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The Success Rate of Military Students in the Armed Services Vocational Aptitude Battery Preparation Class

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THE SUCCESS RATE OF MILITARY STUDENTS IN THE ARMED SERVICES
VOCATIONAL APTITUDE BATTERY PREPARATION CLASS WHO EITHER
ATTENDED THE TWO WEEK, 54-HOUR FORMAT, OR THOSE WHO EXCEEDED 54
HOURS AND FINISHED BY USING A SELF-PACED FORMAT AT NAVAL AIR STATION
OCEANA

A Research Paper
Presented to the Graduate Faculty of
the Department of Occupational and Technical Studies
at Old Dominion University

In Partial Fulfillment
of the Requirements for the
Masters of Science

By
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APPROVAL PAGE

This research paper was prepared by Margaret A. Russo under the direction of Dr. John M. Ritz in OTED 636, Problems in Occupational and Technical Studies. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master of Science in Occupational and Technical Studies.

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To the men and women of the armed forces who are proud to serve their country. They are to be commended for their determination to do what it takes to remain in the service. I would also like to thank the Naval Air Station Oceana Navy College Learning Center for their assistance in this research.

Margaret A. Russo

TABLE OF CONTENTS

	PAGE
Approval Page.....	i
Acknowledgment.....	ii
Table of Tables.....	v
 Chapter	
I. INTRODUCTION.....	1
Statement of the Problem.....	1
Hypothesis.....	1
Background and Significance.....	2
Limitations.....	4
Assumptions.....	5
Procedures.....	5
Definition of Terms.....	5
Overview of Chapters.....	6
II. REVIEW OF LITERATURE.....	8
Armed Service Vocational Aptitude Battery Preparation.....	8
Two Week ASVAB Class Format.....	9
Self-Paced ASVAB Format.....	10
Summary.....	10

III.	METHODS AND PROCEDURES.....	11
	Population.....	11
	Instrument Design.....	11
	Data Collection Procedures.....	12
	Statistical Analysis.....	12
	Summary.....	12
IV.	FINDINGS.....	13
	Success Rate of the ASVAB Preparation Class.....	13
	Sample Combination.....	13
	Statistics and Analysis.....	14
	Summary.....	16
V.	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	17
	Summary.....	17
	Conclusions.....	18
	Recommendations.....	20
	BIBLIOGRAPHY.....	22

TABLE OF TABLES

	PAGE
TABLE 1. Time Used to Complete the ASVAB Preparation Class for Each Format.....	14
TABLE 2. T-test Used to Determine Significant Different Between Classes.....	15

CHAPTER I

INTRODUCTION

The Armed Services Vocational Aptitude Battery (ASVAB) Test was given to every member of the armed forces to place them in a job that best suited their skills or education level. Due to factors such as severely undermanned jobs, it became necessary for some members to retake the ASVAB in order to qualify for another job. Before the test can be retaken, members must prove they have attended a preparation class and received two certificates of completion (mathematics and English). In order to assist military members, many Navy College Learning Centers (NCLCs) on most bases have implemented ASVAB Preparation Classes that can be taken in a structured two week, 54-hour format, and for those who did not finish in 54 hours, the member has a self-paced format they could use to finish the class requirements.

STATEMENT OF THE PROBLEM

The purpose of this study was to determine the success rate of military students on the ASVAB Preparation Class who either attended the two week, 54-hour class format, or those who exceeded 54 hours and used a self-paced format at Naval Air Station (NAS) Oceana.

HYPOTHESIS

To determine the solution to this problem, the following hypothesis was established:

H₁: Military students who had taken the two week, 54-hour ASVAB Preparation Class had a better rate of success than those who exceeded the two week 54-hour class and finished using the self-paced format.

BACKGROUND AND SIGNIFICANCE

The ASVAB Test, which was developed in the 1960s, had been given to every enlisted member in the armed forces before they entered for the purpose of placing members in jobs, or what the Navy calls ratings, that best suited their knowledge and/or education level. For this reason, some lower scoring jobs were filled to overflowing, while more demanding jobs were usually undermanned. To enter different jobs that required more or different skills, service members would try to improve their ASVAB scores by retaking the test. (Powers, 2004)

There was not much encouragement for members to retake the ASVAB themselves until major military downsizing began in the early 1990s and continued until the present with the latest Navy streamlining program called Perform to Serve (PTS). Military members were finding themselves forced out of the armed forces and into an economy that was on a downturn. This was what sparked most of the interest by military members in retaking the ASVAB.

