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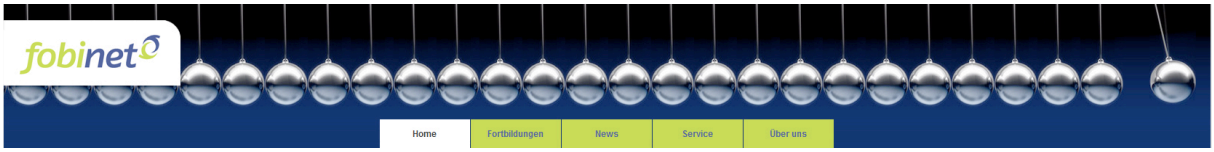

Fobinet: An Internet Supported Platform for Nationwide Coordination, Promotion and Funding of Physics Teacher Training Activities in Germany

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Abstract

Fobinet is a German acronym, meaning "network for in-service physics teacher training". Funded by the German Wilhelm and Else Heraeus foundation [1] and run by the authors under supervision of the German Physical Society DPG [2], Fobinet is a nationwide project in Germany, which was very successfully operating for a period of three years from April 2008 to March 2011.

Its main purpose was to centrally coordinate, strengthen, promote, and initiate in service physics teacher training all over Germany. This was supported by establishing an internet platform [3]. Its data base served as basis for not only initiating new activities but also as platform for announcing nationwide as well as regional teacher training activities in physics. In addition it was intended to help experts in the field – teachers as well as scientists - to start networks, i.e, to come to know each other and start common new activities. Fobinet was very successful and in some respects, expectations were even surpassed: it reached more than 20,000 teachers within the three years running phase!

The project

Physics teacher training can offer support in two different areas: understanding modern ideas of teaching and learning and understanding modern developments in physics. In the first area usually researchers in science education are asked. In the second, physicists are the experts. According to the small number of people working in physics education departments in Germany and according to time consuming reform activities in the universities the capacities for teacher training are getting smaller from year to year.

In order to provide useful information and ideas about contemporary physics and physics education, in service training for physics teachers must at least partially be conducted by experts in the field, i.e. researchers working in physics research and development projects, and physics educators doing research and development. This means that successful activities require involvement of experts from industry or universities. In Germany, this need was seen already more than 30 years ago by the German Physical Society; and in 1983, it established a series of in service teacher training seminars – usually for the duration of one week – at its center in Bad Honnef [4]. At present, there are regularly three full week courses for physics teachers as well as two rather shorter courses (3-4 days) for beginners or new teachers each year, founded by the German Physical Society and partially by the Wilhelm and Else Heraeus foundation [5].

In the 1990-ies and the first decade of this century, the situation of in service teacher training in physics in Germany became critical. Reforms of regulations led to a general increase of the need of teacher training activities. But due to lack of money the regional training centers, focused now more on pedagogy or general didactical skills and very rarely training in modern topics of physics were offered. Second, there was and still exists quite a shortage of physics teacher students. Therefore also students of either other natural sciences or physics without any pedagogical education were allowed to become physics teachers in some of the states of Germany. Those career changing teachers often lack pedagogical, didactical, and methodological skills, but sometimes they also do not have enough physics connected content knowledge as well.

These two facts combined easily explain the enormous demand of teacher training activities. In particular regionally organized short courses focusing on the physics are needed which can help teachers to develop interesting teaching strategies for modern physics teaching as well as courses focusing more on characteristic problems of career changers. This was the starting point for the project Fobinet in the year 2008.

The idea was to

- collect and analyze all available data for offered physics teacher training courses all over Germany in order to get to know in detail the state of the art and offer information
- extract relevant and needed content for such courses
- find experts who would be willing to contribute to regional and nationwide teacher training courses
- plan, program and establish an easy to access data base within an internet platform
- collect data referring to the organization and jurisdiction matters of such courses within the various states of Germany
- find cooperation partners from other institutions/organizations offering similar teacher training activities
- permanently coordinate and help planning and organization of teacher training courses
- help in planning to establish regional teacher training courses
- offer marketing/public relations to make project ideas and results widely known within the community
- reach the concrete aim: at least 20 000 teachers participating in one or more courses/seminars within the three years

