DOCUMENT RESUME

ED 415 264 TM 027 965

AUTHOR Webb, Paula Bauer; Pugh, Ava F.
TITLE The Impact of Project 2061 on Science Education in Northeastern Louisiana Classrooms.
PUB DATE 1997-11-00
NOTE 31p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (26th, Memphis, TN, November 12-14, 1997).
PUB TYPE Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Curriculum Development; *Educational Change; Elementary Secondary Education; Program Effectiveness; Program Evaluation; *Science Education; Science Teachers; *Teacher Characteristics; Teaching Methods
IDENTIFIERS *Louisiana; *Project 2061 (AAAS)

ABSTRACT

Project 2061, a broad-based science reform movement, was launched by the American Association for the Advancement of Science, the Carnegie Corporation of New York, and the Andrew W. Mellon Foundation to define the fundamental science and mathematics American students should know. A second phase of Project 2061 translated the defined learning goals to curricula for grades 2, 5, 8, and 12, and a third phase is the current collaboration of scientific organizations and others to turn the curriculum blueprints into lasting educational practice. This study examined the impact of Project 2061 on science education in northeastern Louisiana schools. Ninety-seven teachers of science from 10 schools completed a survey. Only 3% had a background in pure and applied science, but 88% had an education degree. Forty-four percent of these teachers taught in grades K though 3, and 35% taught grades 4 through 6. Twenty-nine percent taught at the middle school or high school levels. The following conclusions were made: a majority of these teachers recognized the importance of science education; all of the pedagogies suggested by Project 2061 had been used to varying degrees in these schools; the teachers were fairly knowledgeable about the Louisiana program that launched Project 2061 in the state. However, money for science equipment and supplies was inadequate. Recommendations to implement Project 2061 to a greater degree, and to improve science education in Louisiana are presented. (Contains 7 tables and 30 references.) (SLD)

THE IMPACT OF PROJECT 2061 ON SCIENCE EDUCATION IN NORTHEASTERN LOUISIANA CLASSROOMS

by

Paula Bauer Webb
Northeast Louisiana University

and

Ava F. Pugh, Major Professor
Northeast Louisiana University

Monroe, Louisiana 71209

Paper presented to the Mid-South Education Research Association Convention in Memphis, Tennessee, November 12-14.

Rationale:

Eleven years ago Project 2061, a broad based science reform movement, was launched by the American Association for the Advancement of Science (AAAS), the Carnegie Corporation of New York, and the Andrew W. Mellon Foundation. Project 2061's all encompassing aim was to form a consensus regarding the fundamental scientific concepts all United States school children should know. This movement stressed scientific literacy of a common core of learning, integrated science, mathematics, and technology, and concentrated on innovative teaching for grades K-12. Initially introduced in 1985, the year Halley's Comet orbited close to our sun, Project 2061 was named for the year that Halley's Comet will next appear. The year 2061 was also the date chosen as the culmination point of this current round of reform (U.S. Department of Education, 1994).

Steady advances have been made toward achieving the goals of Project 2061. The work of this reform program has consisted of three phases. Phase I defined the fundamental science, mathematics, technological skills, knowledge, and understanding all American students should achieve by grade 12. This baseline of knowledge was presented in the 1989 publication of Science for All Americans.

In Phase II, recommendations from Science for All Americans were translated to specific learning goals for

grades 2, 5, 8, and 12. These curriculum development tools were contained in Benchmarks for Science Literacy, which was published in 1993.

Project 2061, now in Phase III, is collaborating with scientific societies, professional organizations, and other groups to turn curriculum blueprints and suggestions into lasting educational practice (American Association for the Advancement of Science, 1995).

An analysis of statistics relating to academic performance by Louisiana school children indicated both the importance of and the necessity for educational reform (LaSIP, 1996). Louisiana's poor rankings nationally in the illiteracy rate among adults and the number of teenage pregnancies, while worrisome prior to the 1980s, did not appear to be leading to cataclysmic results. Since the 1940s, sufficient well-paying jobs in the oil and petro chemical industries had been available for those Louisiana citizens who did not possess a high level of education. In the 1980s, however, declining oil prices and the increased usage of labor saving technology in the petro chemical field resulted in a sharp decrease in these job opportunities.