In the Navy's Military Personnel Manual (MILPERSMAN), article 1440-010, Policy (2003), objectives and guidelines were given to members on changing ratings (jobs). It read as follows:

The objective of the Navy Personnel Command (NAVPERSCOM) regarding rating conversion is to encourage members to serve in rate or rating for which they have the greatest aptitude and interest. To the extent that changes in rate or rating do not cause an undesirable effect on overall distribution and advancement opportunity for career petty officers, changes of rate or rating may be approved following guidelines presented in this article. (p. 1)

In Section 3, the guidelines are listed as:

a. Applicants must

(1) Be an enlisted member of Regular Navy or Naval Reserve on active duty with less than 12 years active service (including Training and Administration of the Reserves (TAR)).

(2) Be a petty officer, first class or below.

(3) Be eligible in all respects for transfer.

(4) Have served a minimum of 24 months in present rating before being eligible for conversion to another rating. This requirement will be waived for those first-term personnel unable to receive an Enlisted Navy Career Option for Reenlistment (ENCORE) quota in their present rating. (p. 2)

The ASVAB was mentioned under Other Eligibility Requirements in Section 4 as follows:

b. certain ratings require satisfactory completion of an “A” School prior to change of rating (refer to current CREO NAVADMIN). If training is required, applicant must meet prescribed minimum Basic Test Battery (BTB) or Armed Services Vocational Aptitude Battery scores (ASVAB) contained in Navy Formal Schools Catalog (CANTRAC). (p. 3)

The ASVAB score, according to Powers (2004), ABC’s of the ASVAB, consisted of several factors. The AFQT (Armed Forces Qualification Test) was the most important as it determined if one could join the military. The AFQT scores were drawn from four parts of the ASVAB: work knowledge (WK), paragraph comprehension (PC), arithmetic reasoning (AR), and mathematics knowledge (MK).

In 1980, a study known as the Profile of American Youth was conducted by the Department of Defense (DOD) in cooperation with the Department of Labor. The DOD administered the ASVAB to a total of 11,914 individuals, ranging in age from 16 to 23, from July to October 1980. The purpose of the Profile of American Youth was to obtain data on the vocational aptitudes of current youth and establish current national norms for the ASVAB. (Powers, 2004)

In Gargan's (1999) article, To Defend a Nation An Overview of Downsizing and the U. S. Military, these following statistics were cited:

1. For the 1997-2005 periods active forces were to decline from 1.45 million to 1.36 million and reserve forces from 900,000 to 835,000.
2. The Army was to have 10 active divisions and some reduction in reserve elements.
3. For the Navy there were to be 12 carrier battle groups, 10 active and 1 reserve carrier wings, and a reduced number of surface combat ships, from 128 to 116, and attack submarines, from 73 to 50.
4. The Air Force was to be comprised of one fewer active, 12 versus 13, and one greater reserve, 8 versus 7, fighter wings as well as 187 rather than 202 bombers. (p. 228)

With so many members having been affected by downsizing, this researcher thought it significant enough to let members who were interested in continuing in military service know which format of the ASVAB was most successful, should they need to retake it.

LIMITATIONS

The limitations of this study were as follows:

1. Only previously collected data were used,
2. Only raw data pertaining to the class format, time spent on study at the NCLC at Oceana, and receipt of completion certificates were used.

ASSUMPTIONS

The following assumptions were made about students who took either of the ASVAB preparation formats:

1. Students had already taken the ASVAB once.
2. Students of both formats had access to the educational facility at any time space was available.
3. Commands allowed students the time allotted to complete the class.

PROCEDURES

The impetus of this research was to determine which course of action would be most successful for military students who took the two week, 54-hour ASVAB Preparation Class or those who exceeded the 54 hours and finished by using a self-paced format. With the assistance of a facilitator, data were obtained from the NAS Oceana Navy College Learning Center. The data included start and end dates for structured class, study time for mathematics and English modules, and confirmation of receipt of certificates. The data were tabulated to determine the amount of time a student had to spend taking either the two week format or, if they exceeded two weeks, how much extra time was required.

