Subject Inspection of Mathematics
REPORT

Our Lady’s Bower Secondary School
Retreat Road, Athlone
County Westmeath
Roll number: 63210P

Date of inspection: 9 February 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Our Lady's Bower Secondary School carried out as part of a whole-school evaluation. 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 and examined students’ work. The inspector reviewed school planning documentation. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

The mathematics department in Our Lady's Bower secondary school is well organised, vibrant and enjoys a prominent profile within the school. The department is willing to embrace change and is a leading exponent, within the school, of the integration of information and communication technology (ICT) in teaching and learning. The department also encourages and facilitates student engagement with subject-related extracurricular activities and celebrates student achievement through prominently displayed photographic collages.

Timetabling provision for Mathematics is very good. All junior cycle classes are provided with five periods of mathematics per week. Upon completion of junior cycle students can opt to enter Transition Year (TY). Transition year is actively promoted by the school management and it is a popular choice with students. There are four periods of Mathematics per week in TY. Students following the ordinary-level mathematics course in fifth and sixth year are provided with six periods of Mathematics per week while higher-level students have seven periods. The need for such a generous allocation for higher-level students should be reviewed with the intention of reducing the allocation by one period per week. The school also offers the Leaving Certificate Applied (LCA) and there are four classes of Mathematical Applications per week in fifth and sixth year LCA.

The scheduling of mathematics classes in junior cycle is in need of review. Students are assigned to mixed-ability classes in first and second year and follow a common mathematics programme. This programme is primarily comprised of the ordinary-level Junior Certificate syllabus. Classes are set following the summer examinations at the end of second year and the higher-level course is delivered, in the main, during third year.

In order to inform the design and delivery of the common programme in first year it is recommended that all students sit a common mathematics test early in first year. The test should establish the strengths and weaknesses in the mathematics skills-set of the incoming students. The programme content should then address the weaknesses and build upon the strengths identified in the assessment and should be reviewed annually. It is further recommended that the mathematics
classes be set as soon as the programme is completed. This should take place at the end of first year at the latest. The delivery of the common programme as it is currently constituted is not synchronised to any great degree. This should be addressed in designing the new programme.

The scheduling of mathematics classes in TY should also be reviewed. The school has introduced mixed-ability classes in TY this year and there are three mixed-ability mathematics classes in TY at present. These classes are timetabled independently. While the introduction of mixed-ability in TY is very welcome, it would be preferable if the mathematics classes were timetabled concurrently. This would provide enhanced opportunities for collaboration in the delivery of the TY mathematics programme and would allow for the streamlined implementation of inter-class collaborative projects.

Management has been proactive in developing the school’s ICT infrastructure. Except from the rooms occupied by first-year students, all of the classrooms are equipped with computers and data projectors or interactive whiteboards. In addition, these rooms have access to the internet and to the school’s intranet. Many of the mathematics teachers utilise ICT in lesson delivery and a wide range of teaching and learning and assessment resources is available to all members of the department on a dedicated folder on the school’s server. It is intended that the first-year classrooms will be equipped with computers and data projectors in time for the forthcoming academic year. This is a very welcome development.

The mathematics department is well resourced. The department is provided with an annual budget and a number of resources to facilitate active teaching and learning have recently been purchased. In order to build upon this good work and to prepare for the introduction of Project Maths it is advised that an appraisal of resources available to the department be conducted and any additional physical resources required to successfully implement Project Maths be procured. Arrangements for storing and sharing these resources should also be agreed.

Management actively supports teacher attendance at continuing professional development courses and the details of the courses attended by the members of the mathematics department are included in the subject department plan. This is very good practice.

PLANNING AND PREPARATION

Subject department planning in Mathematics is well established. The department holds regular meetings, the minutes of which are contained in the subject department planning folder. Responsibility for co-ordinating the department’s activities rotates between the members of the department. This good practice allows each of the mathematics teachers to lead the development of the department and helps to foster a culture of collaboration within the department.

The mathematics department adopts a reflective approach to department planning. The department conducts an annual analysis of student performance in the state examinations and is developing a template of mathematical terms, in a variety of languages, for use by the school’s many international students. This is very good practice.

A very comprehensive subject department plan is in place. The plan provides a valuable scaffold to support ongoing planning and is subject to frequent review. In light of the changes in the mathematics syllabuses and classroom implementation models as part of the implementation of Project Maths, it is recommended that the schemes of work contained in the plan be reviewed. The template currently used in LCA by the department should be adapted for this purpose.
The mathematics plan provided to the inspector for TY is in need of review. The existing plan is out of date and does not reflect the move to mixed-ability classes in TY this year. The plan that emerges from the review should ensure a cohesive approach to programme delivery in TY and should be sufficiently flexible to facilitate a range of cross-curricular and inter-class activities including project work, research tasks and initiatives to allow the students to gain an appreciation of the importance of Mathematics in the academic and wider world.

Individual teacher planning for lessons was in almost all cases of the very highest quality. In a number of instances, planning for the inclusion of resources in lesson delivery was very good and contributed to lessons that were challenging, visually stimulating and that provided students with a variety of learning opportunities.

