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# Stepping into Design-Based Education

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and H. Assen



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## Chapter 11

# Design-Based Research at the core of the innovative development in the field of multilingual education

Mirjam Günther-van der Meij, Joana Duarte and Myrthe Coret-Bergstra

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### Abstract

The chapter illustrates the ways in which Design-Based Research (DBR; McKenney and Reeves, 2013; Cobb, Confrey, diSessa, Lehrer, and Schauble, 2003) stimulates recent developments within the field of multilingualism and (primary and secondary) education. The chapter illustrates how DBR fits seamlessly into Design-Based Education (DBE) by incorporating students in conducting research that is based on authentic questions from the field. It presents three research projects within the NHL Stenden University of Applied Sciences that aim at developing, implementing, and evaluating design-based interventions for holistic multilingual education (Duarte, 2017; Duarte and Günther-van der Meij, 2018a; Günther-van der Meij, Duarte, and Nap, 2020). The primary and secondary schools that participated in the projects each benefitted in their own unique way from the projects, which shows that, following the DBR-approach, the developments were adjusted to the specific needs of each school. Moreover, in-service teachers benefited from the cooperation with pre-service teachers, who have a different point of view, and vice versa. This emphasises the fruitful collaborative nature of the projects, which stems from the DBR-approach.

Keywords: DBR, multilingualism, multilingual education, holistic approach, minority, and migrant languages

### Introduction

As part of the current teacher training programme at the NHL University of Applied Sciences we work with Design-Based Education (DBE). Design-Based Education is based on social-constructivist, contextual, self-regulating, and collaborative learning (Geitz and Sinia, 2018). It is based on empathy for the student, the lecturer, and the environment. The current complex questions from practitioners and the student's learning question form the starting point for learning and collaboration. DBE thus aims to train students to become entrepreneurial, resourceful, and world-wise professionals by focusing on learning by trying and doing. DBE is an innovative education concept in which valuable elements from the competence-oriented and problem-based education are used. The teacher training education of NHL Stenden and the research group of Multilingualism and Literacy closely cooperate in designing the DBE-curriculum. This research group contributes to the teacher training education, by offering content for essential themes and projects in the research curriculum, which can both be accommodated in DBE-workshops and ateliers. In this way, students are introduced to design-oriented research in a natural, appropriate way and learn to design, implement, and test interventions themselves. Under the supervision of researchers and lecturers, students work on authentic issues in the professional field and learn research skills and methodologies.

The design-based approach is also important in the research group's projects in which a Design-Based Research (DBR) approach (McKenney and Reeves, 2013) is used. DBR centres around acknowledging the complexity of educational contexts by carefully examining the different processes, levels and actors involved in carrying out a jointly engineered educational experiment (Cobb, Confrey, diSessa, Lehrer, and Schauble, 2003). As in the case of an intervention, these experiments are based on previously gathered theoretical knowledge. However, design-based approaches are of formative nature, in that they must possess an iterative, cyclic design intended to systematically improve the original experiment and report back to all participants involved. They are thus specifically adequate to yield sustainable results in lecturers' professional development (Collins, Joseph, and Bielaczyc, 2004; Kirsch, Duarte and Palviainen, 2020). In the research group's projects DBR is used to cooperate with different stakeholders (e.g., lecturers, researchers, students, policy makers).

Starting at the end of a DBR-cycle, let us look at the final reflection of one of the practitioners participating in a primary school project on multilingual education:

*If a child is eight or ten when they arrive in the Netherlands, and they speak Chinese at home and no one else speaks this language in class, it is difficult [to succeed at school] but possible. They have learned how to learn, they know how to sit on a chair at a table, how to pay attention, how to write. Skills like that enhance learning of a new language. We also had children from Eritrea who had no education at all in their home country. They don't even know what it is like to sit on a chair at a table all day or to write with a pencil. So, they first must learn the motor skills to write (4th grade teacher in the province of Fryslân, the Netherlands).*

This quote shows firm knowledge of the heterogeneity of situations of multilingual pupils and a high degree of reflection on how skills can be transferred from one language to the other. Such open attitudes, diversified knowledge, and pedagogical skills were not the *status quo* in most of the schools with which we started DBR a bit over two years ago. The present chapter reports on three projects that were set up to work with teachers around multilingualism and education and on the outcomes of our DBR approach.

