DOCUMENT RESUME

ED 135 662 SE 022 162

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TITLE Kindergarten Science Project.
PUB DATE Nov 75
NOTE 10p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Curriculum Development; Elementary Education; *Elementary School Science; *Inservice Education; *Kindergarten; Teacher Education
IDENTIFIERS *Science Curriculum Improvement Study

ABSTRACT

Described is a workshop program for inservice education for North Carolina teachers implementing "Beginnings," the kindergarten component on the Science Curriculum Improvement Study (SCIS). Teachers generally liked the workshop, liked the curriculum materials, and felt the program fit their pupils. A substantial number of teachers felt the Kits were not needed. (RH)

Division of Science Education
Department of Public Instruction
Raleigh, North Carolina 27611
November 1975

KINDERGARTEN SCIENCE PROJECT

by

William E. Spooner

During the past five years, the Division of Science Education has provided 32 hours of in-service training for approximately 1,200 elementary teachers representing 74 school administrative units. These five-day-long workshops have trained teachers in grades 1-6 to implement a national curriculum project called SCIS (Science Curriculum Improvement Study). SCIS was developed over a 10-year period under the direction of Dr. Robert Karplus at the University of California at Berkeley with National Science Foundation funds. The kindergarten component of the SCIS program entitled "Beginnings" was the last phase developed. It was released the latter part of 1974.

Numerous school systems which are using upper levels of the SCIS program made inquiries to the Division of Science Education for assistance with training teachers to use the "Beginnings" material. A pilot project was set up in order to get teacher reaction to the K-program. Invitations were sent to those school systems which expressed an interest in using the "Beginnings" science program.

On January 21, 1975, 16 kindergarten teachers representing 11 school systems attended an all-day workshop in Raleigh. The workshop was conducted by Bill Spooner from the Division of Science Education and Charlotte Barnes from the Division of Kindergarten-Early Childhood Education. The participating kindergarten teachers were to use the "Beginnings" program for the remainder of the school year and to submit individual lesson evaluations, as well as their reactions to the total program, at the conclusion of the school year. This report contains:

1. Objectives and Characteristics of the "Beginnings" Program
2. General Teacher Questionnaire on K-Science
3. Workshop Format
4. Workshop Evaluation with Teacher Responses
5. Final Questionnaire
6. Lesson Evaluation
7. Summary

Objectives and Characteristics of the "Beginnings" Program

"Beginnings" is viewed as a readiness program. The general goal is to develop and refine children's sensory perceptions. The objectives are to help children become better informal observers, describers, and discriminators. A total of 65 activities in life and physical science comprise 9 areas of study. They are: color, shape, texture, odor, sound, size, quantity, position, and organisms. The "Beginnings" program is flexible, informal, nonsequenced, and designed for small groups. It provides spontaneous, as well as, planned isolated activities such as cooking and field trips; in-depth units of study are also provided. The science activities can be integrated into the total program. All materials are provided in kit form, which includes a teacher's manual, at a cost of $125.00. Rand McNally and Company received the contract to publish and sell the program.

General Teacher Questionnaire on K-Science

The following questionnaire was completed at the beginning of the workshop. Results are expressed in percentage response with additional teacher comments.

QUESTIONNAIRE

1. *Do you feel you presently have a good basic K-science program?*

   36% Yes 59% No 4% undecided

   Comments:

   - But not so good it couldn't be better.
   - I have no good sequential plan to follow
   - I do not have the background or know-how to do a good job of this.
   - We have a K-1 program and we are using 1st level SCIS.

2. *How often do you have science activities?*

   20% once a day

   35% several times a week

   45% occasionally

   Comments:

   - No space for a science center. Set up experiments and experiences two or three times a week.
   - Most activities stem from incidental happenings in the room.
   - Child-centered program. Materials in use through centers.
   - Often do complete units for two to three weeks; then we may not do science for some time.
   - It all depends on what you label as science.
   - Science is a part of our everyday activities. Hardly a day goes by without some sort of discovery in an area of science. However, a structured activity in science does not usually take place.
   - We have classroom pets that we talk about and do simple research with, but this is not done daily.

