Flight Observations for Initial Flight Students: Are They Worthwhile?

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FLIGHT OBSERVATIONS FOR INITIAL FLIGHT STUDENTS:

ARE THEY WORTHWHILE?

by

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This thesis, submitted by Tammy Jo Schwarz in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been ready by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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This thesis meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

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ABSTRACT

There are many different theories on how people learn, and by finding the preferred learning style of college aviation students it could lead to better training programs. By breaking down the learning cycle and identifying the predominant learning styles, it is possible to see what types of extra training aids could be beneficial to students, both in the classroom and at the airport. This study was designed to answer the following two research questions: 1) To what extent are flight observations beneficial to initial flight students? 2) Does it matter in regard to perceived benefit what type of flight lessons the student observes? If so, which specific flight lessons should be designated as suitable for student observation flights? There were three components to this study: a student questionnaire, a Certified Flight Instructor (CFI) questionnaire, and flight records data. The sample size for the student questionnaire was 60 students, and the sample for the CFI questionnaire was 138 instructors.

Literature regarding collegiate aviation students was very limited. However, there was much literature available about college learning and motivation. College aviation students need to move away from the type of learning that they did throughout most of high school into more of a self-motivated adult style learning. They need to take the initiative and responsibility to seek new knowledge to better themselves as a whole and recognize that it will benefit them in the long run. Finding this motivation to learn in a different manner at a time when most students have just moved away from home and are

dealing with many other changes in their lives could be a very difficult challenge for some.

Data indicated that 59 of the 60 students were enrolled in an aviation related major. Twenty-four students felt the observations made “no difference” in their training. One finding indicated that there was a significant difference ($F=3.52$, $P=.01$) between the five levels of observer involvement and how beneficial the observer thought the flight observations were. The more involved the students were during their observation flights, the more beneficial they felt observing was ($r=.442$, $P<.001$).

Another finding indicated that there was a significant difference in the total number of hours it takes to receive a private pilot certificate between similar semesters (Spring 2002 versus Spring 2003, Summer 2002 versus Summer 2003, Fall 2001 versus Fall 2002) for those students who were required to observe no flights and those whom observed two or four flights. The general trend in the number of hours to receive a private pilot certificate was decreasing.

CHAPTER I

INTRODUCTION

Finding ways to increase student pilot knowledge without increasing the individual amount of time spent with a flight instructor or the number of hours flown in an aircraft would be helpful because students could gain insight without incurring the extra cost. Flight simulators have replaced some of the flight training that has been done in an aircraft, and with advances in technology there are plenty of other interactive tools available to initial flight students. Students have flight simulation programs, landing trainers, computer-based instruction labs, weather trainers, Global Positioning System (GPS) trainers and checklist trainers available to help them at no additional cost. Several of these products are available to students through the Internet or other computer programs. Time and motivation are two key factors for how much a student will actually utilize these tools. If the student feels the program is beneficial with respect to time, they would be more likely to want to use that particular program.

While observing other students' flights is an option for students, many do not take advantage of this opportunity and others may simply not be aware of the fact that they may observe other flights. With flight observations, the observing student is actually sitting in the backseat of an airplane watching another student pilot do the same things that they would be doing or have done on their own flight. The only difference is that they are not at the controls doing everything themselves, which allows the student to relax. This may allow students to see additional things that may have gone unnoticed due the stress of having to perform those tasks. Observing is basically a free pass to watch what is happening in the cockpit without controlling the aircraft. The intake of information should be stress-free because there is not any pressure to perform. The observer can see similar mistakes being made and it allows him or her to see how those mistakes can be corrected or prevented. Students would also have an opportunity to listen to material be explained in different ways from the other flight instructors. This could potentially result in a stronger foundation of knowledge for those initial students, which may help them reach their first solo flight faster, or it may help prevent an extra review flight or two during the preparation for their stage checks.

Flight observations have recently been reintroduced into the initial flight training course at the University of North Dakota (UND). In the Fall of 2002 the students enrolled in Aviation 102 had to observe a total of two flights, and now the requirement has been changed to four flights throughout the semester (Klawon, 2003). Students are required to observe two flights within the first block of training and two additional flights within the second block of training. The idea behind this is that initially the learning curve of the students is very high, so if they observe flights within the first block of training, they will be more likely to pick things up. This may translate into being able to solo at an earlier point. Perhaps the observations would result in fewer landings prior to their first solo flight. The observations in the second block of training are primarily serving as a means of finding different points of view and to see how other flight instructors teach their students. Other flight instructors might present information in a manner more suited to the observer's learning style. Often times one can pick up new things from watching someone else. The hope is that student pilots would be able to see other ways of doing things in the airplane.

Many students have tight schedules; therefore having a flight partner to do paired training for an entire flight course may not be feasible because it requires a large block of time to complete a single lesson for both students. Paired training had previously been done at UND in the late 1980's and into the early 1990's, but it was discontinued because of time constraints on both the students and instructors. With paired training, students also lose the opportunity to fly with several different student pilots and flight instructors, which means that they also lose the different viewpoints. However, observing a flight several times throughout the semester should not place too large of a time commitment on students, provided that they gain something from the lesson. If student pilots do not gain enough information to make it worth the time, then it might not be in their best interest to have required flight observations, as their time may be better utilized by studying or using some other interactive tool for training.

Purpose of the Study

The purpose of the study is to determine to what extent flight observations are beneficial for initial flight students with respect to the amount of time spent observing flights. In addition, if the observation flights were considered to be beneficial, the study intends to determine if it matters what type of flight lessons are observed.

Statement of Problem

Students at the University of North Dakota enrolled in Aviation 102 are currently required to observe four flights throughout the course of the semester. However, according to Rob Clausen, Assistant Chief Flight Instructor and Private Pilot Course

Manager at UND, that number was randomly chosen. Finding the type of flight lessons observed that best fits the needs of the students should be a main concern for all involved so that the time of the students is not wasted. If flight observations are not beneficial with respect to student's time or money, then the requirement of the current observations should be reevaluated.

Significance of the Study

If it were found that observing other flights was actually beneficial to initial flight students, then it would add to the number of tools available to students and flight instructors. The foundation for the initial students may also be stronger, which could result in the students having their first solo flight faster or having better performance in later courses. The students would also be accustomed or familiarized with several instructors versus just their own, which could lead to having material explained to them in a manner more suitable to their learning style.

Research Questions

There are two research questions:

1. To what extent, if any, are flight observations beneficial to initial flight students?
2. Does it matter in regard to perceived benefit what type of flight lessons the student observes? If so, which specific flight lessons should be designated as suitable for student observation flights?

Conceptual Framework

There are three basic elements of aviation training: the individual, the flight instructor, and the organization. Each of these three elements has a responsibility for training. "The outcome of training and instruction is largely determined by the motivation and strategies of the individual pilot or student, by the instructor's values, skills and knowledge, and by the nature of the organization (or system) in which the training occurs" (Telfer and Moore, 1997). Each element must be working towards the same common goal and also doing their respective part in order for the training to be successful. Students have the responsibility to be prepared for lessons and to increase their knowledge level. Flight instructors need to be able to adapt to the needs of each individual and effectively interact with their students. The organization needs to maintain an open environment that is conducive to learning. These three elements of aviation training: the flight instructor, the student, and the organization, form the conceptual framework for this study. However, for this study, the primary focus is on the flight instructors and students in an effort to effectively answer the research questions.