The very low performance rankings on the American College Testing (ACT) assessment by Louisiana high school students served notice on the state's education program (LaSIP, 1995). An important prerequisite for attracting and

keeping new industries in Louisiana would be the availability of a properly educated labor force.

The educational reform movement in Louisiana gained impetus in 1986 when the state legislature passed a constitutional amendment creating the Louisiana Education Quality Support Fund. These funds, dedicated solely to education, were derived from the settlement of a substantial oil related lawsuit between Louisiana and the federal government (LaSIP, 1995).

The Louisiana Systemic Initiatives Program (LaSIP), introduced in the 1992-93 academic year, was a five-year statewide effort to restructure mathematics and science education. Modeling the broad interrelated initiatives of Project 2061, LaSIP was in the vanguard of the educational reform movement in Louisiana. The main goal of the LaSIP reform was that students utilize critical thinking and problem solving skills while participating in hands on learning (LaSIP, 1995).

From inception in 1992 through March 1996, a total of 102 mathematics and science projects involving over 3,300 teachers had been conducted throughout the state. Almost 200,000 Louisiana students had been taught mathematics or science by a LaSIP trained teacher. Although not yet definitive, statewide math test results indicated that the 17% of students who had received instruction by LaSIP

trained teachers averaged two to three items higher than the total population (LaSIP, 1995).

This study sought to determine the impact of Project 2061 on science education in the elementary and middle-senior high schools in the northeastern region of Louisiana.

Statement of the Problem

Project 2061 had, as its main objective, the complete reform of the manner in which science education was carried out. This study determined what impact, if any, Project 2061 has had on northeastern Louisiana elementary teachers of science.

Research Questions

The research questions examined in this study were:

1. How important is science education for the 21st century as perceived by current science teachers?

2. Did teachers use pedagogical methods suggested by Project 2061?

3. How familiar with LaSIP were teacher participants in this study?

4. What money for supplies and materials was available for implementation of Project 2061 to northeastern Louisiana teacher participants?

Definition of Terms

For the purpose of this study the following definitions were utilized.

Louisiana Systemic Initiatives Program (LaSIP)--"The five-year statewide effort to reform mathematics and science learning consistent with the rapidly changing needs of the age of technology" (Louisiana Systematic Initiatives Program, 1995, p. 3).

Project 2061--"A broad, long range movement to improve math, science and technology education for American students" (American Association for the Advancement of Science, 1995, Fall).

Scientifically literate--"One who is aware that science, mathematics, and technology are interdependent human enterprises with strengths and limitations; understands key concepts and principles of science; is familiar with the natural world and recognizes both its diversity and unity; and uses scientific knowledge and scientific ways of thinking for individuals and social purposes" (Kelter, Hughes, & Murphy, 1992, p. 365).

Utilization of lists of science teachers across the state of Louisiana provided a contact person within a public school in each of the 17 towns. One private parochial school was also randomly selected for inclusion in the survey.

Of the 18 schools chosen according to their geographical location for this study, 10 expressed a willingness to take part. The research survey, which was sent to 219 teachers, was completed by 97 teachers of

science at the K-3 grade elementary level, the 4-6 grade upper elementary level, and the 7-12 middle school and high school levels of instruction.

Nineteen percent of the teachers who responded were between 20-29 years of age. Twenty-seven percent were in the 30-39 age range. Forty percent were in the 40-49 age range. Thirteen percent of the teachers were between 50-59 years of age, and 1% did not reveal their age.

Thirty-eight percent of the respondents were of the Caucasian racial group. Fifty-five percent stated they were of African American heritage. One percent indicated they were of Native American roots and 6% of the classroom teachers stated that they were of a mixed racial background. Of the 97 teachers answering the survey, 92% were female and 8% were male.

When surveyed concerning the field of study for their bachelors degree, 3% of the teachers had received a business administration degree. Eighty-eight percent had received an education degree. Five percent of the teachers had bachelor degrees in liberal arts, and 3% had a pure and applied science background.

