



Team-Workshops for Science Teachers in Schools

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Abstract

Teaching science in middle school is very challenging since it is an extremely demanding discipline, and in addition, the teacher has to be an expert in chemistry, biology, and physics whereas he has usually mastered only one of them. While many authorities offer disciplinary professional development courses for teachers, these courses usually take place out of school and teachers participate as individuals. Professional development courses, occasionally given in schools, are generic, and do not strengthen and revise the disciplinary knowledge. In our unique program - Team workshops - we offer a series of short, and intensive, active workshops, given in schools. Our experts come to schools to work with the teams of science teachers and lab technicians, in their natural working environment. The main objective of the team workshops is to enable teachers to develop new curricular activities through the implementation of new pedagogic tools that fit the needs of their students. The workshops are varied, but all of them are based on three main elements - reinforcing the subject matter, experiencing use of the new pedagogic tools and collaborating for the development of new activities. Operating the Team Workshops Program provides benefits as well as challenges. This is the third year of the program, and teachers' feedback in anonymous, evaluation questionnaires are very positive. More than 90% of them note that the workshops contribute to their work, and ask for additional workshops.

Background

Professional development of teachers continues throughout their professional life [1]. Teachers in Israel regularly participate in professional development courses, which are integral part of their job, and a prerequisite for professional promotion. These courses are highly important to improving and maintaining the quality of teaching, yet the courses offered in schools are often generic and not disciplined-oriented, hence they are less beneficial to science teachers. On the other hand, disciplinary specific courses are usually offered to all teachers in Israel and provide professional development and mutual enrichment for the participants. However, such courses are not dedicated to enhancement of teamwork inside the school, nor are they specific to teachers' needs in their particular schools. Therefore, the development of disciplinary teams inside school is limited. In the last decade, we witnessed increased usage of all kinds of customized services - people prefer to be treated by personalized medicine, to follow a personalized diet and further, to obtain advice specific to their personal lifestyle [2]. In the Team Workshops Program, we offer short and intense workshops adapted for the specific needs of science teams in school. The workshops focus on learning how to implement advanced discipline-related pedagogical tools, aiming at the collaborative development of new lessons [3].

Objectives

The Team Workshop Program for science teachers has four main objectives

- To deepen base of scientific knowledge and to enrich that knowledge with cutting-edge science innovations.
- To equip the science teachers with new pedagogical tools.
- To strengthen the daily and professional interactions of the team and to develop a framework of collaboration between the teachers.
- To encourage teachers to develop new modules that are adapted to both the syllabus and specific needs of the school, with emphasis on the specific characteristics of their students.

Methodology

We offer short and intensive workshops (60-90 minutes each), aimed at being implemented in the science teachers team-meetings or as professional development courses at school. The workshops are modular, so that one or a series of modules can be run with a specific team of teachers. During a

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workshop, the teachers participate in a short activity that incorporates a new or advanced pedagogical method in the same way the students experience it. The teachers then apply the new tool while developing similar curricular activities/lessons. The Team workshops emphasize the empowering of teachers as learners and developers and contribute to their teamwork. The content of the workshops is determined in liaison with the science coordinator, according to the needs and requests of the teachers.

An example for a workshop could be a treasure hunt game on the topic of lever laws.

In this workshop, we emphasize the advantages and how motivation can be intensified using competition in a learning game [4]. In this game participants proceed along the quest by solving riddles, assembling their knowledge through building levers, watching videos and experiencing the force achieved by levers within the human body.

In such a workshop, the teachers experience the active learning achieved while playing games, in addition to the excitement of being involved in a competition. Further, technology-based teaching is threatening for some teachers hence experiencing the technology may reduce the technophobic responses and enhance the chances of applying technology-based pedagogy in class. Moreover, this is an example for a pedagogical tool that teachers can easily adopt in a collaborative teamwork development.

Results

Following each set of 3-6 modules, we sent the teachers a feedback questionnaire. The results reflect the significant contribution that this program has on their teaching and their teamwork. We asked the participating teachers questions about the utilization of the pedagogical tools presented in the workshop, and the contribution of the collaborative part to their teamwork. The charts presented are based on the responses of 62 teachers from ten different schools.