Although multilingualism and forms of multilingual communication were always the norm in Europe, with several dialects co-existing in one region, modern education systems have a mainly monolingual orientation. Throughout the late 18<sup>th</sup> and 19<sup>th</sup> centuries, the formation of larger nation-states became at the root of the modern ideological triad in which an alignment is expected between one nation – one people – and one shared language (Duarte, 2020). This monolingual mindset has since then harshly affected attitudes towards minority and migrant-induced language diversity, as languages became associated with one national standard language. This has been described by several researchers: drawing on Bourdieu, Gogolin (2002) speaks of the monolingual habitus of nation-states and education systems, Cummins (2008) reflects on how monolingual ideologies affect the teaching of languages in schools by keeping them strictly separate, and Heller (1999) claims that studying multilinguals through a monolingual lens, results in an analysis of forms of parallel monolingualism, rather than of multilingualism. The Netherlands offers a unique example of the rise of nationalism and of the new discourse of one language-one nation, leading to extensive standard language policies and the rise of cultural nationalism (Rutten, 2019). This monolingual mindset also leads to a serious achievement gap between the multilingual pupils and those who speak the language of instruction at home (Gubbels et al., 2019).

Recent research identifies an urgent need to 'unlearn monolingualism' (Scarino, 2014; Spence-Brown, 2014) and suggests an alignment of teaching and learning approaches at schools with the language practices of the changing populations they serve. To address the issue of adequate educational provision for multilingual pupils, several projects have been developed in our research group, focussing on the implementation and evaluation of multilingual education programs. To guarantee the sustainability of the developments within these projects, DBR has been chosen as a framework to work with the different stakeholders.

In the current chapter we aim at answering the following research question: to what extent can DBR support the development of multilingual education approaches from the perspective of pre- and in-service teachers?

## **Current practice**

### **The field of multilingual education**

Today's globalised world has brought people with different language backgrounds together. In many classrooms, this has resulted in an increasing number of children who speak more than one language. While there is evidence that a good development of children's home languages facilitates the learning of a new language (Cummins, 2000; Krashen, 1982), most current educational systems leave little room for such multilingual approaches. The educational system needs fundamental changes to adapt to the growing linguistic diversity. Accordingly, the challenge is to incorporate the concept of multilingualism in educational practices. Since the beginning of the 21st century, new teaching approaches have been developed. Yet, their implementation in school curricula has proved to be a difficult task, due to the many parties involved: Researchers, linguists, teachers, school directors, pupils, politicians, etc. (Van Avermaet, Slembrouck, Van Gorp, Sierens, and Maryns, 2018). This is also referred to as the "multilingual turn" in multilingual education (Conteh and Meier, 2014). Research calls for a change of paradigm from traditional immersion or bi-/trilingual models based on monoglossic ideologies (Flores and Baetens Beardsmore, 2015) to multilingual education approaches within regular schools based on heteroglossic ideologies.

The increase of multilingual students and the growing awareness towards their competences and needs has resulted in a rise of research focusing on dynamic models of multilingual education (Cenoz, 2009; Duarte, 2018; Hobbs, 2012). A common feature within multilingual education is that several languages and varieties are acknowledged and imbedded in teaching (e.g., home language(s), language/s of schooling, foreign languages, regional and minority languages). Several pedagogical approaches have been put forward to include multiple languages in mainstream instruction, such as Content and Language Integrated Learning (CLIL), language awareness or intercomprehension. While several approaches are available and have produced positive academic, attitudinal and socio-affective results for all students involved, "it appears that the most important challenge is not so much a lack of evidence-based strategies in highly diverse classrooms – although clearly more research is needed – but rather the availability of this knowledge and the need for a shift in attitudes of those who work with highly diverse classrooms on a daily basis, teachers, educators and policy-makers" (Herzog-Punzenberger et al., 2017, p. 33). As a result, the focus of research should be on finding ways to facilitate available knowledge for sustainable implementations.

