Banding education through educational research

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Introduction

Banding is primarily a research activity, and this is rightly so. However, one should consider the ultimate use and dissemination of research data. Is the purpose of banding to supply information to a small sector of the population who are intensely interested in birds, or should this information be effectively conveyed to the population as a whole? If the whole, then education will be used for this conveyance. The measurement of various methods of education lies within the realm of the educational researcher. Education has a legitimate place in banding, and banding educators must be involved in educational research if there is to be an increasing effectiveness of banding education. The underlying philosophy of banding education is beyond the scope of this paper.

The purpose of this paper is to present information on independent variable formation, and a summarization of some of the methods of educational research, and thereby, facilitate, as well as propagate, research in this field. The lack of banding education articles indicates that research on the effectiveness of banding education is a virtually untapped area of research. The term effective is widely misused, and should be reserved for methods which have the statistical significance of 0.05 or greater (i.e. closer to 0.01).

The problem.

All research starts with a concise statement of the problem. This is generally a culmination of literature research on related studies. The rationalization behind the choice of variable should be carefully considered and clearly stated. The choice of variables will be determined by the researcher. The variables are generally of the dependent and independent variety — the distinction being that the independent variable is manipulated by the experimenter, and the dependent variable is scrutinized to determine if it has been affected by the manipulation of the independent variable. The independent variable can be the treatment. The hypothesis should be clearly designed to indicate the relationship between variables.

Methods.

In the choice of methods there are several elements which need to be taken into consideration. The first step in developing an educational module is to recognize a need. Next, objectives must be formulated so that when the objectives are met the need is alleviated. The objectives should include: the cognitive domain, which deals with the acquisition of information; the affective domain, which deals with feelings and emotions, including ethics; and finally, the psychomotor domain, which deals with the development of skills. Examples of cognitive objectives are: The student will know why birds are banded; and, The student will know the need for accurate return information. Examples of affective objectives are: The student will develop an appreciation for adaptive design in birds; and, The student will appreciate the role of birds in ecology. Psychomotor examples are: The student will be able to reset Potter traps; and, The student will be able to measure wing cord.

Once the objectives have been clearly stated the educator should then design the treatment, so as to attain each objective. This development of various treatments is very critical, since it is from here that the entire educational process will revolve. It is also here that the educator's creativity will be taxed. If creativity presents a separate problem, the attached list should be of use to the researcher. A literature search will identify past methods of conveying information, but it is highly unlikely that an article on banding education research will be found. Hence, the development and subsequent refining will be required of the researcher.

Having completed the development of the treatment, an evaluative instrument must be designed to assay each treatment in order to measure the attainment of objectives. The choice of a pretest and/or posttest will be dealt with in the experimental design. Most banders who are concerned with education will deal with a wide variety of target populations, ranging from Cub Scouts to college ornithology classes. For the evaluation of effectiveness it is essential that equivalent groups be used. Sampling starts with the choice of the

population to be sampled. This should be the group for which the treatment was designed. Generally, this will be simple random sampling or cluster sampling, whichever results in a suitable situation in which the population can be handled as part of the treatment design. Choice of sampling unit involves a careful selection of experimental design. If sampling units presents a problem, see Deming (1950). Adoption of a particular sample size should be made with efficiency being the fundamental consideration. The method of sample selection will be determined by experimental design or pretreatment population arrangements. The choice should fit the design and the total population. The remainder of the sampling deals with data collection and analysis.

The most commonly employed designs are those of the parallel group design type. The nonequivalent control group design, the Pretest-Posttest Control Group design, and the Posttest-Only Control Group design are all parallel group designs. Another good design is the Interrupted Time Series design, but is not applicable to banding field trips.

The nonequivalent control group design involves a control group, which does not have to be randomized, and an experimental group. Both groups receive the pretest and the posttest, and the groups do not need to be randomized before treatment. Random samples are independent samples. Samples (such as nonequivalent groups) are dependent samples, in that the basis of matching is related to the characteristic being studied which therefore makes the samples related on the second characteristic if they are related on the first. Therefore, various college ornithology classes could be compared. The Pretest-Posttest Control Group design and the Posttest-Only Control Group design necessitate the students being randomly assigned to control or experimental groups. This may exclude the use of these designs by the banding educator. The pretest is designed to measure the students' knowledge prior to treatment. Following treatment, a posttest is administered to measure the increase due to treatment. The Posttest-Only design assumes that randomization gives both groups a similar starting point, and that any differences after treatment are directly attributable to the treatment. This method is used when a pretest is not feasible or the pretest may prejudice the posttest.

The completion.

The remaining areas of data collection, data analysis, substantive and tabular results, discussion, conclusions, and summary are not peculiar to educational research, and each researcher should be facile in these areas.

Conclusion.

It seems practicable that proven method would be disseminated among banders, and thereby, the educational effectiveness of many banders increased. Ultimately we will have a populace that has a well-ordered, proven effective education regarding birds and banding.

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Banding at Mont Alto, Pennsylvania

A college-oriented program

Dr. Ronald R. Keiper

The banding station is located on the grounds of the Mont Alto Campus of the Pennsylvania State University, surrounded by the Michaux State Forest, in south-central Pennsylvania and has been in operation since I obtained my banding permit in the fall of 1972. It utilizes only Potter style traps and operates only from approximately 1 December to 1 May.

Since I am an educator who believes that learning must occur outside as well as inside the classroom, I have incorporated my banding activities into my instructional program. I require students in my courses to spend 6 hours of course-related activities outside of the classroom and offer banding as only one of the ways of satisfying this requirement. Students may also take up to 6 credits of "Special Problems", and may thereby assist in the operation of the banding station. The campus serves a large number of forestry and wildlife biology students and many of them are interested in observing this important management technique. Secondly, I use banding as a way of getting students to learn the identity of birds. Large numbers of birds are attracted to the feeding stations, thus allowing students to easily observe a variety of species. Handling and banding also allow students to see some of the diagnostic characteristics at close range (such as the yellow lores of the mature White-throated Sparrow). Finally, students get a chance to carry out scientific procedures in the field rather than only in the laboratory, and learn the importance of meticulous data collection.

Although I, therefore, feel the main purpose of the Mont Alto banding site is educational in nature, some interesting data has been accumulated over the years and some of it is shared with you in this paper. Table 1 lists the 36 species banded as well as the numbers of each species banded in the years 1973-75. The data refers only to birds caught the first time; recaptured birds are not included in the totals. Even over as short a time period as this, fluctuations are clearly visible in the wintering populations of Evening Grosbeaks, Purple Finches, and Pine Siskins. Table 2 includes the most notable recaptures of birds banded by me at Mont Alto.