Definitions

For this study, the following terms have been defined:

Aviation Information Management System (AIMS): "UND Aerospace has created AIMS, the Aviation Information Management System. AIMS allows organizations such as flight training schools to keep track of their aircraft, instructors, students and their flight training records. The main functional components of AIMS consist of flight and academic records, flight operations, scheduling, dispatch and invoicing, and aircraft maintenance." (http://www.aero.und.edu/visit/research/aims.php3)

Certified Flight Instructor (CFI): a person who possesses a current Flight Instructor Certificate under Part 61 Subpart H of the Federal Aviation Regulations. Flight instructors have the privilege to give instruction in flight training devices and in aircraft for which that person is qualified to fly. They also can give ground briefings to flight students and are responsible for giving endorsements to students.

Cross-country flight: A flight in an airplane that includes a landing at an airport that is located at least 50 nautical miles away from the original point of departure.

Federal Aviation Regulations (FARs): Federal Aviation Regulations, which are Title 14 under the Code of Federal Regulations.

Initial flight student: a student pilot. According to the flight courses at UND, the students would only be enrolled in Aviation 102. Students that were enrolled in Aviation 105 and Aviation 112 were not included as initial flight students for the purposes of this study.

Learning style: the concept of how a person learns is dependent on that person's background and personality, as well as the instructional methods used. (*Aviation Instructors Handbook*, 1999).

Part 141 School: a certificated pilot school where the school has to meet requirements for the personnel, aircraft and the facilities. There also are requirements for the Training Course Outline and curriculum. Students receiving flight training under Part 141 of the FARs have more regimented training than students flying under Part 61 of the FARs.

Private pilot: a person who possesses a current private pilot certificate under Part 61 Subpart E of the Federal Aviation Regulations. A private pilot is able to fly solo and also able to carry passengers while flying under visual flight conditions. They are not allowed to fly for compensation or hire.

Student pilot: a person who possesses a current student pilot certificate under Part 61 Subpart C of the Federal Aviation Regulations. A student pilot is typically working towards a private pilot certificate. They can fly solo once they have been given the proper endorsements from their CFI. Student pilots are not able to carry passengers, fly internationally, or contrary to any other limitation put in their logbook by their CFI.

Stage checks: a flight or knowledge test to determine if a student is meeting specified standards set forth in the Training Course Outline or the Practical Test Standards. For the Aviation 102 flight course there are three stage checks the students must satisfactorily complete. The Stage 15 and Stage 28 are both intermediate stage checks, whereas the Stage 34 is the final certification for their private pilot certificate.

Training Course Outline: the content of a particular course. It typically includes the objectives, descriptions of teaching aids, evaluating criteria, and the desired outcome. (*Aviation Instructors Handbook*, 1999).

Assumptions

1. The initial flight students who observed flights would be similar to the initial flight students who did not observe flights.
2. The quality of training that each student received is similar.
3. Students would actively participate in the flight observations.
4. The students and flight instructors would honestly and accurately answer the questionnaire.

Limitations

1. The study will be limited to a small sample of students from a large Part 141 flight school; therefore the findings may not be applicable to all types of training or in other locations.

2. Calculating an exact amount of time or the number of landings that flight observations possibly save may not be feasible because students learn at different rates and many different situations (weather, traffic, etc.) are encountered to cause differences in each student's flight training.
3. The average number of hours to obtain a private pilot certificate did not incorporate differences between student's launch times. There may or may not be a significant difference in hours for students who typically fly in the early morning, mid-day, or the afternoons. Typically there is a larger volume of traffic in the mid-day and afternoons, therefore the lesson times may be longer for those students who routinely fly during those hours.
4. It may be difficult to incorporate students who require extra training.
5. Utilizing the opinions of beginning students might not be as beneficial because some students may not realize if the observations truly were helpful. The students may look at the observations as another assignment to complete instead of thinking about how much they may or may not have gotten out of the flights.

CHAPTER II

REVIEW OF LITERATURE

This chapter will review the literature relevant to the benefits of observation training. A background on learning and motivation of college learners will be discussed. Collegiate aviation students learning styles, learning cycles and the motivation of students will also be reviewed. The literature reviewed should help support the flight observation program.

Many researchers have studied the different learning styles of college aviation students. Most of the research that has been done to help improve the flight training aspect of aviation has focused on the technological issues such as computer-based training and the usage of simulation. Much of the research focused on the academic aspect of aviation has been in an effort to better design courses to suit student needs.

The introductory chapter to *Aviation Training: Learners, Instruction and Organization* (Telfer and Moore, 1997). addresses several issues related to learning in the flight instruction setting.

> There are significant potential differences in the perspectives on learning and instruction held by pilots, instructors, and the range of organizations which administer aviation training and testing (Telfer and Moore, 1995). These organizations include flying schools, regulatory authorities and airline management. The degree to which congruence or alignment occurs across the

> three groups – trainees, trainers and system- determines the potency of dilution of training effectiveness.

Breaking these three groups into further detail it becomes apparent how important each factor is throughout the learning process. Even if the student and instructor work together in a common goal, Telfer and Moore also state that the organization must be working towards the same goal.

> The outcome of training and instruction is largely determined by the motivation and strategies of the individual pilot or student, by the instructor's values, skills and knowledge, and by the nature of the organization (or system) in which the training occurs (Telfer, 1994). The last input is deceptive, for it is easily as complex as the other two. Organizational or contextual bias on aviation training consists of a hierarchy of interrelated variables: societal, culture, government legislation, regulatory and licensing authority, policy, management, and organizational climate. (1997).

This brings up an interesting point on how a school can levy policies, such as mandatory flight observations, thinking that it is beneficial, yet not positively knowing. One interesting statement that Telfer and Moore make is that "it is management and the organization which is the largest determinant of the quality of learning" (1997). If this statement is true, then perhaps a larger portion of the learning process needs to be focused on the actual organization and not the student/instructor.

Another area that Telfer and Moore discuss is the climate of the organization. This area was not looked at in this particular study, yet it still warrants a discussion. They state "an area yet to be explored in aviation, but one that is recognized in organizational and management theory and practice is that of climate: the set of internal characteristics that differentiates one airline or flying school from another and influences the behaviour of its members" (1997). They discuss an organization being seen as either "open" or "closed." The climate is not set by facts, but it is set by what the people think about the organization. Basically, this introduces another level of complexity to the learning environment in an aviation school. Not only do the students have to be motivated, have good instructors, but the organization and its climate play a roll in the quality of education that a student receives.

Definitions of Learning

Learning can be defined in many different ways. The *Aviation Instructor's Handbook* (AIH) defines learning "as a change in behavior as a result of experience." It goes on to state that the change can be "physical or overt, or it may involve complex intellectual or attitudinal changes which affect behavior in more subtle ways." Kolb (1984) defines learning as "the process whereby knowledge is created through the transformation of experience," and Kolb also maintains that learning from an experience is essential for individual effectiveness. Kolb goes further in-depth about learning resulting from experiences stating, "Knowledge is continuously derived from and tested out in the experiences of the learner."

