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ABSTRACT

Process evaluation is a critical element in understanding the results of any research. Because action research is conducted by practitioners, there is a tendency to think that there is little need for process evaluation. Yet, the complexity of factors underlying most educational treatments tends to defeat all but the best memories when attempting to recall specific facts regarding the treatment. Hence, there is a clear need for process evaluation in all but the simplest of action research undertakings. In this paper, the emphasis is on fundamental techniques that would underlie the evaluation of an investigation into implementation of a curriculum intervention. Four aspects of conducting process evaluations of curriculum intervention are considered. The first aspect is defining the actual curriculum as opposed to the intended curriculum. The next aspect is considering and tracking the level of student involvement. Thirdly, the process of instruction, the use of assessment in instruction, and the relation of both to process evaluation are examined. A final consideration is tracking time by instructional element through process evaluation. Each of these aspects must be examined in a carefully implemented process evaluation, an effort that will more than repay the practitioner. (SLD)

THE PLACE OF PROCESS EVALUATION IN ACTION RESEARCH

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In general, one of the most important elements of research in education and the social sciences is process evaluation. Part of the reputation of research in education as contradictory or even slipshod stems from the relative lack of control and understanding of the research paradigm through adequate process evaluation. Consider the following hypothetical example.

Mathematics-education authority X proposes a new way of teaching the solution of higher-order equations. It is based on the latest research and X has prepared a thorough curriculum incorporating nothing but the best in techniques and content. A research project is proposed and implemented by a dozen teachers in three forward-looking districts. After an extensive two-day in-service on the intricacies and joys of the new method, it is launched with great expectations. Six cleverly selected control classes are chosen from the same districts. The makeup of the control classes mirrors the student population of the experimental group almost perfectly. The control classes are to implement the "old-fashioned" curriculum (miraculously, all districts, control and experimental, use the same textbook adoption) while the project classes implement the brave new approach. At the end of the trial, all the students are given a carefully crafted criterion-referenced test, with several performance items (of course) to insure that the test is an authentic measure.

The results come in. Contrary to all expectations they are both self-contradictory and at variance with those in the literature. Four experimental and one control class (with perversely different population characteristics) show great test results, five experimental and three control classes have only middling scores, and the remainder do poorly by any measure. Overall, the experimental classes have a slight edge in test results, but after an exhaustive analysis of the data with an impressive array of statistical might, our authority,

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X, who is nothing if not conscientious, is forced to conclude that the experimental treatment just fails to have the right stuff.

Regrettably, our friend has neglected to do a thorough job of evaluating the trial. Specifically, of the twelve experimental classes, only three (two which were in the top-scoring group) came close to implementing the program as conceived and presented in the in-service sessions. The others deviated by various degrees along a number of dimensions. Several implemented what looked suspiciously like the old curriculum with fancy new clothes. Of the control group, three classes came somewhat close to implementing the old curriculum, another one implemented the teacher's own method of coming up with solutions of equations, one implemented a program that had many elements of the experimental program, and one implemented hardly any program at all. Our authority has based the carefully analyzed conclusions of the study on the implementation of many more programs than were contemplated in the original design of the study or his universe.

While this example over-simplifies the situation in much educational research, (and may also have given the experiment many respectable features lacking in a number of studies) it illustrates a common problem. Much educational research fails to adequately describe, understand, and, often, control the actual processes under study. As the necessity for doing research is increasingly promulgated for a larger number of practitioners under the aegis of action research, process evaluation is no less important.

In action research, an individual practitioner or a group of practitioners is likely to have more immediate contact with the research being done since the practitioner is usually the implementer as well as the researcher (but not always). This will result in more awareness of the events transpiring in the process of implementing an experimental program, but does not guarantee the accumulation of the type of knowledge necessary to answer questions about why specific results were or were not attained.

Yet, action research offers perhaps the best opportunity to collect valuable process information with which to make detailed analyses of the workings of a program or

experimental procedure. When the researcher and implementer are one and the same, they have the luxury of having time to record what occurs in the trial. (Of course, some practitioners will claim, often with considerable justification, that they have less time than needed precisely because they are the implementers.)