3. *Do you feel science is an important interest area for kindergarten children?*

100% Yes

Comments:

- Correlated with other things.
- So many of the science activities are outgrowths of the exploration that takes place in the open classroom.
- Definitely. I think basic science processes and knowledge enhance learning in all areas of curriculum.
- The children have been very interested in the science units we have studied this year.
- Helps children answer their own questions. To discover and develop curiosity.

4. *Do you feel adequately prepared in working with science for kindergarten children?*

50% Yes 50% No

Comments:

- Yes, now that we have a program to follow.
- Yes, but I'm always learning and eager to extend my knowledge in presenting science to young children.
- Would like more equipment and ideas for science activities at K-level.
- To a certain extent.
- I feel I could do an adequate job with materials available.
- With the aid of good materials.
- I have been using the 1st grade SCIS program on a limited basis to fit my children's needs.
- My materials are not simple enough for some of the children that I work with. The concepts are too hard for many of them.

Workshop Format

The first 30 minutes included a short introduction, completion of the teacher questionnaire, and overview of the program. For the remainder of the morning, teachers were divided into two groups. Each group had access to a complete "Beginnings" kit. The two groups were subdivided into teams consisting of two teachers. Each team selected lessons from one of the nine units. Teams prepared and taught lessons to other members of their group. The afternoon session was a continuation of group activities, except each team presented their lesson to all participants. After each presentation, there was much teacher interaction. Additional ideas related to lesson activities were exchanged and lesson-related problems were discussed and generally resolved.

Workshop Evaluation with Teacher Responses

The following questionnaire was completed by participants at the conclusion of the workshop.

QUESTIONNAIRE

1. *Do you feel the workshop has been worthwhile?*

100% Yes

Comments:

- Helped to understand the structure, purposes, goals, and acquaints teachers with materials.
- I have learned that many activities that are "science thinking" are also considered skills necessary for kindergarten.
- The informality and friendliness was great.
- I had no idea that the lessons were so interesting.
- Enjoyed it very much. I like the informality and friendliness.
- I needed to review the manual.
- I got to know people. The material was explored very well.

2. *As of now, how do you feel about teaching the "Beginnings" science program?*

- I think for the remainder of the year, it will provide an excellent review and means of reinforcement for what I have already done. I look forward to using it as a more complete program next year.
- Very motivated.
- Many of the activities are those commonly done in K. However, a kit with readily available equipment and guide to activities is very helpful.
- I feel that now I would be able to use SCIS "Beginnings" without any real problems.
- Comfortable.
- The "Beginnings" program has many of the K skills that are organized and arranged to be ready at any time. This would help with lesson plans and classroom organization.
- Very well.
- I can hardly wait to get my kit and get into the program.
- Looking forward to using this program. It fills in many "gaps" in observing and describing.
- I'm very excited.
- Confident.
- I feel it is a well-organized program that gives many specific lesson plans and still allows for a lot of flexibility of expansion. I would enjoy using it.
- I haven't begun "Beginnings" but have enjoyed Grade 1 (Material Objects & Organisms). I love it.
- I am eager to use it.
- I feel the program will be very beneficial for my class. The concepts are simplified enough to challenge them, as well as to be enjoyable.
- I'm very excited about finally having a good guide for science.
- Eager. I feel my children will enjoy and benefit greatly from these activities.
- More confident than before I came.
- I am very excited about teaching science in kindergarten.

3. *What did you like best about today's session?*

- Total involvement of those attending. We participated.
- The interaction among the other teachers; to find that their problems and anxieties and joys are the same as mine.