### **Multilingual education in Fryslân**

Until recently, rural areas were generally less concerned with super diversity compared to large urban areas. Regional minority languages and regional languages have had less contact with migrant languages. But this is changing fast. In the past ten years, the

population in the province of Fryslân in the north of the Netherlands has grown solely due to the arrival of new immigrants (Duarte and Günther-van der Meij, 2018b). This results in a complex language ecology: Dutch, Frisian, regional languages, English as a foreign language, other foreign languages (German, French, Chinese, etc.) and a variety of migrant languages (Arabic, Tigrinya, Polish, etc.). Fryslân is therefore also in need of a 'multilingual turn' (Conteh and Meier, 2014) in education. To address this need and in a cooperation between teacher training, schools and researchers, several projects have been developed to pinpoint concrete needs in the domain of multilingual education. As a result, three goals have been defined for the multilingual turn in Fryslân (Duarte and Günther-van der Meij, 2018a):

1. A holistic approach to languages in education
2. Knowledge and skills about languages and in languages
3. Integration of migrant languages in education.

### Teacher training education

A study by van Beuningen and Polišíenská (2019) in the Netherlands on how pre-service language teachers think and act regarding multilingualism showed that there are prevailing misconceptions about (the use of) multilingualism in the classroom. An important outcome of this study is that teachers indicated they need more knowledge and tools about (implementing) multilingualism in the classroom so that can acknowledge and use the multilingual repertoires of their pupils (van Beuningen and Polišíenská, 2019). A survey study in Flanders by Pulinx, Van Avermaet and Agirdag (2015) showed that teachers often struggle with the practical implementation of multilingual approaches, due to both language separation ideologies and to the current fragmentation of approaches for multilingual education. To change the monolingual ideology still present in schools into a more multilingual ideology, one needs to create initiatives that are bottom-up and not solely implemented top-down from policy makers and school boards (Pulinx, Van Avermaet, and Agirdag, 2015). Recent studies have shown that the teacher is increasingly being put forward as the most important 'factor' in the educational process, and as such as the starting point for the implementation of innovations in education (Priestley, Biesta, and Robinson, 2016) instead of policy makers imposing rules top-down. By initiating small-scale projects, tailored at the needs and questions regarding multilingualism schools and teachers and most importantly, including teachers in all steps of the process, lasting changes can be made. Finally, professionalising in- and pre-service teachers with regards to (dealing with) multilingualism in the classroom is an important step to address their lack of knowledge and skills in this area (van Beuningen and Polišíenská, 2019).

### Holistic model for multilingualism in education

To address teacher professional development in the field of multilingual education, we have developed a holistic model for multilingualism in education to tailor the needs of schools and teachers (Duarte, 2017; Duarte and Günther-van der Meij, 2018a; Günther-van der Meij, Duarte, and Nap, 2020), based on the work of Cenoz (2009) and Cummins (2008). The holistic model for multilingualism in education (See Figure 21) allows a combination of the knowledge and teaching approaches that have proven effective in education of both minority and migrant students into one model and is thus appropriate for different school types. In addition, it combines different approaches towards multilingual education, by placing them along a continuum that oscillates between the acknowledgement of different languages and their use in instruction.

The model consists of five approaches from a functional multilingual learning (FML) perspective (Slembrouck, Van Avermaet, and Van Gorp, 2018). With FML multilingualism can be turned "into a powerful didactic tool". It aims at treating all languages and language varieties that children bring to school "as didactic capital which can be invested in real-time learning processes, so as to increase children's chances of development and education" (Slembrouck, Van Avermaet, and Van Gorp, 2018, p. 18). From FML the model is divided in the following five approaches: language awareness, language comparison, receptive multilingualism, CLIL and immersion. A language awareness approach (Candelier, 2010) is used to explore knowledge about languages and language diversity but not typical proficiency knowledge in the language. To create bridges between the several languages, contrastive language teaching through explicit language comparison is used (Gentner, 2010; Rittle-Johnson and Star, 2011). This creates meta-linguistic knowledge about differences and similarities in typologically related languages but, at a different level, also in typologically divergent languages (Ziegler and Stern, 2014). With the aim of raising receptive skills and developing language learning strategies, receptive multilingualism, which is a form of asymmetrical communication in which each speaker speaks a different language while trying to understand the other (Braunmüller, 2013; ten Thije and Zeevaert, 2007), is used. This works well with related languages. Content and Language Integrated Learning (CLIL) is used to teach subject content in different languages and immersion is used to teach the different languages by using them in instruction. Immersion is used when all subjects are taught in a target language, for example, using English, German, or Frisian as instruction language for part of the day. Finally, knowledge of translanguaging-based pedagogies is used in each of the five approaches, in which several languages are used simultaneously in instruction. Translanguaging refers to the use of the learner's full language repertoire in teaching and learning (García and Wei, 2015).