DEFINITION OF TERMS

During the course of this study, the following words or terms used may be unfamiliar to the reader or need clarification:

ASVAB--The Armed Services Vocational Aptitude Battery is a series of tests developed by the Department of Defense in the 1960s. Until recently, the battery consisted of 10 individual tests of the following subjects: Word Knowledge, Paragraph Comprehension, Arithmetic Reasoning, Mathematics Knowledge, General Science, Auto and Shop Information, Mechanical Comprehension, Electronics Information, Numerical Operations, and Coding Speed. In December 2002, DOD eliminated Numerical Operations and Coding Speed from the ASVAB and added a new section titled Assembling Objects. (usmilitary.about.com, 2004)

CAT-- Computerized ASVAB Test.

AFQT--The Armed Forces Qualification Test (AFQT) was introduced as the single test that would be used to screen draftees and volunteers for entry into any of the armed services. (Stitch and Armstrong, 2004)

NCLC--Navy College Learning Center- Navy contracted, computerized center utilizing a variety of self-paced and structured computer-based courses to assist service members and their adult family members in their learning needs.

Facilitator-- Contracted employee of the Navy College Learning Center who runs the facility and assists students with questions concerning the class, computer programs, or the facility.

OVERVIEW OF CHAPTER

Chapter I covered the Armed Services Vocational Aptitude Battery test and how military members were placed in jobs. It also explained why some military members may chose to retake the test and how the Navy College Learning Centers assisted them.

Chapter II reviews literature on the subject of the Armed Services Vocational Aptitude

Battery Preparation Program and what choices military members can make when contemplating a particular study format. Chapter III follows the methods and procedures used to determine the most successful course of action in the Armed Services Vocational Aptitude Battery preparation formats. Chapter IV gives the findings of this study. Chapter V summarizes all the items above as well as conclusions drawn and recommendations.

CHAPTER II

REVIEW OF LITERATURE

Covered in this chapter are some of the various literatures on Armed Services Vocational Aptitude Battery (ASVAB) Test Preparation Courses. Individual classes offered at colleges and universities, on-line courses, books, and the two week, 54-hour ASVAB Preparation Class offered by Navy College Learning Centers (NCLC) were explored. Also covered were the different class formats at NCLCs military students could use to acquire certificates of completion in order to retake the ASVAB test.

ARMED SERVICES VOCATIONAL BATTERY PREPARATION

Military members had several options to prepare for the ASVAB test. College courses, although acceptable methods of preparation are time consuming with the average college course lasting eight to sixteen weeks. Each subject would have to be taken and documented before the ASVAB could be retaken. There were also entrance examinations, tuition, fees, books and other expenses that made this option prohibitive to some.

On-line correspondence courses such as ASVAB.ORG promised to “get to the point” with experts who were once recruiters and had taken and given the ASVAB a number of times. No other materials were required, but the course cost \$29.95. According to the advertisement, the course could be completed in two hours and included a number to call for expert help should the need arise. (ASVAB.ORG, <http://www.4youonline.com/asvab/asvab.html>) Another on-line correspondence course, Thomson-Peterson, offered members the same general information on the ASVAB as ASVAB.ORG, but outlines their program in more understandable detail. They offered study tips and a sample

question on each subject. Yet, in order to take the practice test members had to register. Thompson-Peterson offered the only complete practice Computerized Armed Services Vocational Battery Test (CAT) available on the Internet for \$19.95. Thompson-Peterson also had an educational advisor to assist with any questions, available at a 1-800 number. (Thomson-Peterson, 2004)

Cracking the ASVAB by N. Moss (2002) was one of many books on preparing for the test. Copies could be found at the local public library, but they were often checked out. It was also available at local book stores for \$18.00. Of the books reviewed, this one covered all the subjects needed for the test and included three, full-length practice tests using only 371 pages. Barron's (2003), How to Prepare for the ASVAB, book had 539 pages and included a CD-ROM. It was also available at local book stores for \$29.95 and could be found at the library. Cracking the ASVAB was particularly useful as it gave the student detailed pictures, concise explanations, and mnemonics memory joggers to assist them with their studies. Students can study at their own speed, and because the book was so streamlined they could be ready to take the test within a week.

