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Job-Oriented Basic Skills (JOBS) Training: A Long-Term Evaluation

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**Job-Oriented Basic Skills (JOBS) Training:
A Long-Term Evaluation**

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13. ABSTRACT (Maximum 200 words) An evaluation of the Navy's Job Oriented Basic Skills (JOBS) training program was conducted for the period from 1979 through 1987. Through examination of TRAINTRACK and Survival Tracking File data bases, demographic characteristics and attrition rates in "A" and basic electricity and electronics (BE/E) schools and in the fleet were compared for nearly 7,000 JOBS and over 200,000 non-JOBS students (those qualified to attend Navy technical schools based on their Armed Services Vocational Aptitude Battery (ASVAB) scores). The study involved 30 "A" schools, 12 BE/E schools, and 7 JOBS schools. Minority participation in Navy "A" schools was found to be 30 percent higher for JOBS than for non-JOBS students. Although average Armed Forces Qualification Test (AFQT) scores of JOBS students were only half as high as those of non-JOBS students, 93 percent of JOBS students graduated from JOBS schools; 83 percent, from "A" schools; and 74 percent, from BE/E schools. Attrition rates from "A" and BE/E schools averaged 7 percent higher for JOBS than for non-JOBS students. Differences in attrition varied greatly from one school to another, but were fairly stable over time. Fleet attrition of "A" school graduates was approximately 8 percent higher for JOBS than for non-JOBS students. <i>Keywords: Navy training; aptitude tests; personnel selection;</i>			
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FOREWORD

This research and development was conducted under advanced development program element 0603720N (Education and Training), project R1772 (Education and Training Development), work unit ET030 (Prerequisite Skill Enhancement Program) and was sponsored by OP-112 under the Chief of Naval Operations. The objective of the work unit is to establish methods for providing students with the basic prerequisite skills that they require for effective performance in Navy schools.

The objective of the present effort was to reexamine JOBS student participation and attrition and to evaluate the effectiveness of the JOBS program over an extended time period (from 1979 through 1987).

This report is the fourth in a series describing and evaluating the Job Oriented Basic Skills (JOBS) training program. JOBS is a training program designed to provide basic/prerequisite skills training to selected Navy recruits in preparation for "A" school instruction. The first report (NPRDC TR 81-24) described program development activities; the second and third reports (NPRDC TRs 82-14 and 83-5) described interim evaluations. This report supersedes earlier evaluations.

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SUMMARY

Background

In 1978, the Navy implemented the Job-Oriented Basic Skills (JOBS) training program. JOBS was developed to provide recruits who fail to qualify for Navy school training based on their Armed Services Vocational Aptitude Battery (ASVAB) scores with job-oriented basic/prerequisite skills training needed to complete Navy technical schools and to perform to standard in the fleet. Interim evaluations of JOBS have tracked school and fleet attrition rates of JOBS students into 1982.

Objective

The objective of the present effort was to reexamine JOBS student participation and attrition and to evaluate the effectiveness of the JOBS program over an extended time period (from 1979 through 1987).

Approach

TRAINTRACK and Survival Tracking File data bases were examined for the period between 1979 and 1987 to determine which "A" and basic electricity and electronics (BE/E) schools were attended by students who had received preparatory skill training under the JOBS program. Navy schools providing training to 20 or more JOBS students were included in the study. These consisted of 30 "A" schools and 12 BE/E schools supported by 7 JOBS strands. During the period under investigation, these schools serviced nearly 7,000 JOBS students and a comparison group of over 200,000 non-JOBS students (those qualified to attend "A" schools based on their ASVAB composite scores). JOBS and non-JOBS students were compared in terms of their demographic characteristics and their attrition rates in schools and in the fleet.

Findings

1. Minority participation in Navy "A" schools was found to be 30 percent higher for JOBS than for non-JOBS students.
2. Within ratings, mean Armed Forces Qualification Test (AFQT) scores of JOBS students were approximately one-half as high as those of non-JOBS students.
3. Averaged across ratings, 93 percent of JOBS students graduated from JOBS school; 83 percent from "A" school; and 74, percent from BE/E school.
4. Attrition rates from "A" and BE/E schools have averaged 7 percent higher for JOBS than for non-JOBS students, but differences in attrition rates have varied greatly from one school to another.

5. The "A" and BE/E school attrition rates of both JOBS and non-JOBS students increased slightly over time (from 2% to 5%). Differences in attrition rates between JOBS and non-JOBS students have been fairly stable.

6. Fleet attrition rates were approximately 8 percent higher for JOBS than for non-JOBS students.

Conclusions

Despite a significant expansion in the JOBS program, a high level of success has been maintained in terms of minority involvement, "A" and BE/E school completion and fleet service. However, a full assessment of the JOBS program has yet to be accomplished. Further research is required to directly link the effects of JOBS training to "A" school performance. Similar types of prerequisite skill training may also be needed for non-JOBS students in ratings with excessive attrition.

Recommendations

It is recommended that OP-112:

1. Continue the JOBS program. (OP-112 is currently continuing JOBS.)
2. Continue periodic evaluations of the JOBS program.
3. Use JOBS student attrition data in this report in determining whether areas of JOBS training should be expanded or reduced.
4. For ratings with high JOBS student academic attrition rates, determine the causes of the attrition and develop methods for its reduction.
5. Investigate whether to extend prerequisite skill training to ASVAB qualified students in ratings with excessive academic attrition rates. (Such an investigation is underway at NAVPERSRANDCEN under OP-112 sponsorship.)

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INTRODUCTION

Background

In 1978, the Navy implemented the Job Oriented Basic Skill (JOBS) program to address the widely predicted shortfall of high quality recruits. The JOBS program provides low aptitude recruits with job-oriented basic/prerequisite skills training needed to complete selected "A" schools (basic technical schools) or BE/E schools (preparatory schools in basic electrical or electronics skills) and to perform to standard in the fleet. JOBS prerequisite skills training covers basic skills such as mathematics and reading which are taught in four to eight week courses at designated JOBS schools.

Initially, JOBS training covered four training areas (strands)--propulsion engineering (PE), operations (OPS), administrative/clerical (A/C), and electricity/electronics (E/E). A detailed description of curriculum development procedures for the initial JOBS program appears in Harding, Mogford, Melching, and Showel (1981).

Typically, personnel are assigned to JOBS training on the basis of their Armed Services Vocational Aptitude Battery (ASVAB) composite score. The ASVAB tests that make up these composites and the cutoff scores for admittance to specific Navy "A" schools have varied over the time periods covered in this study. The ASVAB score requirements for JOBS candidates have also varied. For all ratings, however, scores for JOBS qualified students are below the normal cutoff levels for the schools and are limited to a 30-point range.

As a result of the manner in which they are selected, the academic ability of JOBS students is much lower than that of recruits normally admitted to Navy "A" schools. For example, Baker and Hamovitch (1983) reported that the mean Armed Forces Qualification Test (AFQT) scores of JOBS students attending Navy "A" or BE/E schools from 1978 through 1982 averaged 28 to 30 points below those of students whose ASVAB scores qualified them to attend the schools. The AFQT is an ASVAB composite that is used by the Navy to determine eligibility for military service.

AFQT scores are also the basis for classifying recruits into mental categories, ranging from a high of I to a low of V. As expected from their substantially lower mean AFQT score, most JOBS students were classified in the lower mental categories. According to Baker and Hamovitch, from 80 to 96 percent of the JOBS students were classified below category III. Only 20 percent of the ASVAB qualified students were classified below category III.

Baker and Hamovitch reported that, despite the substantially lower mean AFQT score of JOBS qualified personnel and their much greater representation in the lower mental categories, 79 percent of those who attended JOBS schools graduated from the "A" or BE/E school programs to which they were assigned. Their overall attrition rate in the "A" and BE/E schools was 11 percent higher than that of the other students. However, in examining fleet attrition rates of "A" school graduates, it was found that the mean rate of attrition for JOBS students was 8 percent lower than that for non-JOBS students. A subsequent cost-benefit analysis conducted by Lurie (1983) concluded that the JOBS program was cost effective for the A/C, E/E, and OPS strands and only slightly more expensive than normal "A" school training programs (without JOBS training) for the

PE strand. Furthermore, the JOBS program was found to promote greater minority participation in "A" school training. Almost 60 percent of the JOBS students, but less than 20 percent of the non-JOBS students, were members of minority groups.

Since the Baker and Hamovitch investigation, JOBS participation has increased and more ratings have become involved in training JOBS students. It is also suspected that, since implementation, JOBS entry requirements have changed or been less stringently enforced so that personnel in higher mental categories are being admitted to the program. Because of these changes in JOBS, a need exists to reevaluate the program's effectiveness.

Objective

The objective of the present effort was to evaluate the effectiveness of the JOBS program over an extended time period (1979-1987). The characteristics and attrition rates of students who participated in the JOBS training program and of non-JOBS students attending the same schools were examined and compared for the same time period. The study provided data for longer time periods and covered the strands and ratings that have been added to the JOBS program since the Baker and Hamovitch study (1983). Variations over time in jobs student participation and attrition rates were also examined.

APPROACH

JOBS Subjects

A primary objective of this study was to compare attrition rates at "A" and BE/E schools for JOBS and non-JOBS students. In the Baker and Hamovitch (1983) study, JOBS students were identified in terms of qualifying ASVAB and AFQT scores. Since then, however, JOBS qualifying scores have changed. Furthermore, personnel who do not qualify for JOBS training have sometimes been admitted to the program. Therefore, in the present study, JOBS students are defined as Navy personnel who attended a JOBS school and received basic skill training in one of seven JOBS strands (Administrative, Airframe Mechanical, Electrical, Electronics, Navigation, Operations, or Propulsion) in preparation for attending an "A" or BE/E school. Non-JOBS students are defined as those who attended "A" or BE/E schools without first receiving JOBS school training.

