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This report summarizes the results of a questionnaire that was sent to the education offices of 93 Air Force bases in the continental United States. The purpose of the questionnaire was to obtain objective information concerning the present status of Air Force reading improvement programs in an effort to obtain insight into the type and degree of reading problems facing the Air Force. This paper attempts to answer such questions as how many airmen participate in reading improvement programs, what career fields have a significant number of low ability readers, what reading improvement programs are available at different bases, what the major reading problems encountered by Air Force personnel are, and who has the responsibility for organizing and financing the reading programs. Finally, recommendations concerning the Air Force's reading improvement programs are discussed. (TO)



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AFHRL-TR-73-54

AN ANALYSIS OF AIR FORCE READING IMPROVEMENT PROGRAMS

RESULTS OF USAF SURVEY NUMBER 73-89

By William P. Mockovak, Capt, USAF

TECHNICAL TRAINING DIVISION
Lowry Air Force Base, Colorado 80230

January 1974

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MARTY R. ROCKWAY, Technical Director Technical Training Division

Approved for publication.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report summarizes the results of a questionnaire that was sent to the education offices of 93 Air Force bases in the continental United States. The purpose of the questionnaire was to obtain objective information concerning the present status of Air Force reading improvement programs in an effort to obtain better insight into the type and degree of reading problems facing the Air Force. The information presented in this paper attempts to answer such questions as, how many airmen participate in reading improvement programs, what career fields have a significant number of low-ability readers, what reading improvement

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programs are available at different bases, what are the major reading problems encountered by Air Force personnel, and who has the responsibility for organizing and financing the reading programs? Finally, recommendations concerning the Air Force's reading improvement programs are also discussed.



Summary

Problem. In the Air Force, as in other institutions responsible for training large numbers of people, inadequate reading skills are responsible for numerous training difficulties. However, although a great deal of anecdotal evidence exists concerning the reading problem (complaints from supervisors, instructors, etc.), little objective information is available concerning such matters as the types of reading problems being encountered, the number of individuals experiencing reading difficulties, and steps that are being taken to remedy the existing problems. The lack of such information makes it very difficult for Air Force managers to decide if present efforts are adequate, or whether further efforts should be initiated to help Air Force personnel cope with inadequate reading skills.

Approach. Due to the training requirements of the Air Force on-the-job training (OJT) system, each base education office has the responsibility for setting up a reading improvement program. In light of this requirement, it was decided that the education office would serve as the most logical focal point for obtaining preliminary information on



reading problems in the Air Force. A reading program questionnaire was developed and sent to the education services officer at each of 93 Air Force bases in the continental United States. A follow-up questionnaire was also necessary since the return rate on the initial questionnaire was unacceptable.

Results. Of the 84 bases which responded to the questionnaire, 76 (90%) reported that they had a reading improvement program of one form or another in which 5,774 airmen participated during the previous The most frequently cited problems (55%) dealt with an airman's inability to read, comprehend, and pass his CDC material; 28% of the reported problems involved a lack of basic reading skills; and, 11% dealt with the difficulties experienced by trainees who were using English as a second language. The reading programs differed markedly in duration with an average length of 76 hours and a range of 24 to 240 hours. Also, financial support came primarily from Air Force or Veterans Administration funds. Information was limited concerning AFSCs and skill levels but trends exist which should not disappear with additional data. Individuals with reading problems that interfere with their job performance are primarily in training for their 3 skill level (62.5%), or 5 level (25.2%), and come primarily from the Aircraft Maintenance (42 and 43) career fields, Civil Engineering (54 and 55), Transportation (60), Food and Fuel Services (62 and 63), Administration (70), Supply (64), and Security Police (81).



