



Science Fairs Under the 'Scope

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STUDY OVERVIEW

Science fairs have been taking place for more than 60 years. Yet in spite of their wide implementation and long history, there are few empirical studies that have examined the relationship between student participation in these fairs and their learning and interest in science. Additionally, there have been no studies to understand the real cost of these programs relative to the student benefits. Our 4-year study will be the first step to understanding the implementation and effectiveness of middle school science fairs in the United States.

RESEARCH QUESTIONS

1. What are the basic models and elements of middle school science fairs?
2. To what extent does participation in a particular model of middle school science fairs enhance students' mastery of the science and engineering practices (SEP), their interest in science, and/or their interest in future science education or careers?
3. What student-, teacher-, and school-level factors contribute to or inhibit students' gains in SEP mastery and/or their interest in science or science careers?
4. What resources are required—human, financial, and otherwise—to implement an effective middle school science fair?
5. What are the most cost-effective aspects of the science fair experience?

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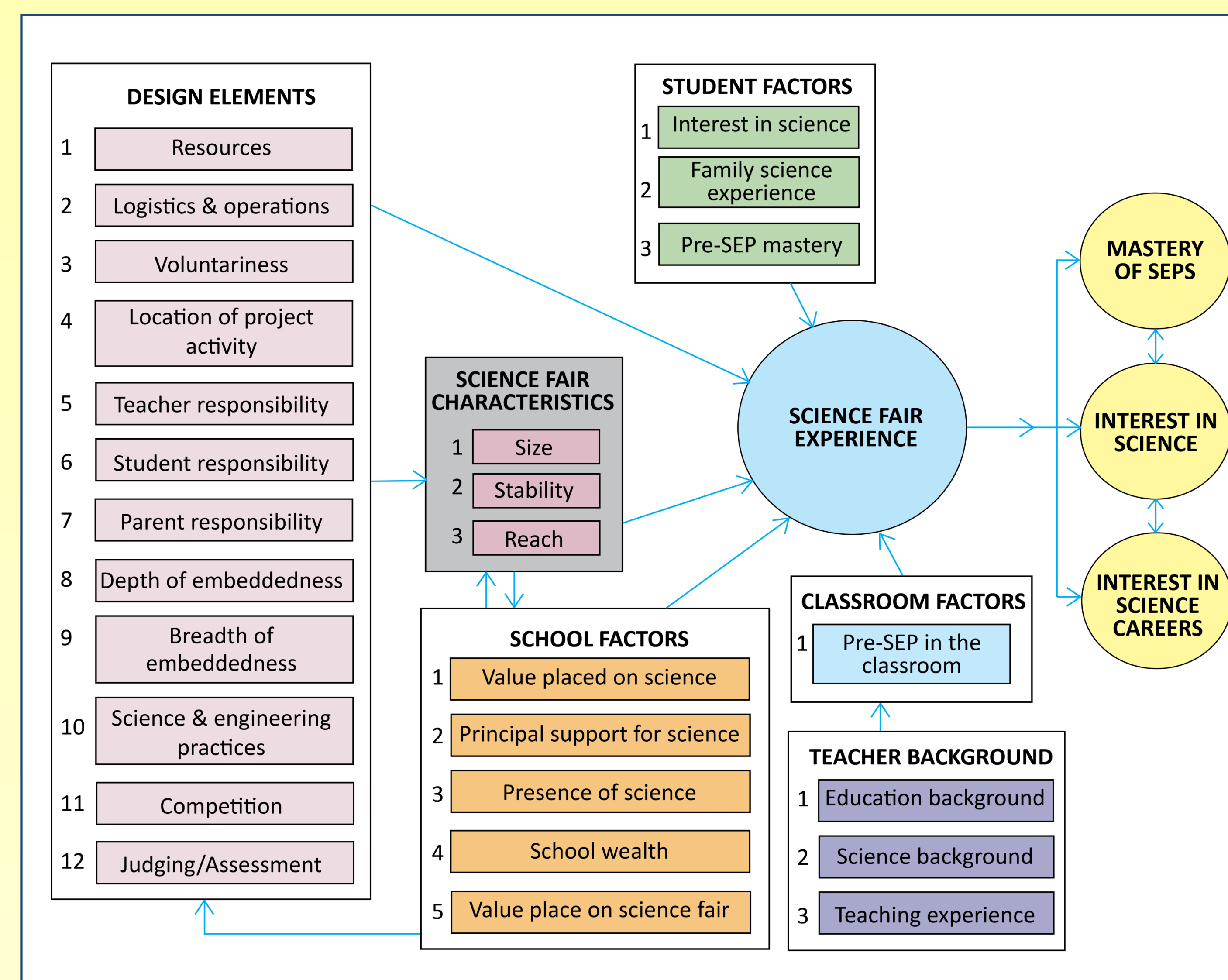
This project is funded by the National Science Foundation, grant #1421112. Any opinions, findings, and conclusions or recommendations expressed in these materials are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

PRELIMINARY FINDINGS (N=157)

SELECTED FINDINGS FROM THE SURVEY OF SCIENCE FAIR COORDINATORS:

- Participation was mandatory for all students in 43% of the schools that had 6th-grade science fairs.
- When asked about the 3 most common ways that parents are involved in the science fair, only 2% of respondents said that parents do the majority of students' projects themselves.
- 45% of respondents said their schools have no funds budgeted or raised specifically for the science fair.
- On average, students spend 6.5 weeks on their projects.
- 63% of schools integrated the science fair in their science curriculum; 27% did not integrate; and 10% integrated across multiple subjects.
- 32% of the 6th-grade classes participating in the science fair have no designated time during the school day (science or non-science classes) to work on projects.

- When asked about the top goals of the science fair at their schools, the majority of respondents said “to promote an interest and/or enthusiasm for science,” followed by “to provide an opportunity to pursue a topic of personal interest.”
- According to respondents, the most common sources of students' science project ideas are online sources, followed by generating their own.



Current logic model of a middle school science fair, to be refined based on findings.

PHASES OF THE STUDY

PHASE I: THE SCIENCE FAIR SURVEY

(Aug 2014–Feb 2016)

Using the Common Core of Data, *Science Fairs Under the 'Scope* selected a stratified, random sample of public middle schools, ensuring that the sample was nationally representative based on region, income, and urbanicity. Schools received a survey if they served grades 6–8 only and held a school science fair. Forty states were represented among respondents. The survey was designed to learn about the elements and models of school-level science fairs.

PHASE II: DATA COLLECTION IN SCHOOLS

(Aug 2015–Aug 2017)

Our study will gather data from 40 middle schools (grades 6–8) across the country. The study will look at the science fair as a whole, but will focus on the 6th-grade students' mastery of science and engineering practices, as well as interest in science. Teachers, parents, judges, volunteers, science fair coordinators, and administrators will take part in our study through interviews, surveys, observations, focus groups, and time queries.

PRODUCTS

Results and products from our study will be shared with teachers, science fair coordinators, researchers, and the public via handbooks, our website, and articles. These materials will provide informal and formal science fair experts with research-based strategies to improve the effectiveness of their school science fairs.