Data Bases

Data for the present study were taken from TRAINTRACK and Enlisted Survival Tracking File (STF) data bases. These data bases are maintained by the Navy to record demographic data of Navy personnel, track their graduation and attrition rates in Navy schools, and monitor their retention and occupational status in the fleet.

Participating Schools

TRAINTRACK data from 1 January 1979 through 31 December 1987¹ were examined to determine the "A" and BE/E courses attended by JOBS students. Courses were identified by Course Data Processing (CDP) codes. This study included only those "A" school CDPs that provided training for 20 or more JOBS students. Since BE/E schools are now being combined with the "A" schools that they support, any supporting BE/E schools that JOBS students attended were also included. No other types of preparatory or advanced courses were included. A listing of Navy ratings with schools included in this study is provided in Table 1. The schools are organized by supporting JOBS Strands. School abbreviations and CDPs are also provided.

Participating Students

The student population included in this study consisted of those students who were identified as attending any of those schools listed in Table 1 between 1979 and 1987. Those students who attended a JOBS school prior to attending an "A" school were identified as JOBS students; those who did not, as non-JOBS students. Students were identified by their Social Security (SS) number. Any entries in TRAINTRACK or STF with missing or improperly formatted CDP codes were excluded from the analysis. JOBS students who attended courses prior to JOBS training were also excluded. Some students attended more than one "A" school or an "A" and BE/E school combination. Because of this, the attrition rates of a given student may appear under more than one rating.

Once the student population was established, student SS numbers were used to obtain demographic and attrition data for each student. Demographic data and fleet attrition data were obtained from the STF data base. School attrition data were obtained from TRAINTRACK.

Data Analyses

Summaries of demographic and attrition data were prepared separately for each rating. Typically, each rating was represented by a single CDP. However, when two or more CDPs provided the same type of training at different locations or for different time periods, the data for the different CDPs were combined. For example, since both CDPs 605Z and 611T provided independent "A" school training for the Interior Communications Electricians (ICs) (Table 1), the analysis combined their attrition rates under the IC rating.

Ratings, in turn, were grouped according to the JOBS strands that provide their prerequisite training. Typically, each rating was supported by a single JOBS strand. The single exception is the Quartermaster (QM) rating which was supported by the Operations JOBS strand from 1979 through 1981 and by the Navigation strand from 1982 through 1987. Since both strands provided the same prerequisite training, but the Navigation strand provided the longest and most recent support, QM data were combined under the Navigation strand for this analysis.

¹In this report, the year alone (e.g., 1979) is used to represent the calendar year (e.g., 1 January through 31 December 1979).

Table 1

JOBS Strands, Ratings, and Course Data Processing Codes (CDPs)

JOBS Strand/Rating	CDP by School	
	"A"	BE/E
<u>Administrative</u>		
Aviation Storekeeper (AK) ^a	6522	-
Aviation Maintenance Administration (AZ)	6528	-
Disbursing Clerk (DK)	6061	-
Personnelman (PN) ^a	6102	-
Storekeeper (SK) ^a	6059	-
Yeoman (YN)	6057	-
<u>Airframe Mechanical</u>		
Aviation Structural Mechanic (Safety Equip.) (AME)	6516	-
Aviation Structural Mechanic (Hydraulics) (AMH)	6517	-
Aviation Structural Mechanic (Structures) (AMS)	6518	-
<u>Electrical</u>		
Aviation Electrician's Mate (AE)	6515	6235
Construction Electrician (CE)	6079	6270
Electrician's Mate (EM)	6070	605U 6258 6273
Interior Communication Electrician (IC)	605Z 611T	6274 -
<u>Electronics</u>		
Aviation Fire Control Technician (AQ) ^a	6240	6231
Aviation Electronics Technician (AT) ^a	6239	6230
Aviation Antisubmarine Warfare Tech. (AX) ^a	6241	6232
Electronics Technician (Advanced Electronics Field) (ET-AEF)	603V	6414
Electronics Warfare Technician (EW)	608J	6306
Fire Control Technician Guns (FTG)	609W	614A
Gunner's Mate (Phase II) (GMG-II)	607W	6370
Radioman (RM)	611E	-

^aRatings involved in the earlier evaluation of the JOBS program (Baker & Hamovitch, 1983).

Table 1 (Continued)

JOBS Strand/Rating	CDP by School	
	"A"	BE/E
<u>Navigation</u>		
Quartermaster (QM) ^a	6001	-
Signalman (SM)	6005	-
<u>Operations</u>		
Operations Specialist (OS) ^a	6540	-
Sonar Technician (Surface) (STG)	6015	-
<u>Propulsion</u>		
Boiler Technician (BT) ^a	6486	-
Engineer (EN) ^a	6487	-
Gas Turbine Technician (GS) ^a	610P	-
Machinist's Mate (MM) ^a	6492	-

^aRatings involved in the earlier evaluation of the JOBS program (Baker & Hamovitch, 1983).

Demographic data were based on populations of JOBS and non-JOBS students enrolled in "A" schools. These data indicate the number of students for each race/ethnic group, level of educational achievement, and mental category. AFQT scores were also obtained and mean AFQT scores computed for each rating. The total number of students varied greatly from one analysis to another because of missing data.

School attrition data were based on populations of JOBS and non-JOBS students enrolled in JOBS schools (attended only by JOBS students), and in "A" and BE/E schools (attended by both JOBS and non-JOBS students). These data indicated the number of students who attrited from each rating. Attrition rates were computed for each rating by dividing the number of attrites by the number of students who enrolled in the school.

"A" and BE/E school attrition rates and mean AFQT scores were also compared over three time periods--1979-1981, 1982-1984, and 1985-1987-- to determine whether major changes had occurred over time. Time periods for students were determined by their course loss date (the date on which the student attrited or graduated). Increases in mean AFQT scores and declines in attrition might be expected following the 1979-1981 period because the ASVAB scores were misnormed from 1976 through 1980. As a result, military recruits were classified as better qualified for military training than they actually were (Ramsberger & Means, 1987). By 1982, the misnormings had been corrected and were no longer impacting on Navy technical schools. However, such misnormings could have had a temporary effect on attrition rates.

Rates of cumulative fleet attrition for JOBS and non-JOBS students were determined in the same manner as that used by Baker and Hamovitch (1983) but for longer time periods. In the present report, cumulative fleet attrition rates were based on populations of "A" school students who graduated and were transferred to the fleet between 1979 and 1986. (Data for 1987 graduates were not included since there was insufficient time following graduation to establish any fleet attrition rates.) Fleet attrition of these "A" school graduates was tracked from 1980 through 1987. Rates of cumulative attrition were established at 6-month intervals following graduation for up to 96 months. The number of students available at the earlier intervals is much larger than the number available at the later intervals because there was less time to track the later graduates. For example, all of the students in the sample had been graduated for at least 1 year and would be represented at 6- and 12- month intervals. However, only those who graduated in 1979 could have been tracked for the 96 months of Navy service (1980-1987).

A second analysis of cumulative attrition provided combined attrition rates for school and fleet attrition. These combined attrition rates were computed separately for each rating and attrition was tracked over the same length of time for all students. In this analysis, attrition rates were based on those populations of "A" school students whose schooling terminated (either in graduation or attrition) between 1979 and 1983. Since fleet attrition data were available through 1987, this analysis procedure allowed for a 4-year fleet tracking period for all students. Combined cumulative attrition rates were determined at graduation and at four 1-year intervals following graduation by dividing the number of attrites at the end of a given interval by the number who had originally entered the "A" school.

In determining cumulative overall fleet attrition and combined cumulative "A" school and fleet attrition, a sample of non-JOBS students was used to reduce data processing demands. However, the entire population of JOBS students was included. To obtain the sample, non-JOBS graduates from each rating were divided into three groups according to the period in which they attended "A" school (1979-1981, 1982-1984, or 1985-1987). A random sample of 10 percent was then taken within each time period within each rating.

RESULTS

Overall Demographics

Demographic characteristics of JOBS and non-JOBS "A" school students in this study are summarized in Table 2. The number of students varies with each characteristic because some types of data were not available for some of the students.

General demographic findings presented in Table 2 parallel those from the earlier Baker and Hamovitch (1983) evaluation in several respects. The mean AFQT score is substantially lower for JOBS than for non-JOBS students. A much higher proportion of JOBS students is found in the lower mental categories. JOBS students are more likely to have graduated from high school and to have higher levels of minority representation.

Table 2

Demographic Characteristics of "A" School Students

Characteristic	JOBS	Non-JOBS
<u>Mean AFQT Score</u>		
Total N	6,799	210,607
AFQT	36	62
<u>Mental Category</u>		
Total N	6,799	210,607
I	0%	4%
II	4%	42%
III High	12%	28%
III Low	47%	21%
IV High	30%	3%
IV Low	7%	0%
V	0%	0%
<u>Race/Ethnic Group</u>		
Total N	6,874	215,454
Caucasian	49%	80%
Black	38%	13%
Hispanic	7%	4%
Other	6%	3%
<u>Educational Achievement</u>		
Total N	6,779	214,283
No Diploma	4%	9%
General Education Diploma (GED)	5%	8%
High School Graduate	89%	80%
Post High School Study	2%	3%

Note. Ns vary due to missing data.

However, present findings indicate higher levels of student ability than were found by Baker and Hamovitch. Present mean AFQT scores are 12 to 15 points higher for JOBS students and 10 points higher for non-JOBS students than those indicated by Baker and Hamovitch. Also, 43 percent more of the JOBS student population and 10 percent more of the non-JOBS student population are classified above mental category IV than was the case for Baker and Hamovitch.

