

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Mathematics
REPORT**

**New Ross Vocational College,
New Ross, Co. Wexford
Roll number: 71660T**

Date of inspection: 6 October 2009



**A N R O I N N | D E P A R T M E N T O F
O I D E A C H A I S | E D U C A T I O N
A G U S S C I L E A N N A | A N D S K I L L S**

**REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS**

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in New Ross Vocational 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 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 of the school was given an opportunity to comment on the findings and recommendations of the report; the board chose to accept the report without response.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

New Ross Vocational College participates in DEIS, the Department's initiative for delivering equality of opportunity in schools. The school is co-educational and offers its 147 mainstream students the opportunity to participate in the Junior Certificate (JC), Junior Certificate School Programme (JCSP), Leaving Certificate Applied (LCA) and established Leaving Certificate (LC) programmes. In addition the school offers a range of Post Leaving Certificate Courses to 179 students, and Mathematics is offered as a component of Business Calculations at Fetac Level 5.

Time allocated to Mathematics is satisfactory. All JC year groups have five class periods of Mathematics per week with an allocation of three periods per week to LCA Mathematics. Fifth-year Mathematics has an allocation of five periods per week and six lessons of Mathematics are allocated to sixth-year students. The distribution of lessons throughout the week is generally good and allows for daily contact with the subject for all year groups excluding LCA.

The Mathematics department comprises four teachers all of whom are subject specialists. In addition the department is supported in the provision of Mathematics by a learning support teacher. Management undertakes the deployment of teachers to class groups and this practice has allowed for Mathematics teachers to share in the teaching of the different programmes and levels. This is in line with best practice as it allows for the development of the expertise within the department. In general, teachers retain a class group from year to year, allowing for continuity of learning for students, and this is commended.

On entry to the school students are streamed into one of two class groups and all students follow the JCSP for their JC. During the first term a review of students' placement is undertaken to allow students who may have been misplaced to be reassigned to a more appropriate class grouping. Students within the upper stream follow ordinary and higher level, while ordinary level is offered to students in the lower stream some students were following foundation level at the time of the evaluation. The early determination of student ability should be reconsidered as evidence suggests that assigning students into an ability setting too early may have negative consequences on JC outcomes. The general practice at senior cycle is that one class grouping follows the LCA

programme and one class group follows the established LC. However, this year it has not been feasible to offer the LCA and all students are following the established LC. Given the school's small student population, established LC classes are taught in mixed ability settings.

A review of the state examination results indicates that many students take either ordinary or foundation level Mathematics in the JC and LC examinations. It is recommended that management and the Mathematics department collaborate to develop strategies to promote participation at higher level among the student population and that suitably high expectations are communicated to students that higher level is available and encouraged in the school.

Management is commended for encouraging and facilitating teacher participation in attendance at in-service relating to Mathematics. In addition whole school professional development has been facilitated and teachers have had the opportunity to participate in in-service in the areas of teaching mixed ability, and subject development planning. Teachers are further supported by management through the provision of resources for the teaching of Mathematics. Requests for resources are made through the department or on an individual basis. Additionally, resources have been procured through the school's involvement with JCSP Mathematics initiatives such as Math Laboratory. Newly appointed teachers are supported by a member of the subject department. The Vocational Education Committee offers financial support to teachers who choose to participate in further studies. The range of supports for the continuing professional development provided to teachers and for the teaching of Mathematics is commendable.

Students in need of numeracy support are identified through information gathered during visits to primary schools and from the entrance assessment and previous school reports. The model of numeracy support provision varies and includes small group withdrawal, and team teaching. However, during the course of the evaluation it was observed that some students were withdrawn from their Mathematics class to receive support. This is poor practice and should cease as it leads to discontinuity in students' learning and may impact negatively on their progress. Numeracy support should be provided to students in a more appropriate way.

Students have in the past participated in the higher-level Mathematics competition Team Math, which is to be commended. Opportunities that offer students the chance to access Mathematics in different situations other than in a classroom context should be encouraged. For example, events such as Math Week and World Maths Day should be considered. The participation and involvement of students in co-curricular and extra-curricular activities would benefit and support the promotion of Mathematics in the school and help to develop enthusiasm for the subject.

PLANNING AND PREPARATION

The Mathematics department is given time during the year for subject department planning. In addition many informal meetings take place on a more regular basis throughout the year. Brief records of minutes are retained and give an outline of issues discussed. In future meetings areas for discussion should include the development of action plans with suggested timeframes; strategies to increase the profile of Mathematics in the school; and strategies to increase participation in levels, particularly at ordinary and higher level. A review of the students' certificate examinations results should provide the basis for strategies for improvement.

The voluntary position of co-ordinator of Mathematics has remained with the same teacher for a number of years. Duties associated with the position include the organisation of departmental meetings and distribution of information regarding in-service. The rotating of this position should be considered to ensure that all within the department share in the responsibility for the

organisation of subject planning and the development and promotion of Mathematics in the school. As part of subject development, planning for the acquisition and use of resources for active learning should feature in department meetings.