Of the surveyed teachers who had received masters degrees, 94% had received the degree in the field of education. Two percent of the remaining teachers had earned master degrees in business, 2% in music and 2% in music

education. Only 1% of the respondents had received an education specialist degree.

Classroom assignments were a part of the demographic information provided. Forty-four percent of the teachers taught at the K-3 grade level. Thirty-five percent taught grades 4-6. Twenty-one percent taught at the middle high or high school levels.

When surveyed concerning the total number of years having taught, 22% of the teachers had taught 0-4 years. Twenty-six percent had 5-9 years, 16% had 10-14 years, 18% had 15-19 years, 13% had 20-24 years, 5% had 25-29 years, and 1% had over 30 years of experience.

Additional school demographic information was provided by respondents. Ascertained were the number of students enrolled in the various schools included in the survey. Schools with a student population of less than 250 students made up 1% of the schools in this survey. Fifteen percent of the schools enrolled 250-399 students, 39% of the schools enrolled 400-550 students and 45% of the schools enrolled more than 550 students.

The location of each school included in the survey was also provided. Twenty-one percent of the schools were targeted as inner city, 48% of the schools were rural, 19% were suburban, and 12% were urban.

For this study, socioeconomic backgrounds were defined by the following annual incomes: upper socioeconomic-

greater than $70,000.00, upper middle socioeconomic-between $69,000.00 and $30,000.00, lower middle socioeconomic-between $29,000.00 and $18,000.00, and lower socioeconomic-less than $15,000.00. One percent of the schools had a student population composed of children from an upper socioeconomic background. Twenty percent of the schools worked with children from an upper middle level, and 35% of this study's schools were from a lower middle level. Thirty eight percent of the schools provided instruction to students from a lower socioeconomic level. Lastly, 5% of the schools reported an equal representation of children from all socioeconomic levels.

Forty-four percent of the teachers who responded taught at the K-3 lower elementary grade level, 79% taught at the 4-6 upper elementary grade level. Twenty percent of the participants taught at the middle school and high school levels.

Also addressed was the racial population of the schools taking part in this study. Sixty percent of the schools were predominantly African American, 22% were predominantly Caucasian, and 18% contained an equal representation of races.

Instrumentation

For this study, the researcher utilized an instrument which consisted of 31 items. The first seven items gathered demographic data from the teachers. This information

included the teachers' age, race, sex and area(s) of earned degree(s). Respondents also indicated grade level teaching assignments, number of years of teaching experience and professional organization affiliations. Items 8 through 13 secured data concerning the teachers' schools. These items related to enrollment, locale, racial population, socioeconomic groups and the availability and monetary value of science equipment at each school. Items 14 through 21 were utilized to collect data concerning the pedagogy utilized by teachers. Frequency and types of science presentations and labs were dealt with in these questions.

Information concerning computer availability and usage was collected from items 19 and 20. Item 21 related to the integration of math into science lessons.

Opportunities provided to teachers for attending instructional science conventions, inservices and workshops were addressed in items 22-24. Items 25-26 gauged how confident teachers were in both their science background and class presentations. The next 3 items asked for teachers' familiarity with Project 2061 and LaSIP and their participation, if any, in a LaSIP project. Item 30 concerned the importance teachers placed in science education as America enters the 21st century, and item 31 regarded grant writing.

Data Collection

Seventeen towns in northeast Louisiana had sufficient population to warrant their own telephone exchanges. Utilizing published lists of science teachers within the state of Louisiana, the researcher contacted by letter a teacher within a public school in each of these 17 communities. Nine public schools agreed to participate in this study. One parochial school was also randomly selected for inclusion in the survey. Postal mailing envelopes of surveys, self-addressed stamped envelopes, and cover letters were mailed to the contact teacher in each of six participating schools which were located farther than 25 miles from Monroe. Packets were hand delivered to and picked up from four schools that were within 25 miles of the researcher.

