An Roinn Oideachais agus Scileanna

Department of Education and Skills

Subject Inspection of Mathematics
REPORT

Wexford Vocational College,
Westgate, Wexford
Roll number: 71680C

Date of inspection: 2 March 2011
REPORT ON THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT
This report has been written following a subject inspection in Wexford 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 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 subject teachers. The board of management was given an opportunity to comment in writing on the findings and recommendations of the evaluation; a response was not received from the board.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT
Wexford Vocational College is a co-educational school which offers Junior Certificate, Junior Certificate School Programme (JCSP), Leaving Certificate Applied (LCA), Leaving Certificate Vocational Programme and the established Leaving Certificate to its 275 students. In addition, 151 students attend Post Leaving Certificate Courses in the school. Wexford Vocational College is one of the pilot schools participating in Project Maths and participates in the Delivering Equality of Opportunity in Schools (DEIS) initiative.

On entry to the school, students are streamed into class groupings based on the outcome of assessment tests administered earlier in the year. Approximately forty percent of new entrants follow the JCSP and these are arranged into distinct class groups. The other junior cycle students are streamed into one or two groups depending on the year’s intake. Such an early determination of student ability should be reconsidered as research suggests that assigning students into an ability setting too early may have negative consequences on junior cycle outcomes. Furthermore, the practice of creating independent class grouping for JCSP should be reviewed, taking due cognisance of the underlining principles of the programme. It is therefore recommended that the practices and procedures for class formation on entry to the school be reviewed. It is also recommended that all junior-cycle students be placed in mixed-ability groups for Mathematics at the beginning of first year and that teachers delay placing students into ability sets until the outcomes of a number of in-school assessments in Mathematics are available.

Concurrent timetabling of Mathematics is confined at present to JCSP classes. If concurrent timetabling was provided for all Mathematics groups in second and third year it would allow for the establishment of discrete foundation, ordinary and higher level classes and for student mobility between them. It is therefore recommended that practice and policy in relation to concurrent timetabling of Mathematics be reviewed.

Time allocated to junior cycle Mathematics is good. All junior cycle year groups have an allocation of five class periods per week with a sixth period allocated to JCSP. In most instances, there is an even distribution of Mathematics throughout the week. Lessons are of forty minute duration.
JCSP students are offered ordinary level, but the majority opt to sit the foundation level in the state examinations. The remaining junior cycle mathematics students taught in mixed-class settings are offered either higher, ordinary or foundation. However, a review of state examination results revealed that many students take foundation level and achieve a grade A or B at this level. It was noted during the evaluation that efforts were made to encourage students to participate at the most appropriate level. Subject department planning meetings should be used to develop strategies to improve attainment and address students’ uptake at junior cycle.

One class group of LCA is formed each year with the remaining senior cycle students following the established Leaving Certificate. The time allocation of three periods of Mathematics per week for LCA year groups and five class periods per week for all other senior cycle mathematics is good and in line with syllabus requirements. Timetabling arrangements for senior cycle are also good. Mathematics classes are distributed through the week and in most instances there is daily contact with the subject, which is in line with best practice. The majority of non-LCA students follow the ordinary or foundation level, with higher level offered when necessary.

The mathematics department comprises seven teachers. Teachers are deployed in line with their subject qualification and share in the rotation of the teaching of levels, which is in line with best practice. Teachers retain a class group from year to year and, on occasion, will retain a class from first to sixth year.

There is very good support by management for the ongoing teacher professional development including subject development and in the provision of resources to support the teaching of Mathematics. Involvement by teachers in the subject association is also supported by management through payment of annual subscriptions. However, current membership of the Irish Mathematics Teacher Association has lapsed and should be renewed to provide opportunities to access additional professional development. Requests for mathematical resources are made by the subject co-ordinator to the principal, with all reasonable requests secured to date.

Students who are in need of numeracy support are provided with additional support tuition in Mathematics through individual or group withdrawal from other subjects. Ongoing review of the needs of students is undertaken with alternative models of provision considered ensure that the most appropriate needs of the individual student are catered for.

Involvement of students in co-curricular activities is commended. Students have opportunities to participate in activities such as Maths Day, Project Maths quizzes and Maths for Fun organized through the JCSP. Ongoing promotion of Mathematics is to be encouraged as it allows students to engage with the subject through a variety of contexts.

**PLANNING AND PREPARATION**

Subject department planning meetings are facilitated by management throughout the school year. Many informal meetings also take place. The position of co-ordinator of Mathematics is undertaken voluntarily and is ably filled.

Minutes of meetings retained indicated that much time has been devoted to discussions in relation to Project Maths. It is now timely that the mathematics department identify areas for the ongoing and future development of Mathematics in the school. The development of action plans should provide a focus for the progression of key areas. Other areas for consideration at meetings should include planning for the integration of ICT into the teaching of Mathematics, the development of
common strategies to teach topics, the development of common assessments as well as the
documented development of strategies to improve attainment.

Subject planning documentation perused included department procedures and planning
documents. The mathematics plan includes the aims, objectives, department policy on student
access to levels and provision for students who experience difficulty with Mathematics. Additionally, schemes of work for each year group and level as well as suggested timeframes are
documented. It is recommended that schemes of work be updated to integrate associated learning
objectives. Furthermore, this review should allow for topics to be synchronised across levels. It
was noted that the mathematics plan, along with relevant resource material, will be placed on the
school’s intranet. This is good practice and should be advanced as it would be an important
resource for all teachers to access.

