

EDUCATION AND TRAINING INSPECTORATE

Better Mathematics

Report of a Survey

MONITORING AND EVALUATION of Mathematics in Post-Primary Schools





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A number of quantitative terms are used in the report. In percentages, the terms correspond as follows:

- More than 90% - almost/nearly all
- 75% - 90% - most
- 50% - 74% - a majority
- 30% - 49% - a significant minority
- 10% - 29% - a minority
- Less than 10% - very few/a small number

The Education and Training Inspectorate uses a six grade scale when quantifying their evaluations. The following table provides indicative descriptors for each of the grades.

Grade	Description
1	Outstanding characterised by excellence
2	Consistently good
3	Many good features but some areas for improvement which the school has the capacity to address
4	Overall sound/satisfactory but with some areas for improvement which need to be addressed
5	Significant weaknesses which outweigh strengths
6	Poor



1. INTRODUCTION

- 1.1 In January 2007, the Education and Training Inspectorate (the Inspectorate) published *Better Mathematics*¹. The report provided an evaluation of post-primary mathematics provision based on evidence gathered through inspections and specialist visits between the years 2001 and 2006. Evaluations of all aspects of provision were presented, including the strengths and weaknesses of departmental management.
- 1.2 During December 2007, as a follow-up exercise, the Inspectorate undertook a survey of the quality of monitoring and evaluation within mathematics departments². Eighteen schools were visited, with the inspector interviewing the head of department (HoD) and examining relevant documentation. In almost all cases, the inspector was able to meet with the Principal. The names of the schools are provided in the appendix.
- 1.3 The evidence and evaluations from the survey visits are presented in this report; the statements on whether there has been improvement were also informed by the evidence³ gathered during the school year 2006-07.

1 www.etini.gov.uk/better_mathematics-2.pdf

2 The term 'mathematics department' is taken to comprise all teachers who teach mathematics - specialist, non-specialist, full-time, part-time, permanent and temporary.

3 Sixteen inspections and specialist visits contributed to the evidence gathered on mathematics provision in 2006-07.



2. THE QUALITY OF MONITORING AND EVALUATION

2.1 Teaching and Learning

2.1.1 Since September 2005, schools have been required to undertake Performance Review and Staff Development (PRSD) through which lessons are observed and the teacher is provided with feedback by a reviewer. A majority of HoDs were acting as reviewer for members of their department and most reported that discussions at the review meetings were helpful and extended to aspects of the teaching and learning beyond the agreed objectives. In a significant minority of schools, the school's PRSD policy and practice included the HoD reviewing teachers other than those in their departments.

Are lessons observed other than through PRSD?

2.1.2 In a minority of schools, the HoD observed lessons other than through PRSD in order to monitor and evaluate the quality of teaching and learning, or undertook team-teaching in order to promote effective practice. In the best practice, there was an agreed proforma that formed the basis of feedback provided for the teacher.

Are the outcomes from observations collated and evaluated?

2.1.3 In one school, the HoD organised peer observations, which included all teachers observing the HoD; the observation of teaching in other subjects was also arranged when appropriate. In addition, at the end of the exercise, the HoD summarised the outcomes at a meeting to which the Principal was invited. In another school, a collation of the evidence gathered through lesson observations was provided for the Senior Management Team (SMT).

Is the monitoring of the work in the pupils' books leading to reflective discussions?

2.1.4 In a half of the schools, the work and marking in an appropriate sample of the pupils' books had been examined by the HoD or, in the best practice, by all of the department members through open, round-table monitoring discussions.

