Subject Inspection of Mathematics
REPORT

Holy Rosary College
Mountbellew, County Galway
Roll number: 63090I

Date of inspection: 10 May 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Holy Rosary College. It presents the findings of an evaluation of the quality of teaching and learning in Mathematics and makes recommendations for the further development of the teaching of this subject in the school. The evaluation was conducted over two days during which the inspector visited classrooms and observed teaching and learning. The inspector interacted with students and teachers, examined students’ work, and had discussions with the teachers. The inspector reviewed school planning documentation and teachers’ written preparation. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal and deputy principal. The board of management was given an opportunity to comment in writing on the findings and recommendations of the report; a response was not received from the board.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

Procedures for facilitating the transfer of students to Holy Rosary College from its feeder primary schools are well planned and are effective in determining the needs and abilities of the students. The formation of the first-year mathematics classes is informed by student performance in a range of assessments including a competency test to establish the mathematical skill set of the incoming students. The use of such a test is very welcome and, while it is of a good standard and reflects the primary mathematics curriculum, it is now in need of review. The review should take cognisance of the syllabuses being introduced as part of Project Maths and, apart from merely determining the mathematical capabilities of the students, it should be used to inform the design of the first year mathematics programme.

Timetabling provision for Mathematics in junior cycle is in need of review. Upon entry to the school, two bands are formed and two mixed-ability mathematics classes are created within each band. The mathematics classes are timetabled independently. There are essentially three bands in second year. The top band comprises one stand-alone higher-level Mathematics class. The middle band contains two higher-level classes and one ordinary-level class. The three classes in the middle band are timetabled concurrently. Finally the lower band contains one learning-support class group. A similar arrangement is in place in third year. While these arrangements allow students to access Mathematics at an appropriate level, they are cumbersome, particularly if students are misplaced and need to change level. The amount of time allocated to Mathematics in junior cycle also needs to be addressed. Currently, all junior cycle classes are provided with four periods of Mathematics per week. This allocation is less than optimal and it is recommended that every effort should be made to increase the number of periods of Mathematics in second and third year to five per week and to provide a greater degree of concurrent timetabling of these class periods.

Timetabling provision in senior cycle is very good. Students opting to enter Transition Year (TY) are provided with four periods of Mathematics per week, while there are six periods of Mathematics per week in fifth and sixth year. Mathematics classes are timetabled concurrently in each year of the senior cycle. This very good practice facilitates collaborative curricular planning and enables students to change level with very little disruption to the timetable. The Leaving
Certificate Applied (LCA) programme is also available in senior cycle. LCA classes are provided with three classes of Mathematical Applications per week.

The structure and content of the TY mathematics programme needs to be reviewed. The existing programme is delivered to two discrete class groups, one following higher level and one following ordinary level. The curricular content for each group, as detailed in the subject department plan, is drawn from the corresponding Leaving Certificate programme. In order that the mathematics programme better reflects the overall aims of TY, it is recommended that mixed-ability classes be formed and that the range of abilities of the students be catered for through the use of differentiation and other student-centred teaching methods. The content chosen should broaden the students’ appreciation and understanding of Mathematics as well as developing their skills base. Given that the classes are timetabled concurrently, inter-class collaborative projects and rotating modules should also be considered. Once the structure and content of the programme is agreed, the TY plan for Mathematics should be adjusted accordingly.

The provision for students with special educational needs or in need of learning support is very good. Learning support in Mathematics in first year is provided during withdrawal from subjects other than Mathematics, while a small learning-support class is formed in second and third year. Students in second and third year are also withdrawn in small groups for additional support when it is deemed necessary. Learning support in Mathematics is provided in senior cycle through the provision of small foundation-level classes. The subject department plan for Mathematics makes frequent reference as to how lesson delivery and assessment procedures should be modified to most appropriately meet these needs of learning-support students. This is very good practice and is indicative of the close links that exist between the mathematics department and the learning-support team.

Teachers are assigned to classes and levels on a rotating basis, and by agreement with management. However, higher-level Mathematics in senior cycle typically alternates between two teachers. It is advised that, as an integral part of the school’s continuing professional development programme, additional teachers be identified and assigned to higher-level Mathematics in the coming years. It is policy and practice within the school for teachers to remain with the same class groups from second to third year, and from fifth to sixth year, where possible. This good practice guarantees continuity and facilitates long-term planning.

Management is proactive in supporting teacher attendance at continuing professional development courses and all of the members of the department have attended the workshops provided as part of the rollout of Project Maths. The cost of membership of the Irish Mathematics Teachers Association (IMTA) is covered by the school and management are anxious to encourage and facilitate any teachers wishing to pursue further study.

The range of resources available to the department is not clear from the department’s planning documentation. Some classrooms have been equipped with overhead projectors, laptop computers and data projectors. Many of the teachers have also shown admirable initiative in developing their own resources. However, a more systematic approach to resource procurement and development is needed, particularly in light of the imminent national implementation of Project Maths. Therefore, it is advised that an audit of available resources be conducted to ensure that the department is adequately equipped to successfully implement Project Maths and any shortcomings identified by the audit should be addressed as soon as is feasible. A current list of available resources should be included in the subject department plan for Mathematics.
The school promotes positive student attitudes towards Mathematics through the provision of a range of co-curricular activities including the Junior Mathematics Competition, the Maths Olympiad and an electronic engineering quiz operating under the aegis of Galway-Mayo Institute of Technology.

