An Internship to Develop a Screening Process to Determine Probable Pilot Training Success

Ronald Dean Quisling
Western Michigan University
AN INTERNSHIP TO DEVELOP A SCREENING PROCESS TO DETERMINE PROBABLE PILOT TRAINING SUCCESS

by

Ronald Dean Quisling

A Report of an Internship
Submitted to the
Faculty of The Graduate College
in partial fulfillment
of the
Specialist in Education Degree

Western Michigan University
Kalamazoo, Michigan
April 1973
AN INTERNSHIP TO DEVELOP A SCREENING PROCESS TO DETERMINE PROBABLE PILOT TRAINING SUCCESS

Ronald Dean Quisling, Ed. S.
Western Michigan University, 1973

The internship with the Department of Transportation Technology at Western Michigan University enabled the investigator to develop a screening method for the department to use in its pilot training program. It provided an opportunity to study the many and varied skills needed in order to successfully complete the pilot training course and to learn the various techniques used in pilot training. After choosing a screening method, it was given to those students enrolled in flight instruction during the 1972 Fall semester. It was the first time any type of research was begun at Western Michigan University in the aviation curriculum and it is going to be continued so that the Department of Transportation Technology will have a tool by which it can select students who have a high chance for success in the pilot training program.
ACKNOWLEDGEMENTS

In writing this project report, I have benefitted from the encouragement, advice and constructive criticism of Dr. Kenneth Engle. My thanks go to him, as well as Dr. Robert Betz of the Counseling and Personnel Department and to Dr. David Taylor of the Teacher Education Department. I also want to thank Dr. Harley Behm and Mr. Ronald Sackett of the Transportation Technology Department, and Mr. Laurence Berman and Mr. Gerard Nowak of the Testing Center for their assistance. The intellectual training from these faculty members of Western Michigan University has made graduate study both a challenge and a pleasure. My gratitude in no way divorces me from the sole responsibility for what is written here.

Ronald D. Quisling
INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms
300 North Zeeb Road
Ann Arbor, Michigan 48106

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
MASTERS THESIS

QUISLING, Ronald Dean
AN INTERNSHIP TO DEVELOP A SCREENING PROCESS TO
DETERMINE PROBABLE PILOT TRAINING SUCCESS.

Western Michigan University, Ed.S., 1973
Education, general

University Microfilms, A XEROX Company, Ann Arbor, Michigan
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td></td>
</tr>
<tr>
<td>THE PROSPECTUS SUBMITTED PRIOR TO THE INTERNSHIP EXPERIENCE</td>
<td>1</td>
</tr>
<tr>
<td>Institution, Advisor, Supervisor</td>
<td>2</td>
</tr>
<tr>
<td>Time Period</td>
<td>2</td>
</tr>
<tr>
<td>Rationale</td>
<td>2</td>
</tr>
<tr>
<td>Conceptual Skill Objectives</td>
<td>4</td>
</tr>
<tr>
<td>Human Skill Objectives</td>
<td>4</td>
</tr>
<tr>
<td>II</td>
<td></td>
</tr>
<tr>
<td>LOG OF EXPERIENCES</td>
<td>6</td>
</tr>
<tr>
<td>Days Scheduled for Internship</td>
<td>7</td>
</tr>
<tr>
<td>Days of August 28-October 8</td>
<td>8</td>
</tr>
<tr>
<td>Days of October 9-November 17</td>
<td>10</td>
</tr>
<tr>
<td>Days of November 1-November 28</td>
<td>12</td>
</tr>
<tr>
<td>III</td>
<td></td>
</tr>
<tr>
<td>REVIEW OF RELATED AREAS</td>
<td>13</td>
</tr>
<tr>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>DESCRIPTION OF THE TESTS</td>
<td>16</td>
</tr>
<tr>
<td>V</td>
<td></td>
</tr>
<tr>
<td>SUMMARY OF INTERNSHIP EXPERIENCE</td>
<td>20</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>22</td>
</tr>
</tbody>
</table>
SECTION I.
THE PROSPECTUS SUBMITTED PRIOR TO THE INTERNSHIP EXPERIENCE

In today's competitive world, individuals cannot afford to waste time in special training programs for jobs only to discover during or after the training that they are neither qualified nor capable of performing a particular job. For example, college students must begin to make occupational choices early in the course of their studies, and any program that helps them to assess their probable skill in a field is invaluable.