Conclusions. Significant numbers of airmen participate in Air Force reading improvement programs, a fact which supports otherwise anecdotal information concerning the Air Force's reading problems. Furthermore. on the basis of the available data, approximately 84% of the airmen receiving reading training come from only 10 career fields. At the present time, the Air Force lacks a systematic, systems-oriented approach to the reading problem. Each base is responsible for its own program which has resulted in a myriad of approaches, varying course lengths, different definitions of successful student performance, diverse financing and teaching methods, and inadequate records concerning student problems, personal data, and progress. It is suggested that more reading improvement programs be financed with Veterans Administration funds because sufficient money is available per student to attract highly qualified instructors which may not be the case given the limited level of Air Force funding. It is also suggested that better student records be maintained to improve individual diagnosis and remediation, and that communication channels be opened between education offices in an effort to disseminate information on effective teaching materials, approaches, and evaluation techniques.



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An Analysis of Air Force Reading Improvement Programs: Results of USAF Survey Number 73-89

I. INTRODUCTION

In any institution responsible for training large and diverse numbers of people, reading problems have continually surfaced as one of the more complex training problems that must be dealt with in order to ensure adequate job proficiency. The Air Force for many years has been in a favored position relative to the other military services because it has been able to attract highly qualified and dedicated individuals; however, the existence of the all-volunteer force poses certain questions concerning the educational characteristics of new accessions. Vitola and Valentine (1971a, 1971b) cite data which suggest that under the all-volunteer force, the acquisition of manpower resources from the higher aptitude levels will be limited, whereas, the percentage of non-high school graduates probably will increase. Whether or not such a trend actually occurs depends on several factors, such as pay scales, enlistment bonuses and incentives, job opportunities in the civilian economy, the available manpower pool, etc. Nevertheless, whatever the future composition of the Air Force manpower pool might be, there has been widespread recognition even at the present time that the reading skills possessed by certain segments of the Air Force population are inadequate to deal with much of the written material



encountered in resident training, on-the-job training (OJT), and in actual job performance. For example, at the 1972 worldwide OJT conference, there was unanimous agreement among the attendees that reading problems existed and were proving detrimental to the conduct of Air Force OJT. Also, training managers at Air Training Command have received numerous complaints from the field which have sensitized them to the reading problem. The problem facing Air Force decision makers at the present time, therefore, is to deal with existing reading problems in the most practical and cost-effective manner. However, objective information necessary to make such decisions is not readily available. For example, at the present time, each Air Force base is responsible for implementing its own reading improvement program. This has resulted in a variety of programs and approaches which differ in content, duration, instructional methods, areas of emphasis, etc. The primary purpose of this study, therefore, is to review these diverse programs and obtain greater insight into the type and degree of reading problems presently being experienced by Air Force personnel; and further, to locate specific career fields where the most serious problems are being encountered. It is hoped that this information will prove useful to those Air Force decision makers who must deal with current training problems, as well as plan for future ones.



II. PROCEDURE

Since local base education offices are the focal point for reading improvement efforts, the education services officer at each of 93 Air Force bases was queried to determine the answers to such questions as (1) what reading improvement programs are available to Air Force personnel, (2) who is responsible for administering the reading programs, (3) how many airmen participated in such programs during the period 1 April 1972 - 1 April 1973, (4) what were the airmen's AFSCs and skill levels, and (5) other general questions concerning costs, materials, procedures/regulations, performance criteria, general suggestions, etc. It should be noted that under the Air Force's current OJT program, an airman deficient in reading skills, either must participate in a base reading improvement program or else study AFP 50-22 (Reference AFM 50-23).

It was necessary to send out a follow-up questionnaire to non-responding bases because the return rate for the initial questionnaire was 57% which is approximately 14% below an average return rate for a military questionnaire of this type (Personal Communication: Mr Stephens, USAF/ACMR). However, the follow-up questionnaire raised the initial return rate by 33% to an overall return rate of 90%. This is a very respectable figure and should therefore reduce the possibility of any sampling bias. It should be noted in the following data, that not all



the bases were able to respond to all of the questions because of lack of data, or insufficient information. (See Appendix A for sample questionnaire.)