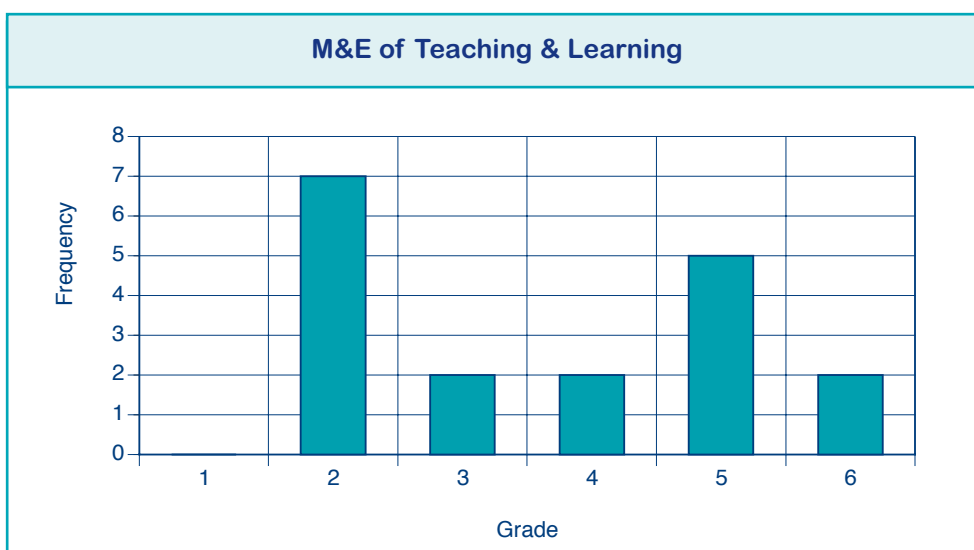


- 2.1.5 All HoDs reported that often they visited the classes of department members when conducting day-to-day administration, and through this they were able to monitor informally the teaching by incidental observation of the activities, the wall displays and having conversations with the pupils.
- 2.1.6 In the best practice, a school had agreed that department meetings were to be held in each of the mathematics classrooms in turn in order that teachers would talk about their new wall displays and the associated teaching and learning.
- 2.1.7 In almost all cases, HoDs reported departmental meetings were predominantly focused on administration matters, although, in a significant minority, teaching and learning was a regular item on the agenda; in the best practice, this was a whole-school requirement.
- 2.1.8 In a significant minority of departments, evaluations by the pupils were considered. In one department, the outcomes of these evaluations contributed to a review of teaching approaches. In another department, the responses from a questionnaire on the pupils' attitudes to mathematics and their experiences in lessons had been evaluated and the department's practices reviewed.

Is good practice shared?

Are pupils' views sought?

What is the quality of M&E of T&L in the department?





Are the department's results benchmarked?

2.1.9 Overall, in a significant minority of the departments visited, the monitoring and evaluation of the teaching and learning was evaluated as consistently good. This is in contrast to a similar proportion in which the monitoring and evaluation had significant weaknesses or was poor.

2.1.10 The evidence from this survey suggests that progress is being made in the area of monitoring and evaluating the teaching and learning⁴ in a significant minority of schools. It also suggests, however, that in a minority of schools two areas for improvement remain, namely, the need to increase and improve the opportunities for mathematics teachers to:

- discuss teaching and learning in an open and reflective manner, in order to share good practice;
- receive feedback on their teaching relating to effective mathematics pedagogy.

2.2 Use of Performance Data

2.2.1 In a majority of departments, the Benchmarking Data⁵ that is issued by the Department of Education (DE) was being used and HoDs were aware of how well their department was performing in comparison to similar schools in the end of key stage (KS) 3 assessments. A significant minority of HoDs, however, were unable to explain, with sufficient confidence and rigour, how good their KS3 performances are. In the best practice, the benchmarking process was undertaken by the whole department in a collaborative exercise; HoDs reported that this led to open discussions about the performance at class level.

