

Strategies of gaining ownership

The Weizmann team

Strategies of gaining ownership

- ✳ **Involving teachers in the development and assessment of the science curriculum**
 - ✳ **Evidence-based professional development**
 - ✳ **Action Research**
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Strategies of gaining ownership

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Involving Teachers in the Science Curriculum Development Process

Teachers as classroom and school
based curriculum developers.

*The bottom-up process as opposed
to top-down process*

Assumptions

It may:

- ❖ Reduce teachers' anxiety
 - ❖ Develop creativity
 - ❖ Enhance motivation
 - ❖ Improve dissemination
 - ❖ Encourage leadership
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An example of a workshop: Development of learning materials

* 22 science teachers who were prepared to teach “Science and Technology for All” from various disciplines: agriculture, biology, chemistry, physics....

* Met for 3 years, one day (8 hours) a week

Hofstein, Mamlok & Carmeli (1997). *Science Education International*, 8(1) 26-29.

Three phases of the workshop

- ❖ Development of learning materials
- ❖ Implementation: A trial version of each module was piloted in schools
- ❖ Dissemination

Five modules

Radioactivity, Plastics, Light and Color, Chemical and biological extermination, Food and nutrition

Mamluk-Naamn, Hofstein & Penick (In press). *Journal of Science Teachers Education*, 8(1) 26-29.

Contribution of the workshop

- ❑ Increased their creativity
 - ❑ Helped to incorporate new teaching strategies into the regular classes
 - ❑ Opportunity to work with less able students
 - ❑ Ownership, autonomy and self-reliance
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Contribution of the workshop

- ❑ Confidence in using alternative assessment
 - ❑ Ability to guide and lead other teachers in the implementation and assessment of a new curriculum
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Evidence-based professional development

- ❖ If you were teachers, how would you report on your professional development?
 - ❖ What artifacts would you present?
 - ❖ How would you transform the artifacts into evidence?
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Evidence-based professional development

- Accomplished teaching should always occur simultaneously with reflection, in order to improve the teaching strategy.
- It should be followed by protocols assembled in a portfolio, which can be used to demonstrate evidence-based accomplished practice in science teaching, in an effort to achieve more effective teaching.
- The portfolio should document the activities, interactions, and behavior in the chemistry laboratory where inquiry-type experiments are implemented. It can be viewed as a systematic and organized collection of evidence used to monitor the growth of a learner's knowledge, skills, and attitudes in a specific content area.

□ **Lave & Wenger, 1991**

The evidence and the activities associated with its processing foster the creation of a community of practice. The process of collecting, explaining and justifying these evidence sources therefore helps in enhancing teachers' development towards accomplishment in their practice.

□ **Klenowski, 2002**

The portfolio used for CPD purposes can include materials and samples of work that provide evidence for critical Examination of teaching and learning practices.

□ **Mamlok–Naaman, Navon, Carmeli & Hofstein, 2003**

The workshop provided an environment of support, collegiality, and collaboration with professional researchers and other teachers who teach the same or related subjects, in a milieu that encourages teachers to reflect on their classroom practice and on the results of their research efforts.

□ **Eilks & Ralle, 2002**

The lectures that those teachers attended at the workshop enabled them to undergo a conceptual change and to realize that a reflective study has its own value and is indeed beneficial to their work (Eilks & Ralle, 2002).

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4. Action Research

A reflected research method performed by an individual teacher or a group of teachers, in order to improve their teaching, and to broaden their understanding of teaching methodologies and the problems involved in their implementation.

Action Research

- *The teachers select teaching problems in their own teaching environment and investigate them.**
- *The investigators are also the customers. Therefore, they can draw conclusions and apply them in class.**
- *This kind of research is usually done in collaboration between colleagues, and it endorses team work.**

Action Research

***Inquiry into their teaching and their students' learning in their own classroom.**

***Teachers research their own practice of teaching.**

Feldman & Minstrel (2000)

Action Research

- *To try to find out what is actually going on.**
- *To monitor and thereby formatively influence the direction of new developments.**
- *To evaluate what is already taking place.**

Lewis and Munn (1987)

