

AN EXPERIMENT IN EDUCATION: THE ARMY AIR FORCES TECHNICAL TRAINING PROGRAM PREMETEOROLOGY "B" PROGRAM¹

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In the larger symposium to which the colleges and universities of the Northwest are contributing, the question that is being asked of all institutions is *What were the Lessons in your Military Training Program/s for Science Education; for Education in General.*

The Pre-Meteorology "B" training program conducted by the University of Washington under the auspices of the Army Air Forces Technical Training Command began March 15, 1943, and continued for a period of six months. This was a special program designed to supply trained personnel to meet a recognized shortage in a special field. The immediate need for a group of young men of specified mental ability necessitated the training to be directed toward a very definite objective. The subject matter consisted of mathematics, physics, vectorial mechanics, geography, and written and oral communication. This subject matter was specific and suitable for immediate and complete adoption for an emergency program.

The course in Mathematics consisted of the material usually covered in a two-semester course in calculus, certain topics from advanced calculus, the elements of solid analytic geometry, and an introduction to the theory of ordinary differential equations. The students were provided with a day-by-day outline of specific requirements.

The course in Physics included all of the topics ordinarily covered in a year of engineering physics as well as some detailed technological applications of physical principles. The coordination of this course with calculus, differential equations, and vector mechanics per-

¹This is the fifth article in this series. Any one wishing copies of this article or the other articles in this series should write to Dr. J. W. Hunsgate, Eastern Washington College of Education, Cheney, Washington.

tenance of acceleration in progress. This impressed the students that the importance of their preparation demanded a definite conservation of time for each individual in the program.

The program was set up by the delegation of academic authority to experts in the specified subjects for planning and conducting the course of study. The success of the program was in a large measure due to this delegation of authority by the Army Air Forces, and to the careful selection of students, and to a just but positive method of elimination. This resulted in a homogeneity in classes. These conditions were largely responsible for our ability to take the students, within a relatively short time and with a satisfactory attainment, over a range of subject matter which by conventional standards is ordinarily spread over a much longer time.

A sufficient portion of the students' time, sixty hours per week, was under the control of the academic staff, and the cooperation of the Army Air Forces with the academic staff was of such a high degree that any distraction which might interfere with the students' study was reduced to a negligible amount.

The subjects of mathematics, physics, and vectorial mechanics were coordinated in such a manner that they mutually supported each other. A careful selection in the order of topics in one course supplied subject matter for utilization in the other courses. Vector analysis was presented early in the program. This augmented the work in calculus by giving the students concepts of rates of change such as velocities and accelerations in rectilinear and curvilinear motion. The introduction of time and space derivatives was a definite aid to the student in his understanding of potential functions and the relation between these functions and the forces involved in the dynamical, electro-dynamical, and hydro-dynamical theorems. The introduction of line, surface, and volume integral theorems served to merge the mathematical and physical aspects of vector processes and was a definite aid to the students' ability to think and work in vectorial language. Many other examples of careful arrangement of topics could be cited

in support of the successful synchronizing of physics and mathematics. Such coordination is possible and for this program was found to be desirable as all students were taking the courses simultaneously.

Student reports on their physics laboratory experiments were used as part of the working material in oral and written communication. This collaboration was illustrative of the necessity on the part of the student to clearly communicate scientific information to people who were not especially trained in science.

While most of the students considered mathematics, physics, and vectorial mechanics as the fields of greater concentration, they did profit by the courses in communications and geography. The students' gain in the two last named courses was derived from the fact that the courses were conducted for the immediate benefit of the purpose at hand and not for the sake of preparing them for advanced or specialized study in these fields.

The concentration necessary for the completion of the program at the appointed time raised several questions concerning accelerated study. It is evident that some of the less formal aspects of the subject matter in all of the courses were given minimum attention. The extent of retention of material studied as compared with the achievement attained by excluding the outside interests of a normal college program is debatable.

From the point of view of the rapid preparation of men for a specific part in prosecution of the war our concentrated program with its abundance of hours of supervised study, definitely can be called a success in *training*. The concentration was exceedingly valuable as a means of furnishing students equipped with certain specified abilities. However, our experience points to the conclusion that a similar acceleration would not provide the same degree of success in building a safe foundation for the education of university students in general.