edu. If you agree to these terms, please click accept to continue.

- Please indicate your current job
- Please indicate your current employer

In what salary range was your first professional job after graduation?

❍ Under 30K

❍ 30K - 40K

❍ 41K - 50K

❍ 51K - 60K

❍ 60K+

What is your current salary range?

❍ Under 30K

❍ 30K - 40K

❍ 41K - 50K

❍ 51K - 60K

❍ 61K - 70K

❍ 71K - 80K

❍ 81K - 90K

- ❍ 90K+

Please think of your first professional job after graduating from the Industrial and Organizational Psychology program at MTSU. For the purpose of this questionnaire, please only consider this one job while answering. Please base your answers on the first 6 months while in this position.

How often did you work as part of a team?

- ❍ 0%-25%
- ❍ 26%-50%
- ❍ 51%-75%
- ❍ 76%-100%

How often did you work with others from differing specializations or departments?

- ❍ 0%-25%
- ❍ 26%-50%
- ❍ 51%-75%
- ❍ 76%-100%

How related was your job related to Industrial and Organizational Psychology?

- ❍ Not Related
- ❍ Slightly Related
- ❍ Somewhat Related
- ❍ Strongly Related

Please continue to only think of your first professional job after graduation while answering the following questions. Answer the following questions based on your experiences within the first 6 months of that job. For each of the following areas of

performance, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Task-Performance

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I immediately knew how to do the technical aspects of my job	❍	❍	❍	❍	❍	❍	❍
It took me some time to learn the details of my job	❍	❍	❍	❍	❍	❍	❍
It was easy to step in and do my job	❍	❍	❍	❍	❍	❍	❍
I was well prepared to perform my individual job duties	❍	❍	❍	❍	❍	❍	❍
Almost immediately, I was good at my job	❍	❍	❍	❍	❍	❍	❍
There were many aspects of my job that	❍	❍	❍	❍	❍	❍	❍

were new to me							
I was able to meet the performance requirements of my job	❍	❍	❍	❍	❍	❍	❍

Self-Efficacy

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I felt confident in my ability to perform my individual job duties	❍	❍	❍	❍	❍	❍	❍
I felt I could learn to perform my individual job duties at a high level of performance	❍	❍	❍	❍	❍	❍	❍
I was confident I could quickly learn to perform my individual job duties well	❍	❍	❍	❍	❍	❍	❍

I was confident that I could perform my individual job duties efficiently	❍	❍	❍	❍	❍	❍	❍
This is a quality check please answer "strongly disagree"	❍	❍	❍	❍	❍	❍	❍
When I set important goals at work I almost always was able to achieve them	❍	❍	❍	❍	❍	❍	❍

The purpose of this section is to determine how you rate your overall adjustment during the first 6 months on this job. For each of the following areas of adjustment, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Organizational Knowledge

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I knew how to acquire resources	❍	❍	❍	❍	❍	❍	❍

needed to perform my job							
I understood the operations of my organization	❍	❍	❍	❍	❍	❍	❍
I understood my organization's objectives and goals	❍	❍	❍	❍	❍	❍	❍
I understood how various departments contributed to my organization's goals	❍	❍	❍	❍	❍	❍	❍
I understood what was meant when other employees used organizational and job relevant language	❍	❍	❍	❍	❍	❍	❍
I understood the organizational policies and procedures	❍	❍	❍	❍	❍	❍	❍
I understood the structure	❍	❍	❍	❍	❍	❍	❍

of my organization							
I understood the financial position of my organization	❍	❍	❍	❍	❍	❍	❍
I understood who controls critical resources in my organization	❍	❍	❍	❍	❍	❍	❍

Role Clarity

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I understood how to perform the tasks that make up my job	❍	❍	❍	❍	❍	❍	❍
I understood which job tasks and responsibilities had priority	❍	❍	❍	❍	❍	❍	❍
I knew when to inform my supervisor about work	❍	❍	❍	❍	❍	❍	❍
I understood what all the	❍	❍	❍	❍	❍	❍	❍

duties of my job entailed							
I knew what constituted as acceptable job performance	❍	❍	❍	❍	❍	❍	❍
I understood the performance standards associated with my job position	❍	❍	❍	❍	❍	❍	❍
I understood the responsibilities associated with my job position	❍	❍	❍	❍	❍	❍	❍
I understood what it took to succeed in my organization	❍	❍	❍	❍	❍	❍	❍
I knew exactly what was expected of me in my job	❍	❍	❍	❍	❍	❍	❍

Social Acceptance

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I understood how to act	❍	❍	❍	❍	❍	❍	❍

to fit in with my organization							
This is a quality check please answer "Agree"	❍	❍	❍	❍	❍	❍	❍
I soon felt I could depend on coworkers for support	❍	❍	❍	❍	❍	❍	❍
Coworkers helped me adjust to the new job	❍	❍	❍	❍	❍	❍	❍
I could talk with some of my coworkers about personal matters	❍	❍	❍	❍	❍	❍	❍
Before long, I felt comfortable around my coworkers	❍	❍	❍	❍	❍	❍	❍
My coworkers quickly accepted me as one of them	❍	❍	❍	❍	❍	❍	❍

Turnover Intentions

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I seriously thought about looking for another job	❍	❍	❍	❍	❍	❍	❍
I actively tried to find another job	❍	❍	❍	❍	❍	❍	❍
I intended to leave the organization	❍	❍	❍	❍	❍	❍	❍

The purpose of this section is to determine how you rate your teamwork during the first 6 months on this job. For each of the following areas of teamwork, please indicate the number that you think is an accurate rating using the response scale below. The scale ranges from (1) strongly disagree to (6) strongly agree.

