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AUTHOR Rowland, Paul
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ABSTRACT

Inservice education in many schools has shifted from the use of outside experts to the education of master teachers who serve as inside educators. The effectiveness of the use of master teachers has been demonstrated. To make this process more effective, there is a need to understand the dynamics that the master teachers confront when they take their university-based education and implement it with their peer teachers. Part of these dynamics are based on a perceived need for change in the existing program. This raises the question of whether the perceptions of need for change of master teachers and peer teachers match. This study used the Transactional Evaluation Technique to evaluate this match in one situation. Findings indicated that two areas need to be addressed: (1) lead teachers need to recognize that their peers are not as critical of their program as they are themselves and therefore peer teachers may be more satisfied with the status quo; and (2) lead teachers must recognize that the other teachers are more apt to request easily used materials, e.g., audiovisuals, such as videotape. The latter point may be seen as an opportunity to encourage more creative approaches that use audiovisuals as springboards for further activity. A copy of the survey instrument is included. (CW)

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Elementary Teacher Needs Assessment Using Transactional Evaluation

Paul Rowland
Assistant Professor
Center for Excellence in Education
Northern Arizona University
Flagstaff, AZ 86011

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Elementary Teacher Needs Assessment Using Transactional Evaluation

Inservice training in many schools has shifted from the use of outside experts to the training of master teachers who serve as inside trainers. The effectiveness of training by master teachers has been demonstrated (Rowland and Stuessy, in press). To make this training more effective there is a need to understand the dynamics that the master teachers confront when they take their university based training and implement it with their peer teachers. Part of these dynamics are based on a perceived need for change in the existing program. This raises the question of whether the perceptions of need for change of master teachers and peer teachers the same or different.

The program:

In 1988, the GLAXO Foundation approached the North Carolina Mathematics and Science Education Network with a grant to improve elementary science teaching in the state. Several centers in the state were funded to develop an inservice training model that worked at the school level, training master teachers who were to serve as lead teachers in strengthening the school's science program. The program developed .. East Carolina University consisted of a planning meeting with lead teachers and principals; summer inservice training in science, science teaching, and leadership skills for lead teachers; and follow-up visits to schools and meetings with lead teachers during the 1989-1990 academic year. Six schools, each nominating two master teachers, were accepted to participate in the program.

Prior to the planning meeting with lead teachers, the science education planning team at the university determined the need for some assessment of the existing program and needs of the schools. A transactional evaluation technique was selected for carrying out needs assessment.

The Transactional Evaluation Technique:

The Transactional Evaluation Technique (TET) is a modification of the Transactional Evaluation Model used by Talmage (1975) and Rippey (1973). Although the original model was used to identify and clarify intergroup differences in values and goals, it was modified by the author for use in needs assessment.

The advantage of TET is that it allows the participants in the process to gain ownership of the instrument used for determining needs. Frequently, teachers respond half-heartedly to an instrument that claims to measure their needs when in fact the instrument only measures the needs of interest to a researcher or curriculum developer. TET shifts some of the responsibility for developing the instrument to the teachers being surveyed. Consequently, teacher ownership begins early on in the assessment process. In addition, because the teachers are developing items on the instrument, it is more likely that the items reflect real issues of interest to the teachers as opposed to issues of interest only to an outsider.

Step 1. Creating statement stems.

The TET process begins by generally defining the scope and use of the evaluation. Since the evaluation was to be used in planning an inservice program for lead teachers, and since that planning was to be

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done by the science education university planning team (SEUPT), the use dictated that the scope of questions to be assessed be determined by SEUPT. This was done by having the team members write and revise question stems until agreement was reached that these stems would prompt responses useful for future planning. The question stems were:

A. Science teaching in our school is:

B. A major strength of our science program is:

C. Our school's science program could be improved by:

D. A lead teacher in our school should:

E. To improve my science teaching I need to know more about:

Step 2. Creating items from stems.

The statement stems were sent to each of the twelve master teachers who had been selected to participate in the program. The teachers were instructed to complete each stem as follows: "For each of the five unfinished statements on the attached sheet, would you please write two endings that describe your perception of science education at your school. Write your statements so that one of them is a statement that you agree with and one is a statement that you disagree with."

