

The SECURE project – Slovenia as an example of national results

Barbara Rovšek and Jurij Bajc
University of Ljubljana, Faculty of Education

Abstract

In the paper some of the Slovenian national results of the SECURE project (Science Education CURriculum REsearch) are presented. The project started in 2010 and is finishing at the end of 2013. The main focus of our contribution is on examples of the significant differences when compared to the findings in the remaining nine member countries of the SECURE consortium. In particular, some teaching activities that are incorporated in the intended as well as in the implemented curricula in Slovenia, but are not (yet) carried out in other consortium countries, are described along with the teachers' and learners' attitudes towards them and opinions about these types of activities.

In the course of the project many formal and practical solutions, some of which exist in Slovene educational system for decades, gradually appeared more and more visible and in contrast to practices in most of the other countries. What we already have incorporated in the educational system and in the life of all pupils in compulsory schools in Slovenia for so long now may become an example of good practice and a role model for other. We shall describe some existing system solutions, which lead to competent teachers at all levels of education, which promote and enable active learning of MST disciplines and which lead to a rise of motivation of pupils for science. External and independent confirmation that we are on the right track, at least when compared to the pupils in other European countries, comes from TIMSS international results in science.

Extended abstract

SECURE is a three year comparative cross-country curriculum research project of a consortium of ten member states. The project is entering the final stage of finalizing the results. The focus of the project is on three aspects of the mathematics, science, and technology (MST) curricula and their objectives in view of balancing the needs between training future scientists and broader societal needs. The three explored aspects of the MST curricula are the written (i.e. *intended*) curricula, the curricula as understood and carried out by the teachers that perform the teaching (i.e. *implemented* curricula), and the feelings and opinions on the MST learning of the learners (i.e. *perceived* curricula). The backbone of the research is the curricular spider web (van den Akker, 2003) that is employed at all three aspects in all member states in altogether 150 classes of each of the four learners' age groups (5, 8, 11, and 13 years old pupils). At the national level, the data is collected by summarizing national curricular documents, by using teachers' and learners' questionnaires, and by interviewing all teachers and about four learners in 6 out of 15 classes for each age group in a country.

During the course of the project we realized that some formal solutions in Slovene educational system, which are so fundamentally interwoven into the compulsory school practice that we do not percept them as special at all, are quite unique but unquestionably good when looked upon from outside (as independently confirmed also by TIMSS results (Martin et al., 2012)). There are also some other features of the school system, which have good and bad sides. On one hand they put certain limits to teacher's autonomy, but are, on the other hand, making a firm frame of basic knowledge, achievable by every pupil. Here are some examples.

- Primary school teachers (for pupils of ages between 6 and 15) were educated in a 4-year university course at Faculty of Education since the year 1987, and kindergarten teachers were educated in a 3-year course at the same institution (before 1987 the courses were 3- and 2-year). With Bologna Process courses become 5-year for primary school teachers and 4-year for kindergarten teachers.
- All future teachers in kindergarten and lower grades of primary school have compulsory university subjects Mathematics, Science, Didactic of Mathematics, Didactic of Science, and Didactic of technology. Corresponding disciplines are all contained in kindergarten and/or primary school curriculum.
- Most (around 95 %) of the primary schools in Slovenia are public schools, obliged to follow the officially accepted curriculum. Public school system, regulated in such a way, is a foundation of equal education opportunities for all children.
- Compulsory education in primary school lasts for 9 years. There are 15 obligatory "Activity days" in **each** grade, 6 or 7 of them are Science and Technical days. Many general goals of education and also those specific to MST education are implemented during Activity days, such as establishing interdisciplinary connections between different school subjects, integrating the school subjects into everyday life, performing active and autonomous learning and learning in groups. Activities are

supposed to be chosen to encourage critical thinking, to enable the usage of gained knowledge, and to learn about new experimental methods of field and laboratory research.

- There is also an obligation for every school to organize the so called "School in natural environment". During their obligatory education in primary school every pupil must have an opportunity (but he/she is not obliged to) to participate at least twice in such a happening, which usually lasts 5 days and is organized away from home. In Slovenia there is a network of the facilities, run by an organization CSOD (Centre of curricular and extracurricular activities), who runs 23 "homes", positioned mainly in rural, natural environment all around Slovenia. Some similar goals as for Activity days and also some other general goals are implemented in the School in natural environment.
- Syllabus and timetable for primary school are precise and definite. Number of hours per year for each school subject is defined. Contents, goals and minimal standards of knowledge are defined in detail in core curriculum documents for every subject. A teacher is constrained in large part to the contents of the curriculum, but nevertheless there is some time left for the so-called optional (suggested) topics. We shall discuss the limitations of teachers, imposed to them by curriculum in connection to findings gained from interviews with teachers. It is not all bad at all.
- National external examinations that are obligatory for schools, but not obligatory for pupils and are performed widely after each triad of the primary school can be considered also as a fuse ensuring equal education opportunities.
- There is some freedom of organisation of lessons. School can decide to perform the flexible syllabus with arbitrary distribution of lessons within one school year, providing the sum of hours per subject is as defined in principal document. The usual practice is to nest science (and technology) lessons in blocks of two school hours. Time consuming active learning and group or individual practical work become possible, if there is more time reserved within timetable.
- A systematic procedures of identifying and working with talented pupils are published in official regulations. Some of them are also well implemented in practice. For example, for pupils talented in the field of mathematics organisation of additional lessons is the usual practice in most of the Slovene primary schools, as well as remedial classes for under-achievers. There are also many competitions in various scientific and technical disciplines organised officially on a national level, and it is a common practice that teachers organise additional lessons for pupils with positive attitudes and interests for these fields.

In successive discussion within the project group in numerous meetings eventually these and some other features of Slovene educational system floated up to the surface as an example of solutions, which on one hand in practice exist and on the other hand seem to be in dialectical opposition to practices in some other European countries. Should a synthesis yet be performed? We believe a *rationale* behind our system solutions is fairly close to ideal (nevertheless the implementation of some can be improved). We are more afraid to lose benefits of existing and well implemented good concepts due to hard times we are all in and not enough thoughtful emergency cost cutting procedures.

Looking at the teacher interviews data from a wider perspective, gained while working with other SECURE partners, a confirmation of a common belief arises: the hardest feelings of the teachers are about the changing (to worse), not about the present state. Various complains brought up in interviews by pupils and teachers will be discussed.

Acknowledgment

This research was supported by SECURE Project No SIS-CT-2010-266640 under the 7th Framework Program funded by European Commission

References

- van den Akker, J. (2003). Curriculum perspectives: An introduction. In J. van den Akker, W. Kuiper, U. Hameyer (Eds.), *Curriculum landscapes and trends* (pp. 1-10). Dordrecht: Kluwer Academic Publishers.
- Martin, M.O., Mullis, I.V.S., Foy, P., & Stanco, G.M. (2012). *TIMSS 2011 International Results in Science*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

Correspondence concerning this article should be addressed to Barbara Rovšek, University of Ljubljana, Faculty of Education, Kardeljeva ploščad 16, 1000 Ljubljana, Slovenia, e-mail: barbara.rovsek@pef.uni-lj.si.