Subject Inspection of Technical Graphics and Design and Communication Graphics
REPORT

Pobalscoil Neasáin
Baldoyle, Dublin 13
Roll number: 91342R

Date of inspection: 4 May 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN TECHNICAL GRAPHICS AND DESIGN AND COMMUNICATION GRAPHICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Pobalscoil Neasáin. It presents the findings of an evaluation of the quality of teaching and learning in Technical Graphics and Design and Communication Graphics and makes recommendations for the further development of the teaching of these subjects 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 the teacher, examined students’ work, and had discussions with the teacher. The inspector reviewed school planning documentation and the teacher’s written preparation. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal and the subject teacher. The board of management 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

Pobalscoil Neasáin caters for 553 students, 411 males and 142 females. First-year students are offered Technical Graphics (TG) as one of the optional subjects they can take for the Junior Certificate examination. In the interest of informing student choice, the school provides first year students with a two week introduction to each of their optional subjects. TG is grouped with Art, Business Studies, Home Economics and Music and by the October mid-term break students are asked to select one of these optional subjects for further study. This experience of sampling the optional subjects is a valuable support to making a final choice and is commended. The year head provides information to parents towards the end of the sampling period to aid the decisions making process. Students are asked to fill in a form where they identify their top three preferences and this form must be signed by parents. All reasonable efforts are made to accommodate students’ subject choices.

Students moving to senior cycle complete a compulsory Transition Year (TY) before being offered their choice of three programme:, the established Leaving Certificate (LC), the Leaving Certificate Vocational Programme (LCVP) and the Leaving Certificate Applied (LCA). Students moving to the LC and the LCVP are offered Design and Communication Graphics (DCG) while students moving to the LCA are offered Graphics and Construction Studies (GCS). The guidance counsellor provides support for students, in the form of advice on subject and programme choice, through timetabled classes and individual interviews. The Differential Aptitude Tests (DATs) are administered during TY and are used to assist in informing subject choice. Subject teachers provide input through a subject-choice information morning for students and through individual consultation with students. The year head also supports students in finalising choices. These arrangements form a good model for the making of informed decisions. Students are asked to
rank their preferences from a list of available optional subjects. The subject groupings are then designed with the main focus on accommodating students’ subject choices as far as possible.

Participation rates indicate that TG and DCG are popular subject choices amongst the students in the school. Participation by female students in most class groups is below the national average and it is recommended that school management and the subject department explore ways to encourage more females to study the subjects. The school website for example could include input from current and past female students describing their experience of the subjects. In addition to this a survey of the female students in the school to determine their attitude to the subjects could provide useful information and guide further development in this area.

All TG and DCG classes are of mixed ability with access to higher and ordinary level being accommodated within class groups. Students’ outcomes in certificate examinations are analysed by the subject teacher and senior management every year with results compared to the national norms. This analysis should be used in conjunction with the marking schemes and the chief advising examiners’ reports which are published by the State Examinations Commission to inform future planning for the subjects. Time allocation for the subjects is good with the provision of double and single periods allowing lessons to be well distributed across the week.

The subject department has access to two rooms for the delivery of the subjects. One of these is laid out as a traditional drawing room with sloping desks and well organised storage facilities. This room has no information and communications technology (ICT) equipment available to aid teaching and learning and it is recommended that a data projector be provided as soon as possible. The other room contains ten workstations, a laptop and a data projector and is used for the delivery of the Computer Aided Design (CAD) element of the DCG course. At present if a large group of students need to use this room they must share computer facilities. More computers are to be provided for this room in the near future. This will greatly assist the delivery of the DCG syllabus. Both rooms are bright and tidy and have good displays of students’ work. To further improve on these displays, consideration should be given to the display of some of the posters and worksheets that are available on the Technology Subject Support Services (T4) website (www.t4.ie). Furthermore, by mounting a full DCG project on the wall, as well as solutions to examination questions modelled using SolidWorks, students would be made more aware of what the subject involves.

It is common practice for schools to supply class sets of T-squares, paper and drawing clips/masking tape for student use during class time. In Pobalscoil Neasáin, however, the school supplies students with all of their drawing equipment needs, including set-squares and compasses with the result that students have no equipment at home for the completion of homework. It is suggested that students should purchase their own sets of drawing equipment for home use and for use in the classroom if they so wish. It was noted that many of the students were using unsuitable pencils of various quality and lead type. This is not conducive to the production of high quality technical drawings. It is recommended that the teacher decides on a standard pencil type to be used by all students studying the subject.

The subject department member has availed of the recent and ongoing continuing professional development (CPD) courses provided by T4. The teacher has also attended a three day Solid Solutions course, a computer networking course run by T4 and a course on LCA Graphics and Construction. The commitment shown by the teacher in attending courses outside school time deserves particular acknowledgement.
PLANNING AND PREPARATION

Teachers of all the technology subjects in the school meet as a group for subject department planning meetings. These meetings are facilitated by school management twice per year. A subject co-ordinator has been appointed and minutes of meetings are retained and copied to management. These formal meetings are supplemented by frequent informal meetings. These arrangements contribute positively to the maintenance of strong links between the various subject departments.

