

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Construction Studies and
Materials Technology (Wood)**

REPORT

**Nenagh Vocational School
County Tipperary**

Roll number: 72440K

Date of inspection: 6 November 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 CONSTRUCTION STUDIES
AND MATERIALS TECHNOLOGY (WOOD)

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Nenagh Vocational School. It presents the findings of an evaluation of the quality of teaching and learning in Construction Studies (CS) and Materials Technology (Wood) (MTW) 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 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

Nenagh Vocational School provides a wide range of technology subjects in a co-educational setting. Technical Graphics (TG) and Metalwork are offered in junior cycle in addition to MTW. Design and Communication Graphics (DCG) and Engineering are offered in addition to CS in senior cycle. There is effective co-ordination of the subject department in line with good practice. Formal subject-department planning meetings are held once a year with planning being undertaken in a less-formal way through the year as the teachers interact on a daily basis. The subject co-ordinator, who is appointed by the mutual agreement of the teachers, convenes subject-department meetings as part of his role. Further formalisation of the subject department is suggested as a means of building on the significant progress already made. The subject department should record the outcomes of all meetings in the course of the year. Such recording should be concise. Simple bullet points will suffice in most circumstances. The role of co-ordinator should rotate to further facilitate active collaboration, work-load sharing and continuity. The development of a subject department of the technologies, involving the teachers of all the technology subjects in the school, should be considered. This would support collaborative planning and development in areas of common interest, including integrated planning for the technologies in first year and in Transition Year (TY).

The subject plan is presented in a coherent, well-produced document comprising discrete sections dealing with CS and MTW and the room-specific safety statement for the subjects. This plan is reviewed annually. It is suggested, as a next step in the further development of the plan, that some

subject-development priorities be identified and included. The achievement of these targets should then provide a focus for an annual review. Good practice is followed in facilitating teachers' access to subject-related continuing professional development (CPD). The teachers of CS and MTW have attended the sessions provided through t⁴, the Technology Subjects Support Service.

Ample time is allocated to MTW. In second year and third year classes, five lesson periods per week are timetabled as two double periods and one single period. Three periods per week, including one double period, are allocated for first year class. In the TY programme, six periods per week are allocated to CS. These periods are divided into one triple period lesson, one double period and one single period, timetabled directly before and after lunch. Five periods per week are provided for CS in fifth year and six periods per week in sixth year. The provision of multiple-period lessons in each case facilitates the completion of practical work. Also, following good practice, the teachers of MTW and CS are deployed in a balanced manner to teach both subjects, and the other technologies, in line with their qualifications, skills, knowledge and interests.

The two woodwork rooms used for teaching CS and MTW are well equipped and maintained. The teachers of the subjects take individual responsibility for ensuring the maintenance of the rooms in which each is predominantly based. This is a satisfactory arrangement. The subject department bases plans for class materials and teaching resources within the annual budget allocated to the department. This is good practice. Clear procedures are in place for the management of purchases.

Arrangements for studying CS and MTW in the school are effective in meeting the needs and interests of students. Both subjects are studied by all students in first year and in TY. The subject-option bands devised in second year and in fifth year are determined primarily by the preferences of the particular cohort of students. Also, in line with good practice, students and parents are appropriately supported and assisted when preparing to make subject choices in first year, third year and in TY. Students' choices are informed by the experience of each of the optional subjects provided in first year and TY. Students are supported by the individual advice of the guidance counsellor and the advice of subject teachers. Meetings with parents are arranged at which the subject choices and their implications are clarified. Good practice is also followed in providing appropriate flexibility for students who wish to revise their choices at an early stage in second year or in fifth year.

PLANNING AND PREPARATION

Long-term planning for CS and MTW is good. Teachers share a clear appreciation of the place of the subjects in the curriculum and in meeting the needs of the students. The programmes of work in the subject-department plan are consistent with the subject syllabuses. The information included on effective teaching methodologies clearly outlines the approaches taken to teaching the practical and theory elements of the respective syllabuses. As a next step in the development of this aspect of subject planning, the teaching methodologies found to be most effective for particular content should be identified and linked to the content in the plan. In particular, additional active-teaching methodologies and strategies for delivering the theory content should be included. The teachers' own professional experience will be of particular value in undertaking this aspect of subject-planning development. It is further recommended that the good practice of introducing students to the process of design from early in first year, already being followed in the school, be reflected in the subject plan. This should be followed by planning for the inclusion of appropriate student-designed elements in each design project undertaken.

