

Appendix 3. Narrative cases

A distinctive character of the ICLON research program is its dual focus on developing both theory and practice, which means that the research projects aim at simultaneously contributing to the improvement of educational practice and generating knowledge about this practice. To this end, we have chosen to use multiple complementary strategies: research about teachers' practical knowledge; research performed within the complexity of authentic teaching practices; research questions that stem from such practices; teachers that are involved in designing and performing research; and teachers as researchers. Research with this dual focus on both theory and practice development mostly results in the development of teaching practices involved in the specific research project. Also, our research often results in practical tools that are transferable to other settings outside of the research population. We here present brief descriptions of cases that illustrate the practical impact of our research program.

Case 1 - Induction program for beginning teachers

Within the setting of a nationwide induction program for beginning teachers (Dutch: *BSL*) a range of projects from all over the Netherlands have resulted in a knowledge base about the way in which teachers can effectively collaborate to stimulate professional development. Specifically for the region where ICLON is located (Zuid-Holland), a regional project was initiated which explicitly builds upon ICLON research on teacher professional learning communities. In this regional project, a total of 105 schools, 150 school-based teacher educators, and more than 700 novice teachers were involved. The project also involved ICLON teacher educators from the teacher training program, who collaborated with school-based teacher educators from various schools with the aim to develop a three-year induction program for novice teachers that met specific school requirements.

Case 2 – SpeakTeach app in foreign language education

In her PhD project Esther de Vrind developed a practical approach for teachers by which to provide adaptive feedback and improve students' speaking skills in secondary education. She designed and tested an app that allows students to assess their speaking ability and devise a plan for improvement. Next, students received adaptive support for improvement. The app is used in ten schools, and many foreign-language teachers use this method without the digital tool. Furthermore, an educational publisher has adopted the SpeakTeach tool in its collection and offers it to students, teachers and schools in the Dutch context.

Case 3 - Hybrid virtual learning and distance education

We have all recently become familiar with distance learning and blended learning. Deeper insight into the underlying principles of these teaching approaches for specific educational contexts and situations is desirable, in order to formulate practical advice and guidelines for education. That is why these research projects focus specifically on hybrid and distance learning. Various researchers have investigated how distance learning can be used effectively; how effective interaction at a distance between instructors and students can be promoted (Guo et al., 2021); how MOOCs are used (Wei et al., 2021), and how self-directed learning takes place with mobile technology (Lai et al., 2022), for example for learning a second language, or learning for an exam through the use of instruction videos on the Internet. This knowledge was used to digitally connect long-term sick children with their class through hybrid virtual education. In a PhD project and a postdoc project financed by NRO, the factors that influence the successful use of hybrid virtual education for chronically ill students were investigated (Klunder et al., 2022).

Case 4 – Professional development of academics abroad

Expertise from ICLON research is regularly used to support the professional development of academics abroad. Academic development activities related to teaching repertoire development, PhD supervision skills, as well as general research competences are provided. Especially for the development of academics at universities a domain-

specific approach is helpful. Academics are specialists in research in their field, and improving and innovating teaching in their domains can be stimulated through their domain expertise. During a 2-year international twinning project, ICLON researchers and educators have worked together with staff at Anton de Kom University Suriname to establish an academic development trajectory in which research and teaching were closely combined. For the participating academics this trajectory was beneficial to both their teaching and their research career development.

Case 5 - Chatbot in the museum

'Smart learning', where learning takes place in an interactive learning environment, can offer tailor-made education, for example by using learning analytics. Saab investigated smart learning in a project called 'Chatting with the past', together with the Leiden Rijksmuseum van Oudheden (RMO, National Museum of Antiquities). The research question was how a chatbot developed by the research team, via which people could communicate with a girl in Roman times, could promote digital literacy of students in secondary education. The pilot version of the chatbot 'Caetennia Pollita' was developed by ICLON and is now available at the RMO. Interactive working methods (an interactive pdf file) for the development of content for the chatbot by students in the upper years of secondary education (*havo/vwo*) have been developed and are used in the museum as teaching material.