Seven teachers returned statements to the university evaluator and those statements were edited and compiled to create the "Survey of the Status and Needs of Elementary Science Education" shown in Appendix 1. Editing of the statements was minimal and consisted mostly of eliminating those items that were duplicates.

Step 3. Responding to the statements.

The next step in the process was to obtain responses to the statements from participants other than the writer of the statement. The Survey was filled out by the lead teachers at their pre-planning meeting.

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Additional copies of the instrument to be administered to peer teachers at the home schools were also distributed. The results of the survey were collected by the university evaluator and were summarized as frequency distributions and means.

Step 4. Reporting the results to users.

The results of the survey were first distributed to the SEUPT members for use in planning. Results were also given to the lead teachers during the summer inservice training session. Lead teachers were to discuss the results with the peer teachers in their schools.

The question:

This study attempts to answer the question: Are the responses of peer teachers the same as the responses of lead teachers?

This question was raised because we often assume that lead teachers carry into a workshop/institute the same concerns as their peers. If the two groups have different concerns or different perceptions of what their program consists or what needs to be done in their school, then the master teachers may face obstacles when they return to their schools and try to provide leadership to their peers. Also, workshop presenters need to know whether or not the needs of peer teachers and lead teachers are all the same. If the needs are different, then the presenter needs to know how they are different and what the implications of those differences might be to inservice training.

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Results:

Significant differences were determined by the following processes:

a. Assigned strongly agree a score of 1, agree=2, not sure=3 etc. then conducted t-test of means comparing leads to peers.

b. Conducted a chi-square contingency table on the responses comparing leads and peers.

c. Collapsed the data by dropping "not sure" responses and combining agree with strongly agree and disagree with strongly disagree. Then did a chi-square as in b.

Five items were significant for all three tests.

3. Science teaching in our school is done in a sequential manner according to the Basic Education Plan.
(Lead teachers disagreed and strongly disagreed to a much greater extent than their peers)

7. Science teaching in our school is often just memorization of facts.
(Lead teachers agreed to a much greater extent while peer teachers disagreed)

17. A major strength of our science program is integrating science into all areas of the curriculum.
(Lead teachers disagreed strongly with this while peer teachers tended to agree)

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18. A major strength of our science program is the teachers' knowledge of the science needs of our students.
(Lead teachers disagreed strongly with this while peer teachers tended to agree)

34. Our school's science program could be improved by ordering more AV materials.
(Lead teachers were more likely to disagree while peer teachers were more likely to strongly agree - on the collapsed chi-square where you can only agree or disagree, 27 % of the lead teachers disagreed while only 5 % of the peer teachers disagreed)

In addition, in the uncollapsed form (a and b) items 2 and 10 were significant using both t-test and chi-square.

2. Science teaching in our school is considered by many teachers to be less important than other subjects.
(Lead teachers strongly agreed while peers tended to be more neutral or disagreed)

10. Science teaching in our school is inconsistent from one teacher to the next.
(Lead teachers tended to strongly agree while peers were more likely to be "not sure")

In general, it appears that lead teachers are more critical of the science program that exists in their school. They tend to be stronger in their characterization of the programs weaknesses. Peer teachers are more likely to request audiovisual materials as a solution to weaknesses in the science program.

Implications:

These findings indicate two areas that need to be addressed in the leadership components of institutes for lead teachers:

1. Lead teachers need to recognize that their peers are not as critical of their program as they, themselves are. The higher level of acceptance of the status quo by peer teachers indicates a need to show them the greater possibilities of alternative science programs. If lead teachers are to convince their peers to participate in the change, the lead teachers will have to educate their peers about the possibilities of science education and about the goals of science education that are not addressed by most science programs. Awareness of outstanding and different approaches to science teaching needs to occur if the peer teachers are to begin accepting the need for a change in how they teach science.

