Why Different Countries Do Better: Evidence From Examining Curriculum and Assessment Frameworks in 16 Countries, 1(3)

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Abstract

The recent publication of the findings from the Third International Mathematics and Science Study (TIMSS) has stirred the UK press and politicians into criticisms of the education service for lagging behind the performance of other countries. This paper looks at five levels of response to international comparisons. Drawing on the preliminary findings of a review of the aims, values, educational structures, internal school organisation, and curriculum and assessment frameworks in 16 countries, it then provides some contextual indicators for the TIMSS results in four areas:

1.  Educational aims and values,
2.  Regulation of the curriculum,
3.  Curricular breadth and balance, and
4.  Student assessment and progression.
Introduction

International comparisons of performance, such as the Third International Mathematics and Science Study TIMSS2), create a great deal of media discussion and often result in knee-jerk reactions by policy makers. However, we feel that a more reasoned consideration of three questions is required. What are the main reasons for international differences in student achievement? What can we learn from comparing outcomes for students in the United Kingdom (UK) with those for students in other countries? In the light of these findings, and of our educational aims, what changes should we make?

In the second half of the paper, we shall consider some of the contextual differences which affect student performance using examples from a review of the curriculum and assessment frameworks of sixteen countries which the National Foundation for Educational Research in England and Wales (NFER) is currently undertaking for the School Curriculum and Assessment Authority (SCAA) in England. We hope to stimulate responses and debate which will enhance the quality of our work.

Responses to International Comparisons of Achievement

The researchers contributing to TIMSS display a certain ambivalence to their studies. On the one hand, they have a natural excitement about their results as they explore the benchmark of another country’s high performance, seeking possible explanations to help them understand marked differences in student performance between, say, Singapore and several northern European countries. On the other hand, they are sensitive to other people’s conclusions about UK performance, because the data available to look behind the differences in raw student performance are incomplete; indeed some of the evidence that exists is contradictory. Wendy Keys and her colleagues on the study (Keys, Harris, & Fernandes, 1996) know this; for people who do not look deeply at the results, there are real dangers.

We find that reactions in England3 to results of international comparisons can be presented as a continuum.

1. The "Quick Fix"

Stimulated by relatively poor performance of UK students, some seek clear and simple guidance - the key action or government regulation - which will translate "our" students into high performers. This approach is the lowest level on the hierarchy because it lacks realism and ignores differences in social structures and education systems. Curriculum and assessment frameworks are highly complex and, even then, they are not the sole determinants of student performance. Family, social and other cultural factors - in combination - influence schooling, other learning, and hence student outcomes. It is likely that those seeking simple solutions will seize happily on the data that accord with their theory, thereby ignoring one of the most important research rigours, namely the
active exploration of the data to find material which could cast doubt on their own hypotheses.

Accordingly, those claiming a simple explanation for England’s mathematics performance must check their hypothesis against the results for science. For example, those wishing to argue that the causal factor in poor mathematics performance is teaching methods in primary schools would need to explain why largely similar teaching approaches result in better performance in science.

2. Understanding Other Systems

A second response to the same results involves visits to, or in-depth study of, the high-performing countries, to investigate their relative success. This constitutes a more mature response because it examines the diversity of educational practice in the world. Studies of Japan, for example, have revealed:

- some of the centrally-controlled, directive and selective educational practices,
- some of the intense family and social pressures for achievement,
- the central place of moral education in overall educational aims and in the curriculum of primary education,
- a high commitment in science to teaching for understanding, and
- a high commitment to music education, much of which takes place outside formal schooling.

Isolating the most important factors among these, and other less evident influences, is no easy task. Successfully implementing the solution in a different country is even more difficult, if not impossible. It requires analysis of the interplay of educational and curriculum goals, key family and social influences, teaching and learning factors, and school variables. The important point is that, at its best, such an in-depth study develops a sensitivity to context. At its worst, however, it merely confirms cultural differences and, by highlighting the difficulties of learning from other educational models, especially where the circumstances are overwhelmingly different, it can discourage efforts to improve.

The scope for identifying applicable lessons is greater, and the likelihood of the message becoming confused through cultural refraction is much less, if the countries under study share a similar pattern of socio-economic student recruitment, similar aspirations, and similar prior attainment on the part of students.