According to Telfer and Moore (1997), "quality learning results when meaning, understanding and interpretation occur." They further discuss that "the more social aspect (interacting with others) is a critical component of adult learning in which quality learning is more than mere acquisition of knowledge. The learner becomes actively involved in developing an integrated, elaborated knowledge base." All of the above definitions of learning are very similar. Telfer and Moore discuss the need for interaction to have quality learning take place.

Learning Cycle

The amount of knowledge that flight instructors are given with respect to the science and art of learning and learning styles comes from the *Aviation Instructor's Handbook*, which has a short (16-page) chapter on learning. This chapter covers the definition of learning, principles and levels of learning. This amount of information given is very limited in comparison to the amount of information on learning that is available. In Kolb (1984) the learning cycle is broken down into four steps and there are four different learning styles that are outlined.

The four distinct steps of the learning cycle are:

> (a) concrete experience, or the ability to become involved "…fully, openly, and without bias in new experience…", (b) reflective observation, or the ability "…to reflect on and observe…experiences from many perspectives…", (c) abstract conceptualization, or the ability to "create concepts that integrate… observations into logically sound theories…", and (d) active experimentation, or the ability to "…use these theories to make decisions and solve problems…(Kolb, 1984).

This process is described as a continuous process in which the student moves from one step to the next by building on what they previously learned. It is not enough for students to just have the knowledge, but they need to be able to apply their knowledge to new situations.

> It is expected that when the student encounters a new problem or situation, he will select an appropriate technique for attacking it and will bring to bear the

> necessary information, both facts and principles. This has been labeled "critical thinking" by some, "reflective thinking" by Dewey and others, and "problem solving" by still others…The most general operational definition of these abilities and skills is that the individual can find appropriate information and techniques in his previous experience to bring to bear on new problems and situations. (Anderson, Sosniak, 1994).

Teaching an individual how to react to every situation that they could encounter in an airplane would be impossible, but it is possible to teach someone how to use good judgment and how to apply their experience to new situations. Having more experiences in an aircraft gives a student more opportunities to see different situations and to develop their skills.

Learning Styles

There are a number of different methods of presenting learning styles.

> Learning style theory, that is, the way people learn best, is of considerable importance in developing and delivering aviation academic programs. One model suggests that there are three recognized primary, or dominant, learning styles: First, *visual learners,* who learn best by reading or looking at pictures. Second, *auditory, or aural, learners,* who learn best by listening. And third, *hands-on, tactile, or kinesthetic learners,* who need to use their hands or whole body to learn (Karp, 2001).

The visual, auditory and kinesthetic learners are mentioned in both the *Aviation Instructor's Handbook* and also in Karp (2001). "By exploring how people learn best, and then providing those learners with the tools to maximize their dominant learning styles, the next generation of pilots, both women and men, should be better prepared to enter the aviation industry.” (Karp, 2001). If there is a clear preference of learning styles among college aviation students, then courses and training could be better tailored.

There are four different learning styles presented in Kolb (1984). These are the accommodator, the diverger, the converger, and the assimilator.

> The accommodator is a concrete-thinking extrovert who combines concrete experience and active experimentation, while the diverger is a concrete-thinking introvert combining concrete experience and reflective observation…. the converger, an abstract-thinking extrovert combining abstract conceptualization and active experimentation; the assimilator, the abstract-thinking introvert combining abstract conceptualization and reflective observation.” Kolb (1984).

According to Kanske (2001), the preferred learning style of USAF pilots was the converger style, while the assimilator style was the preferred learning style of college aviation students surveyed at four colleges in Oklahoma. These learning style preferences can be further broken down into class standing (freshman, sophomore, etc.) and gender.

In a study conducted by Karp (2001), a learning style assessment was conducted of 195 male and 195 female college aviation students. The results of that study found that men and women college aviation students were similar in their dominant learning style, which happened to be the hands-on learning approach. The main focus of this article was towards the classroom. If a majority of students are hands-on learners, yet the method of teaching is a lecture, which would primarily be an auditory learning style, then there might be information that is being lost in the presentation. Flight observations are a way for students to be involved in a flight, which should help accommodate the dominant learning style that is found in the collegiate aviation students. The presentation of information is much more realistic during a flight observation than it is while chair flying at home.

Much of the current information related to college aviation students and learning styles is directed towards the classroom, however, it is likely that those theories are transferable for flight training. According to Kolb's (1984) learning cycle, the second step is reflective observation. It might be possible to say that students observing flights could be fulfilling that portion of the learning cycle. Observing is also a characteristic of two of the styles of learning in Kolb's definitions. Since aviation students are spread across all four of the styles of learning it isn't possible to say that flight observations would be the type of observations that Kolb meant, but perhaps it is for those students who are divergers or assimilators. If flight observations fall under the category of 'reflective observation' as Kolb meant and the preference of college students at those Oklahoma universities, which was of assimilators, can be transferred to all college aviation students, then that would help in saying that flight observations could be beneficial. The *Aviation Instructor's Handbook* (1999) also states "most learning occurs through sight, but the combination of sight and hearing accounts for about 88 percent of all perceptions." Many instructors tell their students to go home and chair fly, which is going through the motions of what the student would do in an actual airplane, but the students do not have the visual or auditory cues that would be present while observing a flight.

Having a solid grasp on different learning styles and knowing the dominant or preferred learning style of a student is not enough to develop better curriculum or training programs.

> As indicated by McKeachie et al. (1985), knowledge of learning strategies does not necessarily lead to better academic performance; students must also develop the motivation to use those strategies. Therefore, if we are going to understand and be able to facilitate the self-directed behavior needed to reach academic as well as other life goals, we must understand the combined influences of motivation and cognition on those processes. (Pintrich, Brown, Weinstein, 1994).

Definition of Motivation

Another issue facing flight instructors and ground instructors is the motivation of the learner. Motivation, like learning, is another term that has many definitions.

> Motivation requires *activity* – physical or mental. Physical activity entails effort, persistence, and other overt actions. Mental activity includes such cognitive actions as planning, rehearsing, organizing, monitoring, making decisions, solving problems, and assessing progress. The activities that students are engaged in are geared toward attaining their goals. Finally, we highlight that motivated activity is both *instigated* and *sustained.*" (Pintrich, Schunk, 1996).

If motivation requires an activity to be instigated and sustained by an individual, how is it possible to motivate students to gain as much out of the flights as if they would had they just felt a need to observe a flight? Some of the mental activities that were listed, such as monitoring and rehearsing, are common suggestions that instructors make to their students. Often times a student is told to go home to "chair fly," which would fall under the rehearsing category.

Motivation of Learners

Many college freshman and sophomores are only 18 or 19 years old; many are not accustomed to more of an adult learning model. These students need to learn how to become more self-directed in their own studies (Karp, 2000). The motives of the learner are an important factor in learning.

> The most important perspective in adult learning motivation is that adults are voluntary, practical learners who pursue education for its use to them. If education is to serve this voluntary learning force, then educators need to understand what to do to motivate their particular learners (Knowles, 1980). (Karp, 2000).

