The impact of high-stakes national testing on teaching and learning: An Icelandic example

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Introduction

This paper gives a short account of an inquiry into the impact of national tests in Icelandic and Science in year 10, on teaching and learning in years 8–10, in four Icelandic compulsory schools. The aim of the study was to shed light on to what extent and in what way the tests might have an impact on teachers’ conceptions, decisions and teaching organisation, and on students’ learning activities and outcomes.

The research was a qualitative case study in four schools, with the two subjects as the main cases. Data was gathered with individual interviews with the head teacher of each of the four schools, with individual interviews with teachers of the two subjects and classroom observations in their lessons, focus group interviews with students, and an analysis of written documents and website-material from the schools.

The paper is in four sections following this introduction. The first section gives a short overview of the educational system in Iceland to explain the context in which the study was conducted. In the next section a conceptual model of curriculum that was developed for the study is presented. The model served as a theoretical basis for the study, and as a framework for data analysis and the presentation of findings. In the third section some main findings are highlighted and the paper finishes with a few concluding remarks.

The Icelandic context

The Icelandic compulsory school is a ten year school from 6–16. It comprises two levels: The primary level with years 1–7, and the lower secondary level with years 8–10. Normally schools have both levels, which means that most children finish their
compulsory education in the same school (Ministry of Education, Science and Culture, 2002).

A National Curriculum for the compulsory school has been in place for a long time, but its current status is rather complicated. An edition of the curriculum, published in 1999, is in effect until the end of this school year (2009–2010). A revised edition, published in 2006 and 2007, is gradually being implemented, and is due to be in full effect from the beginning of the school year 2010–2011 (Mennta- og meningarmálaráðuneytið, n.d.). This edition of the National Curriculum is already under revision, following a new Compulsory School Act, which was a part of a legislation for the entire educational system in 2008 (Ministry of Education, Science and Culture, n.d.).

The 1999 edition of the National Curriculum is highly prescriptive in terms of learning aims and objectives but gives schools a high degree of autonomy over the implementation. It comprises around 900 pages in 12 separate booklets; one providing general guidelines, and the remaining 11 for individual subjects (Ministry of Education Science and Culture, 2004).

The 1999 edition of the National Curriculum states the intended outcomes of learning in three different ways (op. cit.):

1. As final outcomes of each subject, stated as rather broad aims intended to be met at the end of the compulsory school.
2. As three sets of intermediate objectives to be met by the end of year 4, year 7 and year 10.
3. As learning targets for each year, called ‘enabling objectives’ in the curriculum guidelines.

Iceland has a long tradition of national testing in compulsory education. The current system has been in place since 1977, but with various modifications. At the time of the study national tests were held in two subjects, Icelandic and Mathematics in the beginning of years 4 and 7, and in six subjects by the end of year 10, as a part of the final examination for the compulsory school. These were optional, at least in theory, but held the key to enter the upper secondary schools. A cut off score (grade 5 or above in each subject) was decided as a minimum access requirement for the upper secondary schools. This was generally referred to as ‘fail’ or ‘pass’ but secondary schools offered introductory courses for students who did not reach the ‘pass’ score.

The national tests at the time of the study were high-stakes in the sense that the results were published, both for individual schools and regions. Various comparisons and inferences were made from the results, both in media and in public discourse, about the quality of individual schools. The test results were seen as an indicator of
professional competence, and hence individual teachers saw the test results as an important criterion for professional prestige.

This was changed with the new legislation in 2008, and currently there are only three tests in year 10: Icelandic, Maths and English. They are now held in the beginning of the school year, at same time as the tests in year 4 and 7. The tests are meant to be a source of information about students learning, for students, parents, schools and educational authorities, and to be a means of formative assessment for teachers and schools to help the individualisation of teaching and learning (Reglugerð nr. 435/2009 um fyrirkomulag og framkvæmd samræmdra könnunarprófa í 4., 7. og 10. bekk grunnskóla). The test results are no longer published, and the year 10 tests are no longer a part of the final examination, which means that the secondary schools can no longer use them to regulate their intake, and have to rely entirely on the assessment of the compulsory schools themselves. This has reduced the high-stakes nature of the tests.

The national tests have always been controversial. The tests at the time of the study had more or less the same function as described above. Those respondents in my study who favoured the tests saw them as a necessary means of control and organisation, valued their role as a source of information and comparison, and emphasised the importance of a reliable, external evaluation at the end of compulsory education.