Data Analysis

In analyzing data collected from all returned surveys, the researcher utilized descriptive statistics. Percentages were tabulated to obtain information concerning respondents' and schools' demography. Percentages and frequencies also were calculated in determining answers to the research questions formulated in this project.

Data Presentation

Demographic Data

Ninety seven educators at 10 schools in northeastern Louisiana took part in this study. Forty-three of the

respondents taught at the K-3 grade level, 34 taught grades 4-6, and 20 taught grades 7-12. The educators in this study taught at inner city, rural, suburban, and urban schools. Twenty one respondents taught at inner city schools, 46 taught at rural schools, 18 taught at suburban schools, and 12 taught at urban schools.

How important is science education for the 21st century as perceived by current science teachers? Northeastern Louisiana teachers were asked to rate the importance of science education as the United States enters the 21st century. As noted in Table 1, the data suggested that the majority of teachers in all locales placed great value on science education.

Table 1

Value Placed on Science Education by Locale

Value	Inner City	Rural	Suburban	Urban
Very important	100%	93%	100%	100%
Somewhat important	0%	7%	0%	0%

Did teachers use pedagogical methods suggested by Project 2061? To determine the relationship of the pedagogy utilized by Northeastern Louisiana teachers with methods suggested by Project 2061, teachers supplied data regarding components of their science lesson presentations. One questionnaire item was utilized to collect data concerning the frequency of science lessons as follows: daily--67%,

three times weekly--18%, and once or twice weekly--15%. The importance of hands-on investigations in science lessons was rated by teachers as follows: great importance--55%, average importance--28%, minimal importance--10%, and no importance--7%. As evidenced by Table 2, data collected from the study concerned the importance of hands-on investigations by grade levels. Educators rated hands-on investigations to be of greatest importance in grades 4-6, and of least importance in grades K-3.

Table 2

The Importance Played by Hands-on Investigations in Science Lessons by Grade Level

Level of Importance	Grades K-3	Grades 4-6	Grades 7-12
Great importance	53%	66%	42%
Average importance	26%	21%	42%
Minimal importance	10%	10%	11%
No importance	11%	3%	5%

Science teachers were asked to rate the importance of hands-on investigations in science lessons across northeastern Louisiana. As revealed in Table 3, hands-on work was valued as having the greatest importance both in inner city and suburban schools. Hands-on investigation was valued to be of least importance in rural schools.

Table 3

The Importance of Hands-on Investigations in Science Lessons by Locale

Level of Importance	Inner City	Rural	Suburban	Urban
Great importance	79%	40%	75%	46%
Average importance	14%	33%	25%	36%
Minimal importance	7%	17%	0%	9%
No importance	0%	10%	0%	9%

Teachers reported the frequency of their science laboratory studies as follows: once a week--42%, twice or more a week--18%, and none--39%. Teachers reported methods of science demonstrations, experiments, and investigations in their classrooms as follows: cooperative learning groups were utilized--55%, three or four children conducted a demonstration experiment--12%, the teacher conducted a demonstration experiment--20%, no experiments were conducted--12%, and 1% did not respond.

Activities utilized to provide science instruction outside the classroom were reported by teachers as follows: field trips--42%, outdoor investigations--25%, Project Wild activities--5%, Project Learning Tree activities--5%, none--22%, and 1% did not respond.

Represented in Table 4, are pedagogies utilized outside classrooms that were rated by educators to grade levels. Field trips were utilized with the greatest

frequency in junior high and high school grades, although on average, nearly a quarter of all teachers utilized outdoor investigations. Project Wild and Project Learning Tree activities were utilized by the fewest teachers.

Table 4

Various Pedagogies in Science Instruction Utilized Outside Classrooms by Northeastern Louisiana Teachers

Pedagogy	Grades K-3	Grades 4-6	Grades 7-12
Field trips	39%	42%	50%
Outdoor investigations	25%	27%	22%
Project Wild activities	3%	4%	11%
Project Learning Tree Activies	6%	8%	0%
None	27%	19%	17%

By their geographic location, educators rated their use of science instruction outside classrooms. As shown in Table 5, science teachers across northeastern Louisiana were utilizing opportunities presented outside their classroom to facilitate learning. Surburban teachers both utilized all of the pedagogies included in this study, and took their students on more field trips than did the teachers in other locales. The data indicated that the teachers in inner city schools conducted more outdoor investigations than did teachers in other locales.