The critical issues for building better process evaluation in action research are increasing awareness of the payoff inherent in process evaluation for the participants in action research projects, exposing these participants to some of the types of activities which constitute process evaluation, helping them to build effective ways of undertaking process evaluation, and assisting them in understanding the results of process evaluation and the relationship of the results to the research being conducted. This paper will focus on the second of these issues. It will be further limited to process evaluation associated with research conducted in the classroom to improve instruction.

Other papers in this symposium deal with the problems of using data to identify student and school strengths and weaknesses and to set goals in an instructional program. These analyses help focus both the research done to improve instruction and serve as a gauge of whether the research is successful or not. The process of instruction is the means by which these goals are accomplished. The elements of classroom instruction which will be delineated are fairly straightforward: (1) the curriculum used for instruction; (2) the degree to which the entire class is involved in the instructional process; (3) the instructional process, including on-going assessment of progress; and, (4) the time spent on instruction and practice. Naturally, the evaluation of these elements will have much overlap among them.

Curriculum. One of the most easily overlooked elements in the instructional process is the curriculum. Curriculum will be defined, simplistically, as what teachers teach. (The author once heard another researcher attribute to Barak Rosenshine the pithy summary of Rosenshine's research on teaching as "Kids learn what teachers teach." That felicitous phrase, while being more true than would be generally acknowledged, serves as a good

general guide to conducting process evaluation.) Among the sources for the curriculum may be textbooks, instructional guides and outlines field trips, tests, the teacher's own experience, or other students. Guides to the process evaluator in determining what constitutes the sctual curriculum are examination of lesson plans, examination of posted and filed student work, and observation of lessons.

The critical element is to focus attention on what has and, as important, what hasn't been taught. No one guide is generally sufficient for an external evaluator conducting process evaluation. For example, lesson plans may say that main idea or problem solving is being taught daily. An examination of student work may indicate that the only place it is occurring is in the verbal exchanges between the students and the teacher, or, possibly, only in the lesson plans. Thus, for a practitioner engaged in action research serving as an external evaluator for another participant, verification through multiple sources is an essential activity.

When the process evaluator and the practitioner are one and the same, as is often the case in action research, the most effective approach to process evaluation is to draw the practitioner's attention to what actually was taught to whom. For example, a teacher conducts a reading lesson from a text and at the end of the lesson asks the questions in the teacher's guide. Techniques such as logs of teaching activities will serve as a record of the activities in the lesson and a summary. A chart of students responding to the questions will complete the other half of the information collected. The analysis of the log and response chart at another time will help focus on the elements in the actual curriculum and, incidentally, on its delivery. The end result of this type of analysis of the curriculum is often that kids did not learn something because it was rarely or never taught. Indeed, a number of process evaluation studies conducted in Dallas show that the primary barrier to increased test performance on higher-order thinking skills was the fact that they were rarely taught and, when taught, only a small subset of students were typically engaged in learning.

Implicit in the examination of curriculum is either a pre-analysis of the intended curriculum or frequent periodic analyses of what was taught that not only tracks content, but also what level the content was designed to be or actually taught at. For example, analysis of subject by student responses may indicate that all students are being taught a given skill while an analysis by taxonomic level may indicate that it was never taught above the first level: knowledge.

Who was taught. An essential element of instruction is assuring that all students are taught. A critical part of process evaluation is to track who was taught and how much was taught to each student. In the example presented earlier, a response log was used to determine who answered what questions and to track the nature of the responses. A grade book tracking student work and test results, progress charts, records of individual help provided, charts of help provided during guided practice, and other such devices will serve here. Where they are affordable, computer-based management systems can be effective tools in tracking students as part of the process of conducting process evaluation of the curriculum.

The hardest part for most practitioners will be tracking student participation and teacher-student interactions by subject matter. The latter qualification is important since an analysis of who responded without knowing to what will give the teacher and any other practitioner/researchers much less critical information than an analysis of response by subject matter. As indicated earlier, the analysis should also track the taxonomic level of the subject matter.