Demographic Comparisons for Ratings

Demographic comparisons of JOBS and non-JOBS students for individual ratings are provided in Appendixes A through D.

Appendix A provides the mean AFQT scores for each rating for JOBS and non-JOBS students, over three time periods: 1979-1981, 1982-1984, and 1985-1987. Time periods are based on Course Loss Dates from TRAINTRACK.

The mean AFQT scores of students from the first (1979-1981) and last (1985-1987) time periods were compared in order to maximize the potential for changes in AFQT scores over time while maintaining large enough student groups to allow for meaningful comparisons within ratings. Only those ratings that had at least five students in both time periods were included in the comparison. From Appendix A, the following 13 ratings were found to have mean AFQT scores based on five or more JOBS and non-JOBS students for both periods: AK, AT, AZ, BT, DK, EN, MM, OS, PN, QM, SK, STG, and YN. (Table 1 gives complete names for each rating.) Averaged over these 13 ratings, the mean AFQT score for JOBS students increased from 31.3 to 36.1 between the first and the last periods. At the same time, the mean AFQT score for non-JOBS students decreased from 62.2 to 60.3.

Mean AFQT scores varied considerably from one rating to another (from 27 to 54 for JOBS students and from 47 to 77 for non-JOBS students). Most of the higher mean AFQT scores were for electronics ratings. Typically, non-JOBS student mean AFQT scores were at least 20 points higher than those of JOBS students. Only in the Radioman (RM) rating did the JOBS student mean AFQT score exceed or even approach that of non-JOBS students.

Appendix B provides mental category distributions for each rating (based on AFQT scores). In all of the ratings except the RM rating, there was a much greater proportion of JOBS than non-JOBS students in the lower mental categories.

Appendix C provides educational achievement levels for each rating. For most ratings, JOBS students are more likely to have a high school diploma than are non-JOBS students.

Approximately 2 percent of the JOBS students who attended "A" schools were females. Demographic and attrition rate data for these female JOBS students are provided in Appendix D. The mean AFQT scores and resulting mental categories are much higher for female JOBS students than for the general population of JOBS students. The mean AFQT score is 36 for all JOBS students but 57 for female JOBS students. Only 4 percent of all JOBS students but 37 percent of female students exceed mental level III high.

Only 36 percent of female JOBS students, compared to 51 percent of the general population of JOBS students, belonged to a minority group. Female and male JOBS students were similar, however, in educational achievement (90% of the female, compared to 89% of the general population of JOBS students, had high school diplomas).

JOBS School Attrition

Before the JOBS students in this study attended an "A" school, each received prerequisite basic skills training at one of seven JOBS schools. Table 3 presents attrition rates for JOBS students by each JOBS strand for 1979 through 1987. Rates of academic and nonacademic attrition are generally low (5% or less) except for the academic attrition rate of the Electrical strand (15%). No female students attrited from JOBS training.

Table 3
JOBS School Attrition Rates
(1979-1987)

JOBS Strand	Total N	Attrition Rate	
		Academic	Nonacademic
Administration	1,176	0%	2%
Airframe Mechanical	154	0%	0%
Electrical	1,670	15%	4%
Electronics	2,031	2%	4%
Navigation	347	3%	2%
Operations	1,821	3%	5%
Propulsion	2,550	1%	1%
Total	9,749	4%	3%

Note. The total N for each JOBS strand includes all JOBS students who started a JOBS school (Ns for demographic data include only JOBS students who graduated from JOBS schools).

"A" and BE/E School Attrition

Overall

Overall rates of academic and nonacademic attrition for "A" and BE/E school CDPs are compared for JOBS and non-JOBS students for 1979 through 1987 in Table 4. For "A" schools, the analysis includes 6,867 JOBS and 238,181 non-JOBS students. For BE/E schools, the analysis includes 2,747 JOBS and 78,454 non-JOBS students. Since BE/E school CDPs prepare students for Electronics/Electrical "A" school CDPs, many of the same students are included in both comparisons. Again, the total number of students for whom attrition data was available differs from that used in demographic comparisons because some demographic and attrition data were missing from the data bases employed.

Table 4
"A" and BE/E School Attrition Rates
(1979-1987)

JOBS Strand/ Student Group	School Type	Total N	Attrition Rate	
			Academic	Nonacademic
<u>Administration</u>				
JOBS	"A"	1,099	9%	5%
Non-JOBS	"A"	42,594	5%	4%
<u>Airframe Mechanical</u>				
JOBS	"A"	151	3%	1%
Non-JOBS	"A"	28,014	1%	3%
<u>Electrical</u>				
JOBS	"A"	974	13%	3%
Non-JOBS	"A"	31,494	5%	3%
JOBS	BE/E	1,202	16%	6%
Non-JOBS	BE/E	40,258	13%	7%
<u>Electronics</u>				
JOBS	"A"	1,186	22%	11%
Non-JOBS	"A"	54,012	9%	8%
JOBS	BE/E	1,545	19%	9%
Non-JOBS	BE/E	38,196	10%	8%
<u>Navigation</u>				
JOBS	"A"	298	9%	6%
Non-JOBS	"A"	12,007	3%	6%
<u>Operations</u>				
JOBS	"A"	1,293	9%	6%
Non-JOBS	"A"	32,481	3%	5%
<u>Propulsion</u>				
JOBS	"A"	1,866	10%	4%
Non-JOBS	"A"	43,924	2%	4%
<u>Totals</u>				
JOBS	"A"	6,867	12%	5%
Non-JOBS	"A"	238,181	5%	5%
JOBS	BE/E	2,747	18%	8%
Non-JOBS	BE/E	78,454	12%	7%

Table 4 indicates a substantially higher overall academic attrition rate for JOBS students than for non-JOBS students, in both "A" and in BE/E schools. Nonacademic attrition rates for JOBS and non-JOBS students are roughly comparable.

The Electronics strand was the only JOBS strand with a large number of female students. The overall JOBS student academic attrition rate of 22 percent for Electronics "A" schools rose to 39 percent for female students.

Attrition rates for each rating are provided in Appendix E. These rates indicate a wide range of academic attrition across ratings. For "A" schools, academic attrition varied from 0 to 41 percent for JOBS students and from 0 to 17 percent for non-JOBS students. For BE/E schools, academic attrition varied from 2 to 33 percent for JOBS students and from 5 to 21 percent for non-JOBS students.

Many ratings have maintained relatively low levels of "A" school academic attrition for JOBS students. Eleven ratings (AZ, YN, AME, AMH, AMS, CE, IC, GMG-II, RM, SM, and EN) had "A" school academic attrition rates of 5 percent or less, which approximated those of non-JOBS students. At six of these "A" schools (AZ, YN, AMH, CE, RM, SM) and at two BE/E schools (CE and FTG), the rate of academic attrition was actually lower for JOBS than non-JOBS students.

More typically, however, the JOBS student academic attrition rates exceeded those of non-JOBS students. For "A" schools, 22 of the 29 ratings had higher academic attrition rates for JOBS than non-JOBS students. For 13 of these ratings (DK, PN, AE, EM, AQ, AT, AX, ET-AEF, FTG, QM, STG, GS, and MM), the academic attrition rate of JOBS students exceeded that of non-JOBS students by at least 10 percent. For BE/E schools, 9 of the 11 ratings had a higher academic attrition rate for JOBS than for non-JOBS students. For 4 of these ratings (AQ, AT, AX, and GMG-II), the JOBS student academic attrition rate exceeded that of non-JOBS students in BE/E school by at least 10 percent.

While most ratings had a higher rate of academic attrition for JOBS than for non-JOBS students, this was not the case for nonacademic attrition. For "A" schools, only 10 of the 29 ratings had a higher nonacademic attrition rate for JOBS than for non-JOBS students. Similarly, for BE/E schools, only 5 of the 11 ratings had a higher nonacademic attrition rate for JOBS than for non-JOBS students.

Proportions of Minority Graduates

The fact that the JOBS program has a higher minority representation than the regular "A" school training program (Table 2) raises some questions: Does the JOBS program increase the percentage of minority "A" school graduates and, if so, does this rate of increase vary from one rating to another? Appendix F lists the percentage of race/ethnic background for "A" school graduates by rating.

Appendix F data show that, in virtually all of the ratings, the percentage of minority graduates was higher for JOBS than for non-JOBS students. Even among JOBS students, however, the proportion of minority graduates varied considerably from one rating to another. For example, 64 percent of MM, but only 18 percent of AQ, JOBS student graduates were classified as minority students. For all ratings, black students constituted the largest proportion of minority "A" school graduates among both JOBS and non-JOBS students.

Academic Attrition Over Time

For each rating, academic attrition rates for three time periods (1979-1981, 1982-1984, and 1985-1987) are displayed in Appendix G. The 1979-1981 period roughly corresponds to the period covered by Baker and Hamovitch (1983). For each rating, separate attrition rates are provided for JOBS and non-JOBS students in "A" and BE/E schools.

In examining changes in academic attrition over time, only the first (1979-1981) and last (1985-1987) time periods were compared and only for those ratings with attrition data based on 5 or more students for each condition. This procedure maximized the potential for change while maintaining large enough student groups to allow for meaningful comparisons within ratings. The results of these comparisons are summarized in Table 5. The "A" school academic attrition data are based on 13 ratings (AK, AT, AZ, BT, DK, EN, MM, OS, PN, QM, SK, STG, and YN); and the BE/E school data, on 6 ratings (AE, AT, AQ, AX, EM, and GMG).