Table 5

Various Pedagogies in Science Instruction Utilized Outside Classrooms by Northeastern Louisiana Teachers

Pedagogy	Inner City	Rural	Suburban	Urban
Field trips	38%	38%	60%	46%
Outdoor investigations	46%	21%	26%	9%
Project Wild activities	0%	3%	7%	9%
Project Learning Tree Activities	8%	3%	7%	9%
None	8%	35%	0%	27%

Teachers rated the availability of computers in their science classrooms. Data suggested the following: one to four computers--18%, and none--82%. The availability of computers in their school's computer lab was reported by science teachers as follows: five or more computers--66%, one to four computers--4%, and none--30%. The incorporation of math into science lessons by teachers was reported as follows: yes--86% and no--14%.

Science teachers participating in this study were asked to furnish data suggesting provisions made for their attendance at instructional science conventions during the school day. Data suggested the following: 1-4 workshops attended annually--28%, and no workshops attended--72%. Provisions made which allowed respondents to attend

instructional science inservices during the school day were reported as follows: 1-4 inservices attended annually--31%, no inservices attended--68%, and not reported--1%. The number of science workshops, conventions, or inservices attended during the past 12 months was reported by teachers as follows: more than five--12%, one to four--41%, none--46%, and not reported--1%.

The level of confidence in individual science knowledge background required for teaching science classes was rated by teachers as follows: very comfortable--46%, somewhat secure--48%, and not at all secure--6%. Teachers rated individual confidence in presenting science concepts to their students as follows: very comfortable--52%, somewhat secure--47%, and not secure at all--1%.

How familiar with LaSIP were teacher participants in this study? Information was collected to ascertain northeastern Louisiana teachers' familiarity with LaSIP. Data suggested that 66% of the surveyed teachers were familiar with LaSIP and 34% were unfamiliar with this state science reform. Presented in Table 6 were the data concerning the familiarity with LaSIP of this study's respondents by locale. Rural school teachers were most familiar with, and inner city school teachers were least familiar with, the statewide science reform program. Sixteen percent of the surveyed educators had attended projects at Northeast Louisiana University, 17% had

attended projects at Louisiana Tech University, one percent had attended projects at another Louisiana university, 65% had not attended a LaSIP project, and 1% did not respond.

Table 6

Familiarity of Study's Respondents with LaSIP by Locale

	Inner City	Rural	Suburban	Urban
Yes	53%	71%	63%	64%
No	47%	29%	37%	36%

What money for supplies and materials was available for implementation of Project 2061 to northeastern Louisiana teacher participants? Teachers supplied data which suggested available money for science supplies and materials in northeastern Louisiana science classrooms. The availability of science lab equipment at the disposal of teachers in this survey was rated as follows: adequate--17%, minimal--82%, and did not respond--1%. Respondents reported the estimated monetary value of available science equipment by grade levels. Grade levels which possessed over $1,000 of equipment were as follows: grades K-3--24%, grades 4-6--18%, and grades 7-12--30%. Grade levels which had $501-$1000 of equipment were as follows: grades K-3--15%, grades 4-6--15%, and grades 7-12--30%. Grade levels which had $101-$500 of equipment were as follows: grades K-3--32%, grades 4-6--46%, and grades 7-12--35%. Grade levels which had $26-$100 of equipment were as follows: grades K-

3--15%, grades 4-6--18%, and grades 7-12--0%. Grade levels which had no equipment were as follows: grades K-3--8%, grades 4-6--3%, and grades 7-12--0%. Estimated monetary value of the available science equipment at respondents' schools were reported as follows: over $1000-23%, $501-$1000--18%, $101-$500--38%, $26-$100--13%, $5-$25--3%, and none--5%. By locales this study's data suggested estimates of monetary value of available science equipment. As evidenced by Table 7, suburban schools had more access to funds designated for science materials than did schools in other locales. Inner city schools had the least availability to funds for science equipment.