A technology department plan has been developed and this plan contains many of the school’s policy documents, aims and objectives of the various subjects, information on students with special educational needs as well as curricular plans for each year group. The schemes of work outline the resources available for the teaching of each topic and are written in terms of student learning outcomes. This is good practice. As a next step in the development of these plans it is recommended that for each topic, reference be made to teaching methodologies as well as proposed methods of assessment. The schemes are currently divided into weekly blocks of work. It is suggested that dividing these schemes of work into half-year time frames may prove less restrictive while still facilitating accurate tracking of progress through each programme of work.

The usefulness of the subject planning folder is linked to the amount of relevant material it contains. With this in mind it is recommended that copies of past house examinations be retained as well as copies of worksheets and handouts used with classes during their course of study. The analysis of the students’ performances in the certificate examinations, mentioned earlier in the report, should also be included in addition to details of any observations or plans resulting from this analysis.

Currently there is no graphics module offered to TY students. It is recommended that consideration be given by the subject department and senior management to the development of such a module. It is important that students have continuity in their study of these subjects when moving from junior to senior cycle. Such a module would also allow students who may not have studied TG in the junior cycle to get a flavour of Design and Communication Graphics (DCG) at senior level. When planning the content of such a module the emphasis should be placed on the development of students’ parametric modelling skills using the SolidWorks software as well as fostering their freehand sketching and rendering techniques. The introduction of a student project towards the end of the module which included research, sketching and presentation techniques, design modification and computer-aided modelling, would tie the various elements of the course together. It would be important when delivering the module that student learning and assessment is considerably different to that experienced during the Leaving Certificate programme.

The department’s planning documentation does not prescribe any textbooks for the subjects. Textbooks can be a useful resource for teachers in the explanation and allocation of work and for students in the completion of class and homework tasks. Resources permitting, it is recommended that class sets of textbooks be kept to ensure that students have access to a textbook when necessary. Furthermore, consideration should be given to requiring students to have their own textbooks. This would facilitate the allocation of homework and would also enable students to study and revise material covered in class.
TEACHING AND LEARNING

All lessons observed had a clear learning outcome and this learning outcome was shared with students in most of the classes observed. It is recommended that this strategy be extended to all lessons. It is suggested that the proposed learning outcomes for the lesson be written on the chalkboard and ticked off as each is achieved. This would enable both the teacher and the students to focus on the specific objective of the lesson and allow the success of the lesson to be easily evaluated at the end.

Planning for lessons was good with a number of resources prepared in advance and used appropriately. The subject matter in all lessons observed was consistent with students’ prior learning and was delivered in a structured manner. Questioning techniques were used effectively at the start of lessons to revise previous learning and to determine students’ knowledge and understanding of topics. As the lessons progressed, questioning was used well to encourage student engagement with the lesson content and to consolidate learning. Care was taken to ensure that all students felt part of these question-and-answer sessions and they were appropriately affirmed for their contributions to the lesson.

Blackboard drawings were clear and accurate and were enhanced by the use of coloured chalk to reinforce students’ understanding of various line types. In most lessons observed drawings were developed incrementally by the teacher as the lesson progressed and care was taken to ensure that students understood the steps involved. The teacher circulated the classroom and provided support and guidance to individual students at their desks. This strategy was successful. In addition to using the chalkboard for the presentation of work it is recommended that ICT be used to supplement and vary the teaching and learning experience for students. The modelling, by the teacher, of solutions to questions using SolidWorks would support and reinforce learning. ICT can also be used to highlight the link between graphics in the classroom and graphics in advertising, construction and the design of everyday objects.

In a first year lesson observed a teacher-built 3-D cardboard model was used effectively to aid the students’ understanding of truncated prisms. The model proved extremely useful as a visualisation aid and during the explanation of the solution. As the lesson progressed the students were asked to make a surface development of a similar truncated prism. Each individual student then used this development to produce their own 3-D model of the prism. These models were then displayed at the front of the classroom thus affirming the students’ work. A similar approach was used in a third year lesson observed where students were completing a Junior Certificate examination question on developments. The students who were finished first were encouraged to cut out and form the 3-D model. This was a very worthwhile strategy to promote active learning and is commended.

During two of the lessons observed the teacher based the content of the lesson on questions from past certificate examination papers. These questions were distributed in the form of loose sheet photocopies. It is recommended that the teacher promotes the use of books of past examination papers. This would avoid the need to photocopy questions and would allow students to become familiar with the layout and format of the full examination paper. Furthermore these books of examination papers can be used as a study aid by students and to practise questions at home.

