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An Effective Investment: Teaching Study Skills to USAF Allied Health Professionals Prior to Extended Training

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An Effective Investment

TEACHING STUDY SKILLS TO USAF ALLIED HEALTH PROFESSIONALS PRIOR TO EXTENDED TRAINING:

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When study skills are formally taught to students, it enhances their ability to succeed both academically and in the workforce. The teaching of effective study skills can be accomplished in corporate training environments to enhance employee retention and learning capability. An illustration of this idea is in the U.S. military where recruits are brought on active duty, receive formal technical training and then are assigned a duty position in their career field. In the School of Aerospace Medicine, the average cost to train one student in the three month Aeromedical Apprentice course in 1998 was $12,500.00.(1) In this course, students are trained to become medical technicians who are able to effectively support Air Force Flight Surgeons in emergency situations. Students who failed the course of study were eliminated from the program at a cost of thousands of taxpayer dollars with no realized gain by the government or the student.
A recent study examined the effects of a study skills training intervention course on U. S. Air Force Aeromedical Apprentices with five main purposes. The first was to examine the relationship between study skills training and the number of times students required academic interventions outside of normal class time. The second purpose was to examine the relationship between study skills training and end of course averages. The third was to determine the relationship between study skills training and the amount of additional instruction, measured in time, students required. The fourth purpose examined the relationship between study skills training and graduation rates. The final purpose was to recommend areas for further research.(2)

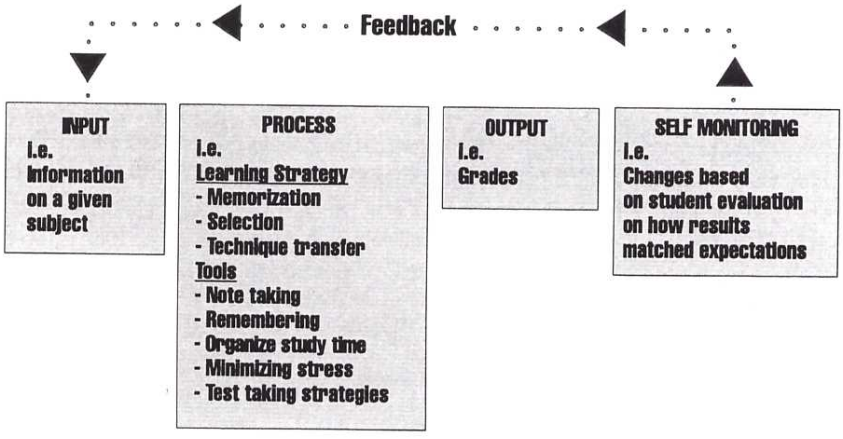
Hypotheses

Study skills course intervention was hypothesized to reduce the number of academic interventions beyond normal classroom instruction, improve higher end-of-course test scores, reduce the time required for one-on-one instruction for student tutoring beyond normal class room instruction and reduce the attrition rate.

Literature Review

An extensive review of literature was conducted and included civilian and military sources to fully investigate research on study skills intervention. Particularly noteworthy was McMurry's work "How to Study and Teaching How To Study", a 1909 effort which formed the foundation of many later works in the field.(3) Walter and Siebert (4) and Ellis (5) provided excellent explanations of effective study skills methods. These works formed the foundation of the study skills model used in this experiment shown in Figure 1;

FIGURE 1. STUDY SKILLS MODEL



The model shows four basic steps with a feedback loop used to evaluate the process of study skills and improve it if necessary. The first step is the input process of study skills and focuses on the receiving of information being learned. The second major step in study skills is the process of how the student assimilates data for later use. In this step, the student first determines whether the information should be memorized, if pertinent information needs to be gleaned from a large amount of information (Selection), or if the student should focus on a specific technique, (such as algebraic formulas) to be used to solve certain types of problems (Technique Transfer). After the student decides the learning strategy, he or she needs to apply the basic study skill tech-

niques which involve effective note taking, remembering, organizing study time, minimizing stress and test taking strategies. The third step in this model is the output the student receives (usually in the form of grades). It is at this point that the student employs "self monitoring" (step four of the model) in answering the question, "did the results match expectations." The student then makes any necessary changes based on the results (grade) for future study.

Differences from Previous Studies

The major differences between this study and previous studies are that it involved a military technical school setting, focused specifically on the effects of teaching study skills using random sampling (not targeted groups), and followed student progress for at least three months.