Table 7

Estimate of the Monetary Value of Available Science Equipment for Different Locales in Study

Value	Inner City	Rural	Suburban	Urban
None	0%	9%	0%	0%
$5-25	0%	5%	0%	
9%$26-100	38%	5%	0%	9%
$101-500	38%	49%	20%	
27%$501-1,000	18%	12%	40%	19%
Over $1,000	6%	20%	40%	36%

Data Analysis

How important is science education for the 21st century as perceived by current science teachers? One

hundred percent of the participants in this study had taught science classes at either the elementary or the middle high level in northeastern Louisiana classrooms. Data suggested that ninety-seven percent of the surveyed educators rated science education to be very important as the United States entered the 21st century. Three percent of educators rated science education as somewhat important. This collected evidence suggested that a majority of classroom science teachers
rated science education as greatly important to the future of America.

Did teachers use pedagogical methods suggested by Project 2061? Providing students with opportunities to learn through hands-on investigations was a key component of Project 2061. Data supplied by science educators in this study suggested that 83% of science teachers in northeastern Louisiana recognized the importance of hands-on investigations. Gathered data suggested that when analyzed by locale, rural schools placed the greatest value on hands on investigations. Suburban schools ranked second, inner city schools ranked third, and urban schools ranked fourth. Among the 55% of teachers who responded that hands-on investigations were of great importance, research suggested the level of perceived importance decreased as the educational level of the students increased. This study's research suggested that teachers of grades K-3

considered hands-on to be of much greater importance than did teachers of grades 7-12.

Of the 83% of science educators who in this study valued hands-on investigations, 60% provided laboratory studies at least once a week as a part of their science program. Data suggested that cooperative learning groups in which all students in class participated were utilized in over half of the laboratory lessons. Other laboratory teaching methods were small group demonstrations and teacher demonstrations.

Project 2061 recognized the value of students utilizing activities outside the classroom to learn science. Data gathered in this study suggested that 78% of northeastern Louisiana science teachers employ various pedagogies outside the classroom including field trips, outdoor investigations, Project Wild, and Project Learning Tree activities. Geo-demographic data suggested that educators in suburban schools provided more science instruction outside the classroom than did rural schools which ranked second, inner city schools which ranked third or urban schools which ranked fourth. Suburban teachers may have more financial, economic resources for outside class instructions.

Project 2061 recognized that due to the great advancements in worldwide technology, America's students must achieve a proficiency in the use of technical tools to

successfully compete in the global market. Data suggested that although 70% of the science teachers in northeastern Louisiana schools had access to a computer lab, only 18% of the teachers had computers in their classrooms. Respondents suggested that math was being incorporated into science lessons by 86% of grades K-12 science teachers.

The science reform movement, Project 2061, advocated that teachers periodically receive instruction both in the areas of science content and methodology. This study's data suggested that provisions had been made that enabled 30% of northeastern Louisiana teachers to attend workshops and inservices during school hours. Fifty-three percent of science teachers had attended conventions during the past twelve months. When asked to rate their level of confidence in individual science knowledge backgrounds, 46% of the respondents were very secure and 48% were somewhat secure in their ability to present science concepts to their students.

How familiar with LaSIP were teacher participants in this study? Data suggested that 66% of the surveyed teachers were familiar with LaSIP, and 34% had participated in summer LaSIP projects. Data suggested that educators in rural areas were most familiar with LaSIP. Teachers in suburban areas ranked second, in inner city schools ranked third, and in urban schools ranked fourth.

What money for supplies and materials was available for implementation of Project 2061 to northeastern Louisiana teacher participants? Data suggested that only 12% of the teachers in this survey rated as sufficient the availability of money at their disposal for science supplies and equipment. Forty one percent of teachers supplied their science classrooms with materials worth $500.00 or more. Data suggested that rural teachers had access to the largest monetary funds for furnishing science classrooms.