On the evidence of lesson observation in the course of the subject inspection, it is clear that lessons are carefully planned, and preparation of equipment and resources is of a high standard. CS and MTW are both taught in a mixed-ability setting throughout the school. Commendably, students are encouraged to study at the highest level appropriate to their individual ability. Students decide the level at which they will sit the certificate examination in consultation with their CS or MTW teacher. It is urged that every effort be made to further involve parents in this decision-making process. Good practice is followed in meeting students' diverse educational needs. The subject teachers seek to meet the educational needs of all students and differentiate students' project work to ensure that they are challenged at their own level. Teachers have access to the special educational needs team and the guidance counsellor and they are encouraged by the school management in their work in regard to meeting students' special educational needs.

The level of very good practice regarding cross-curricular planning and practice in CS is particularly significant in the TY programme. Teams of students design and manufacture products in CS, while business planning and marketing of these products are dealt with in the Business Studies class. Computer Studies and English lessons are involved simultaneously in providing records and presentation documentation. These small teams of students go on to enter for the Young Entrepreneurs Competition.

The information and communication technology (ICT) facilities available for the teaching of CS and MTW in the school are ample to support further technology-related development of teaching and learning in the subjects. Facilities include, four computer rooms, one of which has been developed with the aid of funding, made available by the Department of Education and Skills, through *t⁴*, to support the introduction of new syllabuses in the technologies. One woodwork room also has a ceiling-mounted data projector. The subject department aims to provide two computer work stations in each of the woodwork rooms. This is very positive. To further increase the use of ICT in teaching and learning, it is recommended that all students be facilitated to use *SolidWorks* computer-aided design (CAD) software in MTW and CS. It is desirable that the classes be timetabled for use of the DCG computer room for this purpose. The possibility of developing a cross-curricular approach to the introduction of *SolidWorks* in first year should be considered, perhaps modelling this development on the successful cross-curricular experience in TY already referred to in this report.

There is, in general, very good provision for health and safety requirements in the woodwork rooms. The funding provided for upgrading health and safety in the rooms has been appropriately used and work done includes the installation of 110 volt electricity outlets and the provision of compatible power hand tools. Mandatory safety signboards are displayed and rules for the safe use of the rooms are prominently displayed in line with good practice. Instructional sign boards are used in some instances to reinforce students' awareness of the procedures and practices to be followed, and to ensure safety in the use of specific machines. This is good practice and it should be extended to all machines. The subject-department plan includes a safety statement for the woodwork rooms. This safety statement is generally comprehensive and, in line with good practice, is particular to the classrooms and the machines they contain. However, attention is drawn to the statement, made in relation to the safety precautions and controls for the panel saw, that "*only students authorised by the teacher may operate the saw*". It is required that students are prohibited from using the circular saw as well as the planer thicknessing machine. The *Review of Occupational Health and Safety in the Technologies in Post-primary Schools* (State Claims Agency, Department of Education and Science, 2005), which should be consulted in detail when reviewing health and safety, clearly states this prohibition. This document includes the recommendation that all preparatory work involving the use of circular saw and planer

thickening machines should be completed before class. The safety statement must reflect this recommendation in its safety precautions and controls for the panel saw. The *Review of Occupational Health and Safety in the Technologies in Post-primary Schools* is available on http://www.education.ie/servlet/blobServlet/review_oh_safety_tech.pdf.

The safety statement includes guidelines on safe operational areas. This is good practice. It is urged that such areas be demarcated in the woodwork rooms. With the addition of appropriate instructional sign boards to present the rationale for these areas, and the implications for movement in the vicinity of machines, the students' awareness of good health and safety practice will be further increased.

TEACHING AND LEARNING

The teaching methodologies observed are suited to the abilities, needs and interests of the students. A high standard of teacher demonstration of woodworking skills is a particular feature of practical lessons. The approach generally adopted is to follow detailed demonstration to the whole class with opportunities for the students to complete the work at their benches. The teacher moves among the students as they work, monitoring progress and providing continuing affirmation and additional help where needed. To further support the students' learning, the successful methodologies already in use should be further expanded. In particular teachers should examine the possibility of further differentiating approaches to the teaching of the theory content of the MTW and CS syllabuses. An over-reliance on the text should be guarded against and the direct reproduction of sketches from the text by students should be used sparingly. It is urged that the possibility of engaging students in group work be explored and developed when particular topics are being investigated in theory lessons. A diversity of teaching approaches, in addition to direct teacher-led lessons, will further increase student involvement and motivation.

