



**Summary research report de Achtbaan WOU 2018-2020**  
**Proactive differentiation in primary school math: A case study of KSU De Achtbaan.**

Name school: De Achtbaan

### Introduction

Today's classrooms are characterized by students with diverse academic abilities and achievement levels. Especially in light of the international trend on inclusive education, this diversity in class is increasing. Therefore, teachers should adapt their teaching practices and instruction to their students' diverse educational needs (Corno, 2008). This is also known as *differentiation*, which is defined by Tomlinson and colleagues (2003, p. 121) as "an approach to teaching in which teachers proactively modify curricula, teaching methods, resources, learning activities, and student products to address the diverse needs of individual students and small groups of students to maximize the learning opportunity for each student in a classroom". Yet, meeting a variety of students' educational needs is a major challenge for many teachers as this requires advanced classroom management skills, pedagogical skills, and subject matter knowledge (VanTassel-Baska & Stambaugh, 2005).

At primary school KBS De Achtbaan, teachers were allowed to experiment with differentiation in math lessons in grades 1-6 for the last two school years, with the overall goal to study what ways of differentiation constitute best practice. As differentiation strategies may vary across subject areas, this study focuses exclusively on the subject of mathematics. This would result in domain-specific guidelines and strategies which tend to be more concrete and may provide stronger and more practical guidance for teachers (Prast, Van de Weijer-Bergsma, Kroesbergen, & Van Luit, 2015). Hence, this study examines how primary school teachers can differentiate in mathematics to meet their students' diverse educational needs.

Tomlinson and colleagues (2003) distinguish in their literature review on effective differentiating instruction between differentiation attentive to students' readiness, interest, and learning profile. This study mainly focuses on students' readiness but also addresses differences in interest and learning profiles.

#### Research context

De Achtbaan(KSU) is a school in Leidsche Rijn, Utrecht, The Netherlands. It has 39 employees and 436 pupils. 4% of the pupils have a parent/parents who did not complete an education higher than primary school and for 27% of the pupils the Dutch language is their second language. There are 16 regular groups and 2 full-time gifted classes (IQ 130+). The groups contain between 21 and 28 pupils, gifted classes around 20 pupils. The research is conducted in groups 3 until 8, age 6 until 12.

### Research question & aim

Research question: *How do teachers proactively differentiate in math in primary school to meet the needs of academic diversity?*

1. *How do teachers diagnose academic diversity?*
2. *How do they plan, execute and evaluate proactive differentiated lessons/instructions?*
3. *What is the teachers pedagogical thinking behind the proactive differentiation?*
  - *How do teachers justify their differentiation*
  - *What kind of challenges and benefits do teachers identify in proactive differentiation?*
4. *How do the challenges and benefits compare to the 2014 policy?*

Aim of the study is to contribute to domain-specific differentiation guidelines and strategies in primary school mathematics education. Practical aim is to promote proactive differentiation in primary school math at De Achtbaan in a way that meets all the needs of the academic diversity in our classes.

