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Valenčič Zuljan, M. and Janez, V. (Eds.) (2010). Facilitating Effective Student Learning through Teacher Research and Innovation. Ljubljana: University of Ljubljana, Faculty of Education. 490 p., ISBN 978-961-253-051-8.

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The 20 studies in this monograph, contributed by authors from 13 different countries and four continents (most of the contributions are the result of collaboration between two or more authors), represent a variety of topics, methodological approaches and findings. The studies span the whole school system – from primary through secondary to higher education, (such as the contribution by Maciejowska and Frankowicz, which describes a model of introducing innovative approaches into the teaching of university professors); they range from small-scale innovations, limited to one lecture room (such as the experiment of Rodicio and Sanchez on improving explanations) to nationwide attempts to innovate teaching (such as fostering teacher innovation in chemistry teaching in Tailand, by Coll et al.).

In spite of their differences, all of the studies start from a common, very important question: How can innovations brought about by teacher research lead to deeper, more effective learning and better student results? Tightly connected to this is the further question: How can academic researchers help teachers to improve their qualifications for becoming researchers of their own practice?

It is interesting to note that the majority of the studies deal with innovations in the field of teaching natural sciences, especially chemistry. It is not my intention to present all of the different studies and their findings; I will instead concentrate on selected questions, for example: How can one achieve synergy and cooperation among (university) researchers, curriculum developers/school policy makers and teachers? What approaches have proven to be effective in overcoming the traditional dominant role of "experts" and the reluctance of teachers to introduce innovations dictated "from above"? On the other hand, how can one "empower" teachers to become competent in the relatively new and demanding role of researcher and innovator of his/her practice? What strategies have been employed to strengthen the teacher's capacity and willingness to embrace new approaches? There is also the question of the theoretical foundations of various innovations. The studies that make an explicit reference to this are in favour of social constructivism.

A good example of teacher empowerment is presented in the contribution by Eilks, Markič and Witteck (Germany). The study has a solid theoretical foundation and recognises the persistent difficulties in interaction between "different communities" – researchers, curriculum developers and teachers; it presents a solution in the form of the systematic introduction of teachers to participatory-emancipatory action research (as a better model than technical or practical action research). When the teachers' voice is heard, innovations stem from their own convictions and they become advocates of the innovation, in this case cooperative learning. It is important to note that this project has been underway for 10 years.

The case study presented by Keith Taber describes the UK experience of how student teachers can be introduced to performing action research and case studies during their university study. This well-founded study ends on a cautious note, stating that the "eventual success of this innovation cannot be judged for some decades…" (Taber, p. 40).

The case of major reform towards learner-centred chemistry teaching in Thailand is interesting in the sense that it presents thematic examples of interventions to innovate teaching in inquiry mode, such as teaching chemical kinetics. Students had to design experimental procedures themselves, and there was evidence of enhanced learning outcomes. An interesting observation is the uneasiness of some teachers and students who were not accustomed to learner-centred, more active learning and "it will take some time [my emphasis] for all stakeholders to become comfortable with this" (p. 218). There is also an important reminder to school policy makers: "If there is a mismatch between the assessment processes and pedagogies, the assessment regime wins every time" (p. 218).

The common reminder in these three very well-prepared and successful studies is that of time scale; effective innovations need time to unfold their potential and leave lasting changes. This brings to mind numerous current projects, including those co-funded from European funds, that are expected to "bear fruit" in two or three years; thus, schools and teachers are rushed from one project to another, without having enough time for reflection and real implementation in their everyday teaching.

Good projects do not have to be large; a good example of a small-scale experiment is the study of Rodicio and Sanches on instructional explanations, aimed at revising students' misunderstandings. It is well theoretically founded on the constructivist notion of the importance of existing (mis)understandings – and students' awareness of these – for further learning from instructional explanations; it also documents the efficiency of prompted explanations by test

results on retention and transfer. Cardellini (Italy) presents the usefulness of an under-utilised way of representing knowledge; namely, concept maps. Another interesting small-scale study is that by Glažar and Devetak (Slovenia) presenting teaching by GALC (Guided Active Learning in Chemistry), which helps students to develop learning strategies and enhance understanding and motivation through well-guided group work.

As can be expected, quite a number of the studies describe innovations that concern introducing different kinds of technology, mainly computer-based, into teaching. These attempts seem to be successful when technology is embedded in a well-designed, theoretically founded project, as a welcome a tool to achieve clear goals. Good examples of such an approach are the study by Syh-Jong and Jang, embedded in an excellent teacher education programme, or the study by Gulinska and Bartoszewicz (Poland) with a blended learning approach to educating student teachers of chemistry. The fact that small-scale technology can also be successful is proven by Borota's study on music education and the study by Cotič, Valenčič Zuljan, Simčič and Mešinovič on the use of the geoboard (both from Slovenia). On the other hand, introducing technology into a traditional educational environment without further interventions cannot bring about substantial innovations (studies by Umek and Sešek from Slovenia, and Svatonova and Mrazkova from the Czech Republic).

In addition to providing precious information about various innovations, from small-scale to system-wide, and the teacher's role in them, this international monograph also offers a lot of material for further reflection. Successful experiments and innovations raise the eternal question of transfer: How, if at all, can best experiences be transferred to other environments? How can we achieve a spread of good innovations? Do we have to start from scratch every time? Then there is the question of what makes an innovative project successful. Success does not usually come from short-term projects, introduced in a top-down fashion, nor from merely introducing spectacular high technology. Teachers are central actors, but they have to be supported in their new, demanding role by competent researchers operating within the framework of long-term, theoretically well-founded projects.