The opponent of the tests criticised them for being an external source of control, that deprived teachers of professional autonomy, narrowed the curriculum and limited the possibilities of individualising teaching and learning. They were also meant to cause stress and anxiety among students and their families, and have negative impact on students’ motivation for learning. Opponents of the tests also criticised their high-stakes nature, the publicity of results, and myopic media coverage, focussed almost exclusively on test results rather than the quality of schooling. The form of the tests was also criticised, which is almost exclusively multiple-choice. The fact that dyslexic students had to take a reading comprehension test, as a part of the final test in Icelandic, that affected their possibility to enter secondary education was also criticised (see also Geirlaugsdóttir, 2007; Sigþórsson, 2005).

Now the absence of the tests is also criticised, not least by the secondary schools that complain about inflated assessment marks from the compulsory schools that lack both validity and reliability, and are useless to guide their intake.

A conceptual model of curriculum

In my thesis I related national testing to the efforts of governments, in various countries, to improve the outcomes of education – or raise standards as it is commonly put – by
centralising – or standardising – national curricula, use standardised tests to compare the performance of schools with national standards, and hold schools, teachers and students accountable for the results. There is high controversy over whether this works or not. This approach seems to be favoured by governments and politicians, but is highly distrusted and criticised by academics and researches in school improvement, who call for attention to the internal conditions of schools, such as transformational leadership and empowerment (Bennett, Wise, Woods and Harvey, 2003; Sergiovanni, 2001), collaborative professionalism (Hargreaves, 2000), the relationship between leadership and learning (Leithwood, Louis, Anderson and Wahlstrom, 2004), and professional accountability (Darling-Hammond, 2004).

To further explain the nature of this I developed a conceptual model of teaching and learning to guide my study. The model is based on a well known model of the curriculum process, used for example by the PISA international studies (OECD, 2005). In the model the curriculum itself is seen as having three main aspects (figure 1): The intended, the implemented, and the attained curriculum. These aspects of the curriculum must be seen in the context of the national educational system, the schools and students themselves. This context must then be seen in the light of a number of antecedents, namely, country circumstances, internal school conditions and characteristics of students.

![Image](image.png)

**Figure 1. The curriculum process (OECD, 2005)**

In my own version of the model (figure 2) the backbone of the intended curriculum is the *National Curriculum*, along with various other regulations, issued by educational authorities. The national tests also belong here, as the primary means of the authorities to evaluate the implementation of the *National Curriculum* and the performance of the compulsory school sector generally. The intention is that the prescriptions of the *National Curriculum* are followed through in the classroom, and will result in the intended outcomes for students.
The implemented curriculum is realised along two dimensions: Teaching and learning. Teaching can be studied in terms of curriculum content, teaching organisation and assessment. Learning is related to student traits or internal conditions, such as their readiness for learning (e.g. in terms of prior knowledge), interest and motivation for learning, learning profile, self-efficacy and metacognition. Also the nature and organisation of the learning tasks the pupils are given have to be taken into account.

The attained curriculum refers to the outcomes of student learning, both cognitive, emotional and social. The attained curriculum is a direct outcome of the implemented curriculum and at the same time provides a platform for further learning.

The last aspect of the model is the teachers themselves. This aspect of the model reflects the assumption that the implementation of the intended curriculum is shaped by the conceptions, of teachers, their pedagogical content knowledge and their self-efficacy beliefs. Therefore we cannot analyse the links between the intended, the implemented and the attained curriculum without regard to teachers themselves, internal conditions in the schools and external factors such as the national tests (for a more comprehensive description of the model, see Sigthorsson, 2008).

Figure 2. A conceptual model of curriculum (Sigthorsson, 2008)

Highlights from findings

The teachers that participated in the study were generally satisfied with the National Curriculum in Icelandic and Science, and regarded it in accordance with their own conceptions of the subjects they taught. They thought, however, that the curriculum content of both subjects was too extensive to be covered within the timeframe allotted.
for each subject. The teachers were well aware of their responsibility to follow the *National Curriculum*, but at the same time they thought that the national tests did not reflect all the aspects of the curriculum. For many of them this created a tension between the requirements of the curriculum on one hand, and their obligations to prepare the students for the tests on the other. Most of them solved this by choosing from the curriculum content according to what they regarded as the most effective test preparation for their students, and by using teaching approaches that enabled them to cover the most possible material in the shortest possible time.