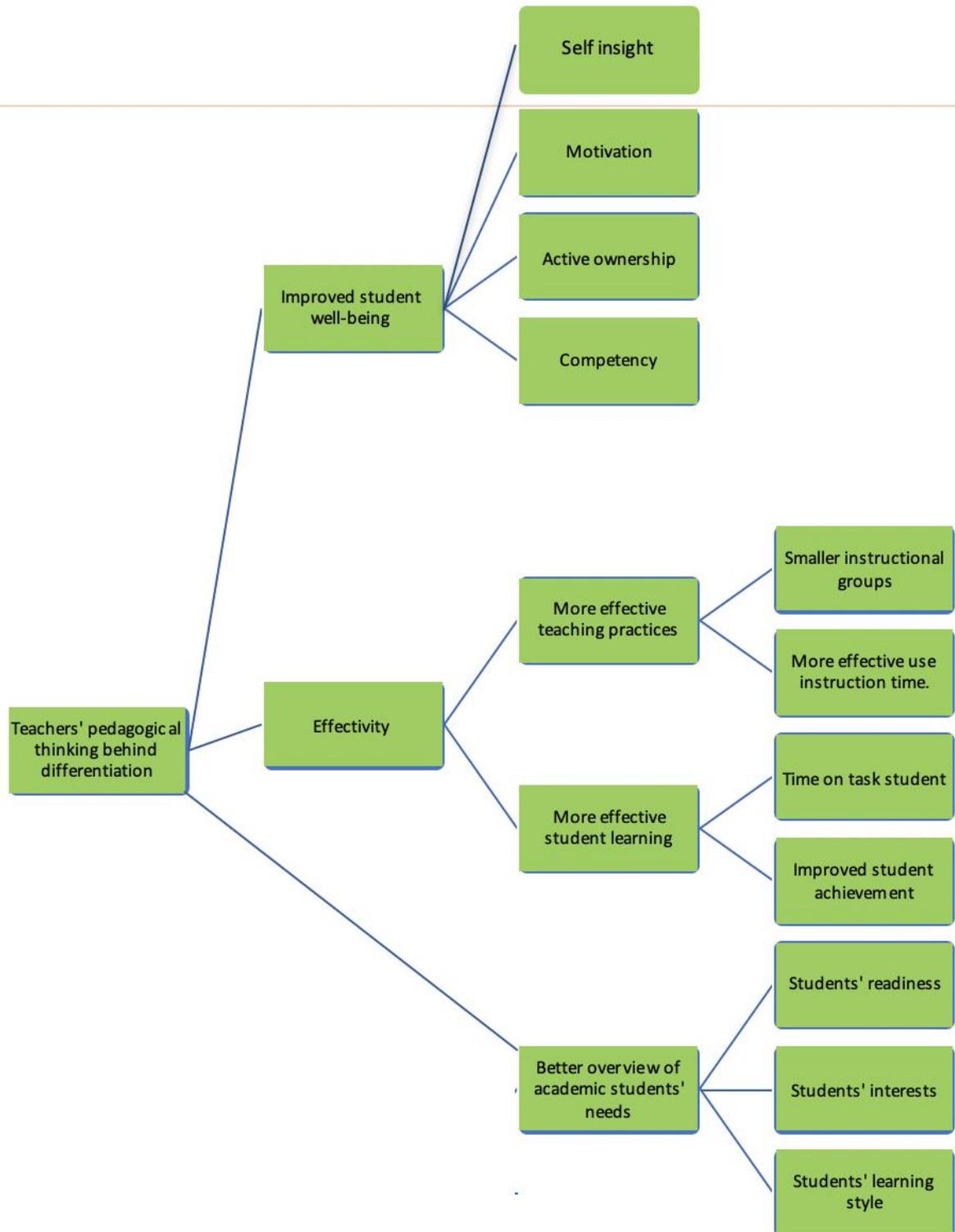
### **Method**

20 teachers participated in this study, teaching levels 3-8 and excellent pupils. In semi-structured interviews teachers were asked about who they are as (math) teacher; how they organize differentiation; about their ideals and challenges; and how they value the current situation (in which they are free to organize differentiation in a way that is meaningful for them) versus the 2014 policy (which demanded that teachers adhere to a certain strategy).

Data analysis in word, using inductive coding strategies, led to the development of three categories: student wellbeing; effectiveness; and insight into students' needs.

### Resultaten

*The following figure shows how the teachers' pedagogical thinking behind the proactive differentiation (RQ 3) can be organized around three pillars:*



## Conclusie

We can conclude that teachers proactively differentiate in math in primary school by stimulating wellbeing among pupils, by stimulating effective learning and by furthering their insight into pupils' needs.

With regard to student wellbeing, teachers implemented strategies that, in their view, might benefit students' wellbeing. Teachers also observed positive effects on pupils' wellbeing in class. By gaining an increased sense of their development, pupils' self-insight and sense of active ownership increased, according to the teachers. Engaging in challenging learning activities also led to an increased sense of competence and increased motivation.

Teachers also found that the effectiveness of their classes increased when they attribute students to groups based on other differentiation factors e.g. (student readiness) than standardized mid-term math test-outcomes; when they give instruction in smaller groups and when they give students more freedom to decide how they want to use their learn/practice time.

Moreover, teachers found that their understanding of the educational needs of their pupils increased by evaluating student performance on mock tests at the start of a lesson block, and that they have become more competent in attending to these needs.

Our findings reside with the work of Van Geel et al. (2019), who have claimed that “de sleutel tot succesvolle differentiatie niet de toepassing van strategieën is, maar de daadwerkelijke aanpassing van het onderwijs aan de grondig geïdentificeerde behoeften van alle studenten” (p. 62). In follow up studies it would be interesting to also examine other components of differences in interest and learning profiles (Tomlinson and colleagues, 2003).

## Contact

Wil je meer weten over dit onderzoek? Neem dan contact op met Roel Scholman,  
Roel.Scholman@ksu-utrecht.nl