

## Teacher's Training in the Czech Republic II

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### Abstract

*This paper deals with the current state of teachers' training in the Czech Republic. It summarizes the topics of past conferences and focuses on the issue of undergraduate training of chemistry teachers. Individual problems in teaching of future teachers are discussed. This report describes the system of undergraduate preparation of chemistry teachers and deals with problems that are encountered. It monitors the directions that contribute to increasing the competence of students during the preparation for a job. It covers the possibilities and various projects focused on improving current situation. In the Czech Republic, the need for change in preparation of future teachers has been discussed for many years. These changes are, however, facing many obstacles.*

*A brief questionnaire was developed. It focused especially on teachers' personal view of usefulness and availability of activities for teachers, what achievements and difficulties in lifelong education did they experience and what they would like to change in practice. The results of the questionnaire are discussed in the report. Furthermore, the paper focuses on finding solutions of these problems.*

### 1. Introduction

Previous papers were focused on new trends in education in chemistry and on problems in lifelong learning of teachers in practice.

This paper is focused on the undergraduate education system which is currently very fragmented. Graduates of high quality are becoming increasingly rare, and the best ones often end up in other professions. This affects the quality of education. Problems of undergraduate chemistry teacher training as well as current issues in teacher practice will be discussed.

## 2. Training of future chemistry teachers

### 2.1 Non-uniformity of pre-graduate education

The main problem is non-uniformity of the education system in different universities. The result is a varying quality of graduates, which in turn affects the quality of education performed by these graduates.

There are various ways to become a certified chemistry teacher by studying at university. A brief list of possible ways to obtain teaching certification follows: [1]

#### Option 1

Bachelor's degree: Pedagogical-psychological preparation, inspection of classes, basics of natural sciences.

Master's degree: Development of natural sciences knowledge. The emphasis is put on teachers' competencies.

#### Option 2

Bachelor's degree: Focus solely on science (one or two areas), pedagogy as an optional subject only.

Master's degree: Follows the bachelor's degree and develops it, inclusion of teaching focus.



### **Option 3**

Bachelor's degree: only of non-teaching character, focused solely on science.

Master's degree: focused on teaching subjects and teaching experience.

### **Option 4**

This one is very different from the previous three. It is designed for chemistry graduates, who decide (during or after completion of their studies) to become a chemistry teacher. First there is a non-teaching master study program.

It is followed by a further bachelor program, focused on chemistry methodology and pedagogical-psychological basics.

### **Option 5**

This is a very unusual way, but we describe it to illustrate the non-uniformity of the pre-graduate preparation system. Teachers at vocational schools can gain their teaching certificate by studying for a bachelor's degree after finishing their secondary chemistry school. There they obtain teaching basics and further develop their professional knowledge. They don't go for master's degree and they become so called 'masters' at vocational schools.

All these options are similar in some aspects, but they differ in many other ones. The aim is to find commonality between the systems and offer suggestions, which could be applicable to all types of schools.

The requirement for becoming a teacher is graduation from a university (master's degree), but reality often leads directors of schools to recruit teachers without proper approvals, and sometimes without a university degree.

Graduates of different universities can differ significantly in their knowledge, skills, teaching experience and motivation for their work.

The creation of a standard of teaching profession is the aim of a special project under the Ministry of Education, Youth and Sport (MŠMT). The quality of teachers and professional standards received special attention in a document titled "National programme of education development in the Czech Republic".

It has been indicated, that the education process goes through changes and reforms. The efforts of innovative methods are visible. Project "Innovation of professional preparation of prospective chemistry teachers" at Palacký University in Olomouc, can serve as an example. This project has been co-financed by the European Social Fund and state budget of the Czech Republic. The aim is to allow prospective chemistry teachers to be in close contact with pupils at primary and secondary schools, through management of student's projects directly in chemistry lessons, tutoring laboratory lessons, organizing Olympiad in chemistry at schools and excursions at laboratories for pupils, chemistry consultations for talented secondary school pupils, preparation of natural science competitions and popularizing events.[3]

The focus on preparation of prospective chemistry teachers came into the front rank during the International Year of Chemistry, at an international student conference Project Teaching in Chemistry and Related Subjects which took place at Faculty of Education, Charles University in Prague (Chemistry and Chemistry methodology department).

## 2.2 Lifelong teachers training

The previous online meeting was focused on lifelong learning. Therefore the main topics will be briefly summarized: Same way, as a lack of system in pre-graduate preparation, there is no unified system of lifelong education of graduated chemistry teachers. During their studies, students meet the information about necessity of lifelong education, but for many, adequate motivation is missing. According to the fact, that the job itself is demanding, the salary rate is low, the courses of lifelong education are not very popular, even if the reputation of the individual schools might improve.

