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# National Tests in Denmark: CAT as a pedagogic tool

JAKOB WANDALL

**ABSTRACT** This article describes standardised testing in Denmark and the protections guaranteed to avoid 'high stakes'. It explains the use of computer-based 'adaptive tests' which adjust to an appropriate level for each student. It is an abbreviated version of an article from 2011 in the *Journal for Applied Testing Technology*. The author is currently providing consultancy advice for assessment reform in Wales.

## Introduction

Testing and test results can be used in different ways. They can be used for regulation and control, but they can also be a pedagogic tool for assessment of student proficiency in order to target teaching, improve learning and facilitate local pedagogical leadership. To serve these purposes the test has to be low stakes, and to ensure this, the Danish national test results are made strictly confidential by law.

Danish is tested in Years 2, 4, 6 and 8; maths in Years 3 and 6; English in Year 7; and geography and science in Year 8. (The later starting age means children are older than in England.) There are also voluntary tests in Years 4-8 for Danish as a second language.

## Adaptive Tests

Adaptive tests are designed to adjust to the pupils' level of proficiency during the test. In this design, the first item presented to the pupil has an average difficulty (compared with the form the test is designed for). If the answer is correct, the next item presented to the pupil will be empirically more difficult. If the answer is wrong, the next item will be empirically easier. In this way the test will adapt to the pupils' level, so that the sequence of items will be different for each pupil.

In a well-designed linear test where the series of items is predetermined, most pupils will experience that some items are too easy and others too difficult, while some items fit the difficulty of the individual pupil's ability. From an analytical point of view the test items that are too easy or too difficult reveal very little about the pupil's ability.

Only the items where the level of difficulty fits the pupil's ability contribute substantially to the estimation of the pupil's ability. And in a well-designed adaptive test the pupils will mostly be presented with items that have a suitable level of difficulty for their level of ability.

### **The Danish Public School is a Comprehensive School**

The Danish public school system is built on the principle that pupils are not to be divided according to ability or social background. These divisions are prohibited by law. A consequence of this philosophy is that there is a considerable distance between the top and the bottom of the academic level in every class in practically every school. For example, a Year 3 class will typically have an attainment range of more than five school years in algebra.

### **How Are the Tests Carried Out?**

The pupils have 45 minutes to answer as many items as possible. During this time, the pupils will typically answer 50-80 items. If a pupil needs more time, it is possible for the teacher to prolong the test for the individual pupil.

### **Which Parts of the Subject Are Tested?**

The tests are designed to assess large and important parts of the subject. However, not all parts of a subject are suitable for this kind of testing (e.g. pupils' ability to express themselves orally or in writing). Teachers are required by law to assess student progress regularly, so it is necessary to combine different kinds of assessment and evaluation. The national tests can only cover a very small part of the total need for evaluation in the Folkeskole. The website [www.evaluering.uvm.dk](http://www.evaluering.uvm.dk) also contains a description and a user guide to a large number of other evaluation tools.

Every subject is divided into three dimensions or strands, called profile areas, to make a more detailed and precise evaluation of the pupil's proficiency possible. When being tested, the pupil will encounter the questions being presented in random order. This means, in effect, that three separate adaptive test sessions are conducted simultaneously, and the selection of the next item in a given profile area solely depends on the pupil's response to the previous items in the same profile area.

### **What is at Stake?**

In high-stakes testing, security, equal terms and fair conditions are key issues. But if the main purpose – as in Denmark – is to assess student proficiency in order to target teaching, and thereby improve the conditions for learning, the teacher should have access to full control over the testing conditions (e.g. which aids, tools, remedies and assistive technology are allowed during the test).

In fact, if it improves the teacher's analysis of the student's proficiency, it would make sense that the teacher is allowed to help – for example, if the pupil gets stuck – even though it could have a significant impact on the test result. Under these conditions, high-stakes uses could not be supported because the scores are not necessarily comparable.

When only a small part of the curriculum is tested – as in the Danish national test system – it is important to keep the stakes low. High stakes would lead to too much focus on the tested profile areas and too little focus on creative, innovative and oral skills – which play a significant role in the curriculum of the Folkeskole.

### **Disseminating Results**

Only those who need information about the results for professional reasons are allowed to see them. All the results are kept in a secure database. The database contains all the items used for testing the pupils as well as the answers that the pupils gave.

The teacher has access to detailed reports with information about his or her individual pupils' results as well as test results at class level for his or her own class. The head teacher is allowed to see each pupil's overall results, the class results and the results for the school. The local authorities have access to results at school level and test results aggregated to municipality level.

Parents must also be informed about their child's test results by the school. For this purpose, the computer generates a written description of the results for each pupil. There is a strong tradition of parent involvement in the Folkeskole, and the test results should support the school's cooperation with the pupils and their parents, in order to support each pupil in the best way possible.

### **What Kind of Response is Given to Whom?**

*The pupil:* As soon as possible after the test (typically within a week), the teacher will talk to the pupil about the result. It is not just information about the result but a discussion about what to do. Together they will plan the best way to improve teaching/learning in the future.

The most common situation is that the test results match the teacher's perception of the pupil's proficiency – in this case, the test just confirms that they are on track. But experience shows that in a class, there are usually at least a couple of surprises, about which the test provides new knowledge and useful information.

*The teacher:* The results help teachers get a more precise overview of the impact of their teaching – for example, how are the pupils performing in that aspect of the subject which has been the focus of teaching? Is there a need for any follow-up activities? The test also provides information about the pupils' proficiencies in areas in which they are to be taught in the immediate future in order to target teaching towards the class's and the individual pupils' preconditions and needs.

*The head teacher:* The head has overall pedagogical responsibility at the school and therefore an obligation to guide and coach individual teachers in pedagogical matters. The test results should therefore also be seen as a tool for pedagogic leadership.

### **National Results: the national profile of performance**

The purpose is to be able to monitor the overall development. Furthermore, the schools and the municipalities should be able to compare their results with the average results for the whole country.

However, the background of the pupils in different schools is very different in socioeconomic terms, which usually relate statistically to the pupils' test results. This is taken into account and a statistical correction made. This correction will take into consideration factors such as gender, ethnic background, parents' education and socioeconomic status. The corrected results are confidential but are given to the school and the municipality.

### **Recent Experiences and Plans for Further Development**

Finally, it is important to emphasise that this system – like any other test system – provides information about the pupil's proficiency, knowledge and attainment – but cannot provide ready-made solutions to pedagogical problems.

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**JAKOB WANDALL** has a background as a researcher in social sciences, evaluation and education. From 1994-2011 he was Head of Division/Chief Adviser in the Danish Ministry of Education. He was the project manager (2006-2011) on the development and implementation of the national testing system. In 2011 he co-founded NordicMetrics, and he is an external lecturer at the University of Aarhus (Department of Education). *Correspondence:* [jw@nordicmetrics.com](mailto:jw@nordicmetrics.com)