Fig. 1: The normalized distribution of answers of 62 teachers, to the question: “Did you find the workshop effective for your teaching?” graded between 1 to 5 (1 represents: ‘Not at all’, and 5 represents: ‘Yes indeed’)

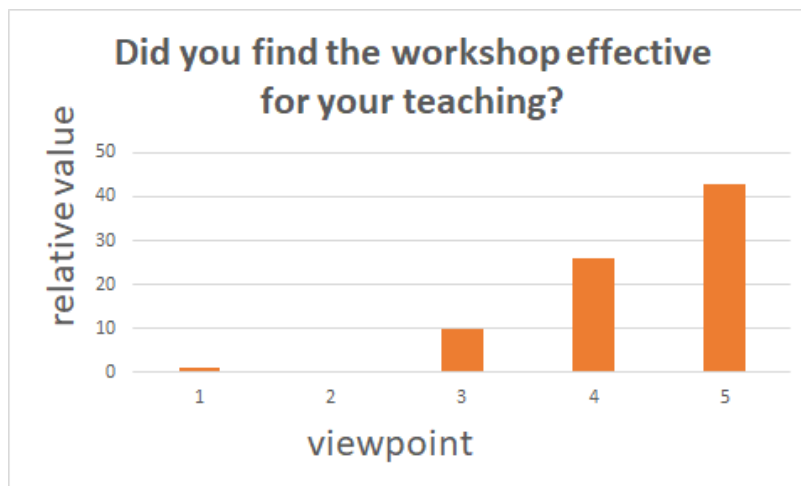




Fig. 2: The normalized distribution of answers of 62 teachers, to the question: “Are you going to use the new teaching tools in your class?” graded between 1 to 5 (1 represents: ‘Not at all’, and 5 represents: ‘Yes indeed’).

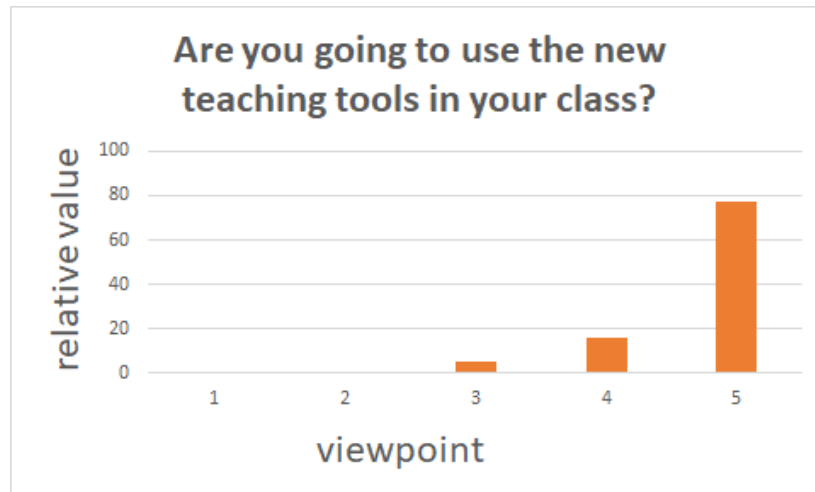


Fig. 3: The normalized distribution of answers of 62 teachers, to the question: “Did the workshop contribute to your team collaboration?” graded between 1 to 5 (1 represents: ‘Not at all’, and 5 represents: ‘Yes indeed’)



Summary

In this paper, we present a professional development program for use by teams of science teachers at their respective schools. The program consists of sets of modular workshops specifically tailored to the team’s needs. They are based on active learning tools, experienced by teachers as a team, thus encouraging collaboration between the team members. The active workshops motivate the development of new modules and lessons specifically oriented to their students.

In the third year of implementation, we still face some challenges: in some schools, there are no regular team meetings and the teachers do not work as a team at all, not even in the sharing of simple learning materials. Additionally, many teachers are reluctant to enrich their pedagogical tool box, concerned that it would delay their meeting of the requirements of the curriculum, and cause them to



lose control over their class. Those teams who enter the program and try the workshops find the substantial advantages offered, as we observe in the evaluation results.

References

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