The purpose and expected outcomes of lessons are commonly communicated to students from the outset in line with good practice. Lessons are well structured and conducted at a pace that suits the abilities of the students. Students, in each of the lessons observed, worked in a disciplined manner and expectations regarding behaviour were willingly met. Discipline is sensitively maintained in line with good practice. Clear and consistent routines are followed in the woodwork rooms and this ensures that little time is lost as students access tools and equipment to complete their work and tidy up at the end of lessons. The atmosphere in lessons, as observed in the course of the inspection, is positive and conducive to learning. Communications among students and between teachers and students are appropriately respectful and pleasant. This atmosphere is supported by regular positive and affirming interactions, on a one-to-one basis, in the course of lessons.

The learning environment of the woodwork rooms is attractively maintained by means of displays of subject-related materials including posters and examples of work completed by the teachers and the students. It is urged that the posters on display continue to be added to and replaced over time, particularly to avail of the opportunity presented to add to the students' awareness of changing construction practices in CS. Good use of ICT for teaching was observed in one lesson. In this instance, the project being marked out by the students had been modelled in *SolidWorks* and was used to clarify and enhance the description of the artefact. The model had also been used to generate and print working drawings to which the students referred in the course of the lesson. Application of ICT to teaching should be further developed to include the use of a range of resources, including resources from the internet and compact disk. The teaching team is urged to

investigate the wide range of resources available, starting perhaps at http://www.t4.ie/arch_teacher_resources.html.

The rapid development of construction technology and design detailing in recent years has significant implications for the content taught in CS. Many textbooks that have been widely and effectively used in support of teaching the subject until now, no longer present accurate up-to-date material for use in lessons. All information presented to students, and specifically, typical building sections, should comply fully with the current building regulations. Some suitable resources, including typical sections that are in line with the regulations, can be accessed at http://www.t4.ie/arch_resources.html. Over-reliance on older textbooks in particular should be avoided.

The level of students' knowledge and understanding was consistent with expectations, based on their responses to questions. Students showed very good levels of practical woodwork skills development. The progress made by students showed that effective learning is taking place in MTW and CS.

ASSESSMENT

Formal assessment of students' progress takes place at Christmas, in summer, at mid-term in autumn, and in the spring. Students' progress is also assessed continually and this continual assessment includes all areas of the students' work: practical, theory and design. A common approach is adopted to assessment in all MTW and CS classes. The outcomes of continual assessment are combined with the Christmas and summer test results to arrive at the overall result in each case. This is a good approach to assessment. It is recommended that this common approach to assessment be detailed in the subject-department plan. All students should be made aware of the proportion of marks that are derived from continual assessment and be given regular feedback on their progress to provide further acknowledgement of success and encouragement of continued effort.

Assessment at a less formal level was observed in each of the lessons visited in the course of the inspection, and is an integral part of all lessons in MTW and CS. Students were commonly asked to reflect on their work providing valuable opportunities for self-assessment. This good practice in the area of assessment for learning (AfL) should be reflected in the subject-department plan. Further opportunities for expanding the use of AfL should also be explored, such as increasing the annotation of students' homework and the use of targeted questioning, in plenary sessions at the conclusion of lessons, to affirm and reinforce students' learning.

Teachers maintain systematic records of students' progress in MTW and CS and these are shared with the parents of the respective students at parent-teacher meetings and by means of the student's journals. This is good practice. The division of marks for course work and the theory examination in Junior Certificate MTW, and for course work, skills test and the written examination in Leaving Certificate CS, is presented and clarified at meetings with, respectively, parents of third-year and sixth-year students. The modes of formal assessment in place in the school are consistent with those of the certificate examinations. This is good practice. On an annual basis, the outcomes for students in the certificate examinations are compared to the national norms and it is suggested that the subject department should include its own analysis of these outcomes in the subject-department plan as an aid to on-going planning and review.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Ample time is allocated for the teaching of MTW and CS, and this time is organised suitably in combinations of single-period and multiple-period lessons.
- MTW and CS are studied by all students in first year and in TY respectively and subject-option bands devised in second year and in fifth year are determined primarily by the preferences of the particular cohort of students.
- The level of very good practice regarding cross-curricular planning and practice in CS is particularly significant in the TY programme.
- A high standard of teacher demonstration of woodworking skills is a particular feature of practical lessons.
- Students display very good levels of practical woodwork skills development, and their progress indicates that effective learning is taking place.

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

- The teaching methodologies found to be most effective for particular content should be identified and linked to the content in the subject plan, and in particular additional active-teaching methodologies and strategies for delivering the theory content should be included.
- All information presented to students in CS, and specifically, typical building sections, should comply fully with current building regulations.
- While the safety statement for the woodwork rooms is generally comprehensive and appropriate, the requirement that students be prohibited from using the circular saw as well as the planer thicknessing machine must be reflected in the statement.

Post-evaluation meetings were held with the teachers of Construction Studies and Materials Technology (Wood) and with the principal at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.