Subject Inspection of Mathematics
REPORT

Tallaght Community School
Balrothery, Tallaght, Dublin 24
Roll number: 91335U

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

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Tallaght Community 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 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, deputy principal and the co-ordinator of the mathematics department. The board of management of the school was given an opportunity to comment in writing on the findings and recommendations of the report, and the response of the board will be found in the appendix of this report.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

The mathematics department in Tallaght Community School is comprised of ten teachers. It is a cohesive and effective department that benefits from very good leadership and engages in a range of collaborative practices. Collaboration within the department is evident from the degree to which the school’s virtual learning environment (VLE) is populated with the department’ planning materials, lesson plans and other materials designed to enhance teaching and learning in Mathematics. The majority of the mathematics teachers are skilled in the use of Information and Communication Technology (ICT). In order to sustain and develop the ongoing integration of ICT in lesson delivery, it is recommended that at least one member of the department be identified to source additional resources, to recommend strategies for their use in teaching and learning and to manage how they are incorporated on the VLE.

The qualifications profile of the mathematics department is very good and the teachers are deployed in line with their qualifications. The teachers are assigned to levels by rotation and it is school policy that teachers retain the same class group from second into third year and from fifth to sixth year. This is very good practice as it facilitates long-term planning and ensures consistency in lesson delivery. Management is aware of the needs of the department and has built its capacity to the point where a good number of the mathematics teachers are available to teach higher-level Mathematics to Leaving Certificate. This is very welcome, not only because it future proofs the department against changes in personnel but it also means that the manner in which higher-level Mathematics is taught in junior cycle more closely addresses the skills the students will need to successfully tackle the higher-level course in senior cycle.

The mathematics department is very well resourced. Mathematics classes have ready access to the school’s three computer rooms and a growing number of classrooms are equipped with data projectors and computers for teacher use. Other resources to facilitate active teaching and learning are also available. Given the imminent national implementation of Project Maths and the associated shift to more active teaching and learning in Mathematics, it is recommended that the department conducts an audit of existing resources to ensure that it is suitably equipped to
successfully implement the project. Any anomalies identified by the audit should be addressed as soon as is feasible. It is school policy that teachers are assigned to dedicated classrooms. This is working very well as the rooms are rich with bespoke posters and charts and the environment created by the teachers serves to generate and sustain positive attitudes towards Mathematics.

Students transferring from the feeder primary schools are well supported. Tallaght Community Schools maintains close relationships with its main feeder schools and the educational and other needs of the incoming students are well established prior to their entry into first year. The mathematical capabilities of students transferring into first year are established through the use of appropriate standardised tests and a mathematics competency test designed by the school’s mathematics department. The latter test merges very well with the primary school mathematics curriculum, is student friendly and contains a commendable degree of differentiation. Following the analysis of the outcomes of the various assessment tests, first-year class groups are formed. Currently mathematics classes are streamed throughout the junior cycle and are timetabled independently in first and second year. The top two classes are timetabled concurrently in third year. It is recommended that the scheduling and composition of Mathematics in junior cycle be reviewed. The review should allow for the concurrent timetabling of mathematics classes in second and third year and for the formation of mixed-ability classes within bands in first year. This would facilitate greater ease of movement between levels and would allow for the delivery of a cohesive common mathematics programme in first year.

The outcomes of the competency test mentioned above should be used inform the design and delivery of the first year programme. The programme content should address the weaknesses and build on the strengths identified by the assessment and should be reviewed annually. In designing the programme, due cognisance should be given to the shift in emphasis advocated by Project Maths and the programme should reflect the new syllabuses. Therefore, the programme should include elements of probability, statistics and geometry in addition to the material currently addressed in the competency test.

