An Roinn Oideachais agus Scileanna

Department of Education and Skills

Subject Inspection of Metalwork and Engineering
REPORT

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Barrack Street, Waterford
Roll number: 64930I

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AN ROINN OIDEACHAIS AGUS SCILEANNA | DEPARTMENT OF EDUCATION AND SKILLS

REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN METALWORK AND ENGINEERING

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in the CBS Mount Sion, Waterford. It presents the findings of an evaluation of the quality of teaching and learning in Metalwork and Engineering and makes recommendations for the further development of the teaching of these subjects 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 the teachers and examined students' work. The inspector also reviewed school planning documentation. 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

In CBS Mount Sion Metalwork and Engineering are offered as optional subjects in both the junior and the senior cycles. These subjects are allocated appropriate time in both programmes, with junior-cycle students being allocated four periods per week and senior-cycle students being allocated five periods per week. These class periods are divided into both single and double lessons as is common practice. Both of the school's subject specialist teachers are deployed to teach both junior and senior-cycle class groups in a manner that promotes continuity for class groups. This is good practice.

Optional subject bands are devised based upon incoming first-year students' preferences. These option bands have changed recently and demonstrate the school's openness to accommodate students' subject choices where possible. Information regarding optional subjects is provided for incoming students and their parents at an open evening in the school and through consultation with the school's guidance counsellor and subject teachers. To further improve students' and parents' access to relevant information pertaining to optional subjects, the school should develop an information sheet for optional subjects to help students make more informed optional subject choices. The National Council for Curriculum and Assessment's (NCCA) subject factsheets may be useful in this regard http://www.ncca.ie/uploadedfiles/Factsheets/MWork_factsheet.pdf.

Access to Metalwork and Engineering for students in need of additional educational assistance is good. A number of positive interventions have been made to assist students whose first language is not English and for students receiving resource and learning support. These interventions include the development of individual education plans (IEP), the use of various pictograms to reinforce essential topics such as safety procedures and increased levels of support from the subject teachers and where applicable, the special needs assistant.

The facilities provided to deliver the subjects in the school are very good and are maintained to a high standard. There is a high regard for health and safety issues and students were particularly familiar with the required protocols regarding personal protective equipment and safe working

zones. Best practice was observed regarding the storage and handling of tools, equipment and consumables. Information and communication technology (ICT) is fully integrated into the specialist room allowing teachers to maximise opportunities to incorporate highly visual and interactive electronic resources into lessons. To further develop the awareness of health and safety in the technologies and to promote a culture of e-learning, the subject department should consider incorporating the online modules available for students and teachers on the Health and Safety Authority's (HSA) website http://www.hsa.ie/eng/education/.

Members of the subject department have attended all of the recent continuing professional development (CPD) courses provided by the Technology Subjects Support Service (t^4). Attendance at these courses has facilitated the incorporation of parametric modelling into the teaching and learning of both Metalwork and Engineering. The use of this software could be utilised to help junior-cycle students visualise mechanisms and complex components and may be useful for senior-cycle students who are at the early stages of the design process.

PLANNING AND PREPARATION

A highly collaborative approach is taken to subject planning for Metalwork and Engineering in the school. The members of the subject department have collaborated in developing teaching aids, resources and facilities collectively and have benefited accordingly from taking this approach to planning and preparation. Practical examples include the development of student process sheets that are used to reinforce students' learning and to promote independent learning and the compilation of electronic resources on accessible portable, local and network locations. Project booklets have also been developed by the subject department and these booklets contain a variety of traditional and contemporary projects which provide the subject department with a useful catalogue of age appropriate projects that help to develop students' skill acquisition in a structured and considered manner. To further improve these project booklets, additional contemporary projects should be identified and included. The key skills developed through the completion of each project should also be identified and clearly outlined to students thereby explaining the rationale for completion.

Regular planning meetings are facilitated by senior management. However, much of the day-to-day planning was reported to occur informally. The proceedings of any future planning meetings should be recorded in order to monitor the progress of ongoing issues in line with best practice.

The subject plan adequately outlines the proposed sequence of the delivery of theoretical and practical subject matter. The plan could be improved considerably through the identification of key skills and learning outcomes for each component of the syllabus. The planning should be carried out in conjunction with the proposed revision of the students' project workbooks.

Good records of student attendance and coursework are maintained. Students following the Junior Certificate School Programme (JCSP) are monitored diligently and rewards are utilised to promote a positive learning experience for JCSP students. Teachers' records indicated a high level of awareness of students in need of additional educational supports and of the most appropriate supports for individual students. This level of planning helps teachers to incorporate useful interventions into lessons and to promote maximum inclusion in lessons.

The teachers prepared their lessons very well. All required materials and resources were readily accessible during planned demonstrations. Teachers' preparations enhanced students' experiences and maximised their opportunities for learning.