I saw my internship at Western Michigan University as an opportunity to gain experience in exploration of the individual factors that enter into defining skills which are necessary to be successful in a specific training area. The training area that I have selected is aviation. With the help and cooperation of Dr. Behm, Chairman of the Transportation Technology Department, I developed a tentative screening model which will be used to measure probable success in the professional pilot training program at Western Michigan University. In order to avoid confusion, I will define a professional pilot as one who is engaged in flying as his primary occupation.

My internship provided me with the opportunity to work with both the staff and students of the Transportation Technology Department and to become aware of the various factors involved
in the training and selection of potential professional pilots.

Institution

Western Michigan University, College of Applied Sciences, Transportation Technology Department

Advisor

Dr. Kenneth Engle, Professor, College of Education, Counseling and Personnel Department

Supervisor

Dr. Harley Behm, Professor and Chairman, Transportation Technology Department

Time Period

Fall Semester, 1972

Rationale

My experiences in Counseling and Personnel Education, especially in dealing with employers and those seeking employment, has led me to realize that in many job areas the applicant is required to successfully complete a specific training program before he is hired. Many training programs are lengthy and costly, but required since the applicant is lacking the necessary skills for the job.

Observing this situation, I determined that it would be desirable to place more emphasis on the screening of potential
professional pilot students. Hopefully, the screening process would eliminate those individuals who do not possess the requisite skills to become successful professional pilots.

A possible approach to this problem is to start a meaningful evaluation program with the intention of a future follow-up study. The evaluation program would make it possible to look at the test results of those who are successful and then develop guide lines for future use.

After spending three years as a flight instructor, I have concluded that some individuals do not make the grade in learning how to fly. Failure is very frustrating for the person who has aspirations of becoming a professional pilot. It is my opinion that it would be more desirable if a person could predict the probability of his success before he wastes his time, money and energies.

My internship, working with Behm, allowed me an opportunity to develop a testing program which may be used to seek certain characteristics which will provide those interested in aviation an opportunity to be tested and evaluated. The evaluation will enable an individual to investigate his probability of success in a professional pilot training program.

Realizing that the screening process is only one tool to be used in the complex arena of predicting success in piloting, I examined the conceptual and human skills necessary to give direction to my objectives.
As a counselor interested in personnel training and development, I had to use both conceptual and human skill objectives to develop a screening program that was of value to the students, faculty and administration.

**Conceptual Skill Objectives**

1. To develop a screening program for pilot training.
2. To provide advisors in the Transportation Technology Department with information that will be useful in advising students who are interested in pilot training.
3. To provide students with an opportunity to take a realistic look at their skills and personality characteristics.
4. To provide employers with information about potential employees that will be helpful in their selection and placement.
5. To improve testing skills and academic advising.
6. To gain expertise by the use of the scientific approach to investigate problems.
7. To discover the various factors that are involved in pilot training.
8. To gain experience in working with experienced administrators and instructors in their role in the education of pilots.
9. To gain a working knowledge of the various facets of pilot training and selection.

**Human Skill Objectives**

1. To develop and improve techniques for testing and screening students with the guidance and help from the professional with whom I will be associated.
2. To increase my ability to analyze the various factors involved in training programs.
3. To develop skills as an educational leader.

4. To approach the problem with originality.

5. To approach the testing process with a realistic and unbiased attitude.

6. To develop communication skills with administration, faculty and students.
SECTION II

LOG OF EXPERIENCES

Percentage of Time Scheduled to Each Area

The experience with the Transportation Technology Department involved exposure to several areas, all aimed at developing a screening program for pilot training at Western Michigan University. Exposure to these areas provided me with an opportunity to look at the many and complex approaches to examining and evaluating a training program. Being exposed to the various areas made it difficult to keep a precise record of the time spent in a specific area because several of my responsibilities and tasks overlapped. However, my goal was to proportion my time in the following manner:

- Transportation Technology Department 20%
- Testing Center 20%
- Coordination between the Transportation Technology Department and the Testing Center 5%
- Screening Project 20%
- Administering the Tests 20%
- Personal Counseling 10%
- Academic Advising 5%

During the study, I kept a record of the days and the total time spent in each area. The log is reproduced on the following page.
Days Scheduled for Internship  
Fall Semester 1972

Examining several of the tests available and making a decision with respect to which tests would meet the objectives of the screening process was accomplished on the following days:

- **August**: 28, 29, 30, 31  
  - Total Time: 46 hours
- **October**: 1, 2, 4, 5, 6, 8  
  - Total Time: 46 hours

Setting up the procedures for administering the screening tests and coordinating this between the Transportation Technology Department and the Testing Center was accomplished on the following days:

- **October**: 9, 10, 11, 13, 17  
  - 19, 24, 26, 31  
  - Total Time: 128 hours
- **November**: 2, 8, 10, 14, 16, 17  
  - Total Time: 128 hours

Counseling and advising the students who were involved in this project was accomplished on the following days:

- **November**: 1, 3, 6, 9, 15, 17  
  - 20, 21, 28  
  - Total Time: 51 hours

Total time for the internship: 225 hours

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
My first task during this time period was to determine what instruments would be used in the evaluation process. To accomplish this, I researched the various types of tests that would provide a description of the individual being tested.

