5. Some preliminary conclusions

A first main conclusion is that the present of a person like the project advisor, who knows the ins and outs of both the developing country (i.c. Surinam) and the expertise providing developed country (i.c. the Netherlands) is crucial for a good design of a cooperation project and for getting the project approved by the financer.

A second conclusion is: the project, the funding organisation and the project members have to be flexible as political and economic circumstances may change during the project period, urging a change in the project design.

A third conclusion is that the educators being trained do not need to be exclusively the teacher trainers from a teacher training institute, but can as well be experienced teachers in the schools who can be the 'advanced adopters' in the curriculum change.

A fourth conclusion is: the educational approach we applied, did change the way the advanced adopters and teacher trainers teach. Whether this means that they can educate their colleagues in implementing new methods is not clear yet.

A fifth conclusion: concrete successful new activities in the classroom motivate students as well as teachers.

Van der Valk, T. (Utrecht University), Kleijer, C. (Utrecht University), Michels, B. (Utrecht University) — Practice-based presentation on structural dimension

Scaling-up in a secondary/higher education STEM network: U-Talent

Tuesday, 15:45-16:45, Room KG4 222

1. Introduction

At the 2014 Educating the Educators' conference, we reported about the scaling-up in the Dutch talent development programme called Junior College Utrecht (Van der Valk, Tromp & Kleijer, 2015). In the years since, the programme has broadened and got a new name: U-Talent. This paper relates to the main conference topic structural dimension, finding an answer to the question: how can the structure of a regional secondary/higher education network be effective in scaling-up talent development in their participant schools?

2. Scaling-up the number of U-Talent Academy participants within the schools

In 2004, Utrecht University started a programme, called Junior College Utrecht (Van der Valk, van den Berg & Eijkelhof, 2007), aiming at STEM talent development with students (Taber, 2007)

and professionalization in schools. Since then, it has developed towards being a regional network of secondary schools and two universities, Utrecht University and Hogeschool Utrecht.

From 2004 to 2013, about 100 motivated students grade 11/12 students a year from 25 schools participated in the programme at the UU campus. About 50 STEM teachers participated in the connected teacher programme. For reasons of scaling-up, the programme design was changed, as was reported in Van der Valk et al. (2015). The main changes were:

- the grade 11/12 student programme, now named 'U-Talent Academy', got a campus part and a school part
- U-Talent student programmes for grades 7 to 10 were added
- the U-Talent teacher programme supports teachers in developing their school programme
- a new, 'lighter' Connection programme was started along with the existing Ambition programme.

In the new arrangement, the regular secondary school STEM curriculum is enriched with additional topics, comprehensive modules and doing research in an academic environment. Half of the programme is provided on Utrecht University (U-TA campus programme) and the other half is taught at school (U-TA school programme).

Now, the number of students participating in the U-Talent Academy has increased to 300 grade-11/12 students. However, the introduction of the U-Talent Academy school programme had an unexpected effect: about another 300 students participated in the student programme only (so, not in the campus programme). Moreover, 1000 grade 7-to-10 students also were involved. That makes a total of 1600 students that get the chance to develop their talents.

The partner schools have agreed that their U-Talent school programmes must have four parts: STEM enrichment projects, differentiation in STEM lessons, assignments preparing for the campus programme and community-forming. The school programme urges STEM teachers in the schools to pay attention to differentiation in their classes and to contribute to the U-Talent school programme. By that, the number of teachers involved has increased to about 300. They are supported by the U-Talent professional development programme, aiming, among others, at applying lessons learnt t to all students in the school (Renzulli, 2005). In addition, schools share experiences and exchange ideas and parts of their programmes.

Moreover, the non-STEM subject departments in the schools (and in the universities) also feel a need for having a talent development programme. Some of them already have realised it or take part in projects like Cambridge English, Goethe (German), Delf Scolaire (French). So there is also a scaling-up to other subjects.

3. Scaling-up the number of schools

The number of schools that can participate is limited, because of restriction of capacity. Other schools noticed that U-Talent was successful and wanted to participate. However, there was no room for. Moreover, full participation requires big efforts of the schools. As a solution, we have introduced a three level model of participation.