Assessment. One of the best tracking tools of who was taught what is the use of frequent formal and informal measurement. As other papers presented in this symposium have or will indicate, frequent measurement is both a guide to what was taught and the success of the methods with each student. To be simplistic again, education can be reduced to nothing more than a continuous cycle of teaching and assessment. This also serves as the basis for effective process evaluation since interim assessment is a productive

method for tracking implicit teaching. Further, when all other evidence indicates something was included in the curriculum and assessment indicates that it was not learned, the process evaluation can point to how it was taught and often provide the most promising direction for further investigation.

Assessment, as indicated, does not have to be formal. Continual informal assessment will provide as much and often more information than formal assessment. (In fact, with effective instructional delivery, formal assessment is rarely more than a confirmation of information already well in hand.) The problem for the process evaluator or the practitioner will be the effective tracking of responses. Generally, this should be in written form. Many practitioners will experience overload trying to track the results of continual informal assessment without some sort of written record. However, this is not intended to denigrate regular assessment of interim comprehension for internal guiding of a lesson. For most practitioner/evaluators, frequent whole-class responses, where the response is clearly indicated by student, will give an ongoing sense of the success of instruction.

Time. As numerous researchers have suggested, time is one of the most critical elements of instruction. Systematic tracking of the time devoted to each part of instruction can be illuminating when combined with the other elements of process evaluation. A practitioner may be implementing an instructional procedure with all of the students, following the outlines of the procedure, and assuring that, when implemented, several levels of the taxonomy are assessed. But the practitioner may be failing to give students sufficient time to understand the concept or enough time to practice and absorb the details of the concept.

Here, analysis of the curriculum before starting the course of action research or constantly reviewing the results of the process evaluation during the research will be of considerable help in determining relative time allotments for each aspect of the curriculum. The continual reassessment will indicate which outcomes are to be most emphasized and

which are receiving what proportion of time. Further, such a course of action will help clarify relative goals for each of the practitioners.

In terms of tracking time, many methods can be employed. The simple use of a stopwatch will allow the easiest tracking of elapsed time for each activity. Charting beginning and ending times is straighforward but more tedious than the use of a stopwatch. If a timeclock is available, punching timecards is an easy way to track time. An added advantage of all these procedures is that they tend to make students aware of both the time allotted for and the relative importance of each element of the curriculum.

Summary. A critical element in understanding the results of any research is detailed process evaluation. Because process evaluation is labor intensive, it is not routinely planned for and implemented in much of educational research. In action research, there is a tendency to think that since practitioners will be conducting the research, there is little need for process evaluation. Yet, the complexity of the number of factors underlying most educational treatments tends to defeat all but the best of memories when attempting to recall specific facts regarding the treatment. Hence, there is a clear need for process evaluation in all but the simplest of action research undertakings. Effective process evaluation also has the added advantage of increasing practitioner awareness of the types of variables critical to success in an educational endeavor.

Process evaluation, when implemented properly, is a complex and demanding activity, if for no other reason than most of the educational activities evaluated are much more complicated that usually recognized. This paper has been strictly limited to describing some of the fundamental techniques which would underlie the evaluation of an investigation into the implementation of a curriculum intervention. The techniques described would also be useful if the goal of the action research was simply to investigate how the current curriculum was being implemented. As a result, the paper has avoided process evaluation methods for other types of research that might be implemented. Further, it has not considered several important aspects of process evaluation which would

be of importance in conducting action research: building an awareness of the value of the information derived from process evaluation; examining specific techniques of conducting process evaluation; and, perhaps one of the most important, tying process evaluation to the results of the research conducted.

The paper has examined four aspects of conducting process evaluation in examining a curricular implementation. It has considered the importance of defining the actual curriculum as opposed to the intended curriculum. Next, the level of student involvement in the curriculum and tracking it has been dealt with. The process of instruction, the use of assessment in it, and the relation of both to process evaluation have been examined. Finally, tracking time by instructional element through process evaluation has been considered.

Each of these elements forms an important aspect of instruction. In turn, each must be examined in a carefully implemented process evaluation. The wealth of information resulting from the evaluation will more than repay the practitioner involved in action research for the considerable effort necessary to conduct process evaluation.