Table 5
Academic Attrition Rates Over Time

School Type	Student Group	Academic Attrition Rate	
		1979-1981	1985-1987
"A"	JOBS	9%	12%
	Non-JOBS	3%	5%
BE/E	JOBS	21%	24%
	Non-JOBS	10%	15%

Table 5 shows that while the academic attrition rates of JOBS and non-JOBS students increased slightly over time, the difference between their rates remained fairly stable. For "A" schools, academic attrition rates increased one percent more for JOBS than for non-JOBS students. For BE/E schools, academic attrition: increased two percent more for non-JOBS than for JOBS students.

Fleet Attrition

An examination of fleet attrition rates was performed that was similar to the one performed by Baker and Hamovitch (1983). However, the present study covered more ratings (those listed in Table 1), more personnel, and a longer time period.

Figure 1 shows total cumulative attrition rates for 5,082 JOBS and 19,346 non-JOBS students who were tracked over a 96-month period following "A" school graduation. While the JOBS students represent the entire population taken from the TRAINTRACK data base, the non-JOBS

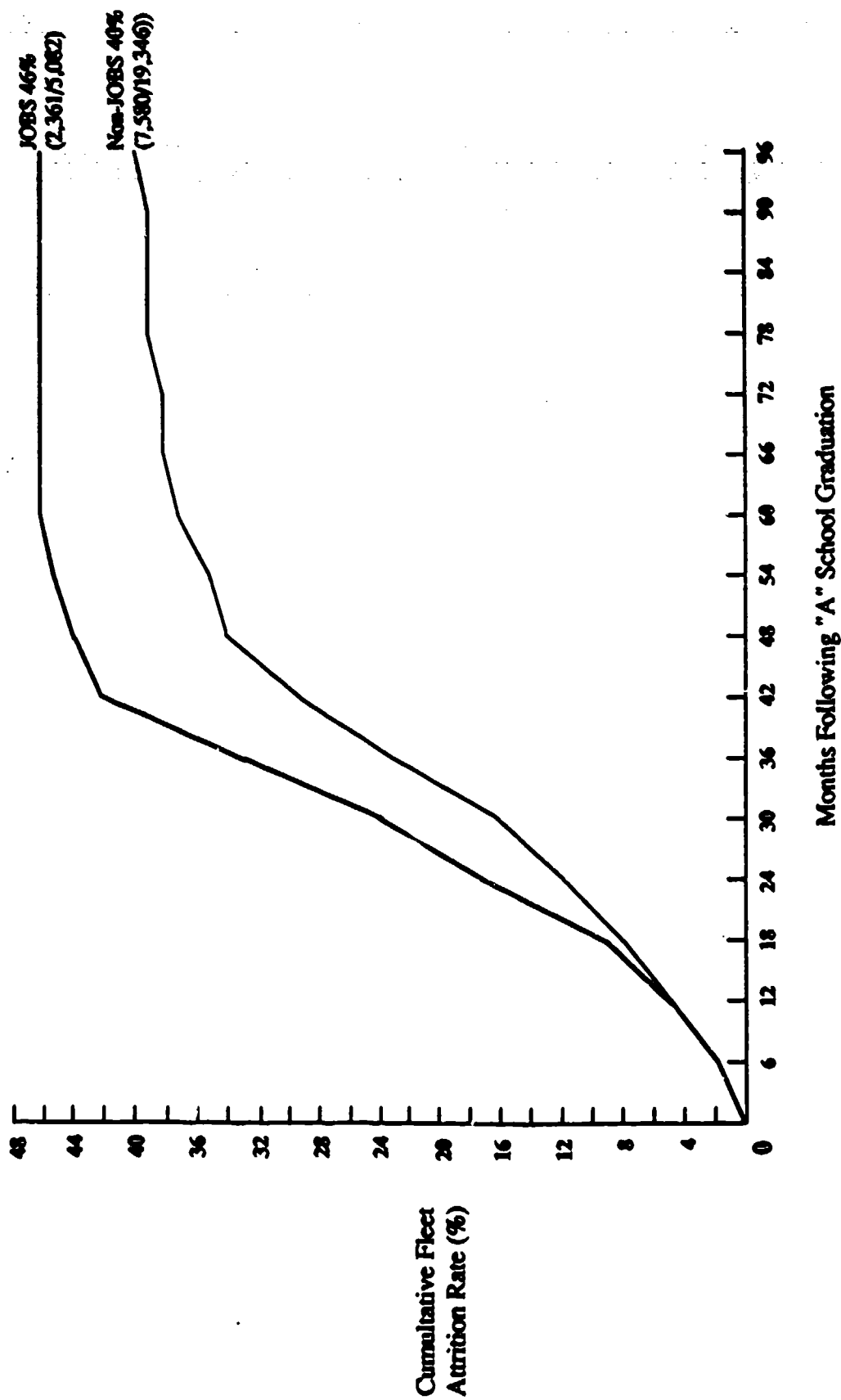


Figure 1. Cumulative fleet attrition rates of JOBS and non-JOBS "A" school graduates.

students represent a random sample of 10 percent of the actual population. This sampling procedure was used in order to reduce data processing requirements. The fleet attrition rates in Figure 1 are much higher than those reported by Baker and Hamovitch. Also, while Baker and Hamovitch found that the mean fleet attrition rate for JOBS students was lower than that for non-JOBS students, the present study found the mean fleet attrition rate for the JOBS students to be 8 percent higher than that of the non-JOBS students.

Categories of fleet attrition (as identified in the Enlisted Master File) were examined to determine whether the reasons given for attrition differed for JOBS and non-JOBS "A" school graduates. It was determined that fleet attrition patterns were roughly equivalent for the two groups except for the fact that 28 percent of the graduates with JOBS training but only 20 percent of the non-JOBS graduates were discharged to inactive duty in the Naval Reserves.

In addition to the separate analyses of school and fleet attrition, it was deemed useful to know the rates of combined school and fleet attrition for each rating over the first term of enlistment (approximately 4 years). These rates of combined attrition are provided in Appendix H. Appendix H lists cumulative attrition rates of "A" school graduates at the time of graduation and 1, 2, 3, and 4 years following graduation. Since attrition data are only available through 1987, only students who had graduated by the end of 1983 had sufficient enlistment time to be included in this 4-year assessment.

Appendix H, provides the mean rate of combined "A" school and fleet cumulative attrition for both JOBS and non-JOBS students. The "A" school portion of the combined attrition rate includes both academic and nonacademic attrition. The overall mean attrition rate was 12 percent higher for the JOBS than the non-JOBS students.

For most ratings, the mean rate of combined cumulative attrition was higher for JOBS than for non-JOBS students. However, the relative attrition rates of JOBS and non-JOBS students varied considerably from one rating to another. For six ratings (AE, AME, AQ, AT, AX, and ET-AEF), the mean attrition rate of JOBS students exceeded that of non-JOBS students by over 20 percent. In contrast, three ratings (EN, GMG-II, and SK) had a lower mean attrition rate for JOBS than for non-JOBS students.

Attrition from JOBS schools and BE/E schools could not be included in calculations of the combined attrition rate for specific ratings because each JOBS school supplies students to several different ratings. Also, students who attend a given Electronics or Electrical "A" school may not all attend the same BE/E school.

DISCUSSION

The Navy's JOBS program had previously been demonstrated to be a cost effective approach for providing new sources of technically trained personnel and for promoting greater minority participation in technical training (Baker & Hamovitch, 1983). Present findings indicate that the current JOBS program, while greatly expanded, continues to be effective in providing additional trained personnel and promoting minority participation.

Student AFQT scores reported in the present study are considerably higher than those reported by Baker and Hamovitch. Several factors may have contributed to the higher scores. First, new ratings with higher average AFQT scores have been added to the JOBS program. Second, while Baker and Hamovitch categorized personnel as JOBS students on the basis of their ASVAB composite score, in the present study, anyone who attended a JOBS school was categorized as a JOBS student. The ASVAB scores of some of the students attending JOBS schools may be higher than officially required for admittance to the JOBS program.

The higher AFQT scores found in the present study cannot be attributed to earlier misnormings, which occurred during the period of the Baker and Hamovitch study. Despite the correction of the misnormings, AFQT scores within ratings actually decreased slightly for non-JOBS students during the time periods examined in the present study.

Although the JOBS program continues to be effective at this time, various aspects of the program are constantly changing. AFQT levels have risen, individual ratings have been added or subtracted from the program, and attrition rates have changed. If such changes continue, it will be desirable to continue to monitor effectiveness of the JOBS program on a periodic basis.

JOBS student attrition rates vary greatly from one rating to another. Many ratings have JOBS student academic attrition rates that are low and approximate those of non-JOBS students; some ratings, however, have academic attrition rates that are quite high, especially for JOBS students. Attrition rates are presented in several of the tables and appendixes in this report. For example, Table 3 provides the attrition rates of JOBS students for each JOBS strand. Appendix G lists "A" and BE/E school student attrition rates for JOBS and non-JOBS students for each rating over time. Appendix H provides the combined cumulative "A" school and fleet attrition rates for JOBS and non-JOBS students for each rating. Such data should be considered in deciding whether to expand or reduce different portions of the JOBS program.

High attrition rates are wasteful and costly to the Navy. JOBS student attrition rates are particularly high in the Electronics and Electrical ratings. For Electronics ratings, the JOBS student academic attrition rate averaged 22 percent for "A" schools (13 percent higher than the rate for non-JOBS students) and 19 percent for BE/E schools (9 percent higher than the rate for non-JOBS students).