- I enjoyed using the children best. (Several teachers went to classrooms and taught lessons to K students.)
- The actual working with a lesson in a teaching activity and having others give pointers.
- Giving us the chance to experiment and explore and teach some sample lessons.
- I enjoyed sharing ideas and feelings with other teachers.
- Teaching another group - exploring a lesson and sounding out ideas.
- Getting acquainted with materials.
- The time spent working with other teachers, sharing ideas, reading through the materials, studying the materials in the kit, and working through some of the lessons was the most beneficial to me.
- Being made to read and do experiments was an excellent idea.
- The whole group lessons with discussion afterwards.
- Group demonstrations - involvement.
- I enjoyed the planned lessons presented by teachers.

4. *Can you give suggestions to improve this workshop?*

- Having children available to use for demonstration would have given a more true-to-life situation.
- I feel the workshop could use a little more guidance and suggestions.
- Could be adequately done in a half-day session.
- Develop ideas that could correlate with the lessons in manual.
- Explore more lessons by shortening the time each takes. That way, we would be forced to read and "do."

Final Questionnaire

The following questionnaire was sent to all participants during the latter part of May. The return on the final questionnaire was 62.5%. A follow-up on those who did not return the final questionnaire indicated their nonparticipation was due to late ordering and/or late arrival of kits. Some arrived as late as March. These participants decided not to use the program until the following school year.

FINAL QUESTIONNAIRE RESULTS

1. *Is the kindergarten "Beginnings" program compatible with your early childhood philosophy?*

   100% Yes

   Comments:

   - Especially like the emphasis on sensory learning.
   - We have an open classroom and the program is not so structured that the children can't use it as a discovery-type of science.
   - It gives the child a chance to explore and find out on his own through guided direction.
   - This year's group of children did not do as well with it. My children were easier last year in working with anything.

2. *Is the program flexible enough in lesson sequence and structure to allow you to integrate science into your normal day?*

   100% Yes

Comments:

- I used most of the lessons as a carry-over in our science center. This was most effective.

3. *Do you feel the "kit" is a vital part of the program?*

66.6% Yes 33.3% No

Comments:

- I treasure the kit because everything is so convenient.
- We in the state kindergarten program already have much of the equipment. A large portion can be collected from home.
- We have the 1st and 2nd level SCIS in our classroom and the majority of the materials we need we could get from our environment.
- Many of the activities are the same type that we already use in language, math, etc.
- I have most of the things in my room other than in the kit but the kit is good to have at your fingertips all together.
- There are not enough planter cups for class of 26.
- Many of the things in the kit would be impossible "almost" to gather together. It would take a lot of valuable time to gather all of the materials the kit contains.
- Teacher supplies too many things.

4. *Generally, has student response been favorable to the lesson activities?*

100% Yes

Comments:

- The language development was tremendous!
- Our children like "hands-on" activities.
- The children enjoy the "hands-on" experiences and have actively participated in the lessons.
- The kids enjoyed every lesson. I'm looking forward to next year when we can do all of them.
- I say "yes" to the extent that I used it. I did not complete all the lessons.

5. *Do you feel you have a better understanding of science at the kindergarten level as a result of this project?*

90% Yes 10% No

Comments:

- Most of these activities are commonplace in good kindergartens.
- The children understand the concepts and can put them to use. This tells me that the project has been a success.
- Science is not my strongest area. I have spent much of my time in the area of reading.
- I had no idea so many things we teachers teach but take for granted were considered science.
- I taught science much more than I had thought I was teaching it before.

6. *What do you like least about the program?*

- Needs some more challenging activities.
- Some of the materials that are in the kit had already been purchased as a part of our manipulative center.

- Some of the material was not stable enough. Example: The objects will not adhere to flannel board.
- I would suggest that the bead cards and totem pole cards be laminated so they would last longer.
- The lack of extension and correlation with other subjects.
- Children have many questions and interests in the biological and physical world. They are capable of observation of scientific phenomena, gaining some understanding. This program does not really explore nature so much as it develops the senses so that children can deal with science. It would not be enough if used alone.

