

**RELATIONSHIPS BETWEEN SELECTED COMMON TERMS**  
**in**  
**SCIENCE EDUCATION**

**AN ABSTRACT OF**  
**A THESIS**  
**PRESENTED TO THE GRADUATE FACULTY**  
**OF WESTERN CONNECTICUT STATE COLLEGE**

**IN PARTIAL FULFILLMENT**  
**OF THE REQUIREMENTS FOR THE DEGREE**  
**MASTER OF SCIENCE**

**by**  
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**February 1969**

This study evolved from a search of the literature. A person who scans the voluminous amount of literature which abounds in the field of science education soon becomes aware that there apparently are many divergent theories and concepts in science education. Theories, studies, and techniques have evolved under various labels, such as; method of inquiry, problem solving method, critical thinking, creative thinking, productive thinking, scientific method, and reflective thinking.

A tremendous amount of overlap and similarity in the use of the above terms seems to exist. The writer has attempted to explore the recent literature on these terms, with the view that similarities may exist, and that perhaps some of the bewilderingly ambiguous terms can be modified into concepts that elementary teachers may readily understand and utilize to organize an appropriate curriculum for the educational program in the classroom.

The purpose of this investigation is to help clarify and reduce the amount of confusion which seems to exist concerning the aforementioned terms. To this extent, the meanings and uses of these terms were analyzed for commonalities and non-common factors which may exist among them. Each text was carefully read for reference to any of the aforementioned terms. References to these terms were noted and extracted for further study. The meaning of each term, as described

by the authors was analyzed. The analyzed terms were compared to ascertain the degree of similarity between the terms.

Chapter I introduces the topic as outlined above, and discusses the criteria established regarding the selection of sources examined for the study. It appeared reasonable to assume that teachers would be exposed to certain materials more than to other materials. Criteria were established in an attempt to ensure that the authorities were appropriate, their texts currently available in the schools, and that the contents discuss science education and methodology in a total school program.

Chapter II consists of an examination and discussion of the selected process terms in science education. There are seven subsections, one for each of the terms examined. Each subsection examines the elements found in the literature, attempts to ascertain the degree of similarity or difference between the views of the authors surveyed, and contains a synopsis of the specific term being discussed. The degree of commonality between the terms examined is also discussed in this chapter.

Chapter III consists of a discussion of the definitions and aims of science proposed by the authors surveyed for this study. The definitions of science were found to be remarkably similar, each proposing that science is both product and process: or a body of knowledge and a way of thinking and acting. The authors surveyed were also in general agreement concerning the goals of science education. Their statements

were compiled and a synthesis of their major goals recorded.

Chapter IV contains an overview of the conclusions reached in this study. The problem solving method and the scientific method were found to be synonymous terms describing procedures and steps for approaching problems. The method of inquiry as described by the authors surveyed is a teaching approach that children can be exposed to in the search for knowledge and truth. Reflective thinking is concerned with internal behavior in following problem solving procedures. Critical thinking is described as an internal activity when attacking problems, and involves making value judgments. Productive thinking is a process involving the examination of relative factors, assumptions, and judgments. Creative thinking is internal and emotional behavior and a process by which the individual produces something unique either to society's experience or to his own.

It was found that each of the terms studied is related to the process goals of science education. The abilities and skills discussed are desirable outcomes to be developed in the classroom. Whichever term is used, the authors are advocating the development of skills, attitudes, and behaviors necessary for effective exploration of the world, and the development of process abilities through science education.

Several suggestions for further study are included with the view that further research into what children do when they think will result in a clarification of textbook terminology.