Freehand sketching and rendering techniques form an important element of the new DCG syllabus. These skills need to be nurtured and developed from an early stage in the junior cycle. From the observation of students’ portfolio work it was clear that students would benefit from a
more structured and directed approach to this area. It is recommended that more opportunities be taken to promote the development of these skills among students. Some useful resources for the teaching of sketching and rendering techniques are available on the T4 website.

The terminology associated with TG and DCG was used appropriately by the teacher and was well integrated into the lessons. This good practice allowed the students to assimilate subject-specific terms while working on their own tasks. There was a good classroom atmosphere and sense of discipline in the lessons observed. This was encouraged by the excellent rapport between the students and the teacher.

ASSessment

Examinations are held at Christmas for all year groups. Junior and Leaving Certificate students have an additional assessment in October as well as ‘mock’ examinations in spring. All other year groups have examinations at the end of the year. Reports are sent home to parents after each assessment and parents of students in each year group are invited to attend one parent-teacher meeting during the year. These arrangements are satisfactory.

Senior management is promoting a move, across all subject departments, towards the integration of continual assessment marks with Christmas and summer test grades. With this in mind it is suggested that a proportion of the marks awarded for end-of-term tests in TG and DCG be based on a number of sheets produced by the students during the year. Students should be given regular developmental feedback on their performance in such continual assessment thus providing an incentive for students to maintain their sheets and folders in good order.

A sample of students’ portfolios was examined. Many of these contained a significant number of incomplete and incorrect drawings. Some of the drawings showed poor standards of neatness and draughtsmanship and there was also considerable variation between the amounts of work contained in the different portfolios examined. It is recommended that constructive and formative feedback be provided to students in all class groups on a regular basis through the evaluation of their portfolios. The importance of neatness and good draughtsmanship should be regularly reinforced. Drawing sheets should be initialled and dated; key mistakes should be highlighted and an affirming or developmental written comment given. This, combined with the oral feedback currently given to students in class should help to encourage students to maintain good quality folders.

From observation of students’ journals and through discussion with the teacher it was established that homework is not allocated regularly. Homework reinforces the work students do in the classroom and is an important part of the learning process. It is recommended that every effort be made to ensure that homework is given on a regular basis to all year groups. This can take the form of completing work started in class, freehand sketching practice, short answer style questions and full technical drawing problems. The homework should be collected and corrected regularly, students should receive timely feedback on their work and a record should be kept of its completion or otherwise.
SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The time allocation to the subjects is good with the classes well distributed across the week.
- First year students are given an opportunity to sample each of the optional subjects before being asked to make their final subject choices.
- The teacher has engaged in extensive CPD.
- Participation rates in the subject are high.
- Classes are of mixed ability with access to higher and ordinary levels being accommodated within class groups.
- The subjects are accessible on all of the Leaving Certificate programmes offered in the school.
- Subject planning is progressing well.
- In the lessons visited, the chalkboard was used well to model the development of solutions.
- 3-D models were used successfully to aid students’ understanding.
- Questioning techniques were used effectively to determine students’ knowledge and understanding of topics.
- The terminology associated with the subjects was used consistently by the teacher and the students.
- There was a very good rapport between the students and the teacher.

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

- Students should purchase their own sets of drawing equipment for use at home.
- Management is urged to seek ways to encourage more females to study the subjects.
- Consideration should be given to offering a graphics module to students in Transition Year.
- There should be an increased use of ICT to support student learning.
- A stronger emphasis needs to be placed on the development of freehand sketching skills and rendering techniques.
- There should be closer monitoring of student portfolio work with greater attention to ensuring that students complete their work, do the correct drawings, and improve on their standards of neatness and draughtsmanship.
- Homework should be allocated more regularly to all year groups studying the subjects.

Post-evaluation meetings were held with the teacher of Technical Graphics and Design and Communication Graphics 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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Appendix

SCHOOL RESPONSE TO THE REPORT

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

The Board welcomes the report and thanks the Inspector for a constructive and supportive visit.

The Board is pleased to note that the report is very positive regarding the excellent rapport between the teacher and students, the positive atmosphere within the classroom and the high participation levels in this subject.

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

As a result of the inspection visit the following changes have been implemented:

1. A further 7 computers have been installed in the DCG room with a commitment that a further 5 computers will be purchased before the end of the 2010/2011 academic year.
2. A Data projector and screen has been installed in the traditional drawing room.
3. Students are now required to purchase their own sets of drawing equipment for use at home. A standard pencil has been agreed upon.
4. The DCG teacher is timetabled for transition year classes and will include an introduction to graphics within the class.
5. Portfolio work will be monitored and included in continuous assessment feedback.
6. Homework will be allocated and assessed as per the schools Homework Policy.
7. A workbook is now being used to consolidate class work at home.
8. A rendered freehand sketch is included on each piece of work.
9. Analysis of subject results in Certificate examinations is now included in subject plans.
10. Copies of house exams, handouts etc. will now be included in the subject plan.