An Roinn Oideachais agus Eolaíochta

Department of Education and Science

Subject Inspection of Mathematics
REPORT

Our Lady of Lourdes Secondary School, Rosbercon, New Ross, County Wexford
Roll number: 63630O

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AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA | DEPARTMENT OF EDUCATION AND SCIENCE

REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

This Subject Inspection report

This report has been written following a subject inspection in Our Lady of Lourdes Secondary School. 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 one day 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 subject teachers. 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

Our Lady of Lourdes Secondary School is a single sex girls' school that offers the Junior Certificate, optional Transition Year, the Leaving Certificate Vocational Programme and Leaving Certificate to its 314 students. The school operates a nine-class period day and classes are either thirty-five or forty minutes in duration.

There is a good level of support for incoming first-year students and their parents. For example the principal visits local primary schools in the school's catchment area to inform prospective students about the programmes and subjects offered by the school. An open evening is convened for prospective students and their parents. A parents' night is arranged in the first term for parents of first-year students. Furthermore, third-year students and their parents are invited to an evening informing them about senior cycle options.

Incoming first-year students sit an assessment test. Students in need of numeracy support are identified from this assessment, from reports provided from the primary schools, from parental information and through teacher observation. First-year students are assigned to mixed-ability classes and are then streamed from second year onwards. Generally, two higher-level class groupings and one ordinary-level class grouping are arranged in each of second and third year. In Transition Year, one mixed-ability class grouping is formed and in fifth and sixth year generally one-higher level and two-ordinary level classes are arranged.

Four teachers teach Mathematics in the school. Teachers displayed a keen interest and commitment to their teaching and their students. Classes usually retain the same teacher from first until third year and from fifth into sixth year. In general teachers rotate levels at junior cycle. However, the practice has developed that the teaching of higher-level Mathematics is associated with one teacher. To ensure that subject expertise is maintained and developed within the Mathematics team, it is recommended that teachers take the opportunity to teach Mathematics at all levels particularly at senior cycle.

Excluding Transition Year, each class grouping has five class periods of Mathematics each week and classes are generally distributed evenly throughout the week. Transition Year class groupings have three class periods per week with two class periods timetabled on one day. Consideration should be given to ensuring, in so far as is possible, that Mathematics classes for Transition Year students be timetabled more evenly across the week. With the exception of Transition Year, concurrent timetabling of Mathematics takes place from second year onwards. Such good practice is to be commended as it provides students with an opportunity to follow a level appropriate to their needs and abilities.

While there is no specific budget allocated to Mathematics any requests for resources are met. Recent purchases include mathematical sets for teachers. To further supplement the resources in the department it is recommended that the Mathematics department collaborate to develop a prioritised list of appropriate teaching and learning aids for Mathematics. This should be included in the long-term plan for the department. Furthermore these resources should be retained in a central location which can be easily accessed by all teachers.

Staff is facilitated to attend relevant Mathematics inservice. For example, teachers have attended the revised Junior Certificate Mathematics syllabus inservice and more recently the Geometry inservice. Management is to be commended for supporting staff in their continuing professional development.

Planning and Preparation

Work on the development of a whole school plan is ongoing. In recent years the school has focused on the review and reform of the Junior Certificate curriculum offered by school. However, during the current school year work has focused on subject planning. Work in this area has been developed in conjunction with a regional coordinator from the School Development Planning Initiative (SDPI) who visited the school and there are plans for further collaboration with the regional coordinator.

There is evidence to suggest that the Mathematics department works as a unified team collaborating on all issues that arise. Management facilitates staff to meet formally at the beginning of the year. During such subject department meetings a Mathematics teacher acts as facilitator for the subject. Further informal meetings take place on a needs basis. In more recent times records of formal meetings are retained which is good practice as it ensures that there are clear structures to inform all members of the department about issues discussed and decisions made.

The current focus on subject planning has afforded Mathematics teachers the opportunity to collaborate and begin work on a long-term plan for the department. To further develop the plan it is recommended that it include aims and objectives, the sections of the syllabus at junior and senior cycle and the advised areas of study under each of these sections. It should also include effective methodologies, the list of prioritised resources and the procedures for allocating students to Mathematics classes and levels. In addition suggested dates for the teaching of each topic of study should be included. Such collaboration and planning should guide the teachers' day-to-day work in the classroom while promoting continuity and steady progression in the students' learning. Furthermore, it should allow for the continuation of common assessments that currently exist for some year groupings and the extension of this good practice to other year groupings as appropriate. The Mathematics department should also plan for the inclusion of Information and Communication Technology to support the teaching and learning of Mathematics.

The Transition Year plan for Mathematics provides students with a good balance of topics that consolidate students' learning from the Junior Certificate syllabus and includes a variety of new Mathematics topics. In addition, the programme contains details about the learning of Mathematics through games and mathematical puzzles. Such a programme is commendable as it ensures that students are given an opportunity to learn Mathematics in different situations while allowing students to consolidate previously studied mathematical concepts.

Planning for lessons observed was good as evidenced by their structured nature and the prior preparation of material such as handouts and other supplementary materials. In general teachers develop resources individually. Consideration should be given to further development and sharing of these resources.

