Development and validation of the ADAPT instrument

Assessing Differentiation in All Phases of Teaching

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Ideally, teachers do not work on a one-size-fits-all basis but differentiate instruction and activities deliberately, i.e. the education students receive matches their diverse educational needs, mostly based on their current level of knowledge and skills



Assessing differentiation



Inventory existing instruments

Self-report regarding DI practice

Perceived difficulty of DI strategies

Attitude towards DI

Lesson observation schemes

Student questionnaires

Vignette and video test



Insight in *match* is lacking

Many instruments: focus on organizational aspects, applying specific strategies or activities.

"the key to successful differentiation may not merely be placing students in groups but actually adapting the teaching to the needs of different ability groups" (Deunk et al, 2015, p. 49)



Theoretical background: CTA

Cognitive Task Analysis to identify, analyze, and structure the skills and knowledge used by experts during the performance of a complex task.

Four interrelated phases, five underlying principles.







ADAPT: Assessing Differentiation in All Phases of Teaching

Assessing degree and quality of DI: classroom observation is insufficient

Development ADAPT instrument: performance indicators based on expert performance and consultation with expert teachers and content experts. Various iterations and pilot studies.

Final ADAPT-instrument: 23 indicators scored based on classroom observation + interview with the teacher













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Phase	Indicator		Principle of differentiation				
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1. Period and	1.1	Evaluation of student learning achievements	•	•			
preparation	1.2	Insight into educational needs		•			
	1.3	Insight into the range of instruction offered	•				
	1.4	Prediction of support needs		•		•	
	1.5	Determination of supplementary remedial objectives and approaches	•			•	
	1.6	Formulation of supplementary enrichment objectives and compilation of a suitable range of instruction	•		•	•	
	1.7	Organisation of instructional sessions for groups of students				•	
	1.8	Involvement of students in the objectives and approach					•
2. Lesson	2.1	Determination of lesson objectives	•				
preparation	2.2	Composition of instructional groups		•		•	
	2.3	Preparation of instruction and processing for the core group				•	
	2.4	Preparation of instruction and processing for the intensive instructional group	•			•	
	2.5	Preparation of instruction and processing for the enrichment group	•		•	•	
	2.6	Preparation of encouragement for self-regulation					•
3. Actual	3.1	Sharing of the lesson objective	•				
teaching	3.2	Activation and inventory of prior knowledge		•			
	3.3	Provision of didactically sound and purposive core instruction	•				
	3.4	Monitoring of comprehension and the working process		•			
	3.5	Instruction and processing for the intensive group in the lesson	•		•	•	
	3.6	Challenging the enrichment group in the lesson			•	•	
	3.7	Encouragement of self-regulation during the lesson					•
	3.8	Conclusion of the lesson	•	•			
4.Evaluation	4.1	Evalueren en vervolgacties bepalen	•	•		•	
1.1							



Purpose

- Provide comprehensive overview of DI
- Show "what it can look like"
- Stimulate reflection
- Provide feedback to teachers
- Identify "next steps" in professional development (individual and school level)
- Research





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Composition of instructional groups

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This indicator is used to measure the extent to which the teacher composes instructional groups for a particular lesson. To receive a high score on this indicator, teachers must search for the most efficient grouping for specific lesson objectives, thereby meeting the needs of all students. In this regard, there is no set number of instructional groups.

| S<br>extent<br>actional<br>ever a<br>must<br>g for<br>veting<br>rd,<br>al | Score | Description                                                                                                                                                                                        | Explanatory notes                                                                                                                                                                  | Example                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                           | 1     | The teacher <i>does not</i> consider the composition of<br>instructional groups.                                                                                                                   |                                                                                                                                                                                    | <ul> <li>The teacher provides standard instruction to the entire<br/>group and then identifies which students have questions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                           | 2     | The teacher uses the instructional groups that were<br>composed earlier or that were created by the software<br>without any further consideration.                                                 | For example, previously created instructional<br>groups might be included in the preparation<br>of a period or a group plan.                                                       | <ul> <li>When preparing a lesson, the teacher does not consider<br/>the composition of instructional groups, because the<br/>adaptive software suggests extended instructional groups<br/>during the lesson.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                           | 3     | <b>The teacher</b> critically examines the needs of some<br>students with regard to the lesson objective and uses<br>this information to compose instructional groups (but<br>not a fixed number). | In this regard, a teacher may deviate from<br>the usual number of instructional groups<br>from the period preparation or school-wide<br>agreements, although this is not required. | <ul> <li>The teacher determines that the three instructional groups from the group plan indeed constitute the best number for this lesson objective. In addition, in the period preparation, the teacher had already noted that two students who are normally in the core group will probably need extended instruction in this lesson. Based on the previous two lessons, the teacher considers this a realistic estimate, and keeps it that way.</li> <li>The teacher determines which students have already met the lesson objective and may thus skip the plenary class instruction. The teacher does not also identify students who need extended instruction, but uses the extended instruction group from the group plan.</li> </ul> |
|                                                                           | 4     | The teacher critically examines the needs of <i>all students</i><br>with regard to the lesson objective, and uses this<br>information to compose instructional groups (but not a<br>fixed number). | In this regard, a teacher may deviate from<br>the usual number of instructional groups<br>from the period preparation or school-wide<br>agreements, although this is not required. | <ul> <li>The teacher determines that the three instructional groups<br/>from the group plan indeed constitute the best number<br/>for this lesson objective, but also notes that two students<br/>who would normally be in the core group will probably<br/>need extended instruction for this lesson. In addition, the<br/>teacher establishes that a student who usually follows<br/>extended instruction has already mastered this objective<br/>reasonably well, and determines that this student may<br/>choose during the lesson whether to start working<br/>independently right away.</li> </ul>                                                                                                                                    |
|                                                                           | NEI   | There is not enough information to determine whether th                                                                                                                                            | e teacher considers the composition of instructi                                                                                                                                   | onal groups when preparing the lesson.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