For Electrical ratings, the JOBS student academic attrition rate averaged 13 percent for "A" schools (8 percent higher than the rate for non-JOBS students) and 16 percent for BE/E schools (only 3 percent higher than the rate for non-JOBS students). However, although differences between the academic attrition rates of JOBS and non-JOBS students appear to be less pronounced for the Electrical than for the Electronics rating, the academic attrition rate of JOBS students at the Electrical JOBS school is 13 percent higher than that of JOBS students at the Electronics JOBS school so that the overall rate of attrition for JOBS Electrical students remains high.

There are a number of methods which could be used to reduce JOBS student "A" school academic attrition rates. One method for reducing JOBS student attrition rates would be to either eliminate ratings with high attrition rates from the JOBS program or raise the qualifying scores for JOBS students in these ratings. The data provided in this report can be used to determine which ratings have the highest JOBS attrition rates and, therefore, might be candidates for elimination from the JOBS program.

Solving the academic attrition problems by eliminating JOBS students from ratings with high attrition could reduce the availability of students in critical ratings. An alternative approach might be to explore improving the effectiveness of prerequisite skill training in schools with high rates of JOBS student attrition. In order to improve the effectiveness of prerequisite skill training, it may be necessary to compare the school performance of groups of JOBS qualified students with and without JOBS training. Although the Navy has been reluctant to send JOBS students to "A" or BE/E schools with inadequate preparation, it might be practical to experimentally administer sample portions of "A" school course materials to JOBS qualified students before and after they receive JOBS training.

Academic attrition is not just a problem for JOBS students. For some ratings, academic attrition is a problem for non-JOBS students as well. Currently, most Navy schools do not admit large numbers of JOBS students. For those schools that do, the number of non-JOBS students still greatly exceeds the number of JOBS students admitted. As a result, although the "A" school attrition rates of non-JOBS students are generally lower, the actual number of non-JOBS students who attrite is much higher than the number of JOBS students. In order to achieve a major reduction in attrition rates, we must address the attrition problems of non-JOBS as well as of JOBS students.

While it is possible that attrition rates of non-JOBS students could be lowered by providing them with prerequisite skill training similar to that provided to JOBS students, this approach would greatly increase training costs. Present JOBS training requires 4 to 8 weeks. Also, while JOBS training is aimed at lower level basic skills, prerequisite skill training for non-JOBS students may have to deal with higher level skills. Therefore, investigations of low cost methods of training that can be applied to higher level prerequisite skills are needed.

CONCLUSIONS

Despite a significant expansion in the JOBS program, a high level of success has been maintained in terms of minority involvement, "A" and BE/E school completion, and fleet service. However, a full assessment of the JOBS program has yet to be accomplished. Further research is required to directly link the effects of JOBS training to "A" school performance. Also, in ratings with excessive academic attrition, similar types of prerequisite skill training may be needed for non-JOBS ASVAB qualified students.

RECOMMENDATIONS

It is recommended that OP-112:

1. Continue the JOBS program. (OP-112 is currently continuing JOBS.)
2. Continue periodic evaluations of the JOBS program.

3. Use JOBS student attrition data in this report in determining whether areas of JOBS training should be expanded or reduced.

4. For ratings with high JOBS student academic attrition rates, determine the causes of the attrition and develop methods for its reduction.

5. Investigate whether to extend prerequisite skill training to ASVAB qualified students in ratings with excessive academic attrition rates. (Such an investigation is currently underway at NAVPERSRANDCEN under OP-112 sponsorship.)

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APPENDIX A

MEAN AFQT SCORES

These data are based on populations of students who were attending Navy "A" schools during the indicated time periods. Total N is the total number of students who entered the school and X AFQT is the mean AFQT score for the rating. CDP is the Course Data Processing Code. The full name for each rating abbreviation is given in Table 1.

Strand/ Rating/CDP		JOBS Students			Non-JOBS Students		
		79-81	82-84	85-87	79-81	82-84	85-87
<u>Administrative</u>							
AK	Total N	99	61	25	1592	1373	2029
6522	X AFQT	30	33	34	61	64	63
AZ	Total N	14	40	17	1140	1099	1372
6528	X AFQT	30	35	36	61	65	64
DK	Total N	34	58	18	815	944	963
6061	X AFQT	29	35	34	64	66	65
PN	Total N	157	85	10	2681	2146	1897
6102	X AFQT	36	40	36	68	72	72
SK	Total N	83	58	44	2200	3309	2997
6059	X AFQT	33	36	32	61	65	63
YN	Total N	146	129	7	3880	4114	4076
6057	X AFQT	32	36	36	54	59	54
<u>Airframe Mechanical</u>							
AME	Total N	0	27	0	1274	1283	1188
6516	X AFQT	-	27	-	50	52	58
AMH	Total N	0	42	0	2057	1632	1620
6517	X AFQT	-	29	-	50	52	59
AMS	Total N	0	81	0	3199	2848	3176
6518	X AFQT	-	30	-	50	52	59
<u>Electrical</u>							
AE	Total N	1	259	145	3372	3653	3520
6515	X AFQT	36	37	41	62	64	60
CE	Total N	3	30	2	359	376	285
6079	X AFQT	27	38	52	59	59	56
EM	Total N	0	221	75	4765	2007	1595
6070	X AFQT	-	36	36	72	60	59
IC	Total N	0	117	116	708	2405	2076
605Z/611T	X AFQT	-	38	41	65	64	67
<u>Electronics</u>							
AQ	Total N	2	71	90	1511	1581	519
6240	X AFQT	50	52	50	73	70	70
AT	Total N	28	243	181	4484	4487	2128
6239	X AFQT	41	48	48	73	73	74

Strand, Rating/CDP		JOBS Students			Non-JOBS Students		
		79-81	82-84	85-87	79-81	82-84	85-87
Electronics (Cont)							
AX	Total N	2	33	27	891	1010	432
6241	X AFQT	37	52	52	75	75	75
ET-AEF	Total N	0	171	120	975	5862	4773
603V	X AFQT	-	51	51	76	77	76
EW	Total N	0	24	523	0	1191	1754
608J	XAFQT	-	54	46	-	76	75
FTG	Total N	0	3	19	0	758	3632
609W	X AFQT	-	50	50	-	76	74
GMG-II	Total N	0	37	50	18	1415	2633
607W	X AFQT	-	39	42	66	64	61
RM	Total N	0	16	5	0	3004	8253
611E	X AFQT	-	58	53	-	55	47
Navigation							
QM	Total N	59	117	119	1754	1843	1638
6001	X AFQT	34	31	34	62	60	56
SM	Total N	0	29	31	1292	1470	1709
6005	X AFQT	-	31	32	63	63	61
Operations							
OS	Total N	172	585	360	4611	5493	5837
6540	X AFQT	33	36	36	67	67	65
STG	Total N	7	45	54	2541	2372	3556
6015	X AFQT	46	52	49	74	74	71
Propulsion							
BT	Total N	115	215	198	6403	4312	3676
6486	X AFQT	29	29	33	59	57	51
EN	Total N	131	149	172	4284	3110	3217
6487	X AFQT	29	30	33	55	49	47
GS	Total N	0	23	8	0	657	421
610P	XAFQT	-	47	47	-	71	70
MM	Total N	202	416	213	7729	4603	4418
6492	XAFQT	27	30	33	60	52	52

APPENDIX B

MENTAL CATEGORIES

These data indicate the mental categories of JOBS and non-JOBS ("A" school qualified) students who attended "A" schools between 1979 and 1987. Mental categories are based on AFQT scores as follows:

<u>Mental Category</u>	<u>AFQT Score Range</u>
I	93-99
II	65-92
III High	50-64
III Low	31-49
IV High	21-30
IV Low	10-20
V	1-9

Only students whose AFQT scores were included in the data base are included. For each rating, the total number of JOBS and non-JOBS students (N) is followed by the percent of the total belonging to each mental category. Because of rounding of fractional percentages, the sum of percentages for mental categories occasionally differs from 100 percent. The full name for each rating abbreviation is given in Table 1.

Strand/Rating/ Student Group	N	Mental Categories						
		I	II	III High	III Low	IV High	IV Low	V
Administrative								
AK								
JOBS	185	0%	0%	2%	48%	45%	4%	0%
Non-JOBS	4,994	2%	41%	41%	14%	1%	0%	0%
AZ								
JOBS	71	0%	0%	6%	59%	32%	3%	0%
Non-JOBS	3,611	3%	40%	43%	13%	0%	0%	0%
DK								
JOBS	110	0%	0%	5%	55%	32%	8%	0%
Non-JOBS	2,722	4%	44%	36%	15%	1%	0%	0%
PN								
JOBS	252	0%	0%	9%	70%	18%	2%	1%
Non-JOBS	6,724	5%	63%	25%	5%	0%	0%	0%
SK								
JOBS	185	0%	1%	5%	59%	31%	4%	0%
Non-JOBS	8,506	3%	42%	40%	14%	1%	0%	0%
YN								
JOBS	282	0%	4%	5%	44%	39%	9%	0%
Non-JOBS	12,100	3%	29%	28%	35%	5%	1%	0%

Strand/Rating/ Student Group	N	Mental Categories						
		I	II	III High	III Low	IV High	IV Low	V
<u>Airframe Mechanical</u>								
AME								
JOBS	27	0%	0%	0%	30%	52%	19%	0%
Non-JOBS	3,745	1%	24%	31%	38%	5%	1%	1%
AMH								
JOBS	42	0%	0%	2%	43%	33%	21%	0%
Non-JOBS	5,639	1%	24%	31%	37%	5%	1%	1%
AMS								
JOBS	81	0%	1%	4%	33%	41%	21%	0%
Non-JOBS	9,223	1%	24%	31%	37%	5%	1%	0%
<u>Electrical</u>								
AE								
JOBS	405	0%	3%	19%	46%	25%	7%	0%
Non-JOBS	10,545	3	41%	34%	21%	2%	0%	0%
CE								
JOBS	35	0%	5%	6%	63%	26%	0%	0%
Non-JOBS	1,020	2%	35%	35%	25%	1%	1%	1%
EM								
JOBS	296	0%	2%	12%	50%	30%	6%	0%
Non-JOBS	8,367	11%	43%	26%	18%	2%	0%	0%
IC								
JOBS	233	0%	4%	17%	53%	22%	4%	0%
Non-JOBS	5,189	4%	51%	27%	17%	1%	0%	0%

