An Roinn Oideachais agus Scileanna

Department of Education and Skills

Subject Inspection of Mathematics
REPORT

Rice College,
Ennis, County Clare.
Roll number: 61910K

Date of inspection: 26 November 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Rice 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 and examined students’ work. 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 subject teachers.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

Timetable provision for Mathematics is good. In the senior cycle, classes in Transition Year (TY) have three lessons per week, fifth-year classes have five lessons and sixth-year groups have six lessons per week. In junior cycle, first year classes have four periods and the other year groups have five periods each week.

Teachers generally continue with classes from second to third year and from fifth to sixth year. There is rotation amongst teachers of levels at junior cycle and more limited rotation at higher Leaving Certificate level. Applied Mathematics is offered as a module in TY and students wishing to follow the subject at Leaving Certificate level are accommodated through the provision of lessons within and outside of timetabled hours.

Mathematics lessons are distributed evenly throughout the school day and in most instances throughout the school week. However, the third-year grouping does not have mathematics lessons on a Tuesday. This should be avoided in future timetabling as ideally students should have contact with the subject each day.

First year classes are taught on a mixed-ability basis. Mathematics classes in each year group from second year onwards are timetabled concurrently. This is good practice as it allows students to follow the highest level possible for as long as possible and facilitates change of level where necessary. This is in line with the school’s policy of facilitating and encouraging students, where possible, to remain at higher level.

First year students are assessed at the end of first year using a common test. The structure adopted from first year on is mixed ability within levels. This is good practice as mixed-ability teaching within levels caters for varying rates of student development and recognises the connection between levels of teacher expectation and levels of student achievement.

In the current year, the mathematics teaching team is large with ten teachers involved in the teaching of the subject. Although the majority of the team are qualified to teach the subject, it is nevertheless suggested that, over time, the number involved in the teaching of Mathematics be
reduced, through the development of a core team of mathematics teachers, each of whom is allocated significant contact time with the subject.

Students who find Mathematics challenging are well catered for in the school. They are identified through psychological reports, assessments, contact with local primary schools and monitoring by parents and teachers during first year. Support is provided through withdrawal for small group or one-to-one tuition. In all instances, the withdrawal is provided by members of the mathematics team and there is close informal contact between the support teacher and the classroom teacher. The school also endeavours to ensure that one of the class groups in each of second, third, fifth and sixth year has a reduced number of students.

The mathematics team is not allocated an annual budget resource but requests for materials are generally favourably considered by management. A variety of teaching resources has been acquired to coincide with the introduction of Project Maths in the school. These resources are stored centrally, are listed in the mathematics department plan and are available to all of the team. Teachers have access to two computer rooms and a number of data projectors have been installed in classrooms to support teaching. There was evidence of the use of information and communication technology (ICT) in the teaching of Mathematics during the evaluation. The availability of suitable equipment will help to integrate ICT more effectively into the teaching and learning of mathematics.

The school is committed to the continuing professional development of its teaching team. All members of the team had attended workshops on Project Maths. This is positive as it will help to facilitate the integration of a variety of teaching methodologies to meet the forthcoming syllabus, pedagogical, and assessment changes in Mathematics.

The mathematics department encourages participation in the Irish Junior Mathematics competition organised nationally by the Irish Mathematics Teachers’ Association (IMTA). A range of other activities has also been made available for students. First year students also complete a project entitled ‘Why Maths’. These are good practices as they help to raise the profile of the subject within the school and enable students to enjoy and appreciate Mathematics outside of the classroom setting. A dedicated mathematics notice area is also used to highlight subject related activities in the school.

The mathematics team undertakes an analysis of the school’s performance in the certificate examinations in Mathematics in relation to achievement and uptake levels. An analysis of results over recent years indicates significant strengths in both of these areas.

**PLANNING AND PREPARATION**

An experienced member of the mathematics team has acted as subject co-ordinator on a voluntary basis for the past number of years. It is suggested that the role of co-ordinator would rotate within the mathematics team, ideally on a bi-annual basis. This would help to develop a wide leadership-skills base within the department.

Formal planning and review meetings are scheduled around staff meeting and school planning days and occur about three times per year. Electronic records of recent meetings have been retained in the subject folder and they show evidence of collaboration. Recent discussions have dealt with the implications of the introduction of the Project Maths strands from September 2010. Further informal meetings occur regularly during the school year. The recording of plans for
students in receipt of learning support in Mathematics and the evaluation of the progress on these plans is a very positive feature of special educational needs provision in the school.

There is a comprehensive written plan for Mathematics. The department plan includes overall aims and objectives for mathematics education within the school along with organisational details, a list of the resources available, teaching methodologies, assessment and homework guidelines. The plan also sets down a detailed programme for each year group and level within the school. Each topic has been divided into sub-topics which are linked to learning outcomes and resources. A timeframe for the completion of topics is also included. This is very good practice. Over time, the plan will need to evolve to reflect the introduction of the further strands of Project Maths and the common introductory course proposed as part of this initiative.

Mathematics planning for TY is good and is in line with the planning for other year groups. One of the two TY groups is taught some modules of Applied Mathematics. However, the material set out for the other TY group is drawn primarily from Leaving Certificate material. The possibility of teachers presenting different modules to each of the groups along with the inclusion of more non-curricular material should be explored in future TY planning.