In those instances the learner is not forced to learn, they have a desire to learn. "Adult learning is a process of active inquiry, not passive reception" (Clark, 2001). Since there is a large quantity of information for students to learn, it is very difficult for many students to actively seek to learn everything they can in the beginning. "One way to foster independent learning in younger college students is by introducing them to peer pressure through cooperative learning techniques" (Clark, 2001). Clark (2001) discussed students learning in groups within the classroom setting. If this motivation needs to be present for classroom learning, then it certainly needs to be present with respect to their flight training. Students would need to take on a responsibility for their own learning, so if they were deficient in one area, they should take the time and effort to seek out additional information. Since these students are in a transition from adolescent learning to adult learning, “beginning aviation students must be “focused” toward self-directed learning to attain their maximum potential. This includes *motivating* the learners by stressing the need to acquire the knowledge and to recognize that this is the time to learn it.” (Karp, 2000). Flight instructors have the opportunity to stress the importance of learning as much as possible during the course of the students flight training.

The literature reviewed discussed collegiate learning and motivation. The literature discusses different styles of learning and motivation and how to apply them to collegiate learners. The reviewed literature supported the recent implementation of an observation training program for the initial flight applicants. Also, the literature may help in finding ways to make improvements to the current system.

CHAPTER III

METHODOLOGY

This chapter will describe the methodology used to answer the two research questions: 1) To what extent, if any, are flight observations beneficial to initial flight students? 2) Does it matter in regard to perceived benefit what type of flight lessons the student observes? If so, which specific flight lessons should be designated as suitable for student observation flights? Information on the population, sample, the design of the study, the data collection method, the instrument reliability and validity, and data analysis is presented in this chapter. Protection of human subjects is also addressed.

This quantitative descriptive and qualitative descriptive study gathered information from both initial flight students and the flight instructors who taught or evaluated those students. The questionnaire was designed to elicit information on the benefits of observation flight training from both the student perspective and the flight instructor perspective. In addition, comparing the initial stage check pass rate for Aviation 102 and the number of flight hours it took to receive a private pilot certificate among several different semesters where the number of required flight observations were changing was also done.

Population / Sample

The population for this study consisted of students and flight instructors at a large Midwestern collegiate aviation program. The student population was all of the students that were enrolled in Aviation 221 during the Spring of 2004 that have completed the

Aviation 102 flight course (N=approximately 100). The flight instructor population (N=approximately 150) was all of the flight instructors who taught Aviation 102 or conducted Aviation 102 stage checks during the previous academic year.

The student sample consisted of four class sections of Aviation 221 at the University of North Dakota. The student sample size was 60 students. The subjects were students that completed their flight training for Aviation 102 and were not enrolled in either the Aviation 105 or Aviation 112 flight course. Students enrolled in either Aviation 105 or Aviation 112 for their flight course were excluded because they had a minimum of 30 hours of prior flight training before coming to UND.

The flight instructor sample consisted of 138 flight instructors that had either taught the Aviation 102 flight course or conducted Aviation 102 stage checks during the previous academic year. Flight instructors hired in December of 2003 were excluded because they did not have prior experience with students.

Comparison of the initial stage check pass rates was completed by obtaining data that the lead flight instructors had compiled. The population for the initial stage check pass rate data was all of the students enrolled in Aviation 102 during the Spring of 2001, Summer of 2001, Fall of 2001, Spring of 2003, Summer of 2003, and the Fall of 2003. The sample was all of the students that had completed the respective stage check.

The comparison of the average number of hours to obtain a private pilot certificate was done by obtaining data from Aviation Information Management System (AIMS). The population for the data collection was all of the students that were enrolled in Aviation 102 in the Fall of 2001, Spring of 2002, Summer 2002, Fall of 2002, Spring of 2003, Summer of 2003, and the Fall of 2003. The sample was all of the students that have completed Aviation 102.

Study Design

A quantitative descriptive design was used for this study to answer the first research question, and a qualitative descriptive design using a coding of categories of data was utilized to answer the second research question. There are three main parts to the study: a student questionnaire, a flight instructor questionnaire, and data collected for various semesters from AIMS and the airport.

A questionnaire was given to students who had completed the Aviation 102 flight course and who were enrolled in Aviation 221 during the Spring of 2004. The list of Aviation 221 sections were found on the Course Schedule section of the UND website. The Aviation 221 classes were randomly selected. Each section had approximately 20 students; however, some of those students had been enrolled in Aviation 105 or Aviation 112, so not all of them were eligible to answer the questionnaire. The questionnaire for the student group was distributed during the first week of the Aviation 221 class in an effort to get a high response rate. The questionnaire was reviewed and approved by the University of North Dakota Institutional Review Board (IRB).

A separate questionnaire was given to flight instructors who either taught or evaluated students in Aviation 102 within the previous academic year. The list of current flight instructors was obtained from the airport. The flight instructor group was given the questionnaire at a flight operations meeting at the beginning of the Spring 2004 semester, in an effort to get a high response rate. The questionnaire was reviewed and approved by the University of North Dakota Institutional Review Board (IRB).

The John D. Odegard School of Aerospace Sciences' flight training programs fall under Part 141 of the Federal Aviation Regulations. Records are kept for each flight the student attempts. The records department provided the records data without any identifying information. The records reviewed were Aviation 102 student's flight records from the Fall of 2001, Spring of 2002, Summer of 2002, Fall 2002, Spring 2003, Summer 2003 and the Fall of 2003 semesters at the University of North Dakota's John D. Odegard School of Aerospace Sciences. These records provided the average number of hours to a private pilot certificate. The other data collected was to compare the initial pass rates of the stage checks in Aviation 102. The records reviewed were Aviation 102 student's flight records from the Spring of 2001, Summer of 2001, Fall of 2001, Spring of 2003, Summer of 2003, and the Fall of 2003.

Data Collection Methods/Procedures

For the student questionnaires, four out of five sections of Aviation 221 were randomly selected. The researcher received instructor permission to visit the four sections of Aviation 221 and distributed the Aviation 102 questionnaire to the students (N=60) during the first week of the Spring 2004 semester. The flight instructor questionnaires were distributed to the flight instructors (N=138) at a flight operations meeting at the beginning of the Spring 2004 semester. Consent for participating was given by the students and flight instructors completing the questionnaire. Since there was not a way to link individual responses to the questionnaires, a consent form was not used. Participation was voluntary, as the students and flight instructors had the option of not participating. Subjects were asked to respond anonymously to the questionnaires to prevent individual responses from being identified.

The records department at the John D. Odegard School of Aerospace Sciences provided the records data without any identifying information. The data points provided were total course flight times and pass rates of students on their stage checks in Aviation 102.

Instrument Reliability and Validity

The Aviation 102 questionnaire (Appendix A) and the Certified Flight Instructor questionnaire (Appendix B) were used to elicit information regarding the perceived benefit of observation flight training. A Likert-scale was used for most questions, along with yes/no responses. Both questionnaires were reviewed by experts to determine the validity. A test-retest was done on five students and five flight instructors to ensure reliability.