PLANNING AND PREPARATION

The mathematics department engages in ongoing formal and informal subject department planning. A key outcome of these activities is a very good subject department plan which provides valuable insights into the operation of the department and acts as a valuable scaffold to support its continued development. The department’s planning structures are, however, less satisfactory. According to the department plan, responsibility for co-ordinating the department’s activities rotates between the members of the department. However, there was no co-ordinator in place at the time of the inspection, nor did the planning documentation contain any details of the roles and responsibilities attaching to the role. It is therefore recommended that a member of the department be appointed as co-ordinator and that the functions of the co-ordinator be agreed and recorded in the subject department plan for Mathematics. Once appointed, the co-ordinator should remain in position for an agreed period at which time responsibility should devolve to another member of the department. In order to facilitate the implementation of Project Maths and to support the work of the co-ordinator, it is also recommended that a member of the department be appointed to act as Project Maths liaison officer.

The subject department plan details the schemes of work, in the form of chapter lists, and the associated delivery schedule for each year and level. While this acts as a useful planning roadmap, it would be preferable if the intended learning outcomes, the teaching methods designed to achieve them and the appropriate modes of assessment, were integrated into the schemes. This approach, which is in keeping with that adopted by Project Maths, would ensure greater cohesion in the manner in which the curriculum is delivered.

An analysis of student performance in the state examinations is carried out annually by the principal and deputy principal. A summary of their findings is presented to the school’s board of management. While this is very good practice, it is advised that the mathematics department assume responsibility for this activity. Analysis of the trends of student performance and in the rate of uptake of higher, ordinary and foundation level should form part of this analysis. The outcomes should be included in the subject department plan and used to inform ongoing department planning.

The lessons observed during the inspection were very well planned. The material covered was appropriate and was, in most cases, in line with the schedule contained in the subject department plan for Mathematics. Planning for the use of resources in lesson delivery is underway and, in a number of instances, very creative use of teacher-produced materials and of information and communication technology (ICT) was in evidence. In order to extend this good practice throughout the department, the further integration of resources, particularly ICT, in teaching and learning Mathematics should be adopted as a targeted area for development in subject department planning.

TEACHING AND LEARNING

The quality of teaching observed during the inspection was, in almost all cases, very good and in some instances was of the very highest standard. The teachers had high expectations of student engagement, behaviour and attainment. These expectations were more than realised. The lessons
had a very good structure, proceeded at a satisfactory pace and the students were provided with appropriate levels of challenge and support.

The effective integration of ICT resources, including dynamic geometry software, and the overhead projector featured in a number of lessons. At their most effective, the resources helped to create clear contexts for the material being covered, engaged the students actively in their own learning and exploited links between the lesson content and other areas of the curriculum. As a result, the students developed a deeper understanding of the lesson content and gained an appreciation of the interconnected nature of Mathematics.

The use of models, to very good effect, was seen in two separate lessons, one introducing students to currency exchange and the other exploring the trigonometry of three dimensional objects. The models used in the trigonometry lesson were produced with great precision by members of the class and greatly enhanced the students’ appreciation of the features of these types of objects. Problems involving three-dimensional shapes can be quite challenging for students and the use of the models allowed the solution to be broken down into a series of simple steps and simplified the process greatly as a result.

The lessons observed during the inspection featured very good use of questioning by teachers, which served to include all of the students in the lessons, to elicit factual responses and to encourage the students to reflect and hypothesise.

The quality of student learning was very good. The students were well able to carry out the tasks assigned to them during the lessons and responded confidently when questioned by the teachers. The attainment of students in the state and house examinations is very good and the uptake of higher-level Mathematics in the Junior Certificate and Leaving Certificate examinations is also most satisfactory.

**ASSESSMENT**

Practices in relation to assessing student performance in Mathematics are good. Homework is regularly assigned and corrected. Students’ homework copies are, in most cases, monitored regularly and, in a number of instances, feature positive written comments from teachers. It was also evident that, in some instances, the students were encouraged to amend their own work while homework was being corrected in class. These very good practices should be adopted as standard across the department. Students sit regular class tests and the results of these are collated and the averages are included in the reports that issue to parents at Christmas and summer, along with the results of the formal examinations. This enhances the profile of the class tests and is commended.

Formal examinations, for non-examination classes, are held at Christmas and prior to the summer holidays. The examination papers are of a very good standard and are similar in style and content to those the students will encounter in the state examinations. This good practice could be further enhanced through the provision of common assessments with common and agreed marking schemes within levels in each year.

Students’ performance in Mathematics is effectively communicated to parents. The student diary is used to inform parents of issues arising with homework and of students’ performance in class tests. Parents of students in examination classes receive written reports in November and following the Christmas and mock examinations.
SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The quality of teaching and learning is very good.
- Procedures for facilitating student transfer from the feeder primary schools and for establishing their educational and other needs are very good.
- Students with special educational needs or in need of learning support receive very good support and the learning-support department liaises very closely with the mathematics department.
- Individual teacher lesson planning is very good.
- Timetabling provision in senior cycle is very good.

As a means of building on these strengths and to address areas for development, the following key recommendations are made:

- It is recommended every effort should be made to increase the number of periods of Mathematics, in second and third year, to five per week and to provide a greater degree of concurrent timetabling of these class periods.
- In order that the mathematics programme better reflects the overall aims of TY, it is recommended that mixed-ability classes be formed and that the range of abilities of the students be catered for through the use of differentiation and other student-centred teaching methods. The use of inter-class collaborative projects and rotating modules should also be considered.
- It is recommended that a member of the mathematics department be appointed as co-ordinator and that the functions of the co-ordinator be agreed and recorded in the subject department plan for Mathematics.
- In order to facilitate the implementation of Project Maths and to support the work of the co-ordinator it is also recommended that a member of the department be appointed to act as Project Maths liaison officer.

A post-evaluation meeting was held with the principal and deputy principal, at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

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