Teamwork Knowledge

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I was able to understand how my particular work group contributed to the organization's goals	❍	❍	❍	❍	❍	❍	❍

I was able to understand the relationship between my job group and other departments in the organization	❍	❍	❍	❍	❍	❍	❍
I was able to understand the skills and knowledge each member brought to my particular work group	❍	❍	❍	❍	❍	❍	❍
I was able to understand how each member's output contributed to the group's end outcome	❍	❍	❍	❍	❍	❍	❍
When working as a group, I was able to know how to perform tasks according to the group's standards	❍	❍	❍	❍	❍	❍	❍
From the beginning, I knew what	❍	❍	❍	❍	❍	❍	❍

information I needed from coworkers							
From the beginning, I knew what information coworkers with different specializations needed from me	❍	❍	❍	❍	❍	❍	❍

Communication Teamwork

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
Information flowed between team members when needed	❍	❍	❍	❍	❍	❍	❍
I was able to communicate with peers without confusion	❍	❍	❍	❍	❍	❍	❍
I was able to provide my peers with feedback about their performance	❍	❍	❍	❍	❍	❍	❍
I tried to listen to and seriously	❍	❍	❍	❍	❍	❍	❍

consider my peers' opinions without evaluating their positions as good or bad							
I was able to provide my peers with relevant information on how well I thought the team's tasks were progressing	❍	❍	❍	❍	❍	❍	❍

Coordination/Collaboration Teamwork

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
It took me a while to learn to work effectively with coworkers from different specializations	❍	❍	❍	❍	❍	❍	❍
Learning to coordinate with coworkers in	❍	❍	❍	❍	❍	❍	❍

other fields was difficult							
Initially, I did not understand the best ways to coordinate with coworkers with different job duties	❍	❍	❍	❍	❍	❍	❍
It was difficult for me to know when to discuss work events with coworkers from other specializations	❍	❍	❍	❍	❍	❍	❍
Working with coworkers from different specializations almost always went smoothly	❍	❍	❍	❍	❍	❍	❍
There was a lot of confusion about how my coworkers and I needed to coordinate our activities	❍	❍	❍	❍	❍	❍	❍

I was able to work effectively with others	❍	❍	❍	❍	❍	❍	❍
This is a quality check, please answer "strongly agree"	❍	❍	❍	❍	❍	❍	❍

Team-Efficacy Teamwork

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree	N/A
I felt confident in my ability to work with other specializations to complete our team tasks effectively	❍	❍	❍	❍	❍	❍	❍
I felt I could learn to work well with other specializations	❍	❍	❍	❍	❍	❍	❍
I was confident I could quickly learn how to coordinate with other specialization	❍	❍	❍	❍	❍	❍	❍

s to complete our team tasks							
I was confident that I could work effectively with other specialization s to perform our team tasks efficiently	❍	❍	❍	❍	❍	❍	❍

Please specify your graduation term and year below

	Term			Year							
	F	Spr	Sum	07	08	09	10	11	12	13	14
When did you graduat e from MTSU?	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

Were you a traditional student? (For the purposes of this study, a traditional student is considered anyone who enrolls in college immediately after graduation from high school and pursues college studies on a continuous full-time basis)

❍ Yes

❍ No

Did you have previous professional experience?

❍ Yes

❍ No

Since graduation, have you pursued any additional schooling or certification?

- ❑ No
- ❑ Additional Undergraduate Degree
- ❑ Graduate Degree
- ❑ Other

Have you completed your additional schooling or certification?

- ❍ Yes
- ❍ No

Since graduation, what percentage of your time have you been employed in a job which utilizes your Industrial and Organizational Psychology degree?

- ❍ 0%-25%
- ❍ 26%-50%
- ❍ 51%-75%
- ❍ 76%-100%

Following graduation, how long did it take you to get your first professional job?

- ❍ Had prior to graduation
- ❍ Under 2 months
- ❍ 3 months - 5 months
- ❍ 6 months - 8 months
- ❍ 9 months - 11 months
- ❍ 1 year+

How did you locate your first professional job after graduation?

- ❑ Internship

- ❑ I/O program assistance
- ❑ University assistance
- ❑ Job fair
- ❑ Working in professional job while in school
- ❑ Other

  Answer If How did you locate your first professional job after graduation? Other Is Selected…Please specify

Please indicate the level of preparation for your career provided by your coursework in the Industrial and Organizational Psychology Department

- ❍ Very Inadequate
- ❍ Inadequate
- ❍ Neutral
- ❍ Good
- ❍ Outstanding
- ❍ N/A

What courses do you utilize most in your job?

