



מכון ויצמן למדע

WEIZMANN INSTITUTE OF SCIENCE

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Doctor of Philosophy

הצעת מחקר לתואר
דוקטור לפילוסופיה

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מוגשת למועצה המדעית של
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מיומנות הטיעון: חקירת ההשפעה של הצגת עקרונות הלוגיקה הבלתי
פורמלית על מורים למדעים ותלמידיהם

**Argumentation: Investigating the effect of Informal logic principles on
science teachers and students**

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Abstract

This research deals with the ability of science teachers to support students in constructing scientific arguments and using them effectively in a socio-scientific context. In recent years, argumentation skills have been especially prominent in the science teaching community, due to studies that show the importance of providing such skills in order to acquire scientific literacy, and to integrate scientific knowledge with an authentic context. Argumentation skills are not required explicitly in most of the science teaching curricula in Israel. The teachers are provided with argumentation tools and skills based on Stephane Toulmin's model. This model is useful in the context of explaining scientific phenomena, or in a laboratory environment. However in a socio-scientific context, Toulmin's model hardly helps in assessing the validity of an argument. Informal logic is a tool that is used to examine the premises of an argument by using a set of rules that define when a logical fallacy is made. Disciplines such as law, philosophy, ethics and others use informal logic principles as part of their practices.

This research proposal presents a study aimed at introducing informal logic principles in the context of socio-scientific issues in junior high and high school. Its purpose is to provide teachers with a tool that will facilitate their ability to assess students' arguments, and it may improve their students' argumentation skills.

Moreover, the aim of the research is to determine how introducing informal logic to teachers affects their argumentation perspective and their integration of scientific knowledge and social issues. The intervention that will be developed as part of the research is part of an ongoing effort to find ways to encourage teaching in a socio-scientific context and to improve the use of scientific knowledge in a different context.