Data Analysis

Statistical analysis was completed by using SPSS for Windows (SPSS-11.0). Descriptive statistics were used to describe the study sample and to report means, range, and medians of the sample. Inferential statistics and correlations were used to determine whether significant relationships and differences existed. Significance for this study was set at $p = .05$. The Tukey Honestly Significantly Different (HSD) test was utilized to determine which groups had a significant difference after it was determined that a significant relationship did exist. Pearson's correlation was used to identify significant correlations within the data and also the strength of the relationship.

A questionnaire was used to elicit information regarding the benefits of observation flight training for initial flight students from both the students and flight instructors' perspective. Analyses of Variances (ANOVAs) and t-tests were used to analyze if there was a significant difference between different groups of students and how beneficial they thought the observations were for themselves. Comparisons were made between the students based on the level of student involvement during the observations and how much flight experience the students had prior to beginning their training at UND.

ANOVAs were calculated to determine if there was a difference between several groups of flight instructor data with respect to beneficial they felt the observation flights were for the students. Comparisons were made between the flight instructors based on how many hours of dual instruction given, the number of observers they have had, how involved they felt the observers were, and also how often the instructor recommended to their students to observe extra flights. T-tests were used to find significant differences between the student and flight instructor questionnaires for how involved each thought the students were and also for how beneficial each thought the observation flights were to the students.

Measuring the results of flight observations might not be directly possible; therefore, comparing a group of similar flight students might be more reasonable. The average total number of hours it takes to receive a private pilot certificate during semesters that the observation flights were implemented was compared to prior semesters to determine if there were significant differences between the groups. In addition to the average total number of hours, the initial pass rate of the Aviation 102 stage checks was compared between those two different academic years to determine if there are significant differences between the two groups.

Protection of Human Subjects

Participation in the study was voluntary. The study was reviewed and approved by the University of North Dakota's Institutional Review Board (IRB). All records data was obtained with the identifying information already removed. There should have been no risks involved for the individuals completing the questionnaires. There was not a way to link individual responses to the questionnaires. Subjects were asked to respond anonymously to the questionnaires to prevent individual responses from being identified. Information was only recorded as group data. The records data and questionnaires are stored in a locked file. Only the researchers and committee members have access to the files. After three years the data will be shredded.

CHAPTER IV

RESULTS

The purpose of this study was to determine to what extent flight observations are beneficial for initial flight students. Questionnaires given to both flight students and CFIs were used to collect part of the data. Student flight records provided the remainder of the data.

The results of the study and the analysis of the data are presented in this chapter, beginning with a description of the subjects. Then an analysis of the following research questions is presented: 1) To what extent, if any, are flight observations beneficial to initial flight students? and 2) Does it matter in regard to perceived benefit what type of flight lessons the student observes? If so, which specific flight lessons should be designated as suitable for student observation flights? Additional findings are also reported. Statistical results were generated using the SPSS for Windows statistical package (SPSS 11.0, 2001). Significance for this study was set at $p = .05$.

Description of Subjects

The student sample (N=60) was very homogenous, with 90 percent being male. In age the student sample ranged from 18 to 33, with a mean of 19.48 years. The majority of the sample were college freshman (55.0%) and sophomores (31.67%), with fewer juniors (8.33%) and seniors (5.0%).

Approximately two-thirds (65%, N=39) of the sample were currently majoring in commercial aviation. All but one was involved in some aviation major. Table 1 depicts the major that the students declared.

Table 1. Declared Student Major of Student Participants

Declared Major	N	Percent of Students
Commercial Aviation	39	65.0
Aviation Management	11	18.3
Pre-Aviation	7	11.7
Air Traffic Control	2	3.3
Electrical Engineering	1	1.7
Total	60	100

Even though 59 of the students were majoring in aviation, a majority (44, 73.33%) had no flight experience prior to beginning their flight training at UND. Nine of the students (15%) had between 5 and 10 hours of flight time before beginning their flight training, and the remaining seven students had greater than 15 hours of flight time.

The flight instructor sample (N=138) had a variance in the amount of experience. The CFIs all began flight instructing at UND between 1998 and the Fall of 2003. The total flight time of the flight instructors varied from approximately 260 hours to 2,275 hours, with a mean of 834.2 hours of flight time. The number of hours of dual instruction given ranged from 25 hours to 1,900 hours. The mean for the hours of dual given was 510.3 hours, and the median was 450 hours.

There were 35 flight instructors who conducted Aviation 102 stage checks during the previous academic year (25.36%), and the remaining 96 instructors (69.57%) had taught at least one Aviation 102 student during the previous year. A total of seven instructors (5.07%) did not respond as to whether they conducted stage checks for the flight course. The 35 flight instructors that had evaluated Aviation 102 students by conducting stage checks may or may not have also taught an Aviation 102 student.

Description of Flight Records Data

The student flight records examined were the average number of hours to receive a private pilot certificate and also the first attempt pass rates for the stage checks in the Aviation 102 course. For the total number of hours it takes to receive a private pilot certificate, a total of seven semesters, beginning with the Fall of 2001 and ending with the Fall of 2003, were analyzed. There were three fall semesters, two spring and two summer semesters. The average number of hours it took a student to obtain a private pilot certificate ranged from 56.2 hours to 62.8 hours. The median was 59.3 hours.

To analyze the first attempt pass rates for the stage checks, a comparison between a full academic year where no flight observations were required (Spring, Summer and Fall of 2001) and an academic year where a total of four flight observations were required (Spring, Summer and Fall of 2003) was done. The stage check pass rates were compared to one another for all three stage checks in that particular course.

Research Question 1

The first research question was, “To what extent, if any, are flight observations beneficial to initial flights students?” This question had three different parts to analyze: the student questionnaire, the flight instructor questionnaire, and the records data.

Students

The students' response to how beneficial they felt the observation flights were was slightly more varied than the flight instructors' response. The bar graph (Figure 1) depicts how beneficial/detrimental the students felt the observation flights were.

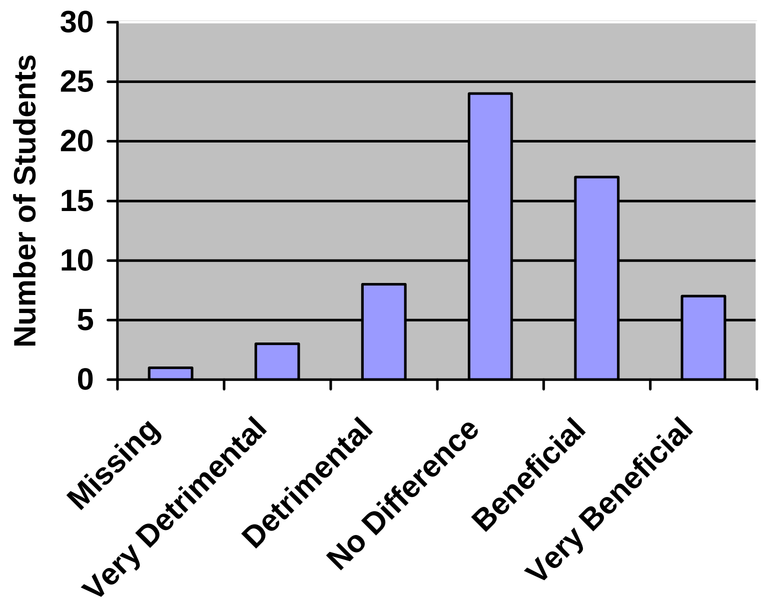

Figure 1. How Beneficial the Flight Observations Were According to the Students, N= 60

Twenty-four of the sixty students felt that the observations made "no difference." On a scale of one to five, the mean for this question was 3.29 out of 5.0, which was slightly above the "No difference" response.

