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13

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SUMMARY PAGE

THE PROBLEM

In 1962 the Navy established a campus Flight Indoctrination Program (FIP) which allowed NROTC students to take FAA administered light plane training and to earn a private pilot's license. The objectives of the program were to attract more NROTC students to aviation, to improve screening of flight applicants from among NROTC students, and to reduce flight training time. This study examined how well these goals have been achieved.

FINDINGS

In general, the results were favorable. Input figures for NROTC students into naval flight training showed a significant increase after the inception of FIP. The FIP group proved to be superior to a non-FIP control group in terms of average grades throughout training, and the FIP group's attrition rate was about half that of the non-FIP group. Greatest reduction in training time was, as expected, in the primary or light plane phase. Although the findings are positive, there is evidence that more careful consideration of campus FIP performance would result in further improvement in screening. In addition, there were a few instances of possible pipeline misassignment of FIP students. Since pipeline assignment is based mainly on the Primary Flight Grade, an artificial elevation of this grade by the previous light plane experience could contribute to misassignment. It is recommended that this area be studied further when additional cases are available.

INTRODUCTION

In 1962 the Navy established a campus Flight Indoctrination Program (FIP) which allowed NROTC students to take Federal Aviation Agency (FAA) administered light plane training and to earn a private pilot's license. The program was similar to one implemented for a short time by the Air Force and reported by Cox and Mullins (1). The problems associated with the Navy program are different, however, because Navy ROTC students do not assume an obligation to take pilot training as part of their NROTC commitment, so that all naval specialities may be described as being in competition with each other for this very excellent source of junior career officers. The objectives of the Navy program were to attract more NROTC students to aviation, as well as to improve screening of flight applicants from among NROTC students and to reduce flight training time. This report examines how well these goals have been achieved.

PROCEDURE

Evaluation of the first objective of FIP was simply a matter of examining the numbers of NROTC students who have entered flight training for the last few years. Table I contains data which show a definite increase in input coinciding with the inception of FIP. A satisfactory examination of the relative performance of FIP and non-FIP students in training was not so easy to arrange because of the impossibility of constructing two study samples that were identical in every respect except for FIP experience. The two samples used for this study consisted of 353 FIP NROTC graduates and 143 non-FIP NROTC graduates. Most of the 55 NROTC universities were represented in both samples, and both samples progressed through NROTC and flight training at the same time. The mean intelligence and flight aptitude of the two groups were the same, as measured by the Aviation Qualification Test and the Flight Aptitude Rating battery, respectively.

Table I

Inputs of NROTC Graduates to Naval Aviation Training

Fiscal Year	Input N	
1961	133	No FIP
1962	201	FIP began
1963	267	
1964	271	
1965	301	

ANALYSIS AND RESULTS

The analysis consisted, first, of comparing the FIP and non-FIP groups on various dimensions of performance in naval aviation training. Table II presents average pre-flight and flight grades earned by the two groups during training. The magnitudes of the differences between the array of means in Table II are not large, but they consistently favor the FIP group. The large differences between mean grades in the Primary phase of training was expected since the FIP students had already completed the FAA light plane syllabus. A more significant point to be made with these data is that most of the later grades earned in heavier aircraft also showed an advantage for the FIP students although differences between the grades of students in jet training were not significant.

Comparative attrition data are contained in Tables III and IV. Again the results favor the FIP group for all categories of attrition and for all stages of training, with the FIP group having less than half the attrition of the non-FIP group.

Table V shows the average number of syllabus hours flown by the two groups. Most of the FIP students' superiority was in Primary training and during dual instruction in the T-28 propeller type of aircraft. There were very small time advantages for the FIP students in the other stages with the exception of Basic Jet where the non-FIP students had a slightly lower solo-hour average. The average Basic Jet dual hours were nearly identical for the two groups; however, jet CQ solo and dual hours were less for FIP students. Translated into cost figures, it can be estimated for this sample that previous FIP training reduced the training cost of a successful jet student by about $400 and of a successful prop student by about $100. The cost reductions associated with reduced attrition are not reflected in these figures, however. A very rough estimate of these savings is a far more impressive $2200 per student graduated.