III. RESULTS

Of those bases responding, 90% indicated they had a reading improvement program of one form or another, in which 5,774 airmen participated during the period 1 April 1972 - 1 April 1973. The composition of reading improvement classes varied from 5-100 percent non-high school graduates, with an average of 50%. Apparently, those individuals responsible for the programs were satisfied with the progress shown by the students since 87% of the respondees viewed their programs as successful. However, in making this judgment, various indices of success were employed. This was most apparent when one considers the average completion time (in classroom hours) for a typical course. This figure ranged from 24 to 240 hours with an average of 76 hours, which suggests radically different definitions of "success." Generally, in 83% of the reading programs, the ninth grade reading level was selected as the desired reading grade level (RGL) which a student was expected to achieve in order to "graduate" from the course. Eleven percent (11%) of the bases had a criterion of greater than the ninth grade; whereas, only one base had a goal of less than ninth grade. The ninth grade level is specified as the



desired goal in AFM 50-23, page 4-8. Other indicators of successful student performance, in addition to a ninth grade level, were increased student motivation, increased reading rate, improved vocabularies, improved word attack skills, high school GED tests passed, and test-retest gains of a specified increment. One base claimed reading grade improvements of 3-5 grade levels after 40 hours of classroom instruction which is surprising at the very least, but somewhat suspect in view of gains typically made in similar programs. Such gains, if valid, however, suggest the possibility that many of the Air Force's reading problems might, in fact, be motivation problems which will disappear given the right training environment.

As far as the design, development, and administration of reading programs is concerned, each base education office maintains ultimate responsibility for its individual program but the means of financing and conducting them differs markedly. For example, 49% of the reading improvement programs were financed through Veterans Administration (VA) funds, generally through the VA PREP program. VA spent an annual average of \$10,471 per base, at a median cost per student of \$187.50 (range: \$20 - \$552).

Air Force base education offices financed 38% of the reading improvement courses at an annual average cost per base of \$1,573, or \$26 (range: \$19.05 - \$50) per student. The remaining reading improvement

programs (13%) were paid for by local school districts, high schools, etc., which were supported by state and federal funding and for which adequate data on costs were not available.

A significant majority (83%) of the bases determined entry into the reading courses on the basis of the criteria outlined in AFM 50-23. These criteria specify that an airman will be entered in a reading. improvement course if he scores less than ninth grade level on the USAFI Achievement Test III which is used as a screening device. He is identified to take this screening test if he has an AQE General or Airman Classification Battery (ACB) score of less than 60 (AFM 50-23, Table 4-4). The AQE general score of 60 is a conservative cutoff point which is based on empirical evidence (Madden-Tupes, 1966); nonetheless, 25% of those bases sampled felt that the established regulations were not adequate for identifying personnel with reading problems. It is interesting to note that 75% of the reading programs used the USAFI Achievement Test III (UAT III) as their primary evaluation instrument; other, less commonly used tests, were the Nelson-Denny (9%), the Science Research Associates (SRA), 6%, and, the California Achievement Test, 4%. The largest percentage of the reading improvement programs (43%) was arranged and taught through local colleges, 25% through local high schools, 28% with independent contract instructors, and only 4% were actually arranged and taught by Air Force personnel.



With regard to the most commonly encountered reading problems (question 9, Reading Questionnaire), it is important to note that 55% of the reading problems cited dealt with a trainee's inability to read, comprehend, and pass his CDC material; 28% of the problems named dealt with a lack of basic reading skills (vocabulary, reading rate, etc.); and 11% involved the difficulties experienced by trainees who were using English as a second language. These data thus support one of the conclusions of the 1972 worldwide OJT conference, that is, reading problems are proving detrimental to the conduct of Air Force OJT. Although the preceding data are beneficial in that they support otherwise anecdotal evidence; some of the most useful information in this survey was also the hardest to obtain, that is, the number of individuals having reading problems in different AFSCs and at different Unfortunately, this information is not generally skill levels. maintained by base education offices; therefore, it was available for only 979 of the 5,774 airmen who participated in reading programs. Table I contains a breakdown of those 979 individuals by skill level, and, as is readily apparent, the biggest problem area (62.5%) lies with those persons training for the 3 skill level. The 5 skill level is also represented by a sizeable percentage, 25.2%, and several education officers expressed the opinion that this was a result of airmen cross-training into a new career field which placed increased demands and stress on their reading skills. Appendix B to this summary includes a complete breakdown of the 979 individuals by career field.