- ❑ PSY 3320 - Introduction to Industrial and Organizational Psychology
- ❑ PSY 4360 - Organizational Psychology
- ❑ PSY 4270 - Personnel Selection and Placement
- ❑ PSY 4290 - Wage and Salary Administration
- ❑ PSY 4330 - Industrial and Organizational Training and Development
- ❑ PSY 4370 - Motivation and Work Attitudes
- ❑ PSY 4070 - Advanced Statistics for the Behavioral Sciences
- ❑ PSY 4380 - Group Dynamics
- ❑ PSY 4390 - Persuasion

- ❑ PSY 4610 - Adult Psychology and Aging
- ❑ PSY 4720 - Multicultural Perspectives in Psychology and Education
- ❑ PSY 4730 - Apprenticeship-Industrial
- ❑ PSY 4340 - Human Factors Psychology
- ❑ PSY 4350 - Safety Psychology
- ❑ Other

  Answer If Other Is Selected…Please specify

For the following statements, please rate the extent to which you agree or disagree with each statement

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A
The I/O curriculum offered the courses necessary to become a professional in a related field	❍	❍	❍	❍	❍	❍
The knowledge acquired through the I/O program is applicable to the environment in which I work	❍	❍	❍	❍	❍	❍

My current occupation is related to the education I received in I/O Psychology program	❍	❍	❍	❍	❍	❍
I am satisfied with the career I have chosen	❍	❍	❍	❍	❍	❍

- Please specify how your coursework in the Industrial and Organizational Psychology program has prepared you for working in the industry
- Since entering the work force, is there anything you have discovered the I/O program should have offered additionally to give you a competitive advantage in the field?
- Thank-you so much for your time and feedback. If you have any questions or concerns please feel free to contact me at ajb8y@mtmail.mtsu.edu

APPENDIX D

Initial Contact E-mail

As an aerospace graduate from MTSU, you have been selected to participate in our program evaluation. The department values past graduate's opinions and wants to use your experiences and feedback to help assess and better our program. Your confidential answers will help the department maintain its top tier status in the aviation industry. The survey takes roughly ten minutes and asks questions about initial employment experiences post-graduation. Please click the link below to take the survey now. If you do not have time to take it immediately, we ask that you please respond by _____."

APPENDIX E

Follow up E-mail 1

Hello,
This is a reminder that if you have not completed the following survey yet. We ask that you please complete it no later than November 3rd.

Thank-you for your time!

APPENDIX F

Follow up E-mail 2

Hello everyone,
This is a final reminder that your survey link will expire in 5 days! Please take a few minutes out of your day to give us valuable feedback.

Thank-you in advance!

APPENDIX G

Follow up Facebook and LinkedIn

Hello,

I am currently a masters student in the Industrial and Organizational program at MTSU. As an alumni of the I/O undergraduate program from MTSU, you have been selected to participate in our program evaluation. The department values past graduate's opinions and wants to use your experiences and feedback to help assess and better our undergraduate major. Your answers will help the I/O program maintain its top tier status in the region. The survey takes roughly ten minutes and asks questions about initial employment experiences post graduation. Please click the link below to take the survey now. If you do not have time to take it immediately, we ask that you please respond by November 20th.

We really appreciate your help with this! If you have any questions please do not hesitate to ask.

APPENDIX H

IRB Approval

IRB
INSTITUTIONAL REVIEW BOARD
Office of Research Compliance,
010A Sam Ingram Building,
2269 Middle Tennessee Blvd
Murfreesboro, TN 37129

MIDDLE TENNESSEE STATE UNIVERSITY

EXEMPT APPROVAL NOTICE

9/17/2015

Investigator(s): Amanda Beaufore
Department: Psychology
Investigator(s) Email: ajb8y@mtmail.mtsu.edu
Protocol Title: "Effects of Interdisiplinary High Fidelity Simulations: A Look at Initial Industry Success in Aviation "
Protocol ID: 16-1047

Dear Investigator(s),

The MTSU Institutional Review Board, or a representative of the IRB, has reviewed the research proposal identified above and this study has been designated to be EXEMPT.. The exemption is pursuant to 45 CFR 46.101(b) **(2) Educational Tests, Surveys, Interviews, or Observations**

The following changes to this protocol must be reported prior to implementation:

- Addition of new subject population or exclusion of currently approved demographics
- Addition/removal of investigators
- Addition of new procedures
- Other changes that may make this study to be no longer be considered exempt

The following changes do not have to be reported:

- Editorial/administrative revisions to the consent of other study documents
- Changes to the number of subjects from the original proposal

All research materials must be retained by the PI or the faculty advisor (if the PI is a student) for at least three (3) years after study completion. Subsequently, the researcher may destroy the data in a manner that maintains confidentiality and anonymity. IRB reserves the right to modify, change or cancel the terms of this letter without prior notice. Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,

Institutional Review Board
Middle Tennessee State University

NOTE: All necessary forms can be obtained from www.mtsu.edu/irb.