Upon completion of the junior cycle, all students enter Transition Year (TY). Timetabling provision for Mathematics in TY is very good. Each class group is provided with four periods of Mathematics per week and all mathematics classes are timetabled concurrently. However, it is recommended that the composition of the mathematics classes in TY be reviewed. Currently, the mathematics classes are set and each class follows a separate programme determined by the level the students intend to take in the Leaving Certificate. While it is acknowledged that some of the skills required of students at higher level in fifth and sixth year are different from those required at ordinary and foundation level, arrangements should be put in place to allow elements of the TY programme to be delivered in a mixed-ability setting. This may require that the programme be reconfigured to include a core and options. The core should contain the key skills and competencies required by students in fifth and sixth year while the options should reflect the interests and strengths of the teachers delivering the programme and should be delivered in a mixed-ability setting. It might also be possible to deliver the options in rotation to different class groups and through the use of inter-class collaborative projects.

Once students have completed TY, they can opt to follow the established Leaving Certificate or take the Leaving Certificate (Applied). Timetabling provision in both instances is very good.

Arrangements in place to cater for students with special educational needs or in need of learning support are inclusive, student centred and thorough. A designated special class is created in each year of the junior cycle and team teaching is deployed to provide additional support in Mathematics to these classes in first and third year. The second-year class group is very small and
does not require this intervention. Team teaching, small-group and one-to-one withdrawal are also used to provide additional support in Mathematics in the mainstream classes in junior cycle and senior cycle. Teachers involved in team teaching are provided with written documentation outlining the protocols to be followed when preparing and delivering lessons. These protocols, which were evident in the teachers’ planning folders, are a very valuable resource and ensure that this innovative approach to lesson delivery is well managed.

PLANNING AND PREPARATION

Subject department planning in Mathematics is well advanced. A co-ordinator, appointed as part of the school’s schedule of posts, is in place and the activities of the department are very well managed. The role of the co-ordinator is clearly defined and involves: advising the principal and deputy principal on all matters relating to the department; keeping teachers informed of developments in Mathematics; assisting staff in preparing and implementing new courses and programmes; leading the development of a plan for the department; assisting with the induction of new staff and managing the department’s resources. The existence of such a comprehensive role descriptor is indicative of the proactive approach adopted by management in supporting the department and is very good practice.

The members of the department meet regularly and the minutes of the meetings are available on the school’s VLE. It is also evident that the members of the department collaborate very effectively in lesson planning, in resource development and in agreeing assessment practices.

A very good subject department plan is in place. The plan, which is subject to regular review, is available on the VLE and contains detailed schemes of work for each year and level. The schemes of work are in most cases written in terms of learning outcomes, with those intended for second year particularly impressive. In order to enhance the good work already underway, it is recommended that the remaining schemes of work adopt the model currently employed for second year and that all of the schemes be extended to detail the teaching methods to be employed and the key points to be emphasised during the lessons. Furthermore, the members of the department should agree and document the approach to be adopted when carrying out key operations and procedures. Reference should then be made to these in the appropriate schemes of work.

In light of the earlier recommendation regarding the provision for Mathematics in TY, this element of the subject department plan will need to be reviewed. Prior to the review, agreement should be reached on the rationale for the programme and on the core competencies and skills that the programme will address. Agreement should also be reached on how the programme is to be delivered and it should be clear that any Leaving Certificate material contained in the programme will be dealt with in a manner that is original and stimulating and significantly different from the approach taken during the Leaving Certificate programme.

An analysis of student performance in the state examinations is conducted annually by the department and the outcomes of the analysis are made available to the school’s senior management team and the board of management. The outcomes are also discussed at meetings of the department and serve to inform ongoing planning. This is very good practice.

Individual teacher lesson planning is very good. The range and quality of the resources prepared by the teachers in advance of their lessons and the detail with which each lesson is laid out in their planning documentation is worthy of the highest praise. The seamless manner in which
resources were integrated into the lessons observed during the inspection offers further evidence of the thoughtful and thorough manner in which the teachers prepare for their lessons.

**TEACHING AND LEARNING**

The quality of teaching observed during the inspection was very good. All of the lessons were well prepared and very good links were made with the students’ prior learning and with their everyday experiences. The teachers taught with enthusiasm and clarity. In some instances, the lesson’s intended outcomes were negotiated at the outset of the lesson and a review of how successfully they were achieved was conducted prior to the lesson’s conclusion. This very good practice, which gives the students a sense of ownership of the lesson content and enhances lesson structure, should be adopted as standard practice across the department.