Individual schemes of work made available during the evaluation were based on the department
scheme and in some instances many were supplemented by individual teachers’ notes. Of
particular note was the development of sample materials for the teaching of geometry using the
software package Geogebra. It is recommended that once operational, all plans and resources
should be placed in a shared folder on the intranet for all mathematics teachers to access.

TEACHING AND LEARNING

Nine lessons were observed across all programmes and a range of levels. There were
opportunities to interact with the students and to review their copies. The predominant teaching
style observed was traditional and in most instances was of a good standard.

In some lessons, features of good practice included the establishment of clear learning objectives,
a good pace and good use of the time available. In such lessons, good progress and learning took
place as students had a clear understanding of what was to be achieved during the lesson. It is
therefore recommended that attention to lesson structure be reviewed where appropriate.

There was good and appropriate use of mathematical terminology and notation by teachers and
some instances where this was also the case for students. The use of keyword notebooks and
keyword posters reinforced students’ engagement and is commended. Some teachers took
opportunities to set mathematics concepts in context for students allowing them to become more
engaged with the topic. For example, during the teaching of statistics, links were made to the
recent general election. It is recommended that teachers take time to identify links with current
work and to avail of every opportunity to exploits these links in their lessons.

The generally traditional teaching methodologies observed were characterised by the teacher
demonstrating a technique and students following a series of exercises. While, in most instances,
this strategy was applied to a good standard, the use of the predominately teacher-directed
approach did not allow for sufficient student engagement. For examples, there were opportunities
where discovery activities or group work would have allowed students to become more actively
involved in their learning. There is a need for greater range of methods to be integrated into the
teaching of Mathematics. In this regard, methods engaged with by teachers during national in-
service in Project Maths should be used in lessons.

Questioning strategies varied in lessons observed. Some use was made of questions to establish
students’ prior learning. In some lessons, very good use made of higher-order questioning that
challenged students to provide reasons for their answers. Such practices are highly commendable
and should be extended to all lessons. In some lessons, insufficient time was given to students to prepare a response to a question before the teacher provided the correct answer. Development in this area is recommended with attention drawn to assessment for learning strategies.

In all lessons, students’ learning was generally appropriate to their ability and syllabus requirements. Students were co-operative and, when assigned a task, were competent in completing the work. On occasion, there were instances where students could have been given additional work as they did not find the work in hand sufficiently challenging. It is recommended that differentiated work be prepared to ensure that students are challenged to achieve to the best of their ability.

Interactions between the inspector and students were generally positive. Students demonstrated clear capabilities when answering questions posed to them during the evaluation. In some instances, students answered at a level higher than their perceived ability. This merits serious consideration by the subject department given the earlier recommendation in relation to raising student attainment.

Resources used during lessons included, textbook, teacher prepared handouts and mock examination papers. Many teachers are classroom based and the walls had both student work and commercially sourced posters on display. The use of a visual verbal square, used effectively during the teaching of a statistics lesson, is recommended for all classrooms. JCSP key work posters were prominent in many classrooms but little use was made of them during lessons and this merits consideration.

ASSESSMENT

The mathematics department has agreed practices in relation to assessment and reporting which are documented in the departments plan. However, practices and policy in relation to students changing level should be agreed upon and become practice to ensure that student and parents are aware of the long-term consequences of level change.

Formal assessments are held for all students at Christmas. Examination year groups have mock exams in February and formal assessments take place for all other year groups prior to the summer holidays. Reports are issued following formal school examinations and parent-teacher meetings are held for each year group. Further communication between home and the school is maintained through the student journal and phone calls to the home and by the Home School Community Liaison teacher. JCSP students receive postcards throughout the school year acknowledging their achievements.

A range of student work was observed during the evaluation. These included students’ mathematics homework copies, samples of LCA key assignments and JCSP subject statements. It was evident from students’ mathematics copies that teachers monitor their students work. Practice observed varied and included, for example, detailed written comments regarding areas for further work while in others instances teachers initialled students work. The mathematics department should consider agreeing common practices and adopting these strategies to bring greater consistency to the monitoring of students work.

Regular homework is assigned and usually corrected as part of the following lesson, which is good practice. Homework assigned was appropriate to the work encountered during the lesson and appropriate in terms of quantity. In line with best practice, students were encouraged to record their homework in their journal. However, a review of journals indicated that such
recording of homework is sporadic. Ongoing monitoring and encouragement is recommended in this regard.

Teachers retain very good records of student attendance and attainment in class-based and formal school examinations. There is evidence to suggest that for many students attendance is poor and a cause of concern. It is important that parents and students realise the importance of regular attendance to ensure continuity in learning and to achieve success.

**SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- Management is commended for the support offered to the Mathematics department in the time allocated to the subject, the provision of facilities for the use of ICT and facilitating and encouraging the continuous professional development of staff.
- The predominant teaching style observed was traditional and in most instances was of a good standard.
- Regular homework is assigned.
- Teachers retain very good records of students’ attainment and attendance.

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

- A wider range of teaching methodologies and questioning strategies is desirable in all lessons to cater for the range of abilities of students.
- It is recommended that a whole-school review be undertaken of the policy and practices of student assignment to classes upon entry to the school.
- A review of the timetabling of Mathematics should be undertaken to facilitate concurrent timetabling for all junior-cycle students so that distinct foundation, ordinary and higher level classes can be formed from second year onwards.
- Department planning meetings should be used to update aspects of the mathematical schemes of work and to identify and progress long-term action plans.

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.

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