3. Exploring the Causes

The third level involves an examination of the possible reasons for the UK’s relative position in international comparisons. We do not yet have the results from TIMSS data relating to this question and the answer that emerges will undoubtedly be complex rather than simple. However, Wang, Haertel and Walberg (1990) have reviewed 179 papers on
US research into the influences on learning. They suggest that the most important factors overall tended to be:

- **Programme design variables**, such as additional classroom aides, smaller groups, or increased material resources, plus the flexible and appropriate use of a variety of instructional strategies. **Classroom instruction and climate variables**, such as maintaining an orderly classroom environment and providing clear, well-organised instruction; the use of questioning and interactive teaching techniques to maintain active participation by all students; the quantity of instruction; and considerate and co-operative interaction between teachers and students.

- **Extramural variables**, such as peer group variables, parental interest and involvement, the educational environment of the home, and student participation in clubs.

Significantly, education policy variables appeared to have relatively little association with learning outcomes, whereas classroom/psychological variables (metacognition, classroom management, quantity of instruction, student-teacher social interaction, classroom climate and peer group influences) were important. Additionally, Wang, et al. (1990) reported that "a large number of variables are moderately related to learning outcomes, but few, if any, single variables are strongly related to learning." They concluded, however, that "taken together [the variables] are powerful determinants of school effects" (p. 38).

Variables differ in the facility with which they are manipulated and in their ramifications for the curriculum. For example, whilst it may be easy to increase the quantity of time devoted to a given subject, this might be at the expense of curricular breadth. Choices would have to be made between, say, high success in core subjects (English, mathematics and science) and lesser success across a wider range of subjects, or between high performance in a limited number of areas of mathematics and more moderate performance across a wider range of topics.

Other variables, such as teaching techniques, classroom climate and classroom management, might offer greater scope for wholesale improvement. Yet, even in these areas, we may need to choose between different resource priorities. Of course, the answer is more complex and probably involves both quantity and quality variables. It would therefore be better to broaden the discussion to include pursuit of general improvement as well as greater success in specialised realms.

4. **Informed Self-Review**

At a fourth level, international indicators, the UK’s relative position, and contributory causes are used to evaluate progress from our own, national perspective. We have a wealth of review, research, and reflection intended to bring about improvements and to identify areas for action. However, self-review has two main shortcomings: it may involve an uncritical acceptance of traditional problems and traditional solutions, and it
may be unduly guided by local or temporal fashion. External evidence of relative performance, based on student outcome differences, is therefore extremely valuable.

We have placed informed self-review towards the top of our hierarchy of responses because it looks for solutions to problems within one’s own context and does not pursue the task of understanding other systems as a substitute for action at home. An illustration may help. The TIMSS findings for mathematics and science have emerged just a few months after another NFER study, of more modest scale, concerned with performance in England on reading (Brooks, 1996). The pattern which emerges from the two studies is that:

- in mathematics, English students perform below the norm compared with many countries it considers as important international benchmarks (in Europe, North America and the Pacific Rim),
- in reading, our best evidence is that English students lie in the middle, and
- in science, English students perform above the norm.

This might lead a policy-maker in England to certain conclusions about, say, the science assessments at the upper primary stage (age 8-11), which had been made more difficult in 1996 because of the previous year’s results. One approach could be to make no further changes in science, because existing provisions appear to be having the desired results, and to concentrate instead on raising performance levels in mathematics and English. A contrasting approach could be to place even greater stress on science, to exploit an apparent international advantage in this area.

5. Linking Progress to Purpose

Benchmarking for schools has now reached the statute books. Section 19 of the Education Act 1997⁴ empowers the Secretary of State to require the governing bodies of public-sector schools to ensure that annual targets are set for student performance in public examinations and National Curriculum assessments. In this context, there are plans for the School Curriculum and Assessment Authority to make benchmarking data available to local education authorities and to individual schools.

However, there is an important message for benchmarking both beyond and within England. Whilst international benchmarks add to our understanding of internal evidence and trends, there is a danger that carelessly adopted benchmarks will result in a shift away from the criterion-referenced assessment introduced in the National Curriculum assessment in 1988, back to the competitive (dare we say, norm-referenced?) assessment which it replaced.

The race to be "top of the league" may not be in our students’, nor our country’s, best interest. There is enormous scope for demotivation, given that only one country can "win. " Moreover, educational purpose is an important determinant of performance. We need, therefore, to use information on possible outcomes to address questions such as:
What do we want our achievements to be?