Ninety-seven science teachers responded to the research survey. Ninety-seven percent of the surveyed educators perceived science education to be very important. Eighty-five percent of the teachers presented science lessons at least three times a week. Of the 70% of surveyed teachers who provided science laboratory studies at least once a week, 55% utilized cooperative learning groups. Seventy seven percent of the teachers provided science instruction outside the classroom. Thirty-four percent of the teachers had participated in a LaSIP project at a Louisiana university. Seventeen percent of the teachers rated available lab equipment as adequate, and 41% of the teachers supplied their science classrooms with $500.00 (in supplies and materials) or less.

Conclusions

1. A majority of the northeastern Louisiana science teachers who responded to the questionnaire recognized that science education was very important as the United States entered the 21st century.

2. All of the pedagogies suggested by Project 2061 had been utilized in varying degrees by northeastern Louisiana teachers.

3. Northeastern Louisiana teachers were fairly knowledgeable of LaSIP which has served as the launch vehicle within Louisiana for Project 2061.

4. Money for science equipment and supplies was inadequate.

Recommendations

1. Since early research suggests that LaSIP benefits science education in Louisiana, funding for this program must be maintained.

2. Information concerning LaSIP projects must be broadly disseminated, so that many teachers can participate.

3. Individual school districts and regional service centers should continue to offer science based inservices and workshops for teachers.

4. The impact of Project 2061, on northeastern Louisiana schools, should be researched further. Another

study utilizing a larger population should be conducted for a longer time period.

5. Information should be sought to determine why more teachers of grades 4-6 favored hands on learning than any other grade level.

6. Research should be collected to determine what effect, if any, grant writing has had on the amount of science equipment in northeastern Louisiana classrooms.

References

Ahlgren, A. (1993, February). Creating benchmarks for science education. Educational Leadership, 50, 46-49.

Ahlgren, A., & Rutherford, F. J. (1993). Where is Project 2061 today? Educational Leadership 50, 20-22.

American Association for the Advancement of Science (Producer), 1991. Children as explorers. Guidebook 3. Schools that work: The research advantage. Oak Park, Illinois: North Central Regional Educational Laboratory & Washington, DC: Public Broadcasting Service. (ERIC Document Reproduction Service No. ED 349 124)

American Association for the Advancement of Science. (1995, Fall). Project 2061 develops resources for science literacy. 2061 Today, 5, 1-6.

American Association for the Advancement of Science. (1995). Project 2061-science literacy for a changing future-a decade of reform. (Ten year report). Washington, DC: F.J. Rutherford.

Anderson, R. D. (1992). Perspectives on complexity: an essay on curricular reform. Journal of Research in Science Teaching, 29, 861-876.

Culotta, E. (1990). Can science education be saved? Science, 50, 1327-1330.

Hamm, M. (1992). Achieving scientific literacy through a curriculum connected with mathematics and technology. School Science and Mathematics, 92, 6-9.

Hartoonian, H. M. (1992). The social studies and Project 2061: An opportunity for harmony. The Social Studies, 83, 160-163.

Helgeson, S. L. (1992, June 12). Trends and issues in science education. Keynote address presented to the International Symposium on Science Education; National Taiwan Normal University; Taipei, Taiwan, Republic of China.

Hoffman, F. M., & Stage, E. K. (1993). Science for all: Getting it right for the 21st century. Educational Leadership, 50, 27-31.

Kelter, P., Hughes, K., & Murphy, A. (1992). Science outreach for the 1990s. School Science and Mathematics, 92, 365-369.

Kumar, D. (1991). Curriculum concerns of science-technology-society education in the United States of America (No. 82, 7-14). Bethlehem, PA: University of Lehigh, STS Program Newsletter.

Louisiana Systemic Initiatives Program (1993). LaSIP's professional development activities impact more than 1600 teachers. LaSIP Nexus, 2, 1.

Louisiana Systemic Initiatives Program (1995, April). Overview of LaSIP: Design of professional development projects: LaSIP contracts. Paper presented at the meeting of National Council of Supervisors of Mathematics, Boston, MA.

