

IMPACT OF PROBLEM FINDING ON THE QUALITY OF AUTHENTIC
OPEN INQUIRY SCIENCE RESEARCH PROJECTS

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ABSTRACT

Problem finding is a creative process whereby individuals develop original ideas for study. Secondary science students who successfully participate in authentic, novel, open inquiry studies must engage in problem finding to determine viable and suitable topics. This study examined problem finding strategies employed by students who successfully completed and presented the results of their open inquiry research at the 2007 Connecticut Science Fair and the 2007 International Science and Engineering Fair. A multicase qualitative study was framed through the lenses of creativity, inquiry strategies, and situated cognition learning theory. Data were triangulated by methods (interviews, document analysis, surveys) and sources (students, teachers, mentors, fair directors, documents). The data demonstrated that the quality of student projects was directly impacted by the quality of their problem finding. Effective problem finding was a result of students using resources from previous, specialized experiences. They had a positive self-concept and a temperament for both the creative and logical perspectives of science research. Successful problem finding was derived from an idiosyncratic, nonlinear, and flexible use and understanding of inquiry. Finally, problem finding was influenced and assisted by the community of practicing scientists, with whom the students had an exceptional ability to

communicate effectively. As a result, there appears to be a juxtaposition of creative and logical/analytical thought for open inquiry that may not be present in other forms of inquiry. Instructional strategies are suggested for teachers of science research students to improve the quality of problem finding for their students and their subsequent research projects.

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APPROVAL PAGE



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OPEN INQUIRY SCIENCE RESEARCH PROJECTS

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DEDICATION

This work is dedicated to:

Ann M. Dougherty

Biology Teacher, New Fairfield High School

and the memory of

Claire M. Berg

Professor of Molecular and Cell Biology, University of Connecticut

Remarkable women of science who most significantly influenced and shaped my professional path and taught me about the beauty and grandeur of the nature of science and the personal reward of conducting authentic research

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