In Science this resulted in strong adherence to textbooks, and teaching where teachers transmitted facts and concepts from the textbooks. The teaching was mainly devoted to the three main curriculum areas of biological, physical and earth sciences. On the other hand there was weak emphasis on the two curriculum areas that are supposed to cut across the other three: About the nature and role of science and about methods and skills (figure 3).

![Figure 3. The elements of the science curriculum (Menntamálaráðuneytið, 1999, p. 8)](image)

The 1999 curriculum for Icelandic comprised six curriculum areas: Grammar, literacy & reading comprehension, literature, spoken language and expression, viewing and listening skills and writing (composition skills). Generally both teachers and students referred to spelling as a distinct curriculum area and spelling was a separate test item on the national test, although it is not one of the content areas of the *National Curriculum*. Taken together spelling and grammar got at least half of the teaching time – which represented its value on the test, while the other five curriculum areas got the rest of the time allocation, apart from *spoken language and expression* and *viewing and listening skills*, that were almost absent from the implemented curriculum.

Despite their emphasis on grammar and spelling, many of the Icelandic teachers expressed concern over diminishing language development, reading comprehension and
even writing skills on part of their students. No attempt was made to verify this in the study, but it should be noted that one of the PISA-findings for Iceland is a constant fall in reading comprehension between the measurements of 2000, 2003 and 2006. The fall is statistically significant between 2000 and 2003 (Halldórsson, Ólafsson, and Björnsson, 2007).

A classification from Hacker and Rowe (1997) was used to analyse the teaching styles of the teachers in the study. Hacker and Rowe identified the following three styles:

- **Informers**, characterised by direct teaching and transmission of factual knowledge, and rather infrequent use of questions other than closed questions that demand recall and application of facts.
- **Problem solvers**, where the initiative is held by the teachers, but the use of questioning is much more challenging than that of the informers, and teacher directed problem-solving activities are applied.
- **Inquirers**, characterised by a pupil directed approach, where initiatives taken by pupils are a more prominent part of the teaching arrangements.

The prominent teaching style of eight out of the fourteen teachers in the study turned out to be that of informers. Four of these teachers applied this style according to their own choice, but the other four reported that this teaching style was imposed on them by the national tests and their requirement to cover a certain amount of material to prepare for the test. The other six teachers endorsed the teaching style of problem solvers, and applied some features of that teaching style, although they all used a good deal of informers’ teaching as well. No teaching that could be classified as that of *inquirers* was observed.

All the teachers acknowledged the importance of meeting individual needs of students in some way. The informers, however, saw individualisation mostly as special education outside the class, and in their teaching organisation there was little scope for differentiation for meeting individual needs in mixed ability classes, as described by Tomlinson (2001, 2003). The problem solvers saw more possibilities of differentiation in mixed ability classes, but on the whole, differentiation in that sense was weak, and the teachers’ conceptions of as it were rather unclear. Those who described the clearest ideas of differentiation all blamed the national tests in some way for limiting their possibilities to organise it. “Why differentiate,” they said, “when everyone is measured by the same yardstick at the end of the day?”

Assessment by the schools themselves was mainly of two types. Written tests by the end of each term (the schools divided the school year into either two or three terms) and some kind of continuous assessment. The main feature of the continuous assessment was small tests and graded assignments and both types served the purpose of summative assessment (assessment of learning). There was also widespread use of
previous national tests that are available for the schools on the website of the National Testing Institute. According to the teachers the purpose of these tests was partly to familiarise the students with the form of the tests, but partly the schools used them to grade students, and to diagnostic their needs for revision and even special education.

The students themselves had different attitudes towards the tests. Some were in favour of them, while others were neutral or thought the tests were OK. The worrying part of what students said was that some of them – in particular those who experienced learning difficulties – reported anxiety and stress because of the tests and the test preparation. Formal use of previous national tests as ‘practice tests’ seemed to enhance this, and so did the heavy and repeated emphasis, placed by teachers, on the importance of good results. The students normally took the ‘practice tests’ seriously, and regarded them as an indication about their performance on the real tests. In most cases the weak students saw the results of the ‘practice tests’ as their schools’ final confirmation that they would fail the real tests.

