

Assessing the Change Process of High School Chemistry Teachers during and after Participation in a Leadership Program

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Abstract

This research focuses on the professional development of chemistry teachers who participated in a program aimed at their instruction as chemistry teacher-leaders. The idea is that these teacher-leaders will eventually foster a change in the way chemistry is taught and will enhance other chemistry teachers professionally, through activities in schools and Teacher Centers. The main goal of this study was to explore the changes that the teachers experienced through their participation in a long-term leadership program.

This thesis includes the construction of a profile of a future chemistry teacher-leader. It describes the characteristics and the essential components of a leadership program conducted in the Department of Science Teaching at the Weizmann Institute of Science, and it examines the process of change that chemistry teachers underwent during and after their participation in the professional development program.

In order to examine different aspects of the change process, two domains were selected:

Teachers' beliefs – This area is related to the changes in beliefs and attitudes associated with the teachers' work.

Teachers' behavior – This area is related to the teachers' spheres of activities within their classes, their schools, and out-of-school frameworks.

In addition, another domain that was examined was the program's contribution, namely, identifying those elements of the program that were considered as contributing the most to the teachers' change as perceived by the participants.

Various instruments were used during the research, combining both qualitative and quantitative methods of analysis. The research tools included several questionnaires, some adapted from the literature and some developed specifically for this study. The participants were interviewed, some repeatedly and many observations were made during the teachers' participation in the program and at different sites where they functioned as teacher-leaders, such as Teachers Centers. These qualitative instruments provided additional in-depth insights regarding the process that the teachers underwent. The research findings include both quantitative results as well as descriptive reports and teachers' case studies.

The main findings of the research were as follows:

- During their participation in the program, teachers changed their beliefs regarding different aspects of chemistry teaching and the teacher's role at school;
- During their participation in the program, teachers developed self-beliefs as teacher-leaders;
- Teachers changed their behavior at class;
- Teachers emphasized leading and managing teamwork at school;
- Regarding students of teachers that participated, there was a significant change, in a positive direction, of their perception regarding the classroom-learning environment;
- Most teachers succeeded to function as teacher-leaders and had a significant impact on chemistry education;
- Insight into the concept of teacher-leader was gained by examining the participants' role in guiding and instructing their colleagues;
- Essential and effective components of the leadership program were identified.

The main conclusion of this research is that an effective long-term leadership program can change teachers' beliefs and behavior and that chemistry teachers can be trained to be successful teacher-leaders.