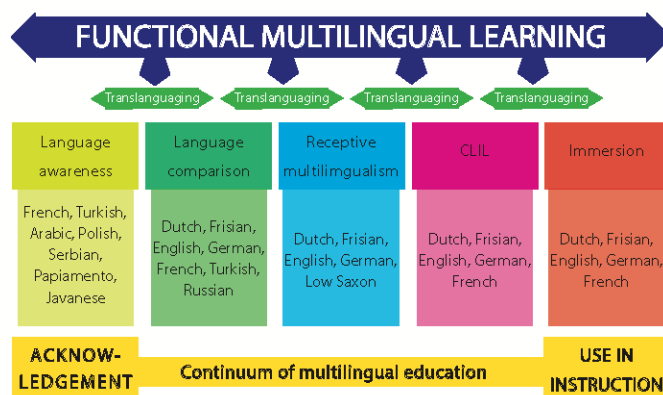


Figure 21. Holistic model for multilingualism in education (Duarte, 2017; Duarte and Günther-van der Meij, 2018a; Günther-van der Meij, Duarte, and Nap, 2020)

The holistic model for multilingualism in education supports teachers in distinguishing between what they can do with languages that they speak themselves but also maps the

possibilities for them to engage with languages which they do not share with their students. A more detailed description of the original model can be found in Duarte and Günther-van der Meij (2018a) and more information on the revised version of the model, that includes FML, can be found in Günther-van der Meij, Duarte and Nap (2020).

### Multilingual education projects

The research group of Multilingualism and Literacy of NHL Stenden has launched several projects aimed at integrating multilingualism in education from a holistic perspective. The four-year project More Opportunities with Multilingualism (Meer kansen Met Meertaligheid - 3M), focuses on the development and implementation of a holistic approach to broad multilingualism in the education of the middle classes of four types of Frisian primary schools. Within the one-year pilot projects Talen4all a similar approach has been developed for the upper classes of Frisian primary schools that have an exemption for Frisian as a subject. Finally, the two-year project Holi-Frysk - multilingual secondary education for everyone - focuses on secondary education for three types of Frisian secondary schools. The project schools have each formulated their own research question regarding language education and multilingualism. In total we work with 26 schools and 58 teachers.

### Design-Based Research (DBR) at the basis of educational innovation

In the three projects, we work with DBR (McKenney and Reeves, 2013). This is used to work with teachers to co-develop the multilingual holistic approach. To assure co-creation of the developed activities, regular school visits are conducted, and workshops are organised in the different stages of the projects. The developed activities are evaluated by the project schools' teachers by means of interviews and questionnaires and then adjusted because of these evaluations to optimise them. We include students (pre-service teachers) from the teacher training programmes of both primary and secondary school level in our projects through working with them in design-based workshops. In these workshops we provide them with a research question or problem around which they must work. The students work in groups of 4-5 persons and are placed at one of our project schools to conduct the research (e.g., research on language attitudes of teachers and pupils) or teach the lesson series they designed. For example, they must design a lesson series in which they combine a foreign language with a content subject or on combining several home languages spoken in a primary classroom and design lesson activities that include these.