A basic assumption of the curriculum model presented in this paper is that the attained curriculum is directly linked to the implemented curriculum. Therefore the less attention curriculum content areas get within the implemented curriculum the less of that content students are likely to attain. Other outcomes of the attained curriculum cut across all subjects, such as motivation for learning, meta-cognitive, problem-solving skills and higher-order thinking. These aspects of the students’ schooling can, in fact, be regarded both as preconditions and outcomes of learning and therefore ‘floating’ between the implemented and the attained curriculum. Needless to say, the students of the four schools did not receive much of the curriculum areas that were more or less absent from the implemented curricula of Icelandic and Science, such as spoken language and expression and viewing and listening skills in Icelandic, and about the nature and role of science and about methods and skills in Science. In terms of other important outcomes the findings from the four schools indicated a learning culture characterised by transmission of factual knowledge, limited motivation, and a desire for grades, rather than a learning environment that encouraged reflection, problem-solving, deep learning and constructed knowledge.

Some concluding remarks

First of all it has to be reiterated that the findings of the study described here are drawn from a small sample and do not support generalisations. But for the four schools it stands out that the implemented curriculum in Icelandic and Science departed in a number of ways from the intended National Curriculum. What was even more interesting – or perhaps puzzling – was that some aspects of the implemented curriculum also departed from the
teaching conceptions of the teachers themselves as they described them. This challenges the notion, often heard in the debate about the national tests that the tests themselves have a direct bearing on teaching and learning, and underscores that the impact of the tests is on the teachers, and through the teachers into the classroom. Having said that we have to be cautious in our conclusions about the direct impact of the tests on teachers, and bear in mind that there may be a number of other factors that influence the conceptions and decisions of them. However, the question still remains what else shapes the teaching arrangements of the teachers.

I offer three possible explanation, although there are certainly many more: The first one lies in a number of indications both from the current study and other research in Icelandic compulsory schools that there prevails a strong tradition of teaching and learning akin to what I have just described (Birgisdóttir, 2004; Jónsdóttir, 2003; Karlsson, 2007; Sigurgeirsson, 1992). Another thing is how that tradition has been created through the years. The long story of national testing in Iceland, not least in Icelandic, may have contributed to that tradition. A further explanation might draw on educationalists who maintain that systems of standardised curricula, high-stakes testing and accountability is likely to undermine teachers’ professionalism and encourage what Hargreaves (2000) has termed as pre-professionalism, where teachers are technicians rather than professionals, whose main role is to transmit knowledge prescribed by authorities.

This tradition has been further analysed by Shepard (2000), who has developed a model of what she calls the legacy of the 20th century. Shepard’s model consists of three interwoven components:

- **Associationist & behaviourist learning theories**, where knowledge is broken down to atomistic testable bits that can be taught in a hierarchical sequence.
- **A standardised curriculum**, based on a scientific model of schools as factories where students can be segregated to different production lines, according to carefully specified and measurable content and performance standards.
- **Scientific assessment**, built on standardised measurements.

These three components are tightly interwoven and one component of the model cannot be changed regardless of the others. Teaching and learning on one hand and assessment on the other are interconnected and one cannot be changed without a direct bearing on the other.

The second of my explanations relates to the part of my findings that indicate that the prevailing curriculum areas of the implemented curriculum in the four schools were those easiest to teach, and requiring the least pedagogical content knowledge as described by Shulman (1986, 1987). Some of the teachers in my study actually indicated
that they lacked the competence to provide the students with some of the less prominent aspects of the curriculum.

The third possible explanation, and a direct consequence of the second, could be that the lack of pedagogical content knowledge resulted in low self-efficacy of the teachers, both individually and collectively, described e.g. by Bandura (1995) and Goddard, Hoy and Hoy (2004). This might result in the teachers’ overreaction to what they perceive as the external directives from the tests, and in lack of confidence to stand by their own conceptions.

Hopefully the above conclusions take us some way towards an understanding of what kind of impact on the quality of education we might – and might not – expect from standardised curriculum and standardised national testing. Perhaps the most important conclusion is that governments’ intentions, however good they are, do not automatically set off an implementation that secures the prescribed outcomes for students. It is teachers who hold the key to the implementation of government’s intentions and while teachers’ conceptions do not change, teaching, learning and assessment do not change either. This is in line with the words of Lawrence Stenhouse (1985) who maintained that it was only teachers who, in the end, would change the world of the classroom by understanding it.

References