4 *Better Mathematics stated: peer-observation and observation by the HoD are underdeveloped; discussion of teaching and learning and the sharing of good practice often happen in an informal setting and do not involve all staff who teach mathematics.*

5 *E.g. www.deni.gov.uk/microsoft_word_-_post-primary_schools_benchmarking_2005-7.pdf*



- 2.2.2 The analysis of the General Certificate of Secondary Education (GCSE) and the General Certificate of Education (GCE) results is completed by most of the schools. A minority of HoDs, however, were unaware of the analysis using the Northern Ireland (NI) averages for similar schools that is available through the Classroom 2000 (C2k) system⁶.
- 2.2.3 The C2k system also provides a comparison between a pupil's score in GCSE mathematics and the average score for all the GCSEs that he or she may have entered. The analysis of these scores can be based on an aggregate at department level or at class level. This analysis was being used in half of the schools; in most of these, it had only a limited audience within the school, for example, at senior or middle management level. Often, however, when shared with the HoD, it was not being used further to promote evaluation and review. In the best practice, this class level analysis was shared openly with all members of staff in the school.
- 2.2.4 A minority of the schools were supplementing the C2k analysis by participating in commercial schemes⁷ to aid target setting and the tracking of pupil progress.
- 2.2.5 Most departments were maintaining records of internal data and/or data from standardised tests. In a few of the schools, the Assessment Manager module of the C2k system was aiding the longitudinal tracking of individual pupil's progress. However, only a minority of HoDs were able to explain a sufficiently rigorous process of intervention and review following the evaluation of the collated data.

How good are the GCSE results?

Are members of the department aware of their residual scores?

Are individual targets set for pupils?

Does the evaluation of collated data lead to review of practice?

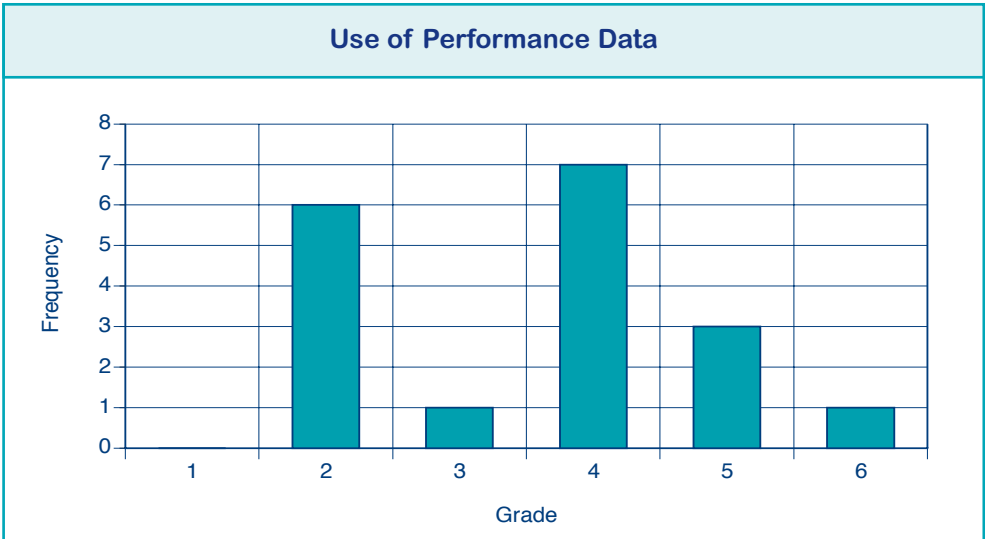
⁶ The CCEA averages are no longer used as a proxy for the averages based on all NI students.

⁷ E.g. Year 11 Information System (YELLIS) administered by the Curriculum, Evaluation and Management (CEM) centre, based in Durham University.



What is the quality of the use of data by the department?

2.2.6 Overall, in a significant minority of departments visited, the use of performance data was evaluated as consistently good, although, in a minority of departments, it was evaluated as having significant weaknesses or as poor.



2.2.7 The evidence from this survey suggests that there has been a slight improvement in the use of performance data⁸. However, two areas for improvement remain, namely, the need to:

- benchmark the performance of the department in an open and effective way;
- use more effectively the departmental records of internal and external assessments.

The former will enable all mathematics teachers to have the relevant information to reflect on the effectiveness of their own teaching, and the latter will enable the progression in the pupils' learning to be tracked and appropriate strategies and approaches to be put in place.

⁸ Better Mathematics stated: the outcomes of benchmarking to evaluate the performance of the department are often not shared with all of the teachers who teach mathematics; while most HoDs do keep departmental records of internal and external assessments, these are often not used effectively to aid the monitoring and evaluation of the progression in the pupils' learning.