For the available data, the Aircraft Maintenance (43) career field accounted for 18.7% of the individuals in the reading programs for whom AFSC data were available. Actually, only 10 career fields accounted for 83.9% of the total number of individuals. Those fields with respective percentages are as follows: (1) Aircraft Accessory Maintenance (42), 6.2%; (2) Aircraft Maintenance (43), 18.7%; (3) Mechanical/ Electrical (54), 3.9%; (4) Structural/Pavements (55), 8.0%; (5) Transportation (60), 11.2%; (6) Food Service (62), 5.9%; (7) Fuel Services (63), 5.1%; (8) Supply (64), 8.3%; (9) Administration (70), 12.7%; and (10) Security Police (81), 3.9%.

TABLE I

Summations and Percentages of Airmen by Skill Levels

		Sk	ill Level		•
	1	3	<u>5</u>	7	9
Number of Individuals	84	612	247	32	4
% of Total	8.5	62.5	25.2	3.2	0.4
Total = 979			•	•	

It should be emphasized that although a career field (X) may have fewer individuals in reading improvement programs than another field 8



(Y), it is not valid to conclude that X has fewer low-ability readers than Y on an absolute basis. Besides the obvious fact that there may be more individuals in Y, the possibility also exists that the reading material in Y is much more difficult than that in X which would tend to emphasize reading deficiencies and focus more attention on them.

One concluding piece of information which may be of interest concerns the AQE scores of those individuals actually engaged in reading improvement programs. Data were available on 367 such individuals and the AQE profile of an "average" participant is as follows: Gen AQE = 39 (s.d. = 15.3), Elec AQE = 40 (s.d. = 16.7), Mech AQE = 44 (s.d. = 15.3), and Admin AQE = 34 (s.d. = 18.4). The Gen AQE of 39 equates to approximately an 8.5 reading grade level (RGL) equivalent using the Madden-Tupes (1966) conversion tables. This means that the Air Force's reading problems are not overly severe if a ninth-grade reading level is found acceptable for most career On the other hand, this may not be a realistic criterion since it was found in a recent field study (Mockovak, in press) that the average readability of written materials for five disparate career fields was 11.1 with 10.7 being the lowest level encountered. Thus, to the extent that there is a relationship between reading ability and technical performance, it would appear that a systematic, realistic, job-oriented reading improvement program implemented on an Air Forcewide basis (or for those clusters of career fields experiencing the greatest reading problems) could significantly increase the 8.5 average reading grade level, and result in increased job and training proficiency.

Question 13 from the reading questionnaire called for suggestions from the education services officers that would improve the quality of the Air Force's reading improvement programs. There were numerous suggestions but the most common was that some preliminary screening should be accomplished in basic training to identify those individuals who could be expected to experience reading difficulties in the field. Once identified, it was further suggested that reading training be provided as a part of basic training at Lackland AFB. Other common suggestions or complaints were as follow: (1) supervisory personnel do not give adquate support to the reading improvement program; specifically, airmen who should be attending the courses are not being released from duty to do so; (2) the reading materials supplied by USAFI are inadequate; (3) the USAFI Achievement Test III does not provide enough information on individual reading deficiencies: (4) AFP 50-22 has severe deficiencies as a reading self-improvement tool; (5) there are numerous difficulties involved in identifying those individuals with inadequate reading skills and motivating them toward upgrading their reading skills; (6) Air Force bases lack the time and expertise to significantly improve literacy skills; and (7) the VA should lower the active duty service requirement to allow for earlier admission of personnel into reading improvement programs (current requirement is 181 days active duty service time).