Do we want to do (equally) well in all subjects?

Can we improve performance in all subjects, or only one at the expense of others?

What effect would pursuing higher performance in (for example) science, English, and mathematics have on the overall breadth of the curriculum?

Towards an Understanding of International Differences

It is in this context that the School Curriculum and Assessment Authority in England (SCAA) has commissioned a review of curriculum and assessment frameworks in 16 countries. Its purpose is to contribute to SCAA’s work in monitoring the curriculum (4-19 years) in England and to a better understanding of international comparisons of student achievement. The review brings together information on the aims, values, educational structures, internal school organisation, and curriculum and assessment frameworks into national profiles which reflect the national contexts and priorities. Collectively, these profiles comprise an archive (Le Métails, O’Donnell, Boyd and Tabberer, in press) which provides the basis for further work at two levels:

- Factual comparisons, identifying similarities and differences (for example, in subjects studied, age of school entry, and duration of schooling) and key educational issues (for example, concerning national educational values and aims, regulatory mechanisms, curricular breadth and balance, student progression, and assessment regimes), and
- More detailed analysis of selected topics, involving consultations with national representatives.

Initial findings from the review reveal a considerable diversity in, for example, educational aims and values, the regulation and content of the curriculum, and student assessment and progression.

1. Educational Aims and Values

There are differences in the degree to which educational aims and values are made explicit. The most commonly articulated aims are in the areas of:

- developing individual capacities and potential,
- promoting equal opportunity or social equity,
- preparing young people for work,
- establishing a foundation for further education and learning,
- developing knowledge, skills, and understanding,
- promoting citizenship (sometimes in the form of promoting democracy or community), and
- safeguarding cultural heritage or language.

It is clear that curriculum and assessment frameworks cannot be divorced from the context of these national aims. Equally, there are important differences in the ways that countries articulate the specific values they seek to promote through education, some of which remain implicit. For example, attitudes to the family and to one’s elders and issues...
of personal loyalty, personal integrity, and interpersonal competition are often hidden behind, or between the lines of, national curriculum and assessment frameworks. Explicit expressions of the personal qualities and values which systems seek to inculcate include the following:

2. Regulation of the Curriculum

Despite some similarities in the mechanisms for defining and controlling curriculum and assessment in pursuit of raising standards - for example, virtually all countries specify the subjects to be covered and most set minimum or desirable attainment targets - there are interesting differences among nations:

- All the countries in the study, except the English speaking countries (Australia, Canada, England, New Zealand, and the USA), prescribe the time to be spent on each subject/curricular area per year or cycle.
- The Netherlands and Spain require school curriculum plans to conform to national minimum standards and to be approved by the inspectorate.
- France, German Länder, Hungary, Korea, Japan, Singapore, and the Swiss Cantons exercise control over textbooks.
- Italy, Singapore and Japan have high stakes assessment and the first two countries control access to lower secondary education by examinations at the end of the primary phase.
- England conducts inspections and publishes information on examination performance, by institution.
- France, Hungary, New Zealand and Spain monitor the performance of samples of students across the nation.

Each of these approaches will have an impact on student outcomes. For example, whilst some approaches provide cost-effective education of the élite to a high standard, others may result in the achievement of less ambitious standards by a larger percentage of the student body.

3. Curricular Breadth and Balance

The range of subjects covered varies considerably among countries and, on occasion, among states or districts within a country. At the primary level, most countries include their national language, mathematics, science (not Spain), art/craft, and physical education. History, geography, a second language, and music appear frequently, whilst technology and the environment are slightly less common. Hungary has a very broad subject coverage, including health, social/life skills, and homemaking alongside more traditional subjects. Japan also includes homemaking and places great emphasis on music, engaging students through the early use of recorders and progressing to broadly-based involvement in orchestras from the upper primary phase. In the breadth or balance debate, two countries which have introduced compulsory primary curricula during the 1980s (England and the Netherlands) have, during subsequent reviews, determined that the curriculum is overloaded.
The position of religious education is interesting. It is by no means common and is expressly forbidden in French public schooling. In contrast, Spanish schools are obliged to provide courses in the Catholic religion for up to two hours per week, but students are free to undertake private study instead. It is notable that the three Pacific-rim countries included in the study (Japan, Korea and Singapore) have a clearly defined place for moral education, especially in primary education.