7. *What do you like most about the program?*

- The lessons are very understandable. The equipment is well-organized. A good program for beginning the year.
- The fact that the lessons can be used out of sequence and not disturb the learning process. They can be used spontaneously as a discussion arises, as well as planned lessons. The lessons present the concepts in a usable "hands-on" way that helps make the concepts a part of the child.
- The sequence from easy to hard. I like the philosophy--especially objectives.
- I like the simplicity of the lessons and the ease at which one can incorporate it into the total curriculum. One can integrate the lessons or concepts in the kindergarten program so easily.
- The kit which gives all the materials necessary to do a complete lesson and also provides activities for individuals.
- The fact that everything is already organized for you in each unit and that the program can be used individually.
- I like the many different activities that are planned for each lesson. A teacher can be very selective.
- It has a wide variety of manipulative activities that are interrelated with other curriculum areas and can be done in small groups and individually.
- The kit does not take up too much room. The materials are easily stored where they are easy to get to. The manual is very helpful in working with the kit and also helps in evaluation of overall objectives.
- I am very impressed with the SCIS program. I think one of the most vital things in the program is the kit. So many teachers would never collect those things even though a good science program would be the result. The kit makes it possible to have everything ready to go. I also like the fact that I am able to carry over activities in our science center.

Lesson Evaluation

Individual lesson evaluation forms were given to teachers at the January workshop. Teachers were asked to complete a form for each lesson used. These were returned, along with the final evaluation form, at the conclusion of the school year.

Because of the lengthiness of the total lesson evaluations--one page per lesson, each with teacher's comments, and the low number of responses per lesson--the final results are reported as average percentage response per question.

Reports were received for 51 of the 65 lessons. The average number of responses per lesson was 2.55, with a range of 1 to 6. Individual lesson comments are not provided in this report.

LESSON EVALUATION SUMMARY

Total Responses

114 1. *What is your overall reaction to the lesson material?*

	Number of Responses	Percent Responding
Excellent	56	49.0
Good	39	34.3
Fair	16	14.0
Poor	3	2.7

124 2. *Do you feel the lesson objectives were achieved?*

99.2% Yes .8% No

131 3. *How was student reaction to the lesson activity?*

	Number of Responses	Percent Responding
Excellent	77	58.2
Good	42	31.8
Fair	10	7.6
Poor	2	1.5

130 4. *Are instructions for using the lesson activities clear and easy to follow?*

100% Yes

Summary

All kindergarten teachers in the pilot project believe science is an important interest area for kindergarten children while only 50 percent feel they are adequately prepared to work with science. Fifty-nine percent indicated they do not presently have a good basic science program and 45 percent indicated they conduct science activities only occasionally.

All participants rated the workshop worthwhile. Major factors for the workshop success, according to participants, were total involvement of teachers with lesson activities and teacher interaction that occurred. Participants suggested

changing the workshop from one to one-half day. They indicated that presenting lesson activities to kindergarten children would improve the workshop. There were NO negative comments on the "Beginnings" program.

After one semester of classroom use, all reporting teachers indicated that the "Beginnings" program was compatible with their early childhood philosophy, that the program was very flexible, and that children's response to the lessons was favorable. One-third of the teachers indicated they did not think the purchase of a kit was necessary for implementation of the "Beginnings" program, since most of the items were already available in their classrooms. Ninety percent of the participants felt they had a better understanding of kindergarten science as a result of using the "Beginnings" program. Several negative comments were received on the stability of some items in the kit. Since the program was initiated during the spring semester, some teachers felt their students already possessed the science readiness skills and were ready for more challenging activities. Teachers liked the organization of the kit, simplicity of the lessons, and philosophy of the program.

Teachers gave consistently high ratings to lesson materials, achievement of lesson objectives, and student reaction to lesson activities. All teachers indicated instructions in the teacher's manual were clear and easy to follow.