Teaching and Learning

Lessons were conducted in a warm friendly atmosphere which was conducive to a good learning environment. The pace of lessons was appropriately pitched which complemented the needs and abilities of each class grouping. Topics such as integration, differentiation and algebra featured in the lessons observed. Teachers used Mathematics terminology appropriate to the relevant topics and students' abilities. Best practice was evident where appropriate connections were made between various sections within the syllabus as this allows for the development of secure understanding of mathematical concepts. This practice should be extended to all lessons.

Textbooks and handouts were the main resources used in lessons. However there were some good examples where differentiated worksheets were prepared in advance and used effectively in lessons. The use of such worksheets is commendable practice as it ensures that the material matches both the prior attainment of students and their current learning intentions. On occasion the use of an overhead projector would have been beneficial in lessons in order to highlight key points and also to provide a variety of examples.

In some lessons observed the methodology used was traditional whole-class teaching. This usually involved the teacher demonstrating a technique and then the students practising it by completing an exercise while the teacher circulated to assist individuals. In other lessons more student-centred learning took place. The success of this methodology ensured that students' focus is maintained throughout the lesson and that students are actively involved while taking responsibility for their own learning. During such lessons there was a good balance between student activity and teacher input. It is important that students experience a varied range of methodologies in their learning of Mathematics. In this context it is recommended that all teachers use a variety of methodologies such as group and pair work during Mathematics lessons.

Teachers are to be commended for their interaction with students. Best practice was evident where teachers skilfully used a range of questioning strategies including recall, lower-order and higher- order questions. For example when introducing a new topic in Mathematics, teachers built on students' prior knowledge, developed students' answers, exploited the learning potential of wrong answers, probed, checked and extended the students' understanding and encouraged them to explain and justify their thinking and methods. Such practice is important as it helps students to consolidate their learning and is central to success and competence in Mathematics.

Students presented as being highly motivated and eager to participate in lessons. Their attitude to Mathematics is very positive and they share responsibility with the teacher for their own learning. In all lessons there was a very good pupil-teacher relationship.

There were no mathematical posters or displays in evidence in classrooms visited. It is important to surround students with a print-rich environment with students' work and other materials on display. It is therefore recommended that mathematical displays be designed or sourced to provide a stimulating environment for students.

Assessment and Achievement

Students are assessed in a number of ways including questioning in the classroom, homework assignments and end-of-topic assessments. Formal examinations take place in the summer for non-examination students. The school is currently trialing continuous assessment for all year groupings which forms the Christmas assessment. Examination year groupings sit 'mock' examinations in the second term.

Communication between the school and home is maintained through school reports and parent-teacher meetings. Furthermore, each student has a school journal that is used as a means of communication between the school and parents as well as to record homework. Commendable practice was evident where management provides staff with two record books; one to record attendance and another for recording assessment. The school operates a "tracker" system that electronically records students' attendance.

In lessons observed, homework was assigned which was appropriate in terms of the quantity and relevance to the work done during the lesson. This is good practice. There was evidence that some teachers are carefully monitoring students' copies. Teachers circulated during some lessons to observe students' work and to provide individual and immediate feedback. This was always done in a sensitive and discreet manner. There was evidence that some teachers are annotating Mathematics copies with commendations and suggested areas for development given. This is good practice and should be extended to all copies.

Students demonstrated a clear understanding of concepts engaged with during the lesson. Questions were answered in a confident manner and students were capable of justifying their solutions. Students communicate by using mathematical terminology appropriate to the topic. They are encouraged to follow Mathematics at the highest level appropriate to their ability. Consequently the proportion of students taking higher and ordinary levels at both the Junior and Leaving Certificate examinations is commendable. Teachers are to be commended for the practice that has been developed whereby they aim to keep the number of students taking foundation level to a minimum.

Students have been invited to participate in Mathematics Olympiads. Such exposure to Mathematics promotes interest in the subject while allowing students the opportunity to develop their interest and skills in Mathematics and experience Mathematics in different learning environments. To this end teachers are to be commended for their encouragement and support of students' participation in Mathematics competitions. Furthermore it was reported that teachers are available to meet students after school to give extra help as needed, which is applauded.

Summary of Main Findings and Recommendations

The following are the main strengths and areas for development identified in the evaluation:

- Teachers displayed a keen interest and commitment to their teaching and their students.
- The Mathematics department present as being a unified team who collaborate on issues pertaining to Mathematics.
- Management facilitates staff to attend inservice.
- In general Mathematics classes are distributed evenly throughout the week.
- Teachers set high expectations for their students and students strive to reach them.
- The proportion of students taking higher-level Mathematics in State examinations is high.
- Good practice has developed whereby teachers aim to keep the number of students taking foundation level to a minimum.
- There is good communication between the school and parents.
- Students are encouraged to participate in Mathematics competitions.

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

- Mathematics teachers should rotate the teaching of higher level in senior cycle to ensure that the expertise within the department is maintained.
- The Mathematics department should continue to collaborate and develop the long-term plan for the department.
- A variety of methodologies should be used in Mathematics lessons.
- The Mathematics department should develop a prioritised list of resources for the teaching and learning of Mathematics that should be retained centrally.

Post-evaluation meetings were held with the teachers of Mathematics and with the principal at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.