2.3 Accountability

- 2.3.1 In almost all cases, the minutes of department meetings were taken and passed to the Principal or a member of the SMT. In a few cases, the HoD reported that the Principal regularly attended department meetings. The agenda was shared with the SMT in advance of the meeting on a small number of occasions, although in one school the items for the agenda were set by the Principal. In the best practice, there is a flexible approach to department meetings, with some items on the agenda set by the SMT, for example, teaching and learning, and other items on the agenda arising through ongoing reflection of practice. In one school, there were rigorous procedures in place for the issues arising at department meetings to feed into the agenda for the next SMT meeting.
- 2.3.2 In most cases, the HoD had a meeting with the Principal, or a member of the SMT, in August or September to discuss the department's results in public examinations. This level of accountability was supported by the submission of a departmental report in a majority of schools. The quality of these reports ranged from one that comprised only tables of summary statistics to others that were evaluative and promoted review, that is, suggested actions to address issues. In the best practice, the meetings helped develop strategies to promote improvement and aided the identification of staff development needs; in addition, the reports outlined targets for examination results.
- 2.3.3 In one school, the thorough monitoring of the progress towards departmental action plan targets enabled a high level of accountability. This was achieved through the ongoing completion of a 'Departmental Status Report', through which the HoD was able to inform the SMT of progress.

Is T&L always discussed at department meetings?

What are the outcomes of the meetings between the Principal and HoD?

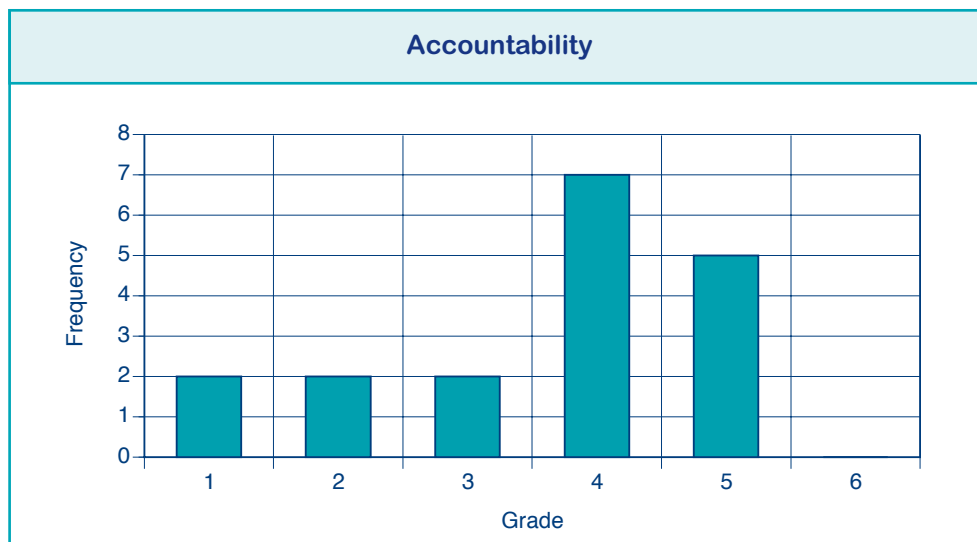
Is the department's development monitored?



What is the quality of the processes by which the work of the department is held to account?

Do the department's targets arise through inclusive discussions?

2.3.4 While the measures of holding the work of the mathematics department to account were evaluated as sound or better in a majority of schools visited, there was a minority of schools in which procedures need to be more rigorous.



In particular, the requirement for departments to produce an annual report for senior management promotes effective monitoring, evaluation and review. In the best practice, these are produced through all members of the department working collaboratively.

2.4 Baseline and Self-Evaluation

2.4.1 In a majority of departments, the targets for the action plans were identified through discussion at department meetings, and often met the requirement that they were aligned to the School Development Plan (SDP) targets. In a small number of schools, the SMT set the targets and, in a very few others, the HoD prioritised before seeking the agreement of the members of the department.