TEACHING AND LEARNING

The quality of teaching was in almost all cases very good. The teachers were well prepared for the lessons, were well aware of the needs and abilities of the students and tailored the lesson content and delivery models accordingly. The lessons proceeded at a suitable pace and there was a good balance between teacher exposition and student-centred activities. In some cases, the lesson’s objectives were outlined at the outset and a review was conducted prior to its conclusion. This very good practice, which served to contextualise the lesson content and to provide a clear focus for the lesson’s activities, should be adopted as standard across the department.

A range of teaching methods was in evidence during the inspection. In one mixed-ability class a table quiz provided an enjoyable and effective means of reviewing introductory algebra. The questions were very cleverly differentiated and provided the students with a range of challenges. The students responded very positively and got through an impressive amount of work during the lesson. A friendly but keen competitive edge meant that the students at each table pushed each other to achieve to their potential. The supporting materials were student-friendly and good use was made of ICT in recording and collating the scores achieved by the different teams.

ICT was also effectively integrated in a number of instances. One of the mathematics teachers is a strong advocate for ICT integration in teaching and learning and has produced a number of excellent animations to illustrate basic concepts in geometry and co-ordinate geometry. These resources are available to all of the members of the department and added considerably to a lesson on axial and central symmetries observed during the inspection. The ICT resources were used to model the symmetries and the students then worked in pairs to construct images of letters of the alphabet using drawing equipment and graph paper. The outcomes of the exercise were then discussed and the ICT resources were used to reinforce the correct method for carrying out the constructions. The lesson worked well because a variety of approaches was adopted and because ICT was used to support learning rather than merely as a tool to deliver content. In order to build on the very good work already in hand, it is recommended that all of the members of the mathematics department collaborate in the development of strategies to fully exploit the school’s ICT resources in teaching and learning the different areas of the mathematics curriculum.

Classroom management and student behaviour and engagement were of a very high standard. The students worked diligently on any assigned tasks and the interactions between teachers and students and between the students themselves were courteous and good humoured. Very good teacher movement meant that students who found the material challenging received appropriate and timely support. It was evident, however, that the more able students in the mixed-ability
classes in first year were not always sufficiently challenged. It is therefore recommended that the schemes of work emerging from the review recommended earlier in this report reflect the need for upward differentiation in all lessons but particularly in the mixed-ability classes in first year.

The quality of student learning was very good. The students responded confidently when questioned by the teachers and during their interactions with the inspector. The quality of the students’ written work was also very good. Analysis of student attainment in the state examinations provided further evidence of the high standards expected of, and achieved by, the students in the school.

ASSESSMENT

The subject department plan for Mathematics outlines the procedures and practices in relation to the assignment and correction of homework. It was evident during the inspection that these procedures are being implemented consistently across the department. Homework was corrected at the beginning of each lesson. In some instances, the correction of homework served to initiate discussions and influenced how the early part of the lessons unfolded. This good practice ensured that the correction of homework provided opportunities for shared learning and served to reinforce the students’ understanding of the material in hand.

The homework copies are very well maintained and are appropriately monitored. The very good practice of students amending their own work was evident in a number of cases and written feedback from the teachers was a consistent feature of the homework copies reviewed during the inspection.

Students sit class tests upon completion of each topic and the question papers used in these tests can be accessed by all of the members of the department on the school’s intranet. The class tests can be customised by individual teachers and used when appropriate. This is very good practice. However it would be preferable if a synchronised schedule of class tests in first and second years was agreed at the beginning of the year. This would serve to support a more synchronised delivery of the mathematics programme in each year.

Common assessments with agreed marking schemes are provided within levels for the formal assessments which take place at Christmas and prior to the summer holidays. Examination classes sit mock examinations early in the second term. Reports issue to parents following the formal assessments and the mock examinations. Additional written reports are issued to parents if concerns relating to student performance arise during the course of the year. These interim reports can also be generated in response to request from parents. This is very good practice.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The quality of teaching and learning in Mathematics is very good.
- Timetabling provision for Mathematics is very good.
- The school has a very impressive ICT infrastructure and the mathematics department makes very good use of a range of ICT resources in teaching and learning Mathematics.
- The mathematics department is very well resourced and is strongly supported by the school’s management.
• The mathematics department adopts a reflective approach to subject department planning and a very thorough subject department plan is in place.
• Ongoing assessment practices in Mathematics are consistent and comprehensive

As a means of building on these strengths and to address areas for development, the following key recommendations are made:
• In order to inform the design and delivery of the common programme in first year, it is recommended that all students sit a common mathematics test early in first year. The test should establish the strengths and weaknesses in the mathematics skills-set of the incoming students. The programme content should address the weaknesses and build upon the strengths identified in the assessment and should be reviewed annually. It is further recommended that the mathematics classes be set as soon as the programme is completed. This should take place at the end of first year at the latest.
• It is recommended that all of the members of the mathematics department collaborate in the development of strategies to fully exploit the school’s ICT resources in teaching and learning the different curricular areas of Mathematics.
• In light of the changes in the mathematics syllabuses and classroom implementation models as part of the implementation of Project Maths, it is recommended that the schemes of work contained in the plan be reviewed. It is further recommended that these schemes reflect the need for upward differentiation in all lessons but particularly in the mixed-ability classes in first year.

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

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