TWO WEEK ASVAB CLASS FORMAT

The NCLCs contract provides facilitated computer learning centers that are open a minimum of 40 hours a week. Each NCLC was available to all active duty Navy personnel. They were located on many military bases for easy access to military members. The NCLC used Plato® educational software in their ASVAB Preparation Class. (Integrated Publishing, 2004) Students were given temporary assigned duty (TAD) orders from their commands to attend the class. After computerized placement tests were completed, students were assigned mathematics and English (reading or language arts)

modules according to their ASVAB requirements. Students were also monitored and expected to attend the entire course. There were no charges for the class or for the retest. (Integrated Publishing, 2004)

SELF-PACED ASVAB FORMAT

Students who did not complete the two-week, 54-hour class and desired additional time, opted to continue at a self-paced format. These students could set up a schedule during their off duty time and come in on a space available basis to complete the specific modules that remained in their studies. Since there was no specified time limit, students could finish at their own pace no matter how long it took. These students were not monitored, although they also had access to the facilitator if they encountered problems during study. After completion of the modules, the students were issued the completion certificates and scheduled for the ASVAB retest.

SUMMARY

This chapter covered information on various Armed Services Vocational Aptitude Battery Test Preparation Courses. It also covered the different options for preparing to retake the ASVAB test offered at Navy College Learning Centers. Chapter III will cover the method and procedure used to collect and analyze that data.

CHAPTER III

METHODS AND PROCEDURES

The purpose of this chapter was to outline the methods used to gather data for the study. Topics to be presented in this chapter included population, instrument design, data collection, procedures, statistical analysis, and summary.

POPULATION

The population for this study were military members who had taken the two week, 54- hour ASVAB (Armed Services Vocational Battery) Preparation Class at the Navy College Learning Center (NCLC) located on NAS Oceana. The population consisted of 120 service members who, for the sake of this report, were referred to as students. Of that population only 60 members passed the class and received their certificates. In the population of 60 that completed the class, two had completion times that were abnormally high and were not used. This left 58 service members that made up the sample for this report. Thirty-three students completed the two week, 54-hour format on time, and 25 students continued after the 54-hour format on a self-paced basis.

INSTRUMENT DESIGN

The Navy College Learning Center was a facilitated computer based Center. Due to importance of ensuring personal information was not disclosed, data were collected by a facilitator at the Center. Only computer usage time was collected for this study. Both groups of students covered elements of the ASVAB including: paragraph comprehension (PC), arithmetic reasoning (AR), and mathematic knowledge (MK).

DATA COLLECTION PROCEDURES

Each student was assigned an account when they began studies at the NCLC. Data were collected every time students logged onto the computer. The facilitator gathered information on what subjects the students studied and the length of time spent on each subject. Students could have logged into a subject at any time during or after the regular class hours if they needed further instruction. The data for this research were gathered from July 1 to December 31 of 2003.

STATISTICAL ANALYSIS

The data used for this research were compiled from the 58 students who started and completed the ASVAB Preparation Class. Students were divided into groups according to those who completed the class in 54 hours or less and those who needed additional time. Each group was also required to have received certificates of completion in mathematics and English. Both certificates were needed before they were allowed to retake the ASVAB test. The method used to analyze the data was a *t*-test.

SUMMARY

This chapter covered the population used to make up the sample for this study. The sample consisted of 58 military members who had taken the Armed Services Vocational Battery Preparation Class at NAS Oceana Navy College Learning Center. Data were collected to compare times used to complete the class by students who finished it in a two week 54-hours format, and by those who needed additional time and completed the class self-paced. A *t*-test was used to analyze the data. The results of the analysis will be covered in Chapter IV.

CHAPTER IV

FINDINGS

The purpose of this study was to determine if taking the two week, 54-hour Armed Services Vocational Aptitude Battery (ASVAB) Preparation Class had a better success rate, than taking the self-paced course that exceeds 54 hours in preparation for the certification test. A sample of 58 service members out of a population of 120 was used for this report. The information for this report was gathered for a period of six months from July 1 through December 31, 2003.

SUCCESS RATE OF THE ASVAB PREPARATION CLASS

During the period which the research data were taken, July 1 through December 31, 2003, at NAS Oceana, 120 military members took the ASVAB Preparation Class. Using the sample of 58 service members that passed the class and received their certificates only 48% of the total population successfully completed the class.

SAMPLE COMBINATION

Thirty-three students completed the class within the two week, 54-hour time period. This represented 57% of the class. The other 25 students needed additional time to complete the class. These students represented 43% of the class.

The times recorded for each student who completed the class within the two week, 54-hour format and for those who were above 54 hours are listed in Table 1. Students were identified by numbers from 1-58.

