Editorial

Joke Voogt* and Jules Pieters

Department of Curriculum Design and Educational Innovation,
Faculty of Behavioural Sciences,
University of Twente,
Postbus 217, 7500AE, Enschede, The Netherlands
E-mail: j.m.voogt@utwente.nl
E-mail: j.m.pieters@utwente.nl
*Corresponding author

1 Introduction

Recent studies on teacher's professional development and the implementation of innovations reveal that several factors that influence implementation can be attributed to the effectiveness of the professional development arrangement that was in place in order to prepare teachers for the innovation (e.g., Garet et al., 2001; Penuel et al., 2007). From the perspective of implementation of educational innovations professional development arrangements are effective when they focus on pedagogical content knowledge, provide opportunities for active learning and are embedded in the local context. Accommodation of follow up support and reflection, sufficient time, and collective participation of teachers adds to the effectiveness of a professional development arrangement. More time for learning opportunities of teachers to integrate new knowledge into practice has a positive impact on implementation. Collective participation with colleagues plays an important role as well: innovations have more authority and impact when they are embraced by peers. Teaming up with colleagues also increases collegial interactions and motivation. By collaboratively tackling curriculum and practice problems related to the innovation teachers develop ownership of the innovation (Deketelaere and Kelchtermans, 1996; Parke and Coble, 1997; Voogt et al., 2005; Voogt, 2010). Active involvement in (re-)designing or attuning the innovation to teachers' own practice helps to give coherence to the external and internal goals of the innovation and contributes to teachers' self-efficacy in dealing with the innovation.

In this special issue, we discuss the role of technology in prospective and practicing teachers' professional development from two perspectives:

1   the role of collaborative curriculum (re-)design aiming at technology integration in teachers' educational practice as a format for effective teacher professional development

2   the support for teachers by technological tools and the impact on teachers' professional development.

In the first perspective, the use of technology in educational practice is considered an educational innovation. The current emphasis in research and policy is ensuring that

technology is used to create new opportunities for learning and to promote student achievement. Despite the fact that the use of technology in schools is no longer an issue in education, research shows that effective use of technology in education is often limited, because teachers are not well prepared to integrate technology and pedagogy fruitfully in their educational practice (e.g., Law et al., 2008; Voogt, 2008). According to Koehler and Mishra (2008) teachers' need technological pedagogical content knowledge (TPACK) to be able to effectively use technology in their educational practice. Hence, many teachers require professional development on how to integrate technology in education. In this special issue, we discuss professional development arrangements to prepare prospective and practicing teachers for technology use in schools. In particularly, the contributions will show how collaborative (re-)design of curricula with the aim to make them technology-rich can help teachers to acquire TPACK, to better understand the role of technology in education and to implement technology in their practice. In the first contribution, Nihuka and Voogt discuss how teacher design teams in the Open University of Tanzania collaboratively (re-)designed their course for e-learning delivery. The study explored the potential of teacher design teams in orienting teachers on course redesign. Experiences of teachers on collaborative course redesign and students' experiences with the redesigned e-learning courses were examined. Initial results showed that both teachers were enthusiastic on working in the design team and students were satisfied with the e-learning courses. The findings of this study showed that despite its challenges, the teacher design teams approach had enormous returns in terms of professional development of teachers and improvement of students support. In the second contribution, Alayyar, Fisser and Voogt discuss how pre-service students from a teacher education programme in Kuwait can be prepared to be ready for the integration of technology in their future educational practice. Students worked in small design teams and were coached by technology, pedagogy, and content experts, to find a technological solution for a pedagogical problem that a teacher normally faces. In their design teams, students blended content, pedagogy, and technology to design a learning environment enhanced with technology. The findings indicated that students gained significantly in their development of TPACK and their technology skills. In addition, they also showed a positive attitude toward technology and toward working in design teams. The third contribution in the first perspective is from Koehler, Mishra, Bouck, DeSchryver, Kereluik, Shin and Wolf. They present a conceptual view on possible solutions for hurdles teachers face when they want to integrate content, pedagogy and technology. Their assumption is that making a tool an educational technology requires creative input from the teacher to re-design, or maybe even subvert the original intentions of the designer. Teachers need to develop a willingness to play with technologies and ideas, and an openness to the construction of new experiences for students. The learning technology by design framework (Koehler et al., 2007) has been proposed as an effective instructional technique to develop deeper understanding of TPACK. In this paper, they expand their description of the LT/D technique to develop a deep-play model for teacher professional development. The deep-play model integrates

a   pedagogy for key 21st century learning skills

b   content that cuts across disciplines with trans-disciplinary cognitive tools

c   technology by the creative repurposing of tools for pedagogical purposes.