Case 6 - Collaborative learning tasks

The PhD project of researcher Miranda de Hei resulted in a tool aimed at designing collaborative learning tasks in higher education. On the basis of a problem analysis and the ADDIE-framework, collaborative tasks can be designed step-wise, starting with Analysis (characteristics of the target group), followed by Design (of group interaction, learning goals and assessment), Development (of tasks, structures, guidance group constellation, and facilities), and finally Implementation and Evaluation. This framework is widely adopted nationally and internationally by researchers and practitioners designing collaborative learning.

Case 7 – 'Whole task first' and 'adaptive support'

'Whole task first' and 'adaptive support' (scaffolds) are two powerful principles which we can use for instructional design. We noticed that it can be hard for teachers to design a whole tasks and adaptive support themselves. Therefore, bridging research activities were employed to assist teachers and to develop a toolbox that teachers could use to redesign their teaching approaches to that of 'whole task first' with adaptive support. The toolbox provided support for to stepwise expand their teaching repertoires. Many subject-specific teacher educators (*vakdidactici*) on various school subjects and multiple teacher education institutes were deeply involved with the development of this toolbox. Together, this resulted in the publication of a book *Uitdagend gedifferentieerd vakonderwijs* ('Challenging differentiated subject-matter teaching'), and several brochures and videos, which were downloaded over 10,000 times. The toolbox was distributed via 'train the trainer' courses and workshops in schools (both national and international), professional learning communities, at least three teacher education curricula and a small private online course (SPOC). In this way over 5,000 teachers have learned to work with the toolbox.

Case 8 – Goal systems

Goal systems have been used in several projects, to understand teaching practice as well as for the development of targeted support. We have developed a method for co-constructing a goal system with teachers, called the laddering interview. This method is being used in teacher education programs of at least three teacher education institutes, and has been described in *Uitdagend gedifferentieerd vakonderwijs* ('Challenging differentiated subject-matter teaching') and the accompanying SPOC.

Case 9 – Teacher research labs

In research labs, groups of teacher-researchers from schools and a university researcher jointly perform research on a shared problem in school practice. The aim of research labs is not only to stimulate teachers' professional development (both as teacher and teacher-researcher), but also to improve teaching practices and generate

insights about this practice. During one school year, a research lab follows a complete research cycle, starting with an orientation phase on the research problem, and finishing with a research report, preferably in an article ready to be published. Examples are a research lab *Calvijn Goes*, and a research lab *Lucas Den Haag*. The lab in Goes examined how to teach reading strategies in science and social sciences in secondary education. Lucas Den Haag examined how to support students' autonomy in primary education. Both labs completed their work by publishing a journal article.

Case 10 – *Perspectives as domain-specific thinking tools*

Perspectives represent ways of domain-specific thinking. On the basis of multiple research projects, each focused on these perspectives within a specific domain, we developed a method for elaborating and representing these perspectives effectively. Next, teacher educators from ICLON and some other teacher education institutes elaborated perspectives for a great number of school subjects, which were published in a book entitled *Wat is echt de moeite waard om te onderwijzen: Een perspectiefgerichte benadering* ('What really is worth teaching: a perspective-based approach'; open access available for free). Furthermore, at several teacher education institutes in the Netherlands and for various subject specific method courses this innovative method was used. These perspectives play a role in the development of the new national curriculum framework (project curriculum.nu) for secondary education and also were implemented in Higher Education contexts.

Case 11 – *Peer and self-assessment with video*

One of the projects funded by CEL (a collaboration between Leiden University, Delft University and Erasmus University) was to support the use of online video platforms (Kaltura and Pitch2Peer) to facilitate reflection and feedback on professional practices such as giving presentations. Within this broader project, one of the tools was the use of *peer and self-assessment with video* in courses on professional practices, which was a subject of ICLON research. During this project, several institutes of Leiden University became so enthusiastic that they implemented the use of video platforms for peer and self-assessment (Anthropology, Child and Education Studies, Political Science, Astronomy and ICLON).