Table VI gives the relationships among selected FIP grades and flight training performance variables for 140 FIP NROTC graduates for whom complete data were available. In general, the coefficients are low. The relationship between Instructor Rating on Aptitude (for flying) during FIP and Basic Flight grades, however, is of sufficient magnitude for possible use in prediction formulae for flight students.

DISCUSSION

In general, these findings indicate that the campus Flight Indoctrination Program is effective, although the enhancement in performance of the FIP students and the slight reduction in training time, in themselves, probably would not justify continuning the FIP. The most beneficial changes associated with FIP were the increase in NROTC input to flight training and the reduced attrition of the FIP students from training. Whether FIP actually "caused" reduced attrition or attracted students with greater motivation toward flight cannot be determined with certainty. To the extent that the Flight Aptitude Rating battery measures motivation, the FIP and the non-FIP groups were equivalent; therefore, there is some inferential evidence in support of a causal

relationship. Some increase in screening efficiency could be realized by utilizing aptitude ratings from the FIP evaluation forms filed by the campus instructors. Also, the FIP records of a few students who attrited in flight training were found to contain negative comments by their FIP instructors. Two students who voluntarily withdrew from flight training reported that they disliked flying intensely during FIP but that they had felt a moral obligation to at least "give it a try" in the military setting.

All of the results regarding the application of the Flight Indoctrination Program to military aviation were not positive, however. Given the fact that the FIP students earned unusually high Primary training grades, and given the additional fact that assignment of students to the jet pipeline is based largely on these grades, there is still a strong possibility that the FIP experience could cause some students to be misassigned to the high performance aircraft. It was noted earlier that FIP students did not have significantly higher average grades in the jet training syllabus. Furthermore, in this sample it was found that a greater proportion of the FIP students (53%) were assigned to jets than were non-FIP students (41%). If there had been no misassignments, the attrition rate for these FIP jet students would have been about half the rate of the non-FIP jet students, thus reflecting the relative values of the over-all attrition rates as shown in Table III. This was not quite the case; the 172 FIP jet students had eight attritions for a rate during jet training of 4.65 per cent. The non-FIP jet group had three attritions out of 49 assignees for a rate of 6.12 per cent. The small number of attrition cases makes the findings tentative, but it can be reasoned that at least some of these eight FIP jet students were misassignments.

These findings suggest that standards for pipeline placement of FIP students might be modified to correct for the fact that their high pre-solo grades may mean "previous experience" rather than "superior aptitude." Any specific recommendation in this area must await the availability of additional cases for study, however.

CONCLUSIONS

This study supports the concept of the campus flight indoctrination program as a preparation for naval aviation training. The evidence indicates that students with this campus opportunity can be trained more efficiently and economically in the military setting, and that the instructor aptitude rating and, perhaps, instructor comments from the FIP might be used to increase screening effectiveness. It is recommended that additional FIP students be studied to determine if separate standards would be appropriate for these students when assignments to specific types of military aircraft are made.

Table II

Average Pre-Flight and Flight Grades for FIP and Non-FIP Groups

Performance Grade		FIP	Non-FIP
Pre-Flight Final	$\bar{X}$	55.63	54.83
	S. D.	4.75	5.01
Primary Flight (VT-1)	$\bar{X}$	3.13*	3.03
	S. D.	0.12	0.09
Basic Prop (VT-2)	$\bar{X}$	3.05*	2.98
	S. D.	0.11	0.07
Basic Prop (VT-3)	$\bar{X}$	3.04*	2.98
	S. D.	0.10	0.07
Prop CQ+ (VT-5)	$\bar{X}$	3.00	2.98
	S. D.	0.08	0.06
Basic Jet (VT-7 or 9)	$\bar{X}$	3.04	3.03
	S. D.	0.07	0.06
Jet CQ+ (VT-4)	$\bar{X}$	3.05*	3.01
	S. D.	0.08	0.06
Final Jet	$\bar{X}$	54.80	53.78
	S. D.	8.72	8.23
Final Multi Engines	$\bar{X}$	54.19*	48.84
	S. D.	11.75	14.61
Final Helicopter	$\bar{X}$	57.23*	49.56
	S. D.	10.46	9.57