The Mathematics department has developed a subject plan. It details procedural issues relating to the organisation of Mathematics in the school and includes teachers' individual schemes of work for each year group and level. Many of these are lists of chapters from the textbook rather than being syllabus based. The work to date provides a good overview of the operation of the department. However, to further enhance the plan it is recommended that the schemes of work be developed to include the intended learning outcomes associated with each topic of the syllabus. The sequencing of topics should be reviewed to ensure that students have engaged with sufficient material prior to progressing.

Individual planning documents made available during the evaluation were based on the subject planning file. Teachers were well prepared for their lessons and had the relevant and necessary materials available to hand.

TEACHING AND LEARNING

During the evaluation six lessons were observed, allowing for all programmes to be evaluated. The teaching style observed was generally traditional and of a satisfactory standard. Best practice was in evidence when the lesson's objectives were shared with the students at the outset. This practice should be extended to all lessons as it allows students to become involved in their own learning and provides a clear beginning to the lesson. Furthermore, teachers should review material covered during the lesson just prior to its conclusion. This will make students fully aware of what has been achieved during the lesson and give teachers an opportunity to appraise areas for further review or attention in a subsequent lesson.

The use of traditional teaching, which involves the teacher demonstrating a technique and students completing a series of exercises to practise, was the predominant methodology used in lessons observed. In one lesson, group work was used for a short period of time. However, the methodologies in most lessons were not sufficiently challenging or differentiated to allow students to become active in their own learning. The choice of an inappropriate methodology, for example, led to some students becoming disengaged in their learning. Active participation is an important component in the learning process. Therefore it is recommended that a range of more appropriate methods and greater differentiation for students be used by all teachers in the teaching of Mathematics. For example, the use of discovery and investigative methods should become a feature of lessons and will support the new approaches promoted by Project Maths.

Teachers' questioning of students tended to focus on the next step in the solution to a question. Limited use was made of more challenging questions that probed students' understanding and required them to provide justification for a solution. Such questioning also provides opportunities for students to become active in their own learning and generates greater dialogue during lessons. It is strongly recommended that a greater range of questioning strategies be used in lessons.

Many teachers are classroom based and some had mathematical posters and samples of students' work based on a survey displayed on the classroom walls. Resources used by teachers in lessons included teacher-developed worksheets and textbooks. There were occasions where greater use of available resources such as an overhead projector or data projector would have been effective for the teaching of Mathematics. During the teaching of coordinate geometry the use of such a

resource, rather than drawing the diagram free-hand on the board, would have allowed the teacher to demonstrate accuracy in the presentation of work.

In the lessons observed classroom management was generally good. Many teachers circulated to provide individual assistance to students. However, care is advised that students do not become over-dependent on their teachers, as some students lacked the confidence to proceed with their work until they received assistance.

Learning among students varied. During interactions between the inspector and students some were capable of answering questions posed to them and used suitable terminology. However, some students had difficulties with the correct use of mathematical terminology. It is recommended that teachers continue to work on key terms that will improve students' confidence and knowledge of mathematical terminology. The use of JCSP key word posters, for example, could provide opportunities for the development of such skills.

ASSESSMENT

Regular assessment of students takes place throughout the school year and includes in-class questioning and end-of-topic assessments. Formal school assessments take place at Christmas for all students and in summer for non-examination year groups. 'Mock' examinations are held for examination year groups in the second term. School reports are issued following formal examinations and more immediate communication is maintained with home via student diaries. Parent-teacher meetings are arranged for each year group and newsletters and communication via telephone are also used to keep in contact with parents. JCSP postcards in a range of areas are issued to homes to recognise students' achievements.

Homework was assigned in all lessons observed and teachers took time to correct homework at the beginning of lessons. While students were encouraged to record their assigned homework into their student diaries, there was evidence that not all students are careful in the accurate recording of assigned work. This should be monitored more carefully.

Student copies were reviewed during the evaluation and indicate that regular work is assigned. However, it was not always clear from the copies what work was completed in class and what was assigned as homework. Students should be encouraged to develop clear procedures in the presentation of their work.

Management provides teachers with teacher diaries to record student attendance, and attainment. A review of student attendance revealed that some students have attendance problems. It is important that parents and students realise the importance of regular attendance to ensure continuity and success in learning.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Management offers good support for teachers of Mathematics in New Ross Vocational College. Teachers are facilitated and encouraged to attend and participate in ongoing continuous professional development and through the range of resources for the teaching of Mathematics.
- Teachers retain good records of student attendance and attainment in their school based assessments.

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

- A greater range of more suitable methods and questioning strategies should be used by all teachers in the teaching of Mathematics.
- Subject department planning should focus on the development of action plans to increase participation in higher and ordinary level Mathematics and on the promotion of Mathematics within the school.
- The long-term plan for Mathematics should be updated to specify the learning objectives associated with each topic and the sequencing of topics.
- The practice of withdrawing students from Mathematics classes to receive support in Mathematics should cease.

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.

Published May 2011.