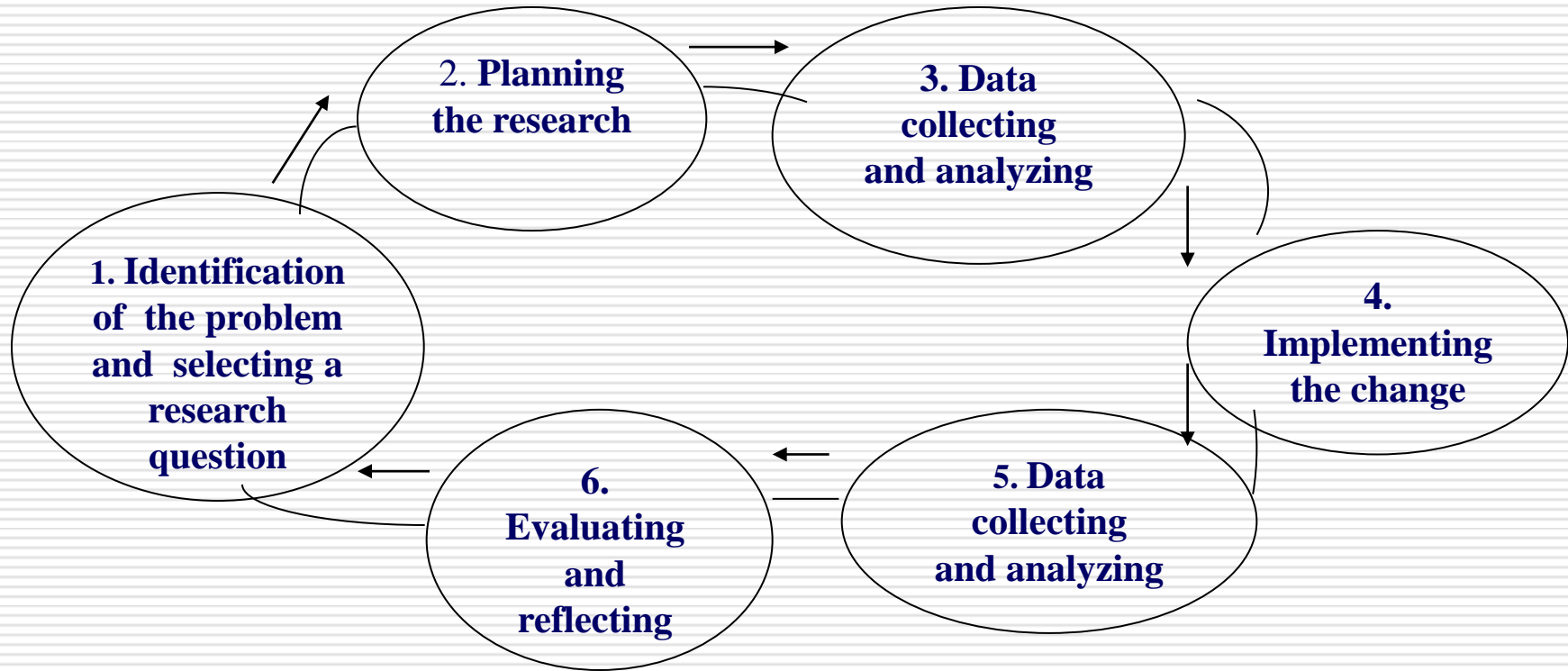
Action Research - Why?

- *Scientists from academic institutions are usually unfamiliar with the “culture” and atmosphere in class.**
 - *Academic research is usually performed in a traditional manner.**
 - *The teachers take interest in the individual rather than in the class.**
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Objectives of the Study

- *To use *Action Research* as a tool for the professional development of chemistry teachers.**
- *To encourage the creation of a professional community of chemistry teachers.**
- *To establish a leading-teachers' team who will perform *Action Research* with teachers.**

The Various Stages of *Action Research*



Thank you!



Making things explicit

Practical advices for activities
that might help developing ownership

Activities to enhance ownership

- A letter to the principle about the teacher's participation in the workshop.
 - Asking the teacher to share with other teachers at school.
 - Asking teacher to present at the annual chemistry teacher conference/
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...Activities to enhance ownership

- Happening – preparing posters and creative activity

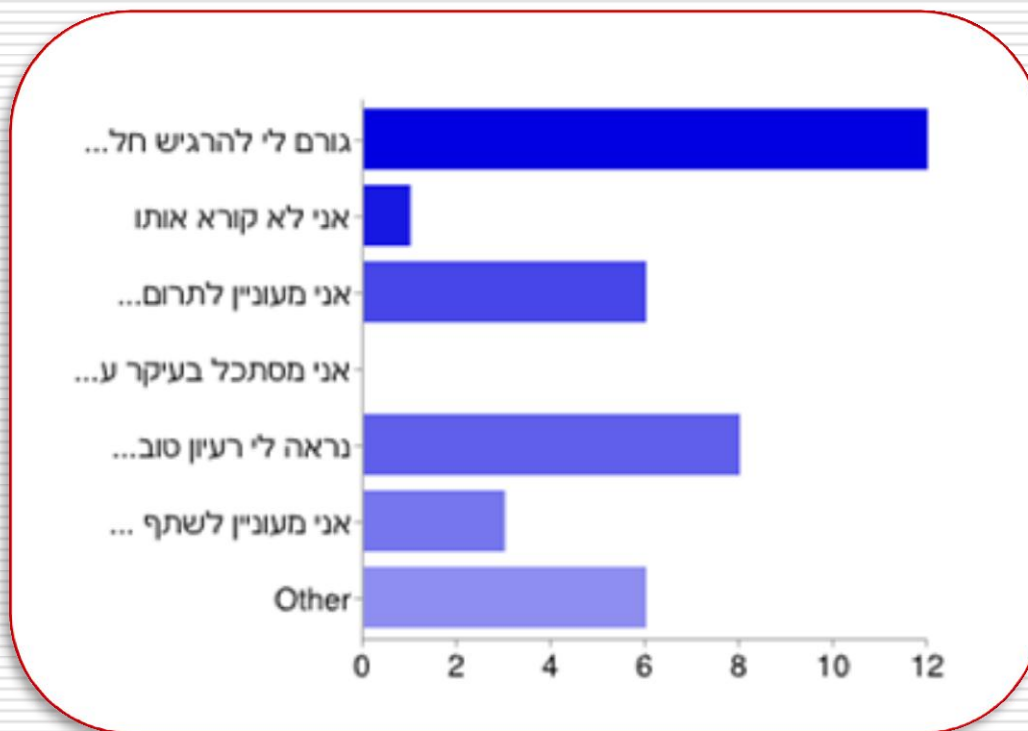


...Activities to enhance ownership

- Each teacher presents in front of the whole group at least twice.
 - Asking the teacher to write an article to the teachers journal – “Al-Chimia”.
 - Lectures, in the face to face sessions, are tailored according the modules which developed.
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...Activities to enhance ownership

□ Newsletter



Atmosphere to enhance ownership

- ❑ Providing a feeling of home
 - ❑ A close & warm contact between the teachers and the CPD providers
 - ❑ Finding the golden path for the guidance of the teachers and for overcoming difficulties.
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