At the secondary level, curricular diversity is greater and more complex, due to the range of institutional as well as course options. Variations exist in the inclusion of information technology as a separate subject (Hungary and the Netherlands), homemaking (Hungary, Japan, Korea and Sweden), moral education (Hungary, Japan, Korea and Singapore), economics (France, Hungary and the Netherlands) and second or third foreign languages (the Netherlands and Sweden). History, geography, technology and music are not ubiquitous. England is notable for excluding society studies or civics.

These comparisons must be treated with care, however, because subject titles may disguise the detail of content. Moreover, in some countries, decisions on curriculum content are devolved to the schools, which may entail even greater diversity than is apparent from a country-wide description.

4. Student Assessment and Progression

Progression between classes follows chronological age in just over a third of the countries studied and work is often paced to ensure that this is manageable by the large majority. In some cases, this policy forms part of a specific reform towards non-selective, common education for all during the compulsory phase of education (for example, France and Spain) and may be supported by routine provision of additional tuition, as is the case in France for secondary age students who experience difficulties in French, mathematics, and English.

The countries which control progression according to the student’s readiness for the work of the next class/phase usually organise end-of-year assessments and/or reviews by all the teachers of a particular class. They often offer opportunities for students to retake an examination. A recommendation that the student repeat a year usually requires the consent of parents. Repeating a year is exceptional at the primary level and, at the secondary level, is usually limited to two repetitions per cycle. In some cases, failure to achieve the required standards for two consecutive years entails a transfer to a school with a less demanding curriculum (for example, in the Netherlands and Switzerland). However, where the curriculum is organised in modular form, students may only be required to repeat the module which they failed.

In some countries (for example, the Netherlands and Sweden), students may prematurely progress to a higher class if they are felt to have mastered the requirements of their current class. This, also, is usually subject to parental consent.
Transfer to lower secondary school is usually automatic but Italy and Singapore require students to pass a primary school leaving examination. In Italy, this comprises written examinations in language/expression and logic/mathematics, and a single oral examination covering all subjects, which is conducted by the class teachers and two teachers nominated by the Teachers’ Assembly for the school. However, the outcome does not influence the nature of the student’s lower secondary education since the Italian system does not have differentiated school types until the upper secondary phase. In Singapore, however, as in Germany, the Netherlands and Switzerland, achievement at the end of primary education determines the student’s suitability for, and access to, differentiated secondary school courses, which in turn lead to different secondary school leaving examinations.

Most countries require students to obtain lower secondary school certificates for entry to upper secondary education. Success at this level is critical in Japan, where senior high schools are hierarchically ranked by academic quality and access to a good school is essential for subsequent admission to an élite university and high-status employment. In Korea, lower secondary entrance examinations were abolished in 1969, but admission examinations nevertheless continue to control entry to upper secondary schooling.

**Conclusion**

The work on an archive (Le Métais, et al., in press) and the analyses are ongoing. The crucial messages emerging are about international diversity and the importance of examining what lies behind international comparisons, whether of student achievements or the organisation of teaching and learning. Without an understanding of the overarching curriculum and assessment frameworks, it is hard to identify the lessons which can be learned from overseas experience. More importantly, we would argue, without a clear reflection on our purposes, it is dangerous to apply any of these lessons.

**Notes**

1. This paper is a revised, updated version of a presentation to the Annual Conference of the National Foundation for Educational Research in England and Wales, London, 10 December, 1996.
2. TIMSS collected data on half a million students from 41 countries. Further information is available on: [http://www.ed.gov/NCES/timss](http://www.ed.gov/NCES/timss)
3. And not only England. See, for example, ASCD (1997) International maths and science study calls for depth, not breadth, *Education Update*, 39, 1.
4. This legislation applies only to schools in England and Wales. Northern Ireland and Scotland each have separate legislation.
5. The countries involved in the study are: Australia (selected states), Canada, England, France, Germany, Hungary, Italy, Japan, Korea, the Netherlands, New Zealand, Singapore, Spain, Sweden, Switzerland and the USA.
6. A pilot version of the Archive is due to become available in CD ROM format in the summer of 1997. We would be delighted to discuss our work, and ways to improve it,
with others, especially from the countries currently included in the study. Please contact
the Project Leader at: j.lemetais@nfer.ac.uk

References


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