When a test is used descriptively, we do not confine ourselves to one definite question. Rather, we try to record all important facts so that they will be available when questions about treatment arise. A description may catalog a student's interests, describe his personality pattern, or give an inventory of his knowledge about his major field. The description is multidimensional and helps resolve many different questions about how to treat the person (Cronbach, 1960).

Knowing that interest, personality and knowledge are important in the description of a professional pilot, I selected three methods of obtaining this information. The Strong Vocational Interest Blank (SVIB) was selected to measure an individual's interest. The Edwards Personal Preference Schedule (EPPS) was selected to measure an individual's personality characteristics. And finally, the General Aptitude Test Battery (GATB) was selected to measure an individual's intelligence, verbal aptitude, numerical aptitude, and spatial aptitude. A more detailed report on these tools is provided in Section IV.
With help from members of the Counseling and Personnel Department, Transportation Technology Department, and the Testing Center, I developed several objectives for the evaluation procedure.

**Evaluation Objectives**

1. To help students determine if they have the necessary qualifications to become a professional pilot.

2. To assist the staff and advisors in the Transportation Technology Department in academic and vocational guidance.

3. To assist the staff of the Transportation Technology Department develop and/or change the training program to meet the varying needs of the student pilots.

4. To select a battery of tests that will be used in a positive manner to give students assistance in selecting their vocation.

5. To provide the Transportation Technology Department with an evaluation method that is easy and inexpensive to administer.

6. To utilize tests that are well established and well known.

7. To utilize tests that have been researched and have normative data available.

8. To provide the Transportation Technology Department with data that will be used for continued scientific investigation.
October 9, 10, 11, 13, 17, 19 24, 26, 31
November 2, 8, 10, 14, 16, 17

During this time period, my objective was to obtain the tests, make arrangements for the scheduling and administration of the tests, and to administer the tests.

Obtaining the Tools for the Evaluation

1. Authorization to use the GATB was obtained from the Testing Center and the State Employment Services.

2. A fee was assessed for the use of the EPPS and the SVIB.

3. The Testing Center at Western Michigan University was very helpful and cooperative in making the arrangements for obtaining the tests.

Scheduling for the Administration of the Tests

1. Scheduling was difficult because the students had classes during all hours of the day with little free time.

2. Scheduling times could not interfere with other classes.

3. It was difficult to schedule more than five students for testing at one time, because it took approximately three hours to complete the tests.

4. It became necessary to schedule individual testing periods, which took a great deal of time for the tester.

5. Scheduling time had to be coordinated between the Testing Center and the Transportation Technology Department.
Test Administration

1. To assure fair testing, the tester must become thoroughly familiar with the test. Even a simple test usually presents one or two stumbling blocks which can be anticipated if the tester studies the manual in advance (Cronbach, 1960).

2. The tester must maintain an impartial and scientific attitude. The beginning tester might be tempted to give hints or extra time to the students being tested (Cronbach, 1960).

3. The testing room has to have good ventilation, lighting and seating arrangements.

4. The tests should be given to an individual only when he is both physically and emotionally ready.

5. Group tests are given only to reasonably mature and cooperative subjects who expect to do as the tester requests (Cronbach, 1960).

6. The subject should know the reason for the tests and he should be motivated enough to care about the results.

7. The tester should observe the behavior displayed by each individual taking the tests (Cronbach, 1960).
I found that once a student became involved in this project, he felt a need to make a closer examination of his vocational choice. I also discovered that the EPPS stimulated several students to start searching for solutions to their personal problems. Therefore, it was necessary to become involved in both vocational guidance and personal counseling. For many, this was the first time they had had an opportunity to deal with their concerns and feelings about themselves.

**Academic and Vocational Guidance**

1. The SVIB caused a few of the students to question their vocational choice.

2. The students came to me with their questions about careers in professional flying. Some of the questions I could answer, others were referred to different sources.

3. Some of the students started looking for alternative vocational choices when they discovered they could not become a professional pilot.