Strand/Rating/ Student Group	N	Mental Categories						
		I	II	III High	III Low	IV High	IV Low	V
Electronics								
AQ								
JOBS	163	0%	15%	36%	44%	6%	0%	0%
Non-JOBS	3,611	8%	61%	25%	6%	0%	0%	0%
AT								
JOBS	452	0%	10%	35%	44%	9%	1%	0%
Non-JOBS	11,101	10%	64%	20%	5%	0%	0%	1%
AX								
JOBS	62	0%	24%	24%	42%	8%	2%	0%
Non-JOBS	2,333	11%	67%	17%	4%	0%	0%	1%
ET-AEF								
JOBS	291	0%	20%	33%	38%	8%	1%	0%
Non-JOBS	11,610	11%	71%	14%	4%	0%	0%	0%
EW								
JOBS	76	0%	13%	32%	47%	7%	1%	0%
Non-JOBS	2,945	9%	69%	17%	4%	0%	0%	0%
FTG								
JOBS	22	0%	23%	32%	27%	18%	0%	0%
Non-JOBS	4,390	9%	69%	18%	4%	0%	0%	0%
GMG-II								
JOBS	89	0%	8%	13%	56%	20%	2%	0%
Non-JOBS	4,069	3%	42%	29%	23%	2%	0%	0%
RM								
JOBS	21	0%	29%	38%	33%	0%	0%	0%
Non-JOBS	11,257	1%	19%	20%	48%	11%	0%	0%

Strand/Rating/ Student Group	N	Mental Categories						
		I	II	III High	III Low	IV High	IV Low	V
<u>Navigation</u>								
QM								
JOBS	295	0%	0%	5%	52%	36%	7%	0%
Non-JOBS	5,235	4%	31%	32%	31%	1%	0%	0%
SM								
JOBS	60	0%	0%	2%	48%	45%	5%	0%
Non-JOBS	4,471	2%	39%	42%	15%	1%	0%	0%
<u>Operations</u>								
OS								
JOBS	1,116	0%	8%	57%	31%	3%	0%	0%
Non-JOBS	15,941	3%	49%	38%	9%	0%	0%	0%
STG								
JOBS	106	0%	18%	33%	38%	10%	1%	0%
Non-JOBS	8,469	7%	65%	22%	5%	0%	0%	0%
<u>Propulsion</u>								
BT								
JOBS	528	0%	1%	3%	39%	44%	13%	0%
Non-JOBS	14,351	2%	33%	27%	29%	8%	1%	0%
EN								
JOBS	452	0%	0%	5%	40%	39%	16%	0%
Non-JOBS	10,611	1%	20%	30%	39%	8%	1%	0%
GS								
JOBS	31	0%	6%	29%	58%	6%	0%	0%
Non-JOBS	1,078	6%	62%	22%	9%	0%	0%	0%
MM								
JOBS	831	0%	1%	3%	36%	42%	17%	0%
Non-JOBS	16,750	4%	27%	27%	33%	8%	1%	0%
<u>Overall (All Ratings)</u>								
JOBS	6,799	0%	4%	12%	47%	30%	7%	0%
Non-JOBS	210,607	4%	42%	28%	21%	3%	0%	0%

APPENDIX C

EDUCATIONAL ACHIEVEMENT

The following data indicate levels of civilian educational achievement for JOBS and non-JOBS ("A" school qualified) students who attended "A" schools between 1979 and 1987. (Only those students with educational achievement records are included in the data.)

For each rating, the total number of JOBS and non-JOBS students (N) is followed by the percent of the total who achieved each level of education: no diploma (No), a general education diploma (GED), a high school diploma (HS), or post high school education (Post HS). Because of rounding of fractional percentages, the sum of percentages for levels of education occasionally differs from 100 percent. The full name for each rating abbreviation is given in Table 1.

Strand/Rating/ Students	N	High School Education			
		No	GED	HS	Post HS
<u>Administrative</u>					
AK					
JOBS	185	2%	4%	90%	4%
Non-JOBS	5,126	11%	9%	75%	5%
AZ					
JOBS	71	3%	7%	89%	1%
Non-JOBS	3,746	12%	9%	75%	4%
DK					
JOBS	110	0%	2%	91%	7%
Non-JOBS	2,765	7%	6%	80%	7%
PN					
JOBS	248	6%	7%	83%	4%
Non-JOBS	6,942	8%	9%	75%	8%
SK					
JOBS	184	3%	3%	91%	3%
Non-JOBS	8,778	11%	9%	75%	5%
YN					
JOBS	280	3%	8%	86%	3%
Non-JOBS	12,458	7%	6%	83%	4%

Strand/Rating/ Students	N	High School Education			
		No	GED	HS	Post HS
<u>Airframe Mechanical</u>					
AME					
JOBS	27	0%	4%	92%	4%
Non-JOBS	3,843	12%	8%	79%	1%
AMH					
JOBS	42	2%	5%	91%	2%
Non-JOBS	5,792	12%	8%	79%	1%
AMS					
JOBS	80	1%	5%	94%	0%
Non-JOBS	9,356	12%	8%	79%	1%
<u>Electrical</u>					
AE					
JOBS	404	5%	6%	88%	1%
Non-JOBS	10,723	10%	7%	81%	2%
CE					
JOBS	35	6%	6%	77%	11%
Non-JOBS	1,005	7%	9%	81%	3%
EM					
JOBS	294	5%	9%	84%	2%
Non-JOBS	8,671	5%	4%	87%	4%
IC					
JOBS	233	3%	3%	92%	2%
Non-JOBS	5,179	4%	6%	88%	2%

Strand/Rating/ Students	N	High School Education			
		No	GED	HS	Post HS
Electronics					
AQ					
JOBS	162	10%	10%	79%	1%
Non-JOBS	3,653	7%	9%	81%	3%
AT					
JOBS	451	11%	8%	80%	1%
Non-JOBS	11,317	7%	8%	82%	3%
AX					
JOBS	61	15%	3%	82%	0%
Non-JOBS	2,357	6%	8%	82%	4%
ET-AEF					
JOBS	289	2%	10%	84%	4%
Non-JOBS	11,602	1%	6%	89%	4%
EW					
JOBS	77	5%	8%	87%	0%
Non-JOBS	2,942	5%	6%	86%	3%
FTG					
JOBS	22	5%	5%	81%	9%
Non-JOBS	4,387	1%	6%	88%	5%
GMG-II					
JOBS	88	5%	8%	87%	0%
Non-JOBS	4,062	8%	7%	83%	2%
RM					
JOBS	21	0%	14%	76%	10%
Non-JOBS	11,220	3%	2%	93%	2%

Strand/Rating/ Students	N	High School Education			
		No	GED	HS	Post HS
<u>Navigation</u>					
QM					
JOBS	295	3%	2%	94%	1%
Non-JOBS	5,395	12%	9%	77%	2%
SM					
JOBS	60	2%	2%	94%	2%
Non-JOBS	4,613	21%	13%	64%	2%
<u>Operations</u>					
OS					
JOBS	1,115	4%	6%	89%	1%
Non-JOBS	15,861	14%	10%	74%	2%
STG					
JOBS	106	11%	9%	79%	1%
Non-JOBS	8,642	8%	9%	80%	3%
<u>Propulsion</u>					
BT					
JOBS	527	4%	2%	93%	1%
Non-JOBS	14,684	15%	10%	74%	1%
EN					
JOBS	451	2%	3%	94%	1%
Non-JOBS	10,867	11%	8%	80%	1%
GS					
JOBS	31	3%	13%	84%	0%
Non-JOBS	1,075	2%	7%	88%	3%
MM					
JOBS	830	3%	3%	93%	1%
Non-JOBS	17,222	13%	8%	78%	1%
<u>Overall (All Ratings)</u>					
JOBS	6,779	4%	5%	89%	2%
Non-JOBS	214,283	9%	8%	80%	3%

APPENDIX D

FEMALE JOBS STUDENT DATA

These data are based on populations of female JOBS students who attended Navy JOBS or "A" schools between 1979 and 1987. For JOBS school attrition data, total N is the total number of students who entered the JOBS strands. For all other demographic and attrition data, total N is the total number of students who entered "A" schools within the specified JOBS strands.