* "t" test indicated significant difference at .01 level or better between FIP and non-FIP average grades.

+ Carrier Qualification.

Table III

Percentage of Attrition by Type from Flight Training for FIP and Non-FIP Groups

	FIP Per Cent	Non-FIP Per Cent
Flight failure	2.83	6.99
Voluntary	7.37	16.08
Medical	1.98	2.10
Other	2.55	4.90
Total	14.73	30.07

Table IV

Percentage of Atirition by Stage from Flight Training for FIP and Non-FIP Groups

	FIP Per Cent	Non-FIP Per Cent
Pre-Flight	3.40	3.50
Primary	4.53	12.59
Transition	2.83	7.69
Late basic	3.12	4.20
Advanced	0.85	2.10
Total	14.73	30.08

Table V

Average Basic Syllabus Hours Flown by FIP and Non-FIP Groups

		FIP		Non-FIP	
		Solo Hours	Dual Hours	Solo Hours	Dual Hours
Primary	$\bar{X}$	6.39	24.45*	6.44	26.08*
(VT-1)	S.D.	0.54	2.38	0.36	2.59
Basic Prop	$\bar{X}$	12.93	38.31*	13.08	41.23*
(VT-2)	S.D.	2.57	6.55	2.15	3.13
Basic Prop	$\bar{X}$	20.99	33.08	21.05	33.57
(VT-3)	S.D.	2.24	3.60	2.01	3.75
Basic Prop CQ+	$\bar{X}$	8.60	3.50	8.66	3.78
(VT-5)	S.D.	1.63	1.10	1.47	1.39
Basic Jet	$\bar{X}$	20.89*	70.50	19.09*	70.52
(VT-7 or 9)	S.D.	3.08	5.92	3.44	7.10
Basic Jet CQ+	$\bar{X}$	14.80	10.26	16.03	11.83
(VT-4)	S.D.	3.00	5.04	1.98	4.70

* "t" test indicated significant difference between FIP and Non-FIP average flight hours.

+ Carrier Qualification.

Table VI

Relationships Among Selected FIP Variables and Flight Training Performance Grades

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Dual hours		05*	15	-04	-23	-10	-09	-07	-01	-02	00	07	-05	00	03
2. Solo hours			-06	28	00	-03	12	10	10	17	02	20	-03	13	-01
3. Power rating of plane				13	-04	-06	-05	-13	-06	-01	-08	09	-06	05	05
4. Instr's. rating of aptitude					54	41	48	59	21	64	20	21	15	27	11
5. Instr's. rating on judgment						52	45	34	35	61	13	04	10	11	14
6. Instr's. rating on co-ordination							47	42	24	36	13	10	12	06	03
7. Instr's. rating on reaction								37	38	49	03	15	15	15	06
8. Instr's. rating on attitude									20	35	28	18	19	18	15
9. Instr's. rating on tenseness										29	-04	-05	-12	-15	-08
10. Over-all rating											23	18	14	20	11
11. Fav./unfav. comments												03	14	14	10
12. Pre-solo													41	67	24
13. Transition														74	40
14. Basic flight															36
15. Basic ground															

*Decimals omitted.

REFERENCE

1. Cox, J. A., and Mullins, C. J., Evaluation of light plane training among AFROTC Student Officers. Lackland, Texas: Wright Air Development Center, Personnel Laboratory, July 1959.

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