TEACHING AND LEARNING

A good standard of teaching and learning was observed in the lessons observed. Each lesson began in a similar manner: attendance was recorded; students prepared their materials and tools for the lesson; they were then given clear instructions relating to the day's lesson. This was a positive strategy as it developed a routine for students and ensured that the teachers' guidance was delivered when all students were receptive to instruction. To further reinforce learning, especially among junior-cycle students, a short recapitulation of the key learning outcomes of the lesson should be completed where deemed appropriate.

Student activity during lessons was very good. These activities included independent research and analysis, project design and synthesis. To maximise students' skill development, and in light of the proposed development of subject planning, students should be reminded consistently of the key skills associated with prescribed project work and questioned accordingly during lessons.

Very good questioning occurred during demonstrations of specific processes. The questions focused on key learning outcomes for the specific tasks and consisted of recall and higher order questioning designed to elicit more detailed student responses and opinions. Students offered considered responses to questions posed and demonstrated a good level of knowledge and understanding.

Some keywords were revisited during a lesson with a JCSP group. This good practice should be further developed throughout the junior cycle in line with the school's Delivering Equality of Opportunity in School (DEIS) commitments and priorities. Some suggested strategies to promote improved literacy include students maintaining keyword lists for new topics, placing name-tags on machine parts and equipment and incorporating literacy development activities into everyday lessons. Many examples are readily available online on the National Behavioural Support Service's (NBSS) website www.nbss.ie.

Senior-cycle students were given an appropriate level of autonomy and were encouraged to develop their design concepts independently using card prototypes. This methodology is particularly suitable, especially at the concept development stage. Another useful strategy employed was the preparation of a completed project for students. As a result of this, students were able to visualise a completed project, and to test the project's electrical circuitry thereby developing their enthusiasm and interest in the subject.

Student behaviour was in all instances very good. A positive rapport has been developed between students and teachers. This rapport is being enhanced by the new positive behaviour reward system currently being implemented at junior cycle.

Good quality student project work is also displayed at various locations around the room and this helps to encourage students to strive to improve their machining, shaping, joining and finishing skills based upon the examples of good practice provided for them. The display of completed project work also helped students to visualise finished components and encourages them to complete their own work to a suitably high standard.

In the junior-cycle lessons observed student learning and skill development was very good with students demonstrating a good understanding of the various skills and concepts required of them. At senior cycle, students' skill levels varied and progress fluctuated throughout the class group. To encourage a more consistent approach to design realisation among senior-cycle students, the

subject department should consider all possible strategies. One possibility is the use of parametric modelling software during the concept design and planning stages of the design process. This strategy will help students to become better equipped to develop their ideas and alter the shapes and sizes of their components easily. This strategy will also help students to produce more comprehensive design portfolios and will help them to structure their progress through the design process.

Over the last number of years the majority of junior-cycle students studied the higher level course. At senior cycle, similar numbers of students studied higher and ordinary level. Student attainment at both higher and ordinary level shows an appropriate distribution of grades and suggests that students are studying the level most appropriate to their abilities. As part of the ongoing subject planning, the subject department should not only monitor examination results, but also set appropriate targets for individual students in their examination-year and monitor their progress based upon their projected target. In doing so, students, teachers and parents will be better equipped to identify and address any impediment to students achieving their potential in the subject area.

ASSESSMENT

Students' project and practical work received good levels of summative and formative feedback. Students reacted positively to this feedback and made efforts to improve the quality of their work based upon the advice and guidance of their teacher.

Homework tasks are assigned regularly. It was reported however, that encouraging students to maintain up-to-date written work can be challenging. To address this issue the subject department should consider introducing a system whereby students' copies are stored in class and redistributed when required. This strategy may help students to maintain their work to a more acceptable standard and may be beneficial when students are revising for examinations. In order to ensure that homework tasks are completed, the subject department may need to devise alternative and creative options for students such as the completion of cloze tests, worksheets and research tasks. These assignments could be transferred into their copies thereby reinforcing the benefits of completed homework through repetition.

Very good records of student attendance and project work completion are maintained by teachers. The maintenance of this information helps teachers to identify any changes in a student's application to study and the impact of these changes on academic performance.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Metalwork and Engineering receive good levels of support from senior management in CBS Mount Sion.
- The specialist classroom provided for the delivery of the subjects is very well maintained and is a model of best practice.
- A collaborative approach to subject planning and preparation is in place.
- A good level of teaching and learning was observed during the evaluation.
- A positive and supportive learning environment was evident in all lessons observed.
- Students' practical and project work are assessed and good records are maintained by teachers.

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

- Accurate records of subject planning meetings should be maintained.
- Key skills and learning outcomes should be identified for all elements of the syllabuses.
- Additional literacy initiatives should be introduced to metalwork and engineering lessons.
- Key learning outcomes of lessons should be revisited at the end of lessons.
- The subject department should consider introducing a system whereby students' copies are stored in class and redistributed when required.

A post-evaluation meeting was held with the principal and subject teachers at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

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