Mental categories are based on AFQT scores as follows:

<u>Mental Category</u>	<u>AFQT Score Range</u>
I	93-99
II	65-92
III High	50-64
III Low	31-49
IV High	21-30
IV Low	10-20
V	1-9

Table D-1**Female JOBS Students: Mean AFQT Scores**

JOBS Strand Score	Total N	Mean	AFQT
Administrative	11		39
Electrical	14		48
Electronics	79		63
Navigation	4		49
Propulsion	5		41
Overall	113		57

Table D-2**Female JOBS Students: Mental Categories**

JOBS Strand	Total N	Mental Categories						
		I	II	III High	III Low	IV High	IV Low	V
Administrative	11	0%	0%	9%	73%	9%	0%	0%
Electrical	14	0%	21%	29%	50%	0%	0%	0%
Electronics	79	3%	47%	30%	19%	0%	0%	1%
Navigation	4	0%	0%	50%	50%	0%	0%	0%
Propulsion	5	0%	0%	40%	20%	40%	0%	0%
Overall	113	2%	35%	29%	29%	3%	0%	0%

Table D-3**Female JOBS Students: Race and Ethnic Background**

JOBS Strand	Total N	Racial/Ethnic Group			
		Caucasian	Black	Hispanic	Other
Administrative	11	45%	36%	2%	0%
Electrical	14	43%	43%	14%	0%
Electronics	79	69%	26%	5%	0%
Navigation	4	75%	25%	0%	0%
Propulsion	5	80%	20%	0%	0%
Overall	113	64%	28%	8%	0%

Table D-4**Female JOBS Students: Educational Achievement**

JOBS Strand	Total N	High School Diploma			
		No	GED	HS	Post HS
Administrative	11	0%	10%	90%	0%
Electrical	14	0%	0%	86%	14%
Electronics	79	1%	3%	90%	6%
Navigation	4	0%	0%	100%	0%
Propulsion	5	0%	0%	100%	0%
Overall	113	1%	3%	90%	6%

Table D-5**Female JOBS Students: JOBS School Attrition**

JOBS Strand	Total N	JOBS School Attrition	
		Academic	Nonacademic
Administrative	11	0%	0%
Electrical	14	0%	0%
Electronics	79	0%	0%
Navigation	4	0%	0%
Propulsion	5	0%	0%
Overall	113	0%	0%

Table D-6**Female JOBS Students: "A" School Attrition**

JOBS Strand	Total N	"A" School Attrition	
		Academic	Nonacademic
Administrative	11	0%	0%
Electrical	5	0%	0%
Electronics	51	39%	14%
Navigation	4	0%	0%
Propulsion	5	0%	20%
Overall	76	26%	10%

APPENDIX E

ACADEMIC/NONACADEMIC ATTRITION RATES

These data are based on populations of students who attended Navy "A" or BE/E schools between 1979 and 1987. Total N is the total number of students who entered the school. CDP is the Course Data Processing Code. The full name for each rating abbreviation is given in Table 1.

Strand/ Rating	"A" or BE/E	CDP	Total N		Attrition Rate			
			JOBS	Non-JOBS	Academic		Nonacademic	
					JOBS	Non-JOBS	JOBS	Non-JOBS
Administrative								
AK	"A"	6522	187	5337	8%	4%	4%	4%
AZ	"A"	6528	71	4925	3%	4%	1%	3%
DK	"A"	6061	111	2787	18%	4%	3%	4%
PN	"A"	6102	254	7092	16%	5%	7%	4%
SK	"A"	6059	188	9881	7%	5%	5%	6%
YN	"A"	6057	288	12572	5%	6%	5%	3%
Airframe Mechanical								
AME	"A"	6516	27	5317	4%	1%	0%	4%
AMH	"A"	6517	42	9443	0%	1%	2%	2%
AMS	"A"	6518	82	13254	5%	1%	1%	3%
Electrical								
AE	"A"	6515	407	16164	18%	6%	4%	4%
	BE/E	6235	437	14593	14%	12%	5%	7%
CE	"A"	6079	35	1397	0%	1%	6%	9%
	BE/E	6270	44	823	2%	10%	2%	6%
EM	"A"	6070	298	8697	15%	6%	1%	2%
	BE/E	605U	379	15698	14%	9%	7%	6%
IC	"A"	6258	234	5236	3%	1%	2%	2%
		6273						
		605Z						
	BE/E	611T 6274	342	9144	23%	21%	6%	7%
Electronics								
AQ	"A"	6240	164	3735	19%	9%	16%	8%
	BE/E	6231	188	3989	17%	7%	6%	6%
AT	"A"	6239	457	11943	19%	7%	9%	7%
	BE/E	6230	557	12244	15%	5%	7%	6%
AX	"A"	6241	62	2603	18%	8%	10%	7%
	BE/E	6232	74	2726	16%	5%	5%	7%
ET-	"A"	603V	292	11715	39%	17%	16%	12%
AEF	BE/E	6414	480	6452	21%	13%	11%	9%
EW	"A"	608J	77	3087	8%	2%	1%	2%
	BE/E	6306	55	2810	13%	5%	13%	5%
FTG	"A"	609W	22	4662	41%	13%	18%	12%
	BE/E	614A	35	2200	6%	10%	9%	9%

Strand/ Rating	"A" or BE/E	CDP	Total N		Attrition Rate			
					Academic		Nonacademic	
			JOBS	Non-JOBS	JOBS	Non-JOBS	JOBS	Non-JOBS
<u>Electronics (Continued)</u>								
GMG-	"A"	607W	90	4425	0%	2%	2%	1%
II	BE/E	6370	156	7775	33%	20%	14%	12%
RM	"A"	611E	22	11842	0%	8%	5%	6%
<u>Navigation</u>								
QM	"A"	6001	297	6345	13%	4%	6%	6%
SM	"A"	6005	60	5662	0%	2%	5%	5%
<u>Operations</u>								
OS	"A"	6540	1127	17025	8%	2%	5%	6%
STG	"A"	6015	107	9111	19%	3%	2%	2%
<u>Propulsion</u>								
BT	"A"	6486	534	14682	11%	3%	7%	6%
EN	"A"	6487	459	10998	2%	0%	3%	1%
GS	"A"	610P	31	1123	16%	3%	0%	5%
MM	"A"	6492	842	17121	13%	3%	4%	5%

APPENDIX F

RACE AND ETHNIC BACKGROUND OF GRADUATES

These data present the demographic background of JOBS and non-JOBS ("A" school qualified) students who graduated from Navy "A" schools between 1979 and 1987. Only those students with AFQT scores who were identified in terms of race or ethnic background are included in the data. For each rating, total number of JOBS and non-JOBS students (N) is followed by the percent of the total belonging to each racial/ethnic group. Because of rounding of fractional percentages, the sum of percentages for racial/ethnic groups occasionally does not equal 100 percent. The full name for each rating abbreviation is given in Table 1.

Strand/Rating/ Student Group	N	Race/Ethnic Background			
		Caucasian	Black	Hispanic	Other
Administrative					
AK					
JOBS	162	40%	39%	10%	11%
Non-JOBS	4,725	72%	15%	6%	7%
AZ					
JOBS	68	46%	41%	12%	1%
Non-JOBS	3,541	77%	17%	5%	2%
DK					
JOBS	87	29%	45%	14%	13%
Non-JOBS	2,537	67%	20%	6%	7%
PN					
JOBS	208	38%	43%	6%	13%
Non-JOBS	6,369	76%	14%	4%	6%
SK					
JOBS	165	42%	42%	6%	10%
Non-JOBS	7,979	76%	15%	4%	5%
YN					
JOBS	252	34%	55%	10%	2%
Non-JOBS	11,347	62%	29%	6%	3%

Strand/Rating/ Student Group	N	Race/Ethnic Background			
		Caucasian	Black	Hispanic	Other
<u>Airframe Mechanical</u>					
AME					
JOBS	27	52%	44%	0%	4%
Non-JOBS	3,684	80%	11%	5%	4%
AMH					
JOBS	44	50%	36%	7%	7%
Non-JOBS	5,657	80%	12%	5%	4%
AMS					
JOBS	86	41%	47%	2%	10%
Non-JOBS	9,618	80%	11%	5%	4%
<u>Electrical</u>					
AE					
JOBS	322	57%	34%	7%	2%
Non-JOBS	9,717	83%	11%	5%	2%
CE					
JOBS	34	65%	18%	9%	9%
Non-JOBS	930	79%	9%	5%	7%
EM					
JOBS	253	51%	32%	4%	13%
Non-JOBS	8,066	78%	10%	5%	7%
IC					
JOBS	236	48%	42%	5%	4%
Non-JOBS	5,013	82%	12%	4%	25%

Strand/Rating/ Student Group	N	Race/Ethnic Background			
		Caucasian	Black	Hispanic	Other
Electronics					
AQ					
JOBS	106	82%	14%	3%	1%
Non-JOBS	3,017	90%	6%	3%	2%
AT					
JOBS	322	73%	17%	7%	3%
Non-JOBS	9,834	89%	5%	3%	3%
AX					
JOBS	45	67%	27%	7%	0%
Non-JOBS	2,024	91%	5%	3%	2%
ET-AEF					
JOBS	126	67%	24%	6%	4%
Non-JOBS	8,207	90%	6%	3%	2%
EW					
JOBS	75	61%	32%	5%	1%
Non-JOBS	2,833	88%	7%	4%	1%
FTG					
JOBS	10	60%	40%	0%	0%
Non-JOBS	3,248	90%	5%	3%	2%
GMG-II					
JOBS	85	75%	19%	6%	0%
Non-JOBS	4,001	85%	10%	4%	1%
RM					
JOBS	27	48%	37%	11%	4%
Non-JOBS	9,657	60%	32%	6%	2%

Strand/Rating/ Student Group	N	Race/Ethnic Background			
		Caucasian	Black	Hispanic	Other
<u>Navigation</u>					
QM					
JOBS	238	45%	42%	10%	4%
Non-JOBS	4,840	83%	12%	4%	1%
SM					
JOBS	56	41%	54%	4%	2%
Non-JOBS	4,251	83%	12%	4%	1%
<u>Operations</u>					
OS					
JOBS	968	53%	39%	6%	2%
Non-JOBS	14,647	83%	11%	4%	2%
STG					
JOBS	100	70%	19%	5%	6%
Non-JOBS	8,251	87%	8%	3%	2%
<u>Propulsion</u>					
BT					
JOBS	439	37%	47%	8%	8%
Non-JOBS	13,385	84%	9%	4%	3%
EN					
JOBS	429	37%	45%	11%	8%
Non-JOBS	10,734	85%	8%	4%	3%
GS					
JOBS	26	85%	12%	4%	0%
Non-JOBS	1,002	95%	2%	2%	2%
MM					
JOBS	702	36%	44%	10%	10%
Non-JOBS	15,876	83%	9%	4%	4%
<u>Overall (All Ratings)</u>					
JOBS	5,688	48%	38%	8%	6%
Non-JOBS	194,602	81%	12%	4%	2%

APPENDIX G

ACADEMIC ATTRITION RATES OVER TIME

These data are based on populations of students who attended Navy "A" or BE/E schools during the 1979-1981, 1982-1984, and 1985-1987 time periods. Total N is the total number of students who entered the school and %AA is the academic attrition rate for the rating. CDP is the Course Data Processing Code. The full name for each rating abbreviation is given in Table 1.