Treatment

The treatment (Study Skills Course) was based on the study skills model discussed earlier and emphasized five major areas: note taking, remembering, organizing study time, minimizing stress and test taking strategies. The class was taught in a 90-minute session prior to the start of the Aeromedical Apprentice course. Additionally, a one-hour follow up session was given to students one month after they began technical training in the Aeromedical Apprentice course. The class was interactive as the students were encouraged to participate and express their feelings.

Research Design

This experiment used the post test only control group design.(6,7) This design used a treatment group and a control group. The treatment group received study skills training and was measured on four dependent variables. The control group was measured on the same four dependent variables, but received no treatment (study skills training).(8,9)

The aptitude of all students in this experiment had already been measured by the Armed Services Vocational Aptitude Battery Test General Score which was used as a covariate in the experiment. Use of the covariate reduced the amount of unknown error making this design even more powerful.(10)

Statistic

All of the hypotheses were tested using regression analysis comparing results obtained from comparing the full model to the restricted model for each hypothesis. The Full Model used was; Y (The dependent variable) = X1 (Student ASVAB Score) + X2 (As indicated by a 0 for the control group or 1 as the treatment group to show group membership) + error. The Restricted Model used was; Y (The dependent variable) = X1 (Student ASVAB Score) + error. The difference between the Full and Restricted Models was represented in an F ratio which indicated significance or non significance.(11)

Results

This study examined a random sample of 90 U.S. Air Force Aeromedical Apprentice students, (representing a population of approximately 250 students). Subjects were randomly assigned into the control and treatment groups of 45 students each and observed for a three-month period. A detailed analysis using independent samples t-tests was conducted to ensure the control and treatment groups were not different in any statistically significant way at the $p<0.05$ level prior to the experiment.

The study skills course was given to the treatment group on the first day of training, (90 minute orientation) followed by a 60 minute session one month later. The study skills course was not given to the control group.

Each of the hypotheses were tested by comparing full versus restricted regression models. The differences between the r2 values of the full and restricted models were then computed to determine statistical significance at the $p<0.05$ level. *These results are shown on the table below;*

TABLE 1. STATISTICAL RESULTS OF FULL VS. RESTRICTED MODELS, CRITICAL VALUES AND SIGNIFICANCE LEVELS

	F Value (Full vs. Restricted Models)	Critical Value	Sig*.
Ho_1	5.18	3.951	0.025*
Ho_2	5.454	3.951	0.022*
Ho_3	5.048	3.951	0.027*
Ho_4	1.367	3.951	0.246

Continued page 26

Hypotheses 1, 2 and 3 indicated a statistically significant correlation at the $p<0.05$ level between study skills training and dependent variables of; amount of times additional instruction was required, (negative correlation), end of course grade average, (positive correlation) and additional time required for one-on-one instruction for student tutoring beyond normal class room instruction, (negative correlation). Hypothesis 4 was not significant at the $p<0.05$ level.

CONCLUSIONS

Based on the findings of the study, the following conclusions were reached.

1. Students who were trained in study skills required additional assistance on fewer occasions than students who were not trained in study skills.
2. Students who were trained in study skills had higher end of course grade averages than students who were not trained in study skills.
3. Students who were trained in study skills required less time spent in one-on-one instruction for student individual assistance outside of normal class time than students who were not trained in study skills.
4. Although the student attrition-rate was 50% lower in the treatment group, (3) than the control group, (6), the difference was not statistically significant at the $p<0.05$ level. Though a statistically significant difference did not exist, in this particular study, students who were trained in study skills were more likely to graduate than students who were not trained in study skills.
5. The Study Skills Model presented earlier is an effective tool to use when developing and delivering a study skills course.
6. The implementation of the study skills course used in this experiment appears to be a very effective use of time and resources. The School of Aerospace Medicine saved approximately $36,000 during the course of this experiment (involving only 90 students) due to the attrition rate reduction.
7. Continued efforts in the area of study skills training will lead to a reduction in costs for the Air Force and savings for U.S. taxpayers.

RECOMMENDATIONS FOR FURTHER STUDY

1. The results of this study suggest applicability of study skills intervention to other fields of military and civilian medical and non medical training settings.
2. Further research should be conducted to determine the projected cost savings of implementing a study skills intervention course throughout U.S. Air Force medical and non medical technical training schools. This analysis could then be applied to the other three branches of the military if cost savings prove significant.

CONTRIBUTION TO AIR FORCE MEDICAL SERVICE AND UNITED STATES AIR FORCE

As a result of this research, The U. S. Air Force School of Aerospace Medicine has incorporated the study skills course described in this article into all five enlisted courses taught at the school. Additionally, the author has put forth an official Air Force suggestion regarding the implementation of the study skills course for all Air Force initial technical training courses in an effort to offer this training to over 25,000 students per year.

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