These plans were quite ambitious and it is obvious that the main ingredient for successful realization is funding. Our experiences with this project concerning funding are simple and obvious and can be summarized as follows:

- Attendance increases if there are no large costs associated with attendance /participation. Usually – if at all – there should only be travel costs what automatically means that regional courses are needed if many otherwise reluctant potential course candidates should be successfully reached.
- Course leaders/speakers should also get funding to cover their travel costs. In addition, it was found helpful if small honorariums were given to the speakers. This definitely helps if the speaker is very good and therefore asked more often to offer this service for such events.
- Those organizing a course/seminar – which can e.g. be teachers themselves who feel the need for in service training – must get support also in partial funding. Quite often teacher training is voluntary and must be done in addition to the regular work. Therefore, any obstacle such as finding a room, writing invitations, organizing the speakers, and also handling travel cost refunds for speakers are potential reasons for not organizing such an event. People are hesitating if additional workload appears to happen. Here, financial help for hiring e.g. a student to handle all bureaucracy is helpful. Alternatively, and this was done quite often during the project, professional help was offered with regard to organizing the event.

This means that funding must not only include support for speakers and attendees but for organizational help as well. This last topic is often neglected. To summarize: successful teacher training seminar projects need funding for all three areas, attendees, speakers, and organizers.

Results:

Within the three years running time of the project all planned objectives were reached and many were even surpassed.

- A nationwide web based platform for all physics teacher training activities has been established (see Fig. 1). Within this platform, not only newly initiated courses are listed, but a very detailed and extensive list of all known activities concerning physics teacher training courses within Germany as well. This led to a detailed calendar with many hundreds of listed activities.
- Within this platform the realization of an easy to use graphical physics teacher training map of Germany (see Figure below) was possible. Clicking on a state within Germany opens up a new map with a list of towns where activities can be found immediately.
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Interactive map of Germany used for Fobinet. Moving the mouse across the map leads to highlighting of the respective state (here Niedersachsen), already indicating how many seminars are listed for the near future. Clicking on a particular state of Germany opens up a new window showing all teacher training activities in the respective state with details.

- The manifestation of –so far three – regional centers with permanent training offers of usually at least 1 event /month was possible.
- Numerous new activities in form of single or regular events have been planned and organized.
- A very valuable data base of experts being able to offer training courses for science teachers in several fields of physics and physics education and for all school levels, an expert pool, is now available for future use.

In particular regular teacher training activities at the same location lead to networking of teachers. They communicate and share their ideas and teaching concepts. This networking – although only being a secondary effect of regular events is intended. It leads to more feedback and new input which is very helpful, e.g. for finding new and needed topics and thus helps to establish a dynamic process of teacher training activities.

Two examples shall illustrate some of the many activities. Fobinet often funded expert presentations at large school teacher meetings on physics topics. It led to a scheme called "jour fixe" in the city of Berlin, where each month, at a regular day and time, teachers meet in the afternoon for presentations or workshops by experts, dealing e.g. with special topics like, e.g., climate change and renewable energies. Fobinet as coordinating organization was also able to use synergetic effects e.g. by having experts given a number of talks in neighboring cities. This happened e.g. for topics on astronomy during 2009, the international year of astronomy.

A story of success:

- Within the three years project, more than 500 single events were funded, many of them in the second and most in the third year after the start up phase.
- Overall more than 2200 teacher training activities within German are listed in the data base.
- Overall more than 20 000 teachers have been reached, i.e. have attended courses.

The success of Fobinet even led to some unofficial kind of certificate, the Fobinet approval for an activity and even partner institutions asked whether they could get the Fobinet approval for their activities.

It is our sincere hope that now, after the regular and official ending of the three year project Fobinet in April 2011, the ground has been laid for successful follow up programs. First ideas for funding opportunities seem promising and we are confident that those who wish to initiate and organize physics teacher training activities in their region will also get funding in the future.

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We need to know and share the knowledge with all the people how best to reduce the radiation risks and how to live with the presence of the radioactive contamination.

We also believe that increased effort in strengthening international collaboration in education is essential.

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