The first, highest level, Ambition, includes sending students structurally to the campus (e.g. in the U-Talent Academy). 26 schools are now in this level.

The second level, Connection, is less intensive. Connection schools can send a number of students incidentally to our campus. In the 2016/17 course, 14 schools will participate in this level. The Connection schools share the teacher programme with the Ambition schools.

Ambition and Connection schools signed a cooperation agreement with Utrecht University and Hogeschool Utrecht and pay for their participation.

Schools at the third level, U-Talent Open, can participate in some of the student and teacher activities. They do not pay for a programme, but for the activities they choose to do.

We have experienced that some schools from the open level aim to go to the Connection level, and that some Connection schools want to join the Ambition level. So there are possibilities of further scaling-up the number of schools in the future.

4. Scaling-up the number of regional secondary/higher education STEM networks

When we started in 2004, only one other Dutch university had a programme that somehow was comparable to ours. Now, in 2016, the Dutch Government supports the secondary/higher education STEM networks, resulting in a total of 11, all over the country, with most Dutch universities involved. These networks have very different programmes and approaches, but share the aim of STEM professionalization in the schools.

5. Conclusions and discussion

We conclude that the U-Talent network has been, as a secondary/higher education network, effective in scaling-up talent development in participant schools by the structures chosen.
The Ambition – Connection – Open structure enables schools to choose a level in which they want to participate in U-Talent. this has resulted in scaling-up the number of schools.
Main aspects of the effective structure at the Ambition level are (1) the focus on talent development of motivated students and so on differentiation in STEM education, (2) the combination of developing enrichment programmes for students and teacher professionalization and (3) the combination of teaching an exemplary campus programme and school programmes geared to the campus programme. This has resulted in scaling-up the number of students and teachers of the Ambition schools involved in U-Talent activities.
The success of the Utrecht network has inspired universities and schools in other regions to form secondary/ higher education network.

Wassong, T. (Universität Paderborn), Biehler, R. (Universität Paderborn) — Research-based presentation on personal dimension

What are the challenges of being a math teacher educator? Results of an interview study

Tuesday, 11:30-12:00, Room KA 102

1. *Introduction*

In 2012 and 2013 both authors developed and implemented a 5-month Continuous Professional Development (CPD) on teaching statistics for secondary school mathematics mentor teachers. The CPD was organized by the German Center for Mathematics Teacher Education (DZLM). The participants were mathematics teachers from North-Rhine Westphalia, who have an additional role as regional PD facilitators.

The CPD objectives were to deepen the professional knowledge for teaching statistics using digital tools on one hand and to elaborate fundamental dimensions of facilitators' knowledge and competencies needed for training teachers in statistics themselves on the other hand. In our talk we will concentrate on the first objective. The design of the CPD was conducted by a theoretical framework of professional knowledge for teaching statistics (e.g., Blömeke 2013; Wassong & Biehler 2010) and assumptions concerning the self-concept of the participants in their role as facilitators based on literature (e.g., Tzur 2001; Zaslavsky & Leikin 2004). The CPD was intended as the root in a pyramid design. The concept was to spread the ideas of how to teach statistics combined with the necessary professional knowledge through the work of the participants as regional PD organizers and trainers.

The CPD was evaluated mainly based on intensive interviews with the 12 participants two to three month after ending the course. The evaluation focuses on the concrete implementation of the course in respect of the theoretical framework of professional knowledge for teaching statistics.

2. *Theoretical Framework and objectives of the CPD*

The first part of the theoretical framework discusses a knowledge/competence structure model for professional knowl - edge of teachers (Wassong & Biehler 2010) and extended for facilitators. The model aims to four main facets of professional knowledge: Common and Practice oriented Content Knowledge, Content and Pedagogical Knowledge of Curriculum, Pedagogical Knowledge of Teaching and Learning, and Common and Pedagogical Technological Content Knowledge (cf. Wassong & Biehler 2010) and is based on the ideas from Ball, Thames & Phelps (2008) and Mishra & Koehler (2006).

The second part of the theoretical framework discusses the content structure for structuring the course. The content structure consist of the five subtopics Data: Where from and what for?, Representing,