IV. DISCUSSION AND RECOMMENDATIONS

It should be apparent from the preceding results that the Air Force at the present time lacks a systematic, systems-oriented approach for dealing with the inadequate reading skills of its personnel. Instead, each base is responsible for conducting its own reading improvement program which has resulted in a myriad of approaches, vast difference in costs and duration, and different measures of successful student performance. Also, the disturbing situation exists that some supervisors do not support the programs, and in certain situations, have failed to release personnel from duty to attend reading classes. The biggest problem, however, is the trainee who lacks the motivation necessary to improve his reading skills because no matter how well designed and run a reading program is, it will succeed only if the individual has the desire to succeed. also impractical to suggest that the Air Training Command can significantly raise the literacy skills of trainees during basic training when 12 years of previous schooling could not do it, but there are other alternatives which can be pursued.

For one thing, it seems essential that personnel with reading problems be identified as early as possible in their Air Force careers, preferably in basic training. If some of these individuals then enter into resident training, special attention can be immediately directed



toward them so that they are not allowed to become overwhelmed in the training environment. Also, when such individuals enter into OJT, the services of the base education office can be made immediately available to them, and they can be enrolled in reading improvement programs concurrently with their OJT study.

Another possibility which also exists is the design and development of a Job Specific Literacy Program (JSLP) for a career field, or cluster of career fields experiencing reading difficulties. For example, for the Aircraft Maintenance (43) and Aîrcraft Accessory Maintenance (42) fields (see Appendix B), a JSLP can be developed which stresses the acquisition of job-specific reading skills. In this context, a 2 or 3 RGL gain is not an objective. Instead, an airman identified as having deficient reading skills would enter a program designed to develop and broaden his technical vocabulary, introduce him to common reading tasks in his career field, and then give him practice performing these tasks. The JSLP would utilize only reading material from the selected career fields, and thus in a very real sense, would actually be a job training course. The inclusion of job-related reading materials should also serve to convince the trainee that he is actually training for his future Air Force job, thereby, motivating him and removing the stigma so often attached to reading improvement courses. Here this alternative chosen, the JSLP training could be provided prior to OJT, and upon completion of GJT the individual could voluntarily enter into a base reading program to acquire more generalized reading skills than would be provided in the JSLP training.

The problem still remains, of course, concerning what should be done to improve base reading improvement courses. The best approach at this time appears to be a transition to VA support and funding of reading improvement programs wherever possible. This appears to be the best solution because more money and time would be available per student, and experienced instructors could be hired who are familiar with the reading problems of adults. Also, it would then be possible to tie reading improvement programs in with other VA-supported educational programs which may serve as an inducement to an individual to continually upgrade his education.

It is further suggested that reading improvement programs be maintained on a voluntary basis, since it is impractical and prohibitively expensive to attempt to force someone to read. Of course, if a palatable incentive system is established within a mandatory reading program, then this theoretically should improve student performance. However, the selection of proper incentives, whether positive or negative, is a question which needs to be resolved.

It also seems that it would be beneficial for the Air Force to establish somewhat stricter controls over the conduct of base reading programs. Specifically, better information should be kept on participating airmen, such as, AFSCs, AQEs, AFQTs, number enrolled in course, reasons for entry, entry dates, completion times, criteria used to determine success, etc. Such information would serve as useful

indicators concerning reading problems in the Air Force and their status at any given time, as well as help managers locate career fields that might be in the process of being "overloaded" with personnel who have inadequate reading skills, thereby creating special training problems. It also seems desirable that communication channels be established to inform education services officers of proper procedures for evaluating their courses, and to disseminate information on approaches or materials that have been successful in other courses. The intent, therefore, is not to overload education office personnel with additional administrative burdens and red tape. Rather, it is hoped that attention can be focused on the reading improvement programs to see if they are accomplishing their stated goals in an effective and objectively verifiable manner. This survey has hopefully been a first step in that direction.