**Personal Counseling**

1. It was necessary to provide counseling for those who felt uncomfortable about some of the questions on the EPPS.

2. Personal counseling was provided for a few of the students who did not trust the tests and refused to take them.

3. The items discussed in the counseling sessions were kept in strict confidence.
A psychiatrist with the University of Michigan is conducting research to establish a personality profile of the general aviation pilot. He stated the following:

The personality profile will be used to improve the capability of pilots by pointing out their possible weaknesses, as well as their skills. The tests are to form the basis for a study of why people fly airplanes, what kind of persons make good pilots, and possibly to provide clues as to how to identify the accident-prone pilot. The tests consist of the EPPS and a questionnaire that was developed. This type of study has not previously been attempted (Novello, 1972).

The Director of the Institute of Aviation Research Laboratory at the University of Illinois stated the following:

The Aviation Department's Research Laboratory is concentrating their efforts on finding simulators that will improve the quality of their pilot training program. They use the simulators to familiarize the students with basic piloting techniques. At the present time, research is directed toward development of motor skills rather than looking for personality characteristics of pilots (Roscoe, 1972).

Roscoe was not familiar with any recent research in the area of psychological testing of pilot trainees but he did refer the writer to research specialists in the Air Force.

Contact was then made with researchers at two Air Force bases.
During a recent telephone conversation with a researcher at Williams Air Force Base, I obtained the following information:

The researchers at Williams Air Force Base are presently interested in finding data in the area of task-load effect. They measure changes in individual behavior as environmental and situation-al problems arise (Eddowes, 1972).

I was not able to obtain any information regarding the types of tests presently being used or any that have been utilized in the past. Also, the results of the tests were not made available to me.

A researcher at Lackland Air Force Base, during a recent phone conversation, stated the following:

The Human Resource Laboratory at Lackland Air Force Base recently completed research measuring personality characteristics of the successful pilot, but it has not been published. The title is Analysis of Air Force Pilots on the Basis of Predicted Performance. It will be available to the public within a month (Miller, 1972).

It was discovered that the Air Force is presently involved in analyzing personality characteristics relating to pilot training. But it is unfortunate that it was not available at this writing.

According to Cronbach (1960), much of the research done in the Air Force during the past years has not indicated a very high correlation between pilot success and personality characteristics. A reason may be due to their population sample. Those selected as research subjects had already passed the tests.
required to become an officer, thus making the population a select group.

The major airlines each have a battery of tests that are used for pilot selection and research. These tests are not available to the public, and I was told that they were unavailable to me for use in my internship. Each of the airlines administer these tests to all their prospective pilots. The applicant must already be a commercial pilot with an instrument rating and have at least 1200 hours of flight time before he can apply to take the airline tests. He, therefore, has spent considerable time and expense on the prerequisites, and if his score is not adequate it has all been wasted effort. Exactly what these tests are is unknown, but I am aware they include such areas as learning ability and personality inventories.
SECTION IV

DESCRIPTION OF THE TESTS

The General Aptitude Test Battery (GATB) was one of the tests used. The test consists of eight parts and if all were given, it measures nine aptitudes. I administered four of the parts and thereby measured four aptitudes. The first aptitude measured was intelligence or general learning ability. Intelligence is the ability of a person to "catch on" or understand instructions and underlying principles; the ability to reason and make judgments. General learning ability is closely related to doing well in school. The second aptitude measured was verbal aptitude. Verbal aptitude is the ability to understand the meaning of words and to use them effectively. It is also the ability to comprehend language, to understand relationships between words and to grasp the meanings of entire sentences and paragraphs. Numerical aptitude, the ability to perform arithmetic operations quickly and accurately, was the third area measured. The last aptitude measured was spatial aptitude. Spatial aptitude is the ability to think visually of geometric forms and to comprehend the two-dimentional representations of three-dimentional objects. Also it is the ability to recognize the relationships resulting from the movement of objects in space (GATB, 1968).

The Strong Vocational Interest Blank (SVIB) is a device to
identify the various interests of college students, and then to suggest to them occupations that they might find satisfying. For this purpose, the SVIB provides a measure of the similarity between a person's interests and those of successful men or women in a wide range of occupations.

The SVIB is designed to help guide the student or an employee into areas where he is likely to find the greatest job satisfaction but not necessarily job success. Though it would seem that there must be some substantial relationship between interest and quality of performance, it is at present, not well understood. Strong states that regardless of whether a student likes a course or not, he will probably earn about the same grade that he earns in his other courses. Generally his grades will depend on his abilities and general level of aspiration. But whether or not he elects to take a specific course, and succeeding courses in the series, usually depends on how great his interest is in the subject matter. Thus, while measures of ability are needed to predict quality of performance, measures of interest are also needed to suggest the areas that will be most stimulating. The SVIB is such a measure.