All teachers made individual planning and preparation materials available during the inspection. Included in these materials were termly schemes of work, examples of worksheets and handouts, common examination questions and solutions.

TEACHING AND LEARNING

The quality of the teaching and learning observed was of a high standard. The lessons in Rice College were well structured and purposeful. In all cases, lesson content was appropriate to syllabus and level, and teachers’ explanations were clear. The lessons were very well planned and the learning intentions were shared with the students. This could be enhanced if the teacher checked at the end of the lesson to see that these targets had been achieved. This practice is worthwhile because it increases students’ motivation and leads to a sense of accomplishment on achieving the day’s goal. It is also positive that efforts were made to revise work previously done and to link it to new material being presented, thus helping to reinforce learning and to develop new ideas. The pacing of the lessons was challenging yet realistic, and the content was matched to the ability levels of the students.

The board, textbook and, in some instances, worksheets were the main resources used in lessons. In a number of instances ICT was used to enhance the presentation of topics and in the preparation of materials. It is also reported that there are plans to increase the integration of ICT in teaching and learning over time. This is encouraged.

A variety of teaching methodologies was in evidence during the evaluation. In one instance, students were completing calculations following the use of clinometers to calculate the heights of objects outside of the school as well as the school itself. In another instance, the use of concrete materials to introduce the Theorem of Pythagoras ensured that the students were actively engaged in the learning process. In other instances, the use of active methodologies that had students active in their own learning, and the use of ICT was noted. The wider adoption of methodologies such as these, along with increased use of ICT, will contribute to the smooth transition to having students more involved in the learning process and less dependant on teacher exposition. It is therefore recommended that teachers continue to broaden the range of teaching methodologies especially strategies that involve students more and make them more effective participants in their
own learning. Lesson activities such as: pair work; group work; investigation and consolidation activities; use of concrete materials; discussion; quiz activities and greater use of ICT and student project work, should be included. The incorporation of these and other methodologies into lessons can lead to increased motivation and engage students more in the learning process and improve problem-solving skills. The teaching and learning plans available on the Project Maths development team website www.projectmaths.ie could provide templates for these developments.

Teachers made good use of questioning, both global and directed, throughout many of the lessons observed. Best practice was observed when more open and probing questions were included and used to encourage students to think for themselves. Since this type of questioning is so beneficial to learning in Mathematics, it is recommended that it be incorporated into lessons more frequently.

Classroom management was effective and discipline was well maintained. Teachers set appropriate high standards of expectation for their students and students responded to these expectations. They were affirming of the efforts of their students leading to positive interactions within the classroom. This led to a sense of mutual respect, creating an atmosphere that was conducive to learning.

In some classrooms, displays of posters and in some instances, students work, were used to enhance the visual-learning environment. The display of such posters and students’ project work can be used effectively to motivate students and remind them of key mathematical concepts or formulae. It is suggested that more use be made of students’ own work, through projects or examples of high quality work, to highlight the quality of learning and to engage students further.

Learning was evident as students were able to apply procedures that were learned in class to problems from the textbook. In interactions with the inspector, students used appropriate mathematical terminology. They also showed understanding of concepts and displayed clear mathematical knowledge. They demonstrated the ability to find solutions to problems. They made relevant connections between topics and justified answers to questions posed to them.

ASSESSMENT

The team has devised homework and assessment guidelines as part of their planning. This is good. Lessons generally began with the correction of homework and an examination of students’ copies revealed that homework is regularly assigned, which is good practice. Copybooks contained work that was appropriate, relevant and well presented. There was evidence that teachers are monitoring students’ copybooks. Good practice was evident where teachers encourage students to correct and amend their work as this encourages students to develop as independent learners. It is recommended that this practice be extended to all classes as, in some instances, student monitoring and correcting of their work could have been more explicit. In some instances the good practice of using positive comments to encourage students’ efforts was noted.

Students’ progress is monitored on a regular basis through questioning in class, review of homework and written assessments following the completion of a topic. This is good practice. Students are assessed at the completion of each topic. Teachers retain a record of attendance and results of these assessments. It was positive to note that common examination papers are set for first-year students and within levels for subsequent year groups. Examination year students are formally assessed twice a year, during November and the mock examinations during the second term. All other students are continually assessed throughout the school year and in addition have
formal examinations at the end of the school year. Reports are sent home on foot of these assessments and formal examinations twice each year. Parent-teacher meetings take place once per year for all year groups. There is scope for the students’ journal to be used more effectively as a means of two-way communication between the school and parents.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The teaching and learning observed was of a high standard.
- A range of methodologies is used in the teaching of Mathematics.
- The time allocated to Mathematics is good.
- Students who find Mathematics challenging are well catered for in the school.
- Teachers had high expectations of the students and the students responded accordingly.
- The mathematics team has devised a comprehensive long term teaching plan for each year group and level.
- Students’ progress is monitored on a regular basis.

Key recommendations made in this report.

- The team should incorporate a wider range of methodologies along with increased use of ICT in the teaching of Mathematics.
- A broader range of questioning strategies should be included in all lessons.

Post-evaluation meetings were 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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