According to the data for this study, there was a significant difference (F=3.52, p=.01) between the five levels of observer involvement and how beneficial they thought the flight observations were. The levels of involvement ranged from "not involved at all" to "completely involved." The more involved the students were during their observation flights, the more beneficial they felt observing was for them. This was supported by a significant correlation between how involved the students were during the flight and how beneficial the observation flights were (r =.44, p<.001). Table 2 depicts how involved the students felt they were during the observation flight and how beneficial they felt those flights were for themselves.

Table 2. Means of How Beneficial the Flight Observations Were With Different Levels of Student Involvement

Student Involvement	*Mean	N	Std. Deviation
Not involved at all	2.63	8	.92
Not involved	3.09	23	.90
Involved	3.43	21	.98
Really involved	4.17	6	.98
Completely Involved	5.00	1	.
Total	3.29	59	1.02

*Scale of 1 to 5. 1= Very Detrimental, 2=Detrimental, 3=No difference, 4=Beneficial, 5=Very Beneficial

The students had a wide range of how beneficial they perceived the observation flights to be, no matter what their prior flight training experience had been. A Pearson's correlation test found there was no significant correlation (r=.20, p=.12) between those students who came to UND with no prior flight experience and those who had some prior training.

There was a significant difference between one of the two questions that were compared on the student and instructor questionnaires. The two questions that were compared was student question six to CFI question eight (see Appendix A and Appendix

B), which asked each group how beneficial they felt the flight observations were. The second question compared was student question five to CFI question two, which asked how each group perceived the student involvement during the observation flight. A t-test showed that there was a significant difference (t= -6.31, p= <.001) between how beneficial the students thought the observation flights were for themselves and how beneficial the instructors felt the observation flights were for the students. The flight instructors felt the observations The t-test showed no significant difference (t= .31, p= .76) between how involved the students thought they were in the observation flights and how involved the instructors perceived the students to be.

Flight Instructors

The flight instructors had a fairly even response to how beneficial they felt flight observations were for the initial (Aviation 102) flight students. A total of 31 instructors (22.5%) felt these observations were "very beneficial," while the majority (87, 63.0%) felt they were "beneficial" for the students. Only 1 (.7%) felt the observations were "detrimental" and 14 instructors (10.1%) felt that there was "no difference" for the students. The mean for this particular question was a 4.11 out of a 5.0 scale, which was slightly above the "Beneficial" response.

The CFIs ranged from having no students observe them (6) to having greater than seven students observe them (23) while giving flight instruction to another student. An ANOVA showed that there was a significant difference (F= 2.46, p=.05) between the five groups of instructors, which were separated by how many students had observed them giving flight instruction to another Aviation 102 student, and how beneficial the flight instructor believed the observation flights were for the students. The five groups ranged from having no observers to having greater than seven students observe them giving flight instruction. The Tukey HSD test showed that the significant difference was between the group of instructors that had no students observe them and the group of instructors who had 3-4 students observe them while giving flight instruction. Those instructors who had no students observe them had a mean of 4.67, while the instructors that had 3-4 students observe them had a mean of 3.96 (Scale of 1 to 5. 1= Very Detrimental, 2=Detrimental, 3=No difference, 4=Beneficial, 5=Very Beneficial). The instructors who had students observe them thought that flight observations were slightly less beneficial than those instructors who had no observers.

There was no significant difference (F=2.42, p=.07) between the five levels of perceived observer involvement and how beneficial the flight instructor thought the observation flights were. The five levels of involvement ranged from "not involved at all" to completely involved."

There was a significant correlation (r= .32, p<.001) between how beneficial (or detrimental) it was to teach a student while having an observer in the backseat and how beneficial the flight instructor thought the observation flights were. Table 3 depicts the relationship between how beneficial/detrimental the CFI believed it was to teach while having a student observe and how beneficial the CFI felt the observation flights were.

Table 3. Means of How Beneficial Observation Flights Were With a Student Observer

Teaching a Student with an Observer	*Mean	N	Std. Deviation
Detrimental	3.64	11	.50
No difference	4.08	78	.58
Beneficial	4.18	33	.53
Very beneficial	4.67	9	.71
Total	4.11	131	.60

*Scale of 1 to 5. 1= Very Detrimental, 2=Detrimental, 3=No difference, 4=Beneficial, 5=Very Beneficial

Those CFIs who thought that it was beneficial to teach a student with an observer tended to think that observations were more beneficial. There was no significant correlation between the way the instructor felt their student flew the airplane with an observer on board and how beneficial the observations were to the students.

There was a significant correlation (r=.21, p=.02) between how often flight instructors encourage their students to do more flight observations than the required amount and how beneficial they felt the observations were. The instructors were more apt to encourage extra observations if they felt those observations were worthwhile for the students. However, the flight instructors that “never” recommended extra observation flights still felt that the observation flights were beneficial.

There was a significant difference (F=3.89, p=.02) between three groups of flight instructors and how beneficial they felt the observation flights were. The three groups of instructors were broken up according to the number of dual instruction given. Group 1 had 25 to 500 hours, Group 2 had 501 to 1,000 hours, and Group 3 had over a 1,000 hours of dual given. According to the Tukey HSD test, there was a significant difference (.04) between Group 1 and Group 2. Table 4 depicts the three groups of instructors and how beneficial each group felt that the observation flights were for the students.

Table 4. Mean of How Beneficial the Student Flight Observations Were According to the Three Different Groups of CFIs

CFI Group	*Mean	N	Std. Deviation
1.00	4.18	80	.50
2.00	3.89	36	.75
3.00	4.29	17	.59
Total	4.11	133	.60

*Scale of 1 to 5. 1= Very Detrimental, 2=Detrimental, 3=No difference, 4=Beneficial, 5=Very Beneficial

Flight Records Data

According to the flight data for this study, there was a significant difference in the total number of hours it takes to receive a private pilot certificate between those students who were required to observe zero flights and those whom observed two or four flights. When comparing the three groups of students, those who were required to observe no flights, two flights and four flights, an ANOVA showed no significant difference between those three groups ($F=5.41$, $p=.07$). Those students who observed zero flights had a mean of 61.4 hours to obtaining their certificate, those who observed two flights had a mean of 59.2 hours, and those students who observed four flights had a mean of 57.6 hours. Further analysis of comparing similar individual semesters showed significant differences for each t-test. The Fall of 2001 was compared to the Fall of 2002 (t=60.21, p=.01), the Spring of 2002 was compared to the Spring of 2003 (t=35.40, p= .02), and the Summer of 2002 was compared to the Summer of 2003 (t=31.81, p=.02). Table 5 depicts the relationship between the number of observations required and the average number of hours it took a student to receive a private pilot certificate.