Similarly, although a man's performance on the job depends on his abilities and motivation, whether he stays on the job will largely reflect whether he likes it. For this reason, interest ratings are more of an indication of job persistence than of job success. In most selection techniques, too much attention is given to efficiency and too little attention to satisfaction and enjoyment.
What good is it if a trainee becomes an immediate success but then leaves the job?

The measure of the SVIB contains the summary statement:

A person should consider seriously those occupations in which he receives high scores on the SVIB before entering some unrelated occupation. On the other hand, he should scrutinize critically any occupation in which he receives a low score before accepting it as a final choice (Strong, 1964).

The Edwards Personal Preference Schedule (EPPS) was created primarily as an instrument for research and counseling purposes. It has become a quick and convenient measure of a number of relatively independent normal personality variables. The EPPS measures fifteen of these personality variables. They are as follows: achievement, deference, order, exhibition, autonomy, affiliation, intraception, succorance, dominance, abasement, nurturance, change, endurance, heterosexuality and aggression.

The format of the test is 225 pairs of statements and the one taking the test must choose one from each pair that best describes his feelings of himself. The statements often contain two desirable traits in which case he has to decide which trait he likes better. If the two statements are both undesirable traits, he still must choose the one he dislikes least. From his answers it can be determined where he falls against a norm in each of the fifteen tested areas (Edwards, 1959).

The following page is a copy of the Pilot Profile Analysis Sheet, which was used to record the results from the three instruments used in this study.
PILOT PROFILE ANALYSIS SHEET

Name ____________________________________________

1. ABILITY TESTS
   General Aptitude Test Battery

   NO.  Raw Score  General  Verbal  Numerical  Spatial
   2    [ ]         [ ]      [ ]      [ ]
   3    [ ]         [ ]      [ ]      [ ]
   4    [ ]         [ ]      [ ]
   6    [ ]

   Total converted aptitude scores _________ _________ _________ ________

   %ile
   Nat'l population _________ _________ _________ ________

2. PERSONALITY TESTS
   Edwards Personal Preference Schedule

   Personality Trait  %  Personality Trait  %
   1. Achievement     ___  9. Dominance        ___
   2. Deference       ___  10. Abasement       ___
   3. Order           ___  11. Nurturance       ___
   4. Exhibition      ___  12. Change          ___
   5. Autonomy        ___  13. Endurance        ___
   7. Introversion    ___  15. Aggression       ___
   8. Succorance      ___  16. Test Consistency ___

3. INTEREST TESTS
   Strong Vocational Interest Blank

   Non-Occupational Scales  Administrative Indices

   AACH  DIV  FMII  OIE  TR  UNP  FC  LP  IP  DP

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
SECTION V

SUMMARY OF THE INTERNSHIP EXPERIENCE

Problem

The objective of this internship was to examine several aspects of the reported finding that all students who complete professional pilot training do not end up being employed as a professional pilot. There are two main reasons for this. First, the person does not meet the motor skill requirements of piloting or second, the person does not possess the psychological make-up necessary to become a professional pilot. This study developed a potential evaluation procedure to screen out those who do not meet the psychological level expected of a professional pilot.

Method

Forty-two students who were enrolled in pilot training and interested in becoming professional pilots were given a battery of tests. The battery of tests included the General Aptitude Test Battery, the Edwards Personal Preference Schedule, and the Strong Vocational Interest Blank.

Results

The evaluation procedure provided the Transportation Technology Department with a testing program that is economically feasible and
and easy to administer. The results of the tests will be used for vocational guidance and research.

Advisors will administer the tests to students before they start taking professional flight courses and then discuss the test results with the students. The students will then have a chance to take a realistic look at their vocational choice. In the area of research, the Transportation Technology Department will compare the results of the tests with the student's Federal Aviation Administration test score and an evaluation made by the student's flight instructor. The data will then be statistically examined.

Conclusions

One of the most important findings of this study is that students need to be better informed about their probability of success before they enter a professional pilot training program. Furthermore, the study suggests that vocational counselors and academic advisors should have adequate information at their disposal before they direct students into professional flying.
REFERENCES


Eddowes, W., Researcher at Williams Air Force Base, Higgley, Arizona, Personal Telephone Call, December 1972.


Roscoe, S., Director of the Institute of Aviation Research Laboratory at the University of Illinois, Personal Telephone Call, December 1972.