2.4.2 In the best practice, the discussions were structured through, for example, the use of SWOT⁹ analysis, in order that the members of the department worked collaboratively

⁹ SWOT – Strengths, Weaknesses, Opportunities and Threats.



to reflect on their own practice, the standards the pupils achieve, the targets already set at whole-school level and, if appropriate, on pupils' evaluations. This was happening in only a small number of the departments visited.

2.4.3 In another school, an audit of the provision, based on the strengths identified in *Better Mathematics*, enabled the department to agree their targets. The department had also produced a Progress Report based on the sections of *Better Mathematics*, that is, Ethos, Teaching, Learning, Information and Communication Technology, Assessment and Special Educational Needs.

2.4.4 As noted earlier, one department had used the responses from a questionnaire on the pupils' attitudes to mathematics and experiences in lessons in their self-evaluation process.

2.4.5 In all schools, *Better Mathematics* had been copied and distributed to members of the department and, in a majority of departments, the statements of strengths and weaknesses had been discussed. In a minority of cases, HoDs reported that they were using the statements and the prompts for self-evaluation in an extended way to promote improvement.

2.4.6 In August 2007, the Inspectorate sent a copy of a commentary, *Commentary on Post-primary Mathematics Teaching*¹⁰, to all post-primary schools. This built on the illustrations used during the *Better Mathematics* dissemination seminars¹¹ by providing further comments and suggestions about the identified aspects of mathematics teaching. Two covering letters accompanied the

Has *Better Mathematics* been used to inform an audit of provision?

Has the discussion of the *Commentary* led to a review of practice?

¹⁰ www.etini.gov.uk/commentary_on_mathematics_teaching.pdf

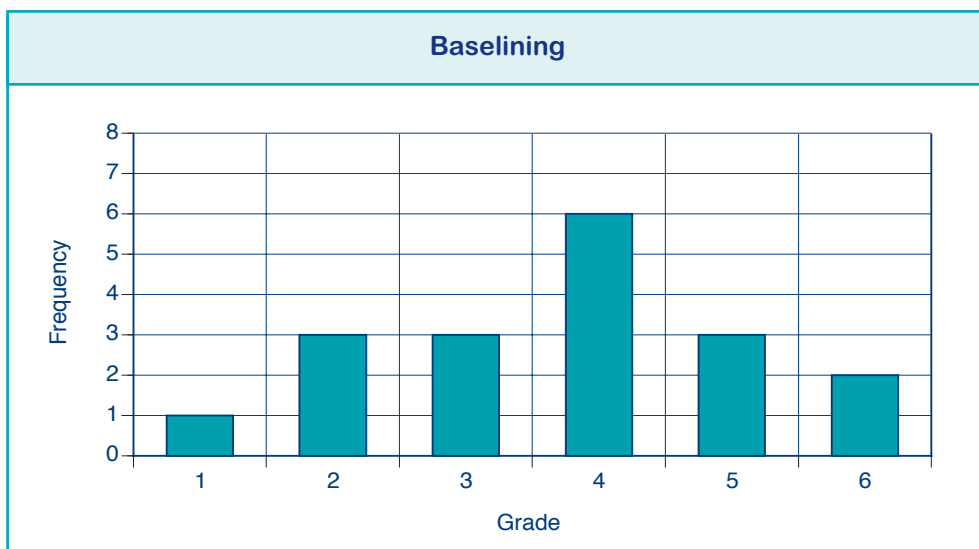
¹¹ *Better Mathematics* was disseminated at seven seminars during the spring term, to which all HoDs were invited. Further individual dissemination visits were completed in the summer term.



commentary – one to the Principal and one to the HoD. Many of the schools that were using *Better Mathematics* were also using the commentary to promote improvement. A small number of HoDs reported that they had not seen the commentary.

2.4.7 Through a school’s participation in the NI Numeracy Strategy (NINS), the use of departmental development plans and action plans have been promoted and improved, as acknowledged in *Better Mathematics*. The findings of this survey confirm that, in a significant minority of departments, the process of reflection leading to effective baselining has many good features or is good or excellent.