Strand/Rating/ School/CDP		JOBS Students			Non-JOBS Students		
		79-81	82-84	85-87	79-81	82-84	85-87
<u>Administrative</u>							
AK "A" 6522	Total N %AA	99 7%	63 8%	25 12%	1747 1%	1411 3%	2179 6%
AZ "A" 6528	Total N %AA	14 0%	40 3%	17 6%	1568 4%	1533 1%	1824 6%
DK "A" 6061	Total N %AA	34 32%	58 12%	19 11%	848 3%	962 6%	977 3%
PN "A" 6102	Total N %AA	157 14%	87 21%	10 0%	2872 3%	2255 5%	1965 7%
SK "A" 6059	Total N %AA	84 1%	60 8%	44 16%	2326 1%	3536 2%	4019 10%
YN "A" 6057	Total N %AA	149 7%	132 3%	7 0%	4116 7%	4286 3%	4170 7%
<u>Airframe Mechanical</u>							
AME "A" 6516	Total N %AA	0 -	27 4%	0 -	1974 1%	1792 1%	1551 2%
AMH "A" 6517	Total N %AA	0 -	42 0%	0 -	3505 2%	3393 1%	2545 2%
AMS "A" 6518	Total N %AA	0 -	82 29%	0 -	4881 1%	4308 1%	4065 1%
<u>Electrical</u>							
AE "A" 6515	Total N %AA	1 100%	260 10%	146 30%	5289 5%	5711 4%	5164 10%
AE BE/E 6235	Total N %AA	23 4%	308 10%	106 25%	7400 13%	4426 9%	2767 13%
CE "A" 6079	Total N %AA	3 0%	30 0%	2 0%	440 1%	475 0%	482 1%

Strand/Rating/ School/CDP		JOBS Students			Non-JOBS Students		
		79-81	82-84	85-87	79-81	82-84	85-87
Electronics (Continued)							
ET-AEF BE/E							
6414	Total N	4	279	197	1088	2555	2809
	%AA	50%	19%	24%	19%	8%	15%
EW "A" 608J	Total N	0	25	52	0	1255	1832
	%AA	-	0%	12%	-	0%	2%
EW BE/E 6306	Total N	0	54	1	1021	1764	25
	%AA	-	13%	0%	3%	6%	8%
FTG "A" 609W	Total N	0	3	19	0	820	3842
	%AA	-	33%	42%	-	12%	14%
FTG BE/E 614A	Total N	0	0	35	0	0	2200
	%AA	-	-	6%	-	-	10%
GMG-II "A" 607W	Total N	0	40	50	19	1506	2900
	%AA	-	0%	0%	0%	0%	0%
GMG-II BE/E 6370	Total N	6	47	103	945	2215	4615
	%AA	17%	15%	42%	13%	14%	24%
RM "A" 611E	Total N	0	17	5	0	3118	8724
	%AA	-	0%	0%	-	2%	10%
Navigation							
QM "A" 6001	Total N	59	117	121	2288	2303	1754
	%AA	20%	15%	8%	3%	5%	5%
SM "A" 6005	%AA	0	29	31	1807	1907	1948
	%AA	-	0%	0%	1%	3%	1%
Operations							
OS "A" 6540	Total N	175	589	363	5008	5866	6151
	%AA	10%	8%	7%	1%	2%	3%

Strand/Rating/ School/CDP		<u>JOBS Students</u>			<u>Non-JOBS Students</u>		
		79-81	82-84	85-87	79-81	82-84	85-87
<u>Propulsion</u>							
QM "A" 6486	Total N	129	217	198	6639	4367	3676
	%AA	8%	11%	12%	2%	3%	6%
EN "A" 6487	Total N	133	151	175	4473	3219	3306
	%AA	1%	1%	6%	0%	0%	1%
GS "A" 610P	Total N	0	23	8	0	682	441
	%AA	-	17%	13%	-	2%	3%
MM "A" 6492	Total N	208	419	215	7961	4691	4469
	%AA	8%	14%	18%	1%	3%	5%

APPENDIX H

COMBINED "A" SCHOOL AND FLEET ATTRITION RATES

These data provide combined rates of school and fleet attrition for JOBS and non-JOBS ("A" school qualified) students who graduated from "A" school during 1979 and 1983. N indicates the number of students originally enrolled in "A" school. Cumulative rates of attrition are provided at the time of graduation from "A" school and 1, 2, 3, and 4 years following graduation. The non-JOBS student N represents a 10 percent random sample of the actual population taken from the data base. The JOBS student N represents the entire population taken from the data bases. Full name for each rating abbreviation is given in Table 1. No data were available for GS, RM, and SM ratings during the 1979-1983 period. Therefore, data for these ratings are not presented.

Strand/Rating/ Student Group	N	Combined Cumulative Attrition				
		Graduation	Following Graduation			
			1 yr	2 yr	3 yr	4 yr
Administrative						
AK						
JOBS	138	12%	16%	25%	34%	54%
Non-JOBS	247	6%	8%	15%	28%	50%
AZ						
JOBS	44	5%	9%	11%	25%	48%
Non-JOBS	262	6%	11%	17%	27%	36%
DK						
JOBS	72	25%	26%	33%	43%	51%
Non-JOBS	155	6%	13%	19%	30%	48%
PN						
JOBS	244	24%	28%	37%	43%	53%
Non-JOBS	448	8%	17%	24%	32%	46%
SK						
JOBS	128	9%	16%	27%	37%	53%
Non-JOBS	440	5%	10%	23%	41%	56%
YN						
JOBS	281	10%	16%	26%	40%	53%
Non-JOBS	747	9%	16%	24%	34%	51%

Strand/Rating/ Student Group	N	Combined Cumulative Attrition				
		Graduation	Following Graduation			
			1 yr	2 yr	3 yr	4 yr
<u>Airframe Mechanical</u>						
AME						
JOBS	26	4%	8%	19%	38%	58%
Non-JOBS	296	5%	7%	13%	22%	35%
AMH						
JOBS	39	3%	10%	15%	33%	51%
Non-JOBS	579	3%	5%	12%	26%	37%
AMS						
JOBS	78	6%	12%	19%	35%	50%
Non-JOBS	781	3%	6%	10%	23%	37%
<u>Electrical</u>						
AE						
JOBS	173	14%	16%	26%	51%	65%
Non-JOBS	855	6%	8%	15%	27%	39%
CE						
JOBS	29	7%	7%	14%	24%	41%
Non-JOBS	81	14%	17%	22%	26%	33%
EM						
JOBS	193	19%	23%	34%	54%	72%
Non-JOBS	626	6%	9%	16%	33%	54%
IC						
JOBS	80	9%	14%	29%	46%	61%
Non-JOBS	220	3%	9%	17%	32%	54%

Strand/Rating/ Student Group	N	Combined Cumulative Attrition				
		Graduation	Following Graduation			
			1 yr	2 yr	3 yr	4 yr
Electronics						
AQ						
JOBS	49	27%	33%	47%	61%	80%
Non-JOBS	274	16%	18%	22%	37%	56%
AT						
JOBS	206	22%	27%	35%	61%	74%
Non-JOBS	787	15%	18%	25%	43%	53%
AX						
JOBS	25	32%	36%	44%	72%	76%
Non-JOBS	167	19%	20%	23%	36%	50%
ET-AEF						
JOBS	63	68%	68%	70%	71%	71%
Non-JOBS	521	32%	34%	37%	41%	45%
EW						
JOBS	13	0%	0%	23%	54%	54%
Non-JOBS	54	2%	4%	9%	30%	46%
GMG-II						
JOBS	21	5%	10%	19%	48%	52%
Non-JOBS	74	1%	3%	15%	43%	55%

Strand/Rating/ Student Group	N	Combined Cumulative Attrition				
		Graduation	Following Graduation			
			1 yr	2 yr	3 yr	4 yr
Navigation						
QM						
JOBS	149	24%	28%	38%	50%	63%
Non-JOBS	363	8%	14%	23%	37%	50%
Operations						
OS						
JOBS	601	16%	21%	35%	53%	69%
Non-JOBS	941	6%	11%	21%	39%	57%
STG						
JOBS	40	30%	35%	43%	50%	60%
Non-JOBS	417	5%	12%	19%	30%	43%
Propulsion						
BT						
JOBS	308	14%	19%	30%	52%	66%
Non-JOBS	983	7%	13%	24%	43%	61%
EN						
JOBS	238	1%	7%	16%	34%	53%
Non-JOBS	736	0%	6%	15%	32%	59%
MM						
JOBS	538	11%	15%	24%	47%	67%
Non-JOBS	1176	6%	12%	23%	38%	61%
Overall (All Ratings)						
JOBS	3776	15%	20%	30%	47%	63%
Non-JOBS	12230	8%	12%	20%	35%	51%

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