As seen in Figure 22, conducting educational research from a DBR perspective includes several phases, during which all stakeholders, including teachers, are seen as experts for their own field. After jointly exploring theoretical knowledge on one of the approaches for multilingual language instruction by means of a workshop with an expert, teachers analyse the situation at their own school and formulate a research question aimed at improving the quality of instruction in terms of multilingualism. Together with researchers, teacher trainers and pre-service teachers, the school team designs a teaching activity and corresponding material. Once the activity is developed, it is implemented in class after which the activity is improved and finalised. Video observations are conducted during implementation. Recordings are analysed by the research team and a feedback form is filled in by the teachers. At the time of writing, for the 3M and Talen4all projects, the developed activities are being implemented at another school to be improved and finalised for inclusion in the projects' online toolboxes. In the



Holi-Frysk project, we are in the phase of designing and evaluating the first teaching activities with teachers, so we have not yet reached the implementation phase.

For an overview of the activities developed by the teachers within these projects, see Duarte and Günther-van der Meij (2018a) and Günther-van der Meij and Duarte (forthcoming). In the current chapter we aim at evaluating the DBR process from the perspective of two different stakeholders: the pre- and in-service teachers that have

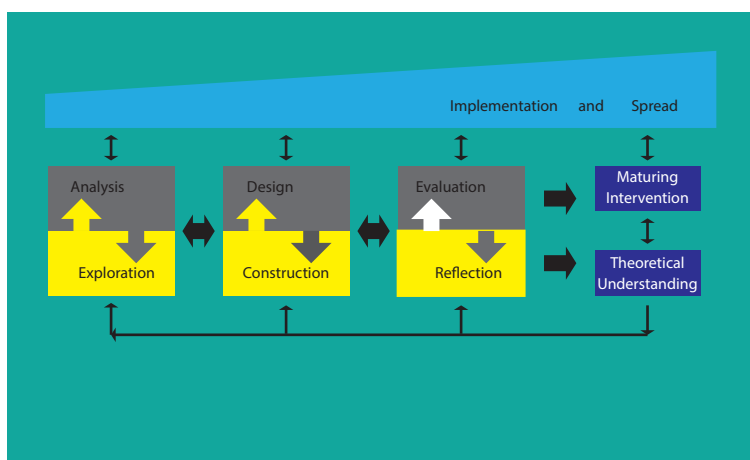


Figure 22. Model for conducting educational design research (reproduced from McKenney, Susan, and Reeves, Thomas C. [2012]. *Conducting educational design research*. New York, New York: Routledge.)

worked in the design-based workshops in which different multilingual classroom activities were co-created. For this purpose, we will present data from interviews conducted with both pre- and in-service teachers that participated in our DBR approach.

### Intended outcomes and monitoring

In the evaluation of our DBR approach, most teachers pointed out that the holistic approach to multilingualism had been very supportive in the implementation of multilingual education. At a secondary school with a high percentage of pupils with Dutch as their home language, most pupils had negative attitudes towards the Frisian language, which was a compulsory subject for them. The Frisian teacher wished to raise motivation and positive attitudes of her pupils towards the Frisian language and at the same time help pupils understand the characteristics of being a speaker of a minority language. Through different activities the motivation and attitude of the pupils was positively improved as was claimed by the participating teacher. In her final evaluation she stated:

*"My pupils now have more respect for people who speak Frisian. They understand better why people choose to speak a dialect (or Frisian) and in which kinds of situations they do" (Frisian teacher in secondary education).*

At a trilingual (Dutch-Frisian-English) secondary school, the teachers wanted their pupils to learn more about similarities between different languages and language families.

Again, different activities were co-developed and implemented. In his final evaluation the teacher claimed that his pupils had learned a lot:

*"The relation between languages is clearer and the pupils are interested." (Frisian teacher in secondary education)*

There were also teachers participating that taught newly arrived refugee pupils. The main goal of these international transition classes is to prepare pupils for regular secondary or vocational education, focusing mostly on Dutch and mathematics. In the evaluation of the project one of the teachers pointed out that, through the project and the developed activities - which mainly focused on using the pupils' home languages as a leverage to learn Dutch and mathematical concepts - his pupils now better understood the importance of their home language for learning additional languages.