TABLE 1. Time Used to Complete the ASVAB Preparation Class for Each Format

COMPLETED WITHIN THE TWO WEEK 54-HOUR TIME FORMAT

TIME	TIME	TIME
1) 35.00	12) 45.15	23) 41.93
2) 49.87	13) 50.87	24) 46.23
3) 38.33	14) 39.28	25) 48.20
4) 48.22	15) 48.95	26) 37.22
5) 29.12	16) 32.10	27) 39.00
6) 48.20	17) 50.25	28) 47.85
7) 51.05	18) 52.97	29) 54.22
8) 50.63	19) 44.65	30) 37.57
9) 51.28	20) 40.33	31) 38.50
10) 36.22	21) 50.08	32) 46.98
11) 44.45	22) 44.85	33) 51.73

COMPLETED OUTSIDE OF THE TWO WEEK 54-HOUR FORMAT

TIME	TIME	TIME
34) 68.58	46) 61.88	58) 57.33
35) 63.20	47) 87.22	
36) 56.85	48) 60.72	
37) 58.75	49) 91.40	
38) 89.45	50) 56.30	
39) 80.03	51) 59.80	
40) 71.43	52) 78.43	
41) 61.26	53) 71.48	
42) 65.30	54) 64.20	
43) 56.15	55) 99.25	
44) 68.23	56) 59.83	
45) 55.18	57) 64.20	

STATISTICS AND ANALYSIS

From the data in Table 1, the mean hours for all students who attended both formats was found to be 55.3 hours. More importantly the mean for the two week, 54-hour class was 43.40 hours, and for those who went above the two week, 54-hour format, the mean was 68.26 hours.

Using the information that was presented in Table 1, the *t*-test was used to determine any significant difference between the two week, 54-hour classes, and the self-paced classes that went beyond the two week format. See Table 2.

Table 2. *t*-test used to determine significant different between classes.

$$t = \frac{M_1 - M_2}{\sqrt{\left(\frac{\sum d^2_1 + \sum d^2_2}{N_1 + N_2 - 2}\right)\left(\frac{N_1 + N_2}{N_1 N_2}\right)}}$$

$$t = \frac{43.40 - 68.26}{\sqrt{\left(\frac{1460.13 + 3683.73}{33 + 25 - 2}\right)\left(\frac{33 + 25}{33 \times 25}\right)}}$$

$$t = \frac{-24.86}{\sqrt{\left(\frac{5143.86}{56}\right)\left(\frac{58}{825}\right)}}$$

$$t = \frac{-24.86}{\sqrt{91.85 \times 0.0703}}$$

$$t = \frac{-24.86}{\sqrt{6.705}}$$

$$t = \frac{-24.86}{2.589}$$

$$t = -9.6$$

The degree of freedom (*df*) was 56 and the *t*-value was -9.6. The significance level was determined to be 2.665 at a 0.01 probability (*p*) value from the statistical table.

Also noted among the findings were when students opted to finish the class self-paced after starting a two week 54-hour class, needed on the average, an additional 12.5

hours to receive their completion certificates. This was 25% more time than students who attended and completed the certificate within the two week 54-hour class.

SUMMARY

This chapter covered data collected on a sample of 58 military members who took the Armed Services Vocational Aptitude (ASVAB) Battery Preparation Class at NAS Oceana Navy College Learning Center (NCLC). Using data gathered via computer by facilitators at the NCLC, total completion time for each student was determined. These data were used to determine the number of students that completed the ASVAB class within the two week, 54-hour format (33 students representing 57% of the sample) and those who needed additional time (25 students representing 43% of the sample). The *t*-test was used to determine if any significant difference existed between students who adhered to the two week, 54-hour format and those who needed additional time to complete the class. The *t* value was found to be -9.6 and the degree of freedom (*df*) was 56. The significance level for a *df* of 56 is 2.665 at a 0.01 probability value from the statistical table. Chapter V will analyze the data and form a summary, conclusion, and make recommendations.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Armed Services Vocational Aptitude Battery (ASVAB) test was given to every enlisted service member as a means of finding the best job for them. In order to accelerate their promotional opportunities it was often necessary to retake the ASVAB test to achieve higher scores and qualify for better duty area preferences. The purpose of this study was to determine if service members who took a two week, 54-hour formal ASVAB Preparation Class had a better rate of success in completing the course than those who exceeded that time and continued on a self-paced basis. Data were gathered and analyzed to determine if service members (students) who attended classes, such as those offered at NAS Oceana Navy College Learning Center (NCLC), had a better success rate than a 54-hour plus self-paced class. A summary will review the data and its analysis and recommendations will be made to the students and the NCLC.