##T |||| |||



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This indicator is used to measure the extent to which the teacher monitors comprehension and working processes students. It refers to monitoring during both instruction and processing. Monit can be done in many different ways (for example by examining students' work, asking questions, observing or looking the dashboard). This indicator measure the extent to which the teacher monit and not the effect of monitoring. For a high score on this indicator, teachers r regularly monitor comprehension and working processes of students of all le with regard to the lesson objective, du both instruction and processing.

|                                                                                            | Score | Description                                                                                                                                                   | Explanatory notes                                                                                                                                                                                                            | Example                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S<br>the<br>s of<br>g<br>toring<br>or<br>i at<br>es<br>sors,<br>a<br>must<br>wels<br>uring | 1     | The teacher <i>does not</i> monitor comprehension and/or<br>the working process, or monitors them <i>only superficially</i><br><i>and/or not purposively.</i> |                                                                                                                                                                                                                              | <ul> <li>The teacher asks superficial questions (e.g. 'Year 5 students, is everything okay?').</li> <li>The teacher does not check on the students until the end of the processing time.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                            | 2     | The teacher monitors comprehension and the working<br>process regularly and purposively during instruction or<br>processing.                                  | Regularly means that the teacher does this<br>at multiple times. It is also important for the<br>monitoring activities and strategies to be<br>aimed at obtaining information related to the<br>lesson objective.            | <ul> <li>During the processing phase, the teacher passes by all<br/>students once to check whether they are using the right<br/>strategy. Those who are having trouble in this regard are<br/>visited an additional time.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                            | 3     | During both instruction <b>and</b> processing, the teacher<br>regularly and purposively monitors comprehension and<br>the working process.                    |                                                                                                                                                                                                                              | <ul> <li>The teacher asks many questions during instruction. During<br/>processing, the teacher makes a number of rounds helping<br/>only those pupils who have indicated they need assistance.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                            | 4     | During both instruction and processing, the teacher regularly and purposively monitors comprehension and the working process for students of all levels.      | All levels explicitly means that the teacher has<br>an overview of students of different levels. To<br>this end, the teacher need not explicitly ask<br>each student a question, but can use various<br>forms of monitoring. | <ul> <li>The teacher asks many questions during instruction, walks around a lot during processing and pays attention to students of all levels. In the meantime, the teacher consults the dashboard in the adaptive software to see how far the students are and how it is going.</li> <li>During instruction, the teacher asks a question. The teacher gives all students time to think before giving them a turn. While a student is answering, the teacher observes the reactions of all students. The teacher then asks another student, 'Do you disagree?' The teacher also pays attention to all level groups during processing.</li> </ul> |
| 66                                                                                         | NEI   | There is not enough information to determine whether the                                                                                                      | e teacher monitors comprehension and the work                                                                                                                                                                                | king process.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



There is not enough information to determine whether the teacher monitors comprehension and the working process.

## Using ADAPT

TRAINING, RELIABILITY, SCORES



#### Training

- Watch introductory video
- Read manual
- Session 1: discuss all indicators
- Watch and score recordings of one teacher (lesson + interview)
- Session 2: Discuss similarities and differences in assigned scores
- Watch and score recordings of one teacher (lesson + interview)
- Session 3: Discuss similarities and differences in assigned scores

Total training time investment: 12-15 hours



#### Procedure and data

42 raters

scored 5-15 teachers each (given, random order)

motivate all scores





86 teachers (grade 1-6) math lesson + interview

399 ADAPT scoring forms



#### ADAPT scores





Parameter estimates provide insight into how each item contributes to overall score and reliability.

Parameter estimates provide insight in relative difficulty.