Table 5. Mean Number of Hours to Obtain a Private Pilot Certificate by Semester (2001-2003) Versus the Number of Observation Flights Required, N=7

Semester	Mean Number of Flight Hours	Number of Required Observations	Percentage of Students Complete
Fall of 2001	61.2	0	88.6%
Spring of 2002	62.8	0	82.3%
Summer of 2002	60.2	0	80.4%
Fall of 2002	59.2	2	89.7%
Spring of 2003	59.3	4	79.8%
Summer of 2003	56.5	4	76.5%
Fall of 2003	56.9	4	46.9%

The Fall of 2003 has a large amount of students that have yet to complete the course in comparison to the other six semesters. The general trend in the number of flight hours is decreasing.

The first attempt stage check pass rates are another measure of success for a flight course. There was no significant difference among any of the stage check pass rates between the year that had implemented observation flights and the year that had not implemented observation flights. Table 6 depicts the percentage of students who passed the stage check on their initial attempt.

Table 6. First Attempt Stage Check Pass Rate by Semester (2001 and 2003)

Semester	Stage 15	Stage 28 Oral	Stage 28 Flight	Stage 34 Oral	Stage 34 Flight	Number of Observations
Spring 2001	84.91%	84.78%	77.44%	91.13%	88.43%	0
Summer 2001	92.86%	79.49%	78.95%	94.29%	91.43%	0
Fall 2001	86.01%	89.31%	81.68%	91.06%	93.50%	0
Spring 2003	90.68%	83.96%	80.95%	94.95%	88.80%	4
Summer 2003	83.33%	82.14%	81.48%	92.31%	88.00%	4
Fall 2003	77.86%	81.37%	74.49%	92.54%	89.23%	4

Research Question 2

The second research question was, “Does it matter in regard to perceived benefit what type of flight lessons the student observes? If so, which specific flight lessons should be designated as suitable for student observation flights?” A qualitative analysis of the data using a coding of categories of data was done to answer this question.

The top five tasks that were being completed during the flight were identical according to both the students and the flight instructors. The top five items flight instructors (N=138) had the observing students complete are:

1. Watch for traffic (124, 89.86%)
2. Watching what was happening in the cockpit during the flight (96, 69.57%)
3. Help with a portion of the preflight (84, 60.87%)
4. Listen for radio calls (64, 46.37%)
5. Answering questions relating to the flight (50, 36.23%)

The two most common things that the flight instructors have students do are for the most part a silent activity for the student. The top five items that the students (N=60) said they did while on their observation flights were:

1. Watching what was happening in the cockpit during the flight (44, 73.33%)
2. Watch for traffic (43, 71.67%)
3. Help with a portion of the preflight (32, 53.33%)
4. Listen for radio calls (26, 43.33%)
5. Answering questions relating to the flight (17, 28.33%)

The top two things that the flight instructors and students say they do during the flight are switched, yet both have an extremely high percentage of students doing those activities.

The students were broken into three groups to determine the types of maneuvers they felt were most beneficial. The students who thought the observations were either ‘very beneficial’ or ‘beneficial’ were in Group 1 (N=24). Those who thought the observations made ‘no difference’ were in Group 2 (N=24), and those who thought the observations were either ‘detrimental’ or ‘very detrimental’ were placed in Group 3

(N=11). Table 7 shows the rank order for each Group according to which types of flights each student observed and how beneficial the student felt the observations were.

Table 7. Types of Lessons Observed According to How Beneficial/Detrimental the Students Felt the Observation Flights Were for Themselves

Group 1	Group 2	Group 3
Maneuvers	Maneuvers	Short and Soft-field
Short and Soft-field	Short and Soft-field	Maneuvers
Local night flight	Local night flight	Instrument Procedures
Instrument Procedures	Instrument Procedures	Local night flight/*XC
Night *XC	*XC/Night *XC	
*XC		

*XC = Cross Country flight

The students were all observing similar flights, with the vast majority of them observing flights that did maneuvers (38, 68.33%) and short-field and soft-field takeoffs and landings (35, 58.33%). Only five students (8.33%) observed a cross-country flight and only six students (10%) observed a night cross-country flight. There appeared to be no preference amongst the students as to which type of flight was more beneficial.

The types of flights that the flight instructors believed were the most beneficial for the students to observe were:

1. Maneuvers (stalls, slow flight, ground reference maneuvers, etc.)
2. Short and soft-field takeoff and landings
3. Instrument procedures
4. Cross-country flight
5. Local night flight

6. Night cross-country flight
7. Other flights

The flight instructor group had similar responses to that of the students.

CHAPTER V

DISCUSSION

The purpose of this study was to determine the effectiveness of observation training for initial flight students. A discussion of the results obtained and conclusions of the analyses are presented in this chapter. Recommendations for flight operations and also for further study are proposed.

Conclusions

Students

A strong relationship existed between how involved a student was during the observation flights and how beneficial those flights were to the student. If the student was not involved at all, they tended to think the flights were 'detrimental' or had 'no difference.' Students that were not involved thought the flight observations made 'no difference' and those who were really involved felt that the observations were 'beneficial.' The results indicated that the flight observations were more beneficial for the students when the observer is involved in the flight.

The most popular suggestion from the students on how to improve the observation flights was to better involve the observing students. One large obstacle to overcome is to standardize getting the students involved in the flights. The students may need a more purposeful objective, but it is the overall responsibility of the flight instructor to create a learning environment for both students.

Flight Instructors

There were a few significant differences found between the groups of instructors. One difference was between the instructors that had no Aviation 102 students observe them give dual instruction to another student and the group of instructors that had three to four students observe them. The group that had no students (N=6) observe them thought that flight observations were significantly more beneficial than those instructors (N=49) that had three to four observe them. One reason for this could be the low number of instructors that had no students observe them. Another reason for this could be that only people who taught and evaluated Aviation 102 students were asked to respond to the questionnaire. Those six instructors could have been people who have only evaluated Aviation 102 students, but who have not taught a student in that flight course for several years.

A significant correlation ($r=.32$, $P<.001$) existed between how detrimental or beneficial a flight instructor felt it was to teach a student while having an observer in the backseat and how beneficial the instructor felt the observations were for the student. Those who thought it was very beneficial to teach a student with an observer in the back thought that the observations were much more beneficial than those who thought it was detrimental to teach a student with an observer in the backseat.

Flight Records Data

The flight records data showed significant differences in the average number of flight hours. There was a general decreasing trend in the number of hours to receive a private pilot certificate throughout the seven semesters that were compared. An ANOVA comparing the three groups of students (those who were required to observe zero flights, two flights, and four flights) was close to being significant (F=5.41, p=.07), and further analysis that compared individual semesters showed significant differences between several similar semesters. T-tests found significant differences between the Fall of 2001 when compared to the Fall of 2002, the Spring of 2002 when compared to the Spring of 2003, and the Summer of 2002 when compared to the Summer of 2003. The study showed that the flight observations were significantly decreasing the average number of hours to receive a private pilot certificate. This decrease in the number of hours cannot be solely attributed to observation training because there are many factors that play into student training. For example the weather, finances, student vacations, individual motivation, changes of flight instructors, and unusual circumstances all are variables that may cause differences in students' training. Those other variables were not able to be restricted for the purpose of this study.