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Appendix A

AFH	RL/TT
REA	DING QUESTIONNAIRE (USAF SCN 73-89)
**N	ote: Replies to this survey are for the period 1 Apr 1972 - 1 Apr 1973; however, include classes in progress at either the beginning or end of this time frame.
1.	Does your base currently have a remedial reading program in operation? Yes No (Circle one.)
	If yes, would you consider it a success? Yes No
	Please explain.
2.	In the past year, how many airmen have participated in remedial reading programs on your base?
3.	Who is responsible for teaching the remedial reading programs at your base?
4.	How much money is spent annually on contracting for your remedial reading program? If no money is contracted out by the base, who sponsors it? (VA, et
	What is the cost per student?
5.	What reading grade level or other criterion is a student expected to attain before he can be classified as successfully completing the course?
	How was that particular reading grade level or criterion decided upon? (For example, AF regulation, decision of course director, etc.)
	•

Do you feel the procedures are adequate for identifying personnel with reading problems? Yes No

What procedures (regulations) are followed for admitting people into the remedial reading program on your base? (Who is eligible, etc.?)



- 7. What is the average completion time (in hours) for a student in the remedial reading course?
- 8. What reading achievement tests are used to assess an individual's reading ability?
- 9. What complaints with regard to specific reading problems have you received in the past year? (Please be specific.)

Also, where did the complaints originate? (Students, OJT, supervisors, etc.)

10. For the past year, please indicate by AFSC the total number of airmen who have participated in your remedial reading program. For example:

AFSC 43131 - 20 airmen AFSC 43230 - 5 airmen

If possible, also indicate skill levels. (Use additional paper, if necessary.)

- 11. For the past year, what proportion of airmen participating in remedial reading have been non-high school graduates?
- 12. If available, please forward the AQE scores of all airmen who have participated in remedial reading training during the past year.
- 13. Any comments which you have concerning this survey or information not requested which you feel is of interest is encouraged.



Appendix B

Summations and Percentages by Career Field

Career Field	Number of Individuals	% of Total
Photomapping (22)	1	0.1
Audio-Visual (23)	4	0.4
Command Control Systems Operation (2)	7) 15	1.5
Communications Operations (29)	7	0.7
Communications Electronics Systems (30) 10	1.0
Missile Electronic Maintenance (31)	1	0.1
Wire Comm Sys Maintenance (36)	11	Ī.]
Intricate Equipment Maintenance (40)	1	0.1
Aircraft Accessory Maintenance (42)	61	6.2
Aircraft Maintenance (43)	184	18.7
Missile Maintenance (44)	3	0.3
Munitions/Weapons Maintenance (46)	2	0.2
Vehicle Maintenance (47)	24	2.4
Metal Working (53)	25	2.5
Mechanical/Electrical (54)	39	3.9
Structural/Pavements (55)	79	8.0
Sanitation (56)	1	0.1
Fire Protection (57)	26 ⁻	2.6
Fabric and Rubber Products (58)	10	1.0
Transportation (60)	110	11.2
Supply Services (61)	16	1.6
Food Service (62)	58	5.9
Fuel Services (63)	50	5.1
Supply (64)	82	8.3
Procurement (65)	4	0.4
Accounting, Finance and Auditing (67	_	0.4
Administration (70)	125	- 12.7
Personnel (73)	3	0.3
Special Services (74)	8	0.8
Education and Training (75)	8 2	0.2
Security Police (81)	39	3.9
Medical (91)	2	0.2
Aircrew Protection (92)	$\bar{2}$	0.2
Dental (98)	39 2 2 2	0.2