What is the quality of baselining in the improvement processes?

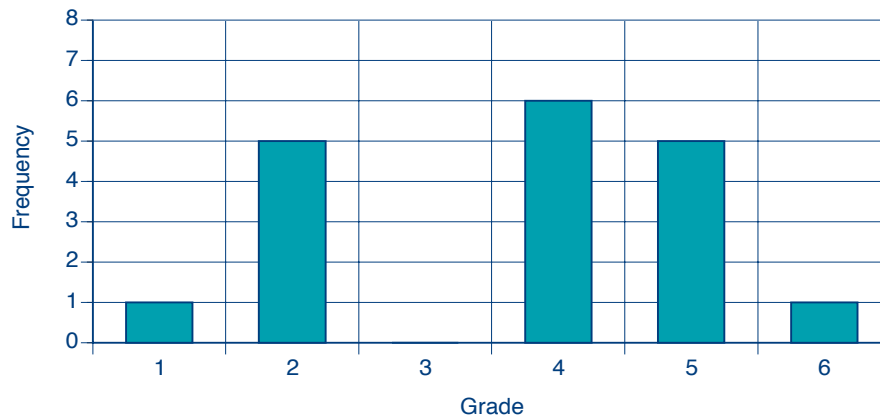


In a majority of departments, however, an area for improvement is:

- the need to develop the processes through which members of the department reflect on their own practice, the standards the pupils achieve, the whole-school targets and, if appropriate, on pupils’ evaluations, in order that development work is focused on appropriate targets.



Overall Monitoring & Evaluation



What is the quality of the overall M&E?

2.5 Overall Monitoring and Evaluation

- 2.5.1 The quality of the overall monitoring and evaluation within the mathematics department in each of the 18 schools was evaluated. The distribution of grades was as shown above.
- 2.5.2 In a third of the schools, the monitoring and evaluation was considered to be consistently good or better. However, a third of the schools had significant areas for improvement, and, in one case, the quality of monitoring and evaluation within the department was poor.



In which sub-group does the school lie?

3. CONCLUSION

3.1 The group of schools visited in this survey had two main distinct sub-groupings:

- schools in which a culture of monitoring and evaluation, including self-evaluation, was well-embedded at departmental level and at whole-school level;
- schools in which the mathematics teachers were teaching in isolation and were missing the necessary catalysts to promote engagement in professional reflection.

3.2 The strengths and areas for improvement identified below were evident in the two sub-groupings respectively.

Strengths include:

- the commitment of the HoD to promote improvement;
- the evaluative feedback arising from lesson observations;
- the open and comprehensive use of performance data;
- the effective links between department and Principal/SMT;
- the self-evaluation processes undertaken as part of development planning; and
- the understanding that evaluation, and especially review, needs to follow monitoring.



Areas for improvement include:

- increased and improved opportunities for teachers to discuss teaching and learning in an open and reflective manner and to receive effective individual feedback on their teaching;
- more sharing of benchmarking analysis, at all levels, and effective tracking of pupils' learning; and
- more rigorous and inclusive processes to baseline the provision before undertaking development work.



Appendix

The following schools¹² were selected for inclusion in the survey:

Aughnacloy High School
Ballymoney High School
Coleraine High School
Devenish High School, Enniskillen
Holy Cross College, Strabane
Integrated College Dungannon
Knockbreda High School, Belfast
Malone Integrated College, Belfast
Newbridge Integrated College, Loughbrickland
St Catherine's College, Armagh
St Malachy's College, Belfast
St Mary's High School, Downpatrick
St Michael's College, Enniskillen
St Patrick's College, Ballymena
St Patrick's Grammar School, Downpatrick
Strabane Grammar School
Sullivan Upper School, Holywood
Victoria College Belfast

¹² The Inspectorate acknowledges the co-operation of the HoDs of Coleraine Academical Institution and Slemish Integrated College, Ballymena, in a pilot exercise prior to the survey.

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