However! For formative, rapid use in classrooms, single item scores and sum scores are way more feasible



D-study – overall

|             | Agreement |        | Reliability |         |  |
|-------------|-----------|--------|-------------|---------|--|
|             | mean      | sd     | mean        | mean sd |  |
| 2 assessors | 0.795     | 0.0392 | 0.888       | 0.0243  |  |
| 3 assessors | 0.853     | 0.0303 | 0.922       | 0.0175  |  |
| 4 assessors | 0.885     | 0.0246 | 0.941       | 0.0137  |  |
| 5 assessors | 0.906     | 0.0207 | 0.952       | 0.0113  |  |

| Variance                    | mean   | sd     |
|-----------------------------|--------|--------|
| var.i (assessors)           | 0.1894 | 0.0552 |
| var.j (teachers)            | 0.7301 | 0.1305 |
| var.ij (assessors*teachers) | 0.1794 | 0.0290 |













Involvement of students in objectives and approach





Preparation of instruction and processing for the enrichment group



### Rater experiences



"It is **interesting to ask a teacher questions about their thinking process**, because a teacher does a lot of things automatically.

Sometimes teachers even answer that they do not do something, but if you ask further questions, they do indeed master that skill. (...) **Differentiation consists of so much more than can be seen in a lesson observation**."

Willemijn, student Teacher Training



"What also struck me is that there can be **significant differences between being able to prepare well** and being able to explain what or why you want to do something, **and how the lesson ultimately works out in practice**. It's nice to see that the instructions and processing have been thought through, but also **how difficult it is to carry out your intended instruction within a class**." *Petra, Academic Coach* 



"By carefully reading the manual, following the training and assessing lessons from other teachers, I have gained more insight into the different phases of differentiation, the associated skills and the underlying principles. It also invites you to reflect, because with each part you start thinking about the extent to which you master the skills yourself and apply the principles in your lessons." *Anne, student Teacher Training* 



### What's next?

USE & RESEARCH



Use in practice

• Online training environment for working with ADAPT

#### Implementation in teacher training

- In-depth understanding of DI
- Support reflection
- Conversation starter for mentoring purposes



#### Future research

- Detailed score descriptions, explanations, examples:
  - how self-explanatory is ADAPT?
  - how reliable are scores from non-trained assessors?
- To what extent can ADAPT be used in different contexts (educational levels, subjects, countries)?
- How do ADAPT scores from external raters compare to selfevaluation scores and/or students' perceptions of DI?





### Your thoughts

International comparisons – is ADAPT applicable to your context?

For what purposes would you use ADAPT?





# Read more & download ADAPT manual

All our publications and the ADAPT manual can be accessed and downloaded on our project website <u>https://www.matchproject.nl/english/</u>

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DISP



#### DISP: Differentiated Instruction from Students' Perspective

|    |                                                                                                 | Strongly<br>agree | Agree | Disagree | Strongly<br>disagree | n/a |
|----|-------------------------------------------------------------------------------------------------|-------------------|-------|----------|----------------------|-----|
| 1  | My teacher explained what we were going to learn                                                |                   |       |          |                      |     |
| 2  | My teacher explained why we were going to learn that                                            |                   |       |          |                      |     |
| 3  | At the end of the lesson, our teacher discussed how we worked                                   |                   |       |          |                      |     |
| 4  | At the end of the lesson, our teacher discussed what we had learned                             |                   |       |          |                      |     |
| 5  | My teacher noticed it when I did not understand something<br>during the lesson                  |                   |       |          |                      |     |
| 6  | During the lesson, my teacher monitored whether I understood the subject matter correctly       |                   |       |          |                      |     |
| 7  | My teacher asked questions so they knew whether I understood the subject matter                 |                   |       |          |                      |     |
| 8  | My teacher knew what I found difficult during this lesson                                       |                   |       |          |                      |     |
| 9  | My teacher explained the subject matter in another way, when I did not understand it right away |                   |       |          |                      |     |
| 10 | My teacher explained the subject matter clearly for me                                          |                   |       |          |                      |     |
| 11 | My teacher explained the subject matter until I understood                                      |                   |       |          |                      |     |
| 12 | My teacher let me think which exercises I wanted to make during the lesson                      |                   |       |          |                      |     |
| 13 | I could decide whether I needed the explanation from my teacher during the lesson               |                   |       |          |                      |     |
| 14 | When I finished my independent work, I was allowed to decide which tasks I wanted to do         |                   |       |          |                      |     |
| 15 | My teacher helped me finding the answer by myself                                               |                   |       |          |                      |     |
| 16 | I had to put effort in doing the independent work exercises                                     |                   |       |          |                      |     |
| 17 | My teacher encouraged me to also try exercises that I found a bit difficult                     |                   |       |          |                      |     |



#### Data collection DISP

Students in grade 4, 5 and 6 (10-12 year old)

Administered by researcher, directly after mathematics lesson

Individual students' performance level indicated by teacher



49 teachers 956 students 19,51 students per teacher (9-30)