A striking feature of the lessons observed during the inspection was the range of teaching methods employed by the teachers. ICT integration, including the use of dynamic geometry software, the creative use of the overhead projector, differentiated worksheets, team teaching and the more traditional methods involving teacher exposition at the board were all in evidence. In addition, all of the teachers were very comfortable with the material being covered and this particularly ensured that the lesson content was accessible to the students and that students’ understanding of the material was greatly enhanced.

ICT was effectively integrated into lesson delivery in a number of instances. In one case, presentation software was used very effectively to review statistics in preparation for the summer examinations. Here, the ICT allowed the lesson content to be delivered in a structured manner and facilitated the development and exploration of the underlying concepts. In another case, dynamic geometry software was used to introduce the concept of area and to enable the students to develop a method for calculating the areas of simple two-dimensional shapes. The dynamic nature of the software also allowed the students to see how the area of a two-dimensional shape alters when its dimensions are changed. The shapes being investigated using software matched exactly those contained in the students’ textbooks. This worked very well as the relevance of the material being covered was immediately obvious to the students. The lessons also featured team teaching where two teachers collaborated very successfully to ensure that all of the students received appropriate levels of support.

The overhead projector (OHP) and team teaching featured in an excellent lesson where students were introduced to bar charts. In preparation for the lesson, a number of surveys were carried out within the class. The data collected was collated into frequency tables and these were then used to create the bar charts. The lead teacher illustrated the process of drawing a bar chart using layered acetate sheets on the OHP. As the sheets were placed in order on the OHP, the bar chart emerged and the correct method of drawing such charts became obvious. The students then engaged in creating their own charts from the remaining locally-collected data. The two teachers worked in tandem to support individuals or small groups of students when the need arose. The lesson concluded with an impromptu survey of the students’ shoe sizes. The data was tallied and placed into a frequency table on a worksheet distributed by the teachers. The students were then asked to construct a bar chart to represent the data for homework.

The teachers were very skilful at gaining and maintaining student engagement and in retaining the focus on the lesson’s objectives. The students were, in almost all cases, very well behaved and interacted with the teachers in a positive and respectful fashion. All of the lessons proceeded at a good pace, were characterised by good teacher movement and any students experiencing difficulties received very good support. Teacher questioning served to include all students in the
lessons and featured a good mix of directed and global questioning. However, higher-order questioning featured in only some of the lessons. In order to address this, ongoing subject department planning should consider how students can be encouraged to speculate and hypothesise and how strategies to challenge the more able students can be integrated naturally into lesson deliver by all of the members of the department.

Student learning, in almost all cases, was very good. The students responded readily to teacher questioning and contributed to the lessons by asking good questions themselves. The quality of the work completed by the students during the lessons and of that contained in their homework copies was also very good. Student performance in the state examinations, when the school’s context is taken into account, offers further evidence of the high quality of student learning.

ASSESSMENT

Ongoing assessment practices are very good. Homework is regularly assigned and corrected. The students’ homework copies are well monitored and any difficulties encountered by students with their homework are dealt with very effectively. The school’s draft homework policy is comprehensive and provides a valuable frame of reference for the mathematics department in agreeing its homework practices. It is recommended that the department customises elements of the policy to reflect the particular needs of Mathematics. The modifications should include the need for students to amend their work while homework is being corrected in class and should detail how homework can provide opportunities for shared and collaborative learning. Students sit regular class tests and the procedures adopted by the members of the department in correcting the tests and in providing feedback to students on their performance are very good.

Students in non examination classes sit formal examinations at Christmas and prior to the summer holidays. Common assessments, within levels, are provided where appropriate. Students in third and sixth year also sit examinations at Christmas and sit the mock examinations during the second term. The papers produced for formal examinations are of a suitably high standard and utilise graphical material to assist the students in interpreting the questions. In some instances the papers featured very thought-provoking context-based questions. This very good practice, which should be adopted across the department, encourages the students to apply their knowledge, develops their problem-solving skills and is in keeping with the approach promoted by Project Maths. Great care is taken by the teachers in marking the formal assessments and the students’ scripts feature positive teacher comments, corrections and amendments and alternative approaches that the students might consider in answering the questions.