There was no significant relationship found in the first attempt stage check pass rate once the observation flights were implemented. The observation flights do not seem to be increasing the knowledge level of a student pilot during any of their three blocks of training. None of the stage checks had a significant difference in the pass rates from before the flight observations were required as compared to after the flight observation program was implemented.

Other Findings

This study did not find any difference in perceived benefit as to which type of flight lesson should be observed. The students were separated into three groups according to how beneficial they felt the observation flights were for themselves, and each group was observing the same type of flights. One of the reasons as to why the students were observing similar flights is that some of the flights, such as the cross-country flights, are much longer and would take advance coordination to observe in comparison to the other types of flights. Another consideration is that many of the students procrastinate until the observations are due towards the middle and end of the semester, and many of the students are on similar lessons during those times.

Recommendations were received on the questionnaires as to how to improve the current observation training program at the University of North Dakota. Both the students and the flight instructors provided feedback on how they felt the program could be improved.

The student comments were fairly spread out in their suggestions. There were several categories that most of the comments fell under: participation, learning, frequency or type of flights, and miscellaneous comments. The two most common comments were to involve the observing student more (N=7) and also that the program is fine as is (N=7). Some students suggested eliminating the program completely (N=3) or just making it optional/extra-credit (N=4), and others suggested lowering the number of observations required (N=4), which is currently set at four per semester. One student suggested putting more emphasis on the observations and another suggested observing flights that focus on their trouble areas. Scheduling the observations was a complaint that the students would like to see addressed so that they can more efficiently utilize their time. At the time the study was conducted, many students hung around the airport in the hope of finding someone they could observe on a flight instead of having the luxury of scheduling an observation time with another student or instructor. There was a sign-up sheet that students could utilize, however that did not mean they would find a flight to observe. A lack of a system for setting up these observations left some students frustrated with having difficulty in finding someone else to observe. On the other hand, some students benefited from having this flexibility in scheduling because they knew several other students/instructors they would like to observe on a flight. Having Aviation 102 students network with other students to find flights to observe would be one option putting the burden back onto the students for scheduling the observations.

The instructor sample had many suggestions that could prove to be helpful. The most common suggestion was again having the observer more involved in the flight (N=20). Eleven instructors felt that the students should complete a more extensive checklist, worksheet or homework assignment. The instructors also addressed the scheduling issue of the observations. Nine instructors mentioned more efficient scheduling, while nine other instructors thought students need to have observations due at different times because too many of them observe on the last day. The students need to have better planning and less procrastination.

Six instructors felt that observations need to be done more frequently. Four instructors felt that the observers need to realize the purpose of observations. The students are doing this to benefit themselves, not just to get participation points for a ground school class. Three instructors would like to see goals or objectives developed for the students to accomplish during the flights.

Many of these comments coming from the students and instructors could be incorporated into the current observation training program. Students should be getting more involved during those flights, whether it be through their own motivation or through the aid of a CFI.

Additional Considerations

One limitation of the current study was the small sample size. It was not possible to collect data from several different semesters of Aviation 102 students. Also, a majority of the flight instructors had only been instructing since the flight observations had been implemented, so many had no comparisons to make between semesters with and without flight observations. Having a more senior sample of flight instructors would have been helpful.

There was an edition change for the Aviation 102 Private Pilot Certificate TCO between the Summer of 2002 and the Fall of 2002. There was not an appreciable change in the course, so it should not have had a significant effect on the stage check pass rates or the number of hours it took a student to obtain a private pilot certificate.

The first attempt stage check pass rate data had incomplete data for the year of 2002, therefore, it was not possible to compare the same semesters (Fall of 2001 through the Fall of 2003) as the flight records data for the average number of flight hours. The stage check pass rates compared the Spring, Summer and Fall of 2001 to the Spring, Summer and Fall of 2003. In 2001 there were no required observations, while in 2003 there were a total of four observations required. Had the data for 2002 been complete, it would have been utilized. Utilizing more than just one year worth of records before and after the observation flights were implemented may give a different set of numbers. It is difficult to compare the courses over a span of several years due to many changing factors such as the TCO, changes in technology, weather and flight instructors.

The flight records data for the average number of flight hours included all of the students that had completed the Aviation 102 flight course at the time the data was collected. The Summer of 2003 and especially the Fall of 2003 had a significant number of students that were not yet finished with their flying. This may have resulted in a lower average number of flight hours for those two semesters. The data indicated that there was not a significant difference between previous semesters, but there was a strong relationship between the two, just not enough to be considered significant.

One last factor for the average number of flight hours could be the increase in the volume of traffic seen at the Grand Forks International Airport. There has been an increase in the number of aviation students, which causes an increase in the amount of traffic. According to Alan Palmer, Director of Flight Operations at UND, that increase in traffic should not have caused a significant increase in a students' training time. This factor does not hold consistent with the general decline in the number of flight hours it takes to receive a private pilot certificate. As the airport becomes more congested, additional delays can be expected. This lends more credence that the observation flights may be more beneficial than the number of flight hours projected since the hours theoretically should be increasing instead of decreasing due to increased traffic at the Grand Forks International Airport.

Recommendations for Flight Operations

The current structure of flight observations has ample room for improvement. Holding students more accountable for these observations and getting them involved during the flight needs to happen if the students are to be getting as much out of this training aid as many people think they should be getting out of it. Students need to be aware of how much of a benefit this tool can be to them if it is properly structured.

Motivating the students so that they want to get the most out of their observations should be a responsibility of each flight instructor.

Perhaps teaching new CFIs how to incorporate a student sitting in the backseat while not taking away from the instruction given to the primary student needs to be addressed. Currently there is no training on how to effectively teach two people in an aircraft. Incorporating how to better involve observing students during flights could be taught to CFIs during their initial training at the University of North Dakota. Perhaps that would lead to having better student involvement throughout the observations. The students who felt the observations were the most beneficial were the students that were involved, so finding a method to involve the students in the flight may help improve the observation program.

The observation program is for the students, so the responsibility of improving the program should not solely be placed with the CFIs. Holding the students more accountable during the observation flights is an option to force the students to learn more from these flights. Currently the form that is completed by the students is a half-sheet of paper that basically asks the students to list the person they flew with, the date, and the maneuvers completed. This form could be upgraded to more of a worksheet that allows the student to be participating throughout the flight.

Another suggestion is to have observation plans for each type of a lesson in the Aviation 102 course. The students need to learn a certain set of skills throughout their training, and each lesson has a specific objective to help accomplish those goals. The observation program could expand to have a loose set of guidelines to follow, not necessarily for each individual lesson, but for each different type of flight. For example, if the students are observing a cross-country flight, it could be arranged so that the observer must also complete the necessary flight planning to accomplish that particular flight. Throughout that flight the observer should then be watching their planning to see how accurate it was. However, this would require advance planning of the observations.

Recommendations for Further Study

Further research is recommended in the study of observation training for initial flight applicants. A replication of this study is suggested, as well as an adaptation of the study to include training two groups of students during the same semester. Having two groups of students, one group having no required observation flights and the other group having four or more required observation flights, during the same semester would allow for having the same time and weather constraints, which would eliminate several of the variables.

Comparisons of Grade Point Averages (GPAs) would also be interesting. Perhaps those students with higher GPAs perceive the observation flights to be more beneficial or are more active in participating during the observations.

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