In the second perspective technology is not the educational innovation which is aimed at, but technology is available as a support tool for teachers. In this contribution we discuss several tools that may help prospective and practicing teachers in dealing with innovative and complex aspects of their practice (e.g., McKenney et al., 2008). Although the tools as such are often not developed with teachers' professional development in mind, they may be used in (collaborative) professional development arrangements or may contribute to aspects of professional development, e.g., by triggering teachers to reflect on their pedagogical approach or by providing teachers follow-up support during the implementation of new practices and routines. The contribution of Albashiry and Pieters studied the learning dimension of course management systems (CMSs). The study investigated the extent to which a CMS is being used by teachers in higher education to serve pedagogical purposes and the factors that influence such a usage. It further investigated whether the use of the system had improved the teachers' course design and teaching skills. Results indicated that the use of CMS by teachers followed the same pattern identified in previous research in the sense that the system is being used to serve organisational purposes with clear underutilisation of its learning potential although many teachers believed in such a potential. The contribution from Folmer, Nieveen and Schildkamp focused on the potential of a web-based support system aiming to improve teachers' formative evaluation capacities in (re-)designing curricula. The system provided support for four main stages: planning the evaluation, gathering data, formulating points for improvement, and undertaking action to actually improve the learning materials. In the contribution the design and evaluation results of the support system will be presented. First evaluation results showed that most teachers (involved in the evaluation of the system) perceived it to be relevant, consistent and usable. The last contribution in this perspective is from Christensen, Knezek, Tyler-Wood and Gibson. They present simSchool, an online dynamic simulator for learning about teaching. SimSchool is a web-based simulation of teaching and learning aiming to improve learning environment management by linking instructional decisions to improved performance for simulated students displaying a variety of learning characteristics. Field trial research conducted with quasi-experimental and mixed methods designs had shown significant impacts on pre-service and in-service teachers. Findings have led to the identification of differences in novice versus expert developmental levels in teaching confidence and competence.

References

Deketelaere, A. and Kelchtermans, G. (1996) 'Collaborative curriculum development: an encounter of different professional knowledge systems', *Teachers and Teaching: Theory and Practice*, Vol. 2, No. 1, pp.71–85.

Garet, M.S., Porter, A.C., Desimone, L., Birman, B.F. and Yoon, K.S. (2001) 'What makes professional development effective? Results from a national sample of teachers', *American Educational Research Journal*, Vol. 38, No. 4, pp.915–945.

Koehler, M. and Mishra, P. (2008) 'Introducing TPCK', in AACTE Committee on Innovation and Technology (Eds.): *Handbook of Technological Pedagogical Content Knowledge (TPCK) for Educators*, pp.3–29, Routledge, New York.

Koehler, M.J., Mishra, P. and Yahya, K. (2007) 'Tracing the development of teacher knowledge in a design seminar: integrating content, pedagogy and technology', *Computers and Education*, Vol. 49, pp.740–762.

Law, N., Pelgrum, W.J. and Plomp, T. (2008) *Pedagogy and ICT Use in Schools Around the World: Findings from the IEA SITES 2006 Study*, CERC studies in comparative education. Comparative Education Research Centre, The University of Hong Kong, Hong Kong, and Springer, Dordrecht.

McKenney, S., Nieveen, N. and Strijker, A. (2008) 'Information technology tools for curriculum development', in Voogt, J. and Knezek, G. (Eds.): *International Handbook of Information Technology in Primary and Secondary Education*, pp.195–210, Springer, New York.

Parke, H.M. and Coble, C.R. (1997) 'Teachers designing curriculum as professional development: a model for transformational science teaching', *Journal of Research in Science Teaching*, Vol. 34, No. 8, pp.773–789.

Penuel, W.R., Fishman, B.J., Yamaguchi, R. and Gallagher, L.P. (2007) 'What makes professional development effective? Strategies that foster curriculum implementation', *American Educational Research Journal*, Vol. 44, No. 4, pp.921–958.

Voogt, J. (2008) 'IT and curriculum processes: dilemmas and challenges', in Voogt, J. and Knezek, G. (Eds.): *International Handbook of Information Technology in Primary and Secondary Education*, pp.117–132, Springer, New York.

Voogt, J. (2010) 'A blended in-service arrangement for supporting science teachers in technology integration', *Journal of Technology in Teacher Education*, Vol. 18, No. 1, pp.83–109.

Voogt, J., Almekinders, M., Van den Akker, J. and Moonen, B. (2005) 'A 'blended' in-service arrangement for classroom technology integration: impacts on teachers and students', *Computers in Human Behavior*, Vol. 21, pp.523–539.