Practices in relation to monitoring student attendance and attainment in class and formal examinations are very good. Roll call is taken at the beginning of each lesson and the results of class and formal tests, and compliance with homework assignments, are kept in the teachers’ diaries.

The school communicates very effectively with parents. The school’s home-school-community liaison officer provides very valuable support in this regard, while regular contact is also maintained though the student diary and telephone calls to the home. Parents of students participating in the Junior Certificate Schools Programme receive frequent updates through the use of dedicated postcards. Written reports also issue to parents after each formal examination and in future, parents will be provided with an additional written report in October each year. This report will reflect student performance in the class tests from the beginning of the year and will provide parents with a timely update on student progress. Each class group has one parent-teacher meeting per year.
SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The mathematics department is cohesive and effective. It engages in a range of collaborative and innovative practices and benefits from very good leadership. Subject department planning in Mathematics is very good.
- The mathematics department is very well resourced and its members are proactive in preparing and sharing their own resources.
- School management is well aware of the needs of the department and is proactive in supporting the development of the department and in creating an environment in which the department can flourish.
- The procedures in place to facilitate the transfer of students from the feeder primary schools and to establish their educational and other needs are very good. Students with special educational needs or in need of learning support are very well catered for in the school.
- The quality of teaching and learning is very good. Teachers utilised a wide range of teaching methods, were very comfortable with the material being covered and ensured that the lesson content was accessible to the students.
- Assessment practices are very good.

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

- In order to sustain and develop the ongoing integration of ICT in lesson delivery, it is recommended that at least one member of the department be identified to source additional resources, to recommend strategies for their use in teaching and learning and to manage how they are incorporated on the VLE.
- It is recommended that the scheduling and composition of Mathematics in junior cycle be reviewed. The review should allow for the concurrent timetabling of mathematics classes in second and third year and for the formation of mixed-ability classes within bands in first year.
- It is recommended that the composition of mathematics classes in TY be reviewed and arrangements should be put in place to allow elements of the TY programme to be delivered in a mixed-ability setting. Those elements of the subject department plan dealing with the TY programme should be amended accordingly.
- It is recommended that the schemes of work contained in the subject department plan adopt the model currently employed for second year and that all of the schemes be extended to detail the teaching methods to be employed and the key points to be emphasised during the lessons. Furthermore, the members of the department should agree and document the approach to be adopted when carrying out key operations and procedures. Reference should then be made to these in the appropriate schemes of work.

Post-evaluation meetings were held with the principal, deputy principal and the co-ordinator of the mathematics department at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

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Appendix

School response to the report

Submitted by the Board of Management
Area 1  Observations on the content of the inspection report

Overall we found the report to be very positive in so far as it makes explicit many of the main strengths and good practices evident within the mathematics department of our school.

It has long been the policy within our mathematics department to revise and review strategies on an annual basis in delivering all aspects of the syllabus. This policy will continue with a view to considering the recommendations in the report and, in particular, meeting the challenges we confront with the changing needs of our student body, along with devising appropriate strategies for the delivery of the new mathematics syllabus.

Area 2  Follow-up actions planned or undertaken since the completion of the inspection activity to implement the findings and recommendations of the inspection.

Re: ICT in the classroom

Additional resources in this area are sourced by each member of the department and shared collaboratively on the schools moodle website. We plan to continue to use this facility on a regular basis. One member of the department has agreed to assume responsibility for co-ordinating the collection of additional resources in the area of ICT as per recommendation.

Re: Scheduling of classes

The concurrent timetabling of maths classes for a second and third year class groups has been implemented as per recommendation for the 2010/2011 academic year. It is our intention to explore the possibility of the formation of mixed ability classes within bands in first year, as timetabling permits, for the academic year 2011/2012.

Re: TY classes

We are currently reviewing our TY syllabus with a view to incorporating more project based work and discovery learning as per recommendation. These changes will be amended accordingly in our schemes of work.