SUMMARY

The purpose of the study was to determine the success rate of military students on the ASVAB Preparation Class who either attended the two week, 54-hour class format, or those who exceeded 54 hours and used a self-paced format to complete the class. The hypothesis was:

H₁: Military students who had taken the two week 54-hour ASVAB Preparation Class had a better success rate than those who exceeded the two week 54-hour class and finished using a self paced format.

The limitations of the study were:

1. Only previously collected data were used.

2. Only raw data pertaining to the class format, time spent on study at NAS Oceana, and the receipt of completion certificates were used.

The following assumptions were also made about the students in the study:

1. Students had already taken the ASVAB test once.
2. All students in the research had access to the educational facility at any time space was available.
3. Commands allowed students the allotted time to complete the class.

Data were collected by the facilitator of the classes. They were gathered as the students logged onto the computer to complete each required module of mathematics and English and compiled at the end of each class. Data from July 1 through December 31, 2003, were used in this study.

As a part of the research, a review of literature found several different methods to complete an ASVAB preparation class and their associated costs. NCLCs offered an ASVAB Preparation Class to service members at no cost and facilities were located on many bases. Classes were set up in two week periods and students were given Temporary Assigned Duty (TAD) orders to attend. Students were also aided by facilitators when they needed assistance. The entire sample of 58 students received the same subjects (mathematics and English) to study to prepare for the ASVAB.

CONCLUSIONS

Using the data collected during this study, the following conclusions can be made about the study's hypothesis:

H₁: Military students who had taken the two week, 54-hour ASVAB Preparation Class, had a better rate of success than those who exceeded the two week 54-hour class and finished using a self-paced format.

It was determined that military students who completed the class within the two week period had a better success rate using time as a measure. From the sample of 58 students, 33 completed the class and received their certificates of completion at or below 54 hours. The other 25 needed additional time. To further confirm the hypothesis the *t*-test was used. A *t* value of -9.6 was calculated and a significance level of 2.665 at a 0.01 probability was determined. Based on this result, the hypothesis can be accepted that military members who had taken the two week 54-hour ASVAB Preparation Class had a better success rate than those who exceeded that time and completed the class in a self-paced format.

The purpose of the study was to determine if service members who took a two week 54-hour ASVAB Preparation Class had a better success rate than those who exceeded that time and completed the class as self-paced. It can also be concluded that a majority of the 58 students, 33 in all (57%), had great success with the two week 54-hour format. Students who completed the class as scheduled did so in an average of 43.40 hours; however, those who needed additional time, 25 students (43%), averaged 68.26 hours to complete the class. Also noted was that students who opted to do a self-paced course after starting the 54 hour class needed, on the average, an additional 12.5 hours to receive their completion certificates. This was 25% more time than students who attended and completed the certificate within the two week, 54-hour class.

According to facilitators at the Navy College Learning Center at NAS Oceana, after students exceeded the scheduled class time, completion of what remained of their modules depended on their own self-motivation. Since there were no Temporary Assigned Duty (TAD) orders, military students had to go back to work and schedule class around duty hours. There was no longer a guaranteed seat/computer which left the student on a space available basis. Facilitators no longer monitored attendance leaving the student to come and go as they pleased. These factors may account for the increased time need exhibited by students who exceeded the two week 54-hour class.

RECOMMENDATIONS

Based on the finding and conclusions drawn from the study, the following recommendations are submitted:

1. Students should be encouraged to complete the class as scheduled. They should be advised to reschedule appointments or other engagements at times after that day's class or after completion of the course.
2. Students should be screened to see if there are learning deficiencies that may prevent them from fully understanding the modules. If this is the case, it is recommended that facilities, such as local community colleges or adult education extension programs, be identified where students can be properly assisted.
3. More computers should be installed at the NAS Oceana Navy College if possible. They would aid students who needed additional time from previous classes without impairing new classes.
4. It should be considered to lengthen classes from two weeks 54-hours to a 68 format. This would add three days to the class. Based on this study, these

additional days should increase the completion rate of more students utilizing the resources that are presently on hand.

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