Such reactions show us that each school has benefitted in quite a different way from the projects, which follows from the fact that the developments were all adjusted to the specific needs of each school, fitting within the DBR-approach. In-service teachers also profited from the cooperation with the pre-service teachers, as, according to one teacher:

*"Pre-service teachers look at classroom activities in a different way, so we could get the best out of it" (primary school teacher, city school, grade 1/2).*

They furthermore pointed out that the enthusiasm and new impulse which the students brought with them were contagious and very useful to them:

*"It was an enthusiastic group. They were able to communicate this well to the children, but also to me." (Primary school teacher, trilingual school, grades 4/5/6) and that the level and quality of the materials was high:*

*"The group gave a well-organised series of lessons. The students could really focus on these lessons, which benefited the quality". (Primary school teacher, newcomer school, grade 1/2)*

Finally, the evaluations also showed positive evaluations of the workshops that were organised by the project teams. The teachers appreciated the cooperation with the research team and pre-service teachers and enjoyed the information exchange with other schools a lot. In short, the teachers reported benefitting from the way in which the projects were organised (the DBR-approach).

While pre-service teachers pointed out in evaluations that the internal communication between their teachers, the researchers and the teachers in the field is a point for improvement, they were happy to get a chance to work together with field experts so early in their careers. They stated that working in the DBR-workshops was very enriching; before this experience they had no idea that there were so many ways to approach multilingualism. One pre-service teacher said she learned that:

*"Speaking another language, such as Frisian or Arabic, in your own Dutch class can actually improve the school performance of the students."*

Another student stated that:

*"There are many ways to deal with multilingualism, ways that are often forgotten. Even when teaching a language like English, there are many ways to integrate multilingualism."*

The evaluations also showed that this approach prepared pre-service teachers for their future as they had to work quite independently:

*"We had to sort out a lot ourselves and therefore take a lot of initiative"*

Another pre-service teacher said that the skills that they learned in the project could be used later in practice. Most students were enthusiastic about the cooperation within their group and with the school:

*"Good cooperation with the group and good contact with the primary school".*

The cyclic design-based approach (Cobb et al., 2003; McKenney and Reeves, 2013) allows teachers to develop their own pedagogical experiments and gradually implement those in their teaching, starting at a small-scale. For this to succeed, teachers need to (a) create safe spaces in which to experiment with multiple languages in the classroom; (b) operationalise the various approaches for multilingual education for their own context and particular aims, and (c) combine them in ways that allow them to tackle their concrete challenges. So far, this design-based approach has been successful in fostering a sense of ownership of the developed activities in the participating schools and high levels of acceptance of the model, as teachers acknowledge its potential to provide answers for language education in their complex linguistic settings.

As researchers we believe that cooperating with pre- and in-service teachers helps us to consider all relevant points of view and expertise when designing and implementing interventions. We are confident that the DBR-approach will lead to greater sustainability of approaches, as it is the only way to take the complexity of educational contexts into account and to draw on the varied expertise of all actors involved. The approach is also well-received by both the in- and pre-service teachers, as was shown here in the form of their reflection on the projects as well as their evaluations afterwards. During DBR, we frequently discussed ongoing issues with both groups and developed joint solution for problems. In general, in-service teachers claimed to have learned a lot about incorporating multilingualism in the classroom and pre-service teachers greatly appreciated the opportunity to work closely with researchers and practitioners together and being part of projects that are directly relevant to current societal and educational needs. In short, the approach clearly provides new insights to the in-service as well as the pre-service teachers. By applying these new insights both in current educational practice (the in- service teachers) as well as preparing for the future (the pre-service teachers), we aim at making our developments sustainable in the field.

However, we have also identified some challenges to be addressed by our future research designs. First, as each DBR cycle is tailored to a particular school, teacher, and pupil population, it becomes difficult to achieve comparability in research in terms of developing a taxonomy of what really works in conducting DBR projects and how to successfully implement them. In the research we are currently preparing we plan to overcome this shortcoming by combining mixed methods with DBR, so that quantitative

measures can help identifying factors leading to significant educational change. In addition, we often found it a challenge working with so many different teachers due to the heterogeneity of their motivation, work methods and expectations. We have now planned a more explicit phase of expectation management and discussion of the different ways of dealing with DBR in the schools. We hope that making differences between teachers and schools visible and discussable will lead to a greater commitment of all schools to the DBR way of working.