Moore, G. R., & Moore, P. (1992). Making science matter in elementary school. (Report No. 11). Alexandria, VA: National Association of Elementary School Principals. (ERIC Document Reproduction Service No. ED 350 174)

Murfin, B. (1994). African science, African and African-American scientists, and the school science curriculum. School Science and Mathematics, 94, 99-102.

National Council of Social Studies (1990). Teaching about science, technology, and society in social studies: Education for citizenship in the 21st century. Social Education, 54, 189-193.

Northwest Regional Educational Lab. (1991). Improving the outcomes of science education for the Pacific northwest, science and mathematics initiatives. Program Report. Position Paper. Portland, OR. (ERIC Document Reproduction Service No. ED 356 940)

O'Neil, J. (1992). Science education: Schools pushed to broaden access, overhaul practice. Association for Supervision and Curriculum Development Curriculum Update (Stock No. 611-92139). Alexandria, VA. (ERIC Document Reproduction Service No. ED 359 031)

Project 2061 (1993). Benchmarks for Science Literacy. New York: Oxford University Press.

Ramsey, J. (1993). The science education reform movement: Implications for social responsibility. Science Education 77, 235-258.

Rutherford, F. J., & Ahlgren, A. (1990). Science for All Americans. New York: Oxford University Press.

Shymansky, J. A., & Kyle, W. C., Jr. (1992). Establishing a research agenda: Critical issues of science curriculum reform. Journal of Research in Science Teaching, 29, 749-778.

Showers, D. (1993, April). An examination of the science literacy of scientists and science educators. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Atlanta, GA. (ERIC Document Reproduction Service No. ED 362 393)

Thayer, R. J. (1990, December). Education for the 21st century: An elementary school perspective. Engineering Education, 80, 1023-1025.

U.S. Department of Education. (1994. Reform in mathematics and science education: The big players (contract no. R168R2003-94). Austin, Texas: Southwest Educational Development Laboratory.

Victor, E., & Kellough, R. D. (1993). Science for the Elementary School. New York: Macmillan Publishing Company.

Yager, R. E., & Blosser, P. E. (1991). Meeting national goals for 2000 and beyond in science education (ERIC/SMEAC Science Education Digest No. 1). Columbus, OH: Eric Clearinghouse for Science, Mathematics, and Environmental Education. (ERIC Document Reproduction Service No. ED 335-211)

Yager, R. E., & Bonnstetter, R. J. (1992), The practices of teachers who develop exemplary science programs (Report No. SE-051-891). Iowa City, IA: University of Iowa. (ERIC Document Reproduction Service No. Ed 328 416)

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

ERIC

TM027965

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: The Impact of Project 2061 on Science Education in Northeastern Louisiana Classrooms

Author(s): Webb, Paula ; Pugh, Ava F.

Corporate Source: Northeast Louisiana Univ. ; Ouachita Public School Syst

Publication Date: 11/12/97

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic/optical media, and sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following two options and sign at the bottom of the page.

Check here
For Level 1 Release:
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical) *and* paper copy.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 1

The sample sticker shown below will be affixed to all Level 2 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2

Check here
For Level 2 Release:
Permitting reproduction in microfiche (4" x 6" film) or other ERIC archival media (e.g., electronic or optical), but *not* in paper copy.

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at Level 1.

"I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries."

Sign here→ please

Signature: Dr. Ava F. Pugh

Printed Name/Position/Title: Dr. AVA Pugh, Professor

Organization/Address:
Northeast Louisiana University
Strauss Hall 236
Monroe, LA 71209

Telephone: (318)342-1282

FAX: (318)342-1240

E-Mail Address:

Date: 11/12/97

(over)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, *or*, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

ERIC Clearinghouse on Assessment and Evaluation
210 O'Boyle Hall
The Catholic University of America
Washington, DC 20064

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
1100 West Street, 2d Floor
Laurel, Maryland 20707-3598

Telephone: 301-497-4080
Toll Free: 800-799-3742
FAX: 301-953-0263
e-mail: ericfac@inet.ed.gov
WWW: http://ericfac.piccard.csc.com