2. Lead teachers must recognize that other teachers are more apt to request easily used materials like audiovisuals. Teachers can show a video with very little preparation. If we want teachers to adopt hands-on activities that are conceptually organized, we need to provide those activities to them in a package that is almost as easy to use as the video. The tendency of peer teachers to strongly desire more audiovisual materials should also be looked at as an opportunity to develop hands-on/minds-on/hearts-in activities that use the videos as springboards for further activity.

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The task of improving elementary science teaching is not an easy one. Change requires motivation to change and reachable goals. Lead teacher systems of change shift responsibility for these factors to the lead teacher. Good inservice programs must include providing lead teachers with ways and means for motivating teachers who do not see a need for change. In addition, these lead teachers must be provided with the materials and methods for bringing about change as easily as possible. Telling teachers to use more hands-on activities will never be as effective as providing them with the hand-outs and materials to do those activities.

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Appendix 1

SURVEY OF THE STATUS AND NEEDS OF ELEMENTARY SCIENCE EDUCATION

East Carolina University Science Education Department

April 1989

The following statements were generated by elementary teachers in eastern North Carolina concerning the status and needs of elementary science teaching. Some were statements with which they agreed and some were statements with which they disagreed. We are interested in obtaining your ideas on these topics. Please respond to each statement below by indicating your opinion on the computer op-scan (bubble) sheet using the following code:

A = strongly agree

B = agree

C = not sure

D = disagree

E = strongly disagree

Please do **NOT** fill in any of the identifying data on the sheet so we can maintain confidentiality. Thank you for your help in assessing the science teaching needs of elementary teachers.

A. Science teaching in our school is . . .

1. structured by the individual teacher.
2. considered by many teachers to be less important than other subjects
3. done in a sequential manner according to the BEP.
4. limited due to poor attitudes towards the subject.
5. correlated with the BEP.
6. textbook oriented.
7. often just memorization of facts.
8. unified by a core curriculum.
9. filled with many hands-on activities.
10. inconsistent from one teacher to the next.

B. A major strength of our science program is . . .

11. the use of current materials that reinforce the competency goals.
12. daily time allotments for science as a separate subject.
13. inservice training on greater use of hands-on activities.
14. teachers' broad knowledge of science.
15. the use of computers with software that reinforces competency goals.
16. having a professional library that houses our resources, making them accessible to all teachers.
17. integrating science into all the areas of the curriculum.
18. the teachers' knowledge of the science needs of our students.
19. plenty of hands-on activities for students.
20. the interest of the students in science.
21. having enough supplies and equipment for science activities.

C. Our school's science program could be improved by . . .

22. adopting a new hands-on curriculum.
23. obtaining more science equipment.
24. providing textbooks for all students to use.
25. greater administration support for teaching science.
26. providing a location for storing science materials.
27. keeping teaching to book-centered, in-room experiences.
28. increasing the use of scientific experiments for the development of our students' scientific reasoning skills.
29. more hands-on activities for students.
30. having teachers work together to determine what is taught and how.
31. fewer experiments and more reading.
32. compiling a list of hands-on activities for all our teachers to use.
33. greater access to science and science education resource people.
34. ordering more AV materials.

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D. A lead science teacher in our school should . . .

35. obtain correlating science materials and contact resource people.
36. observe classroom instruction and evaluate teacher performance.
37. have a broad knowledge of science.
38. make available expertise to other science teachers.
39. design the science curriculum.
40. be able to suggest science activities.
41. provide opportunities for other teachers to observe model science lessons.
42. offer support needed to make science interesting for students.
43. teach all science classes in our school.
44. be knowledgeable about teaching science and working with others.
45. coordinate the science curriculum across grade levels.
46. provide inservice instruction in teaching science.
47. be given some release time to develop the school's science program.

E. To improve my science teaching I need to know more about . . .

48. methods and materials to deal with alternative learning styles.
49. current scientific findings and events.
50. how to integrate science across the curriculum.
51. the earth sciences.
52. ideas about the way children learn science.
53. using everyday experiences and easily obtained materials.
54. the life sciences.
55. hands-on activities for each competency goal in each area of the science curriculum.
56. ways to get children to retain facts.
57. physics and chemistry.
58. different instructional strategies for science teaching.
59. new elementary science curriculum projects.
60. ways to get children to remember science knowledge.