## 2.3 Questionnaire to determine teachers' views in practice

A brief questionnaire was developed. The questionnaire was focused especially on teachers' personal view of usefulness and availability of activities for teachers, what achievements and difficulties in lifelong education they experienced and what would they like to change in practice.

The questionnaire was given to 150 teachers (78 returned) attending Summer school for chemistry teachers at ICT Prague in August 2013. Conclusions from questionnaires follow:

- Participating teachers had practiced for 20 years on average.
- Absolute majority of the participants (62.8 %) said they had enough knowledge and skills from their high school. Some respondents added that the lifelong learning is needed.
- Almost all the teachers (85.9 %) were motivated to participate in lifelong learning programs (conferences, meeting, workshops etc.).
- Almost all the teachers (96.2 %) considered training as useful and beneficial. Teachers highlighted that the quality of some training programmes was worse than others. These teachers did not say which programmes they meant. Nevertheless, this information would be beneficial for reducing of the problems. For some schools trainings are sources of funds (to improve the quality of teaching).
- Three quarters of the participating chemistry teachers (74.4 %) had enough information about ongoing trainings, meetings and workshops. Some teachers had too much information about trainings, and 25 % did not have enough. The question is: did all the teachers try to search for information?
- The trainings were available for 73.1 % of teachers. Problems should be removed for the rest of teachers. The problems are: long journey, time press, etc. The main problem was lack of funds and time (for journey, course fee, remuneration for substitute teachers etc.) Training time takes time to teach students.
- Teachers are most interested in these topics: Chemistry all around us, Chemistry of everyday life, Chemistry in practice, Chemical experiments (safe, interesting, modern).
- We also asked teachers what is the biggest problem in their practice. This question was answered most extensively:
  - o Lack of funding leads to: poorly equipped laboratories, outdated classrooms, lack of chemicals, small wages, and unavailability of materials. Textbooks are outdated (with outdated terminology and information).
  - o Lack of interconnection among science subjects.
  - o Time for educational process is not sufficient. There is not enough time for understanding, repetition and practice of new information.
  - o Laws restrict chemical experiments.
  - o Number of students is declining. The directors of prestigious schools have to accept less motivated students. The level has been falling.
  - o Morality of students is also problematical. Students are focusing on their personal benefits and cheat. Communication with parents is sometimes problematical too.

### 3. Possibilities to improve the current state

There are enough projects focused on lifelong learning of chemistry teachers. A nice example of them is a project named "Innovation in professional training of future chemistry teachers" that has been described in Chapter 2.1.

The Czech Republic participates in EU education programs regularly. The Ministry of Education, Youth and Sports tries to support these projects as much as possible. The National Agency unites these programs (from 1.1.2006).

The results of this support are:

- 1) availability of information to all potential participants,
- 2) enhance transparency and coordination in the administration of programs,
- 3) the use of the experience gained from the implementation of programs,
- 4) effective and average use of financial and human resources [2].

The efforts of the Ministry of Education, Youth and Sports are used. There are many projects focused on students' motivation and lifelong learning in the Czech Republic.

### 4. Project results

One of the highlights of the project was establishment of cooperation among teachers, schools and professionals. The participants were introduced to each other on a workshop held by ICT Prague.

We managed to proceed with project's activities despite some issues during the second year of the project. New articles were added to the database of the project portal. Some of the teachers are little reluctant to cooperate, nevertheless project requirements were met.

### 5. Conclusion

The preparation of future science teachers is not uniform in the Czech Republic. There's a current reform, which tries to set the standards in education to stop further deterioration in this area. There are many issues with lifelong learning for teachers. The good news is that both the ministry of education and faculties of education are well aware of this issue, and they are making efforts to improve the current state. There are also organisations and projects that are intensively dealing with it. It's a long run and projects like this one can help.

Our questionnaire survey revealed that chemistry teachers are interested in lifelong learning, feel being supported by their schools' managements, have enough information on activities in this area and consider the courses available. This gives some hope for improving many problems that were discussed in the questionnaire.

### References

- [1] Koncepce pregraduální přípravy učitelů základních a středních škol (Conception of pre-graduate preparation of primary and secondary school teachers). MŠMT ČR. <http://aplikace.msmt.cz/ak/koncepce1.htm> (accessed July 20, 2013).
- [2] Evropské záležitosti- programy EU-Program celoživotního učení 2007-2013 (European Matters – EU Programmes – Lifelong Learning Programme). <http://www.msmt.cz/eu/program-celozivotniho-uceni-2007-2013> (accessed June 5, 2007)
- [3] Inovace profesní přípravy budoucích učitelů chemie (Innovation of professional preparation of prospective chemistry teachers). Palacky University in Olomouc. <http://ucitelchemie.upol.cz/> (accessed August 1, 2013).



