Subject Inspection of Metalwork and Engineering
REPORT

Central Technical Institute
Clonmel, County Tipperary
Roll number: 72420E

Date of inspection: 15 September 2010
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 Central Technical Institute (CTI) Clonmel, which has three educational divisions. 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 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 was given an opportunity to comment in writing on the findings and recommendations of the evaluation, and the response of the board will be found in the appendix to this report.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

The school’s commitment to Metalwork and Engineering is commended. The subjects are provided and promoted in all three divisions of the school; the senior college, which provides Post Leaving Certificate (PLC) and adult education courses and in both Coláiste Chluain Meala and Gaelscolaiste Chéitinn where second-level education is provided through the media of English and Irish respectively and which are the focus of this evaluation report.

Coláiste Chluain Meala provides Metalwork as part of its junior cycle programme and Engineering as part of its Leaving Certificate and Leaving Certificate Applied (LCA) programmes. The school has also recently introduced the Junior Certificate School Programme (JCSP). This programme has not yet been extended to include Metalwork; however there was evidence of the use of methodologies appropriate to the JCSP being incorporated into mainstream metalwork lessons. This good practice is encouraged. In Gaelscolaiste Chéitinn the subjects are offered in its junior and senior cycle programmes. In addition to this, students are given the opportunity to study a year-long decorative metalwork module during the optional Transition Year (TY) programme.

The time allocated to the subjects in all second-level programmes offered by CTI Clonmel is appropriate. In some instances, particularly TY and the Leaving Certificate programme, the time allocated to the subjects is most generous. These allocations consist of a triple period in TY and a total of six periods in both fifth and sixth year.

Two specialist rooms are utilised for the delivery of the subjects in the school. These rooms are well equipped and maintained to a high level. Information and communication technology (ICT) resources are readily available in each room and are easily incorporated into lessons. While there is a good emphasis on safety in these rooms, there is room for further improvement through the identification of safe operational areas for machinery and the display of additional standard safety signage in appropriate locations. The subject department should identify these and additional
areas for development and initiate strategies to further improve students’ awareness of potential hazards. One possible initiative could include incorporating e-learning modules into lessons, particularly in TY and LCA. Examples of this type of module are now accessible for students, teachers and school management on the Health and Safety Authority’s (HSA) website [www.hsa.ie/eng/Education/Safety_and_Health_Training_for_Teachers/E_Learning/](http://www.hsa.ie/eng/Education/Safety_and_Health_Training_for_Teachers/E_Learning/).

Prior to entry into the school, first-year students are given a significant level of guidance and assistance. This is evident from their involvement in a transfer programme where students from the local primary schools are given the opportunity to sample specific subjects, particularly the practical subjects, over a considerable period of time. For students who express an interest in attending the school this transfer programme extends and additional opportunities are provided for subject sampling. In Gaelscoil Chéitinn a particularly interesting model is used whereby prospective students are brought into the school on a weekly basis and take part in the TY module. The significant efforts made to inform and prepare students prior to their entry into first year are commendable.

The arrangements for students’ access to the subjects vary considerably between Coláiste Chluain Meala and Gaelscoil Chéitinn. In Coláiste Chluain Meala, Metalwork and Engineering are offered as core subjects and students’ non-participation in both subjects occurs only in exceptional circumstances. Senior management reported that this decision is based on the needs of its students and that both parents and prospective students are not only made aware of this, but enrol in the school because of it. In Gaelscoil Chéitinn, students take part in a subject sampling programme during their first year in the school. Prior to entering second year, students choose their preferred optional subjects and the most appropriate optional subject bands are then formed based on students’ preferences. This model continues in TY where students get the opportunity to sample Engineering during the decorative Metalwork module.

Currently there are three teachers deployed to teach Metalwork and Engineering within the school’s second-level section. Of these three, two hold qualifications to teach the subjects to the highest level. The third teacher, who is responsible for the delivery of the TY module, has contributed significantly to the subject department’s skill set. A fourth qualified metalwork and engineering teacher is deployed solely to the PLC section and has responsibility for engineering, metal craft and electronics modules. This subject department is comprised of a most complementary team and is a significant resource to the school.

Senior management actively encourages teachers’ engagement in continuing professional development (CPD) courses. Members of the subject department have accessed elements of the recent CPD provided by the Technology Subjects Support Service (tS) and this should help to facilitate the introduction of parametric modelling into the teaching and learning of the subjects. These newly acquired skills could be particularly useful in the development and completion of students’ design briefs at senior cycle. As LCA is a significant element of the school’s senior cycle curriculum, the subject department should prioritise further CPD in the delivery of the subject within this programme. Priority areas should include strategies that could further promote active teaching and learning and provide further emphasis on students’ literacy development.

**Planning and Preparation**

Senior management facilitates formal subject planning meetings once per year. It was reported that ongoing informal planning meetings take place frequently. A subject convener has been appointed and this role is rotated among all members of the subject department, as is best practice.
There is a very good level of collaboration at subject department level and common programmes of study are implemented with all year groups. This collaborative approach is commended. The curricular plans that have been developed are primarily content-based and outline the sequence in which the various topics will be taught. Planning for the teaching of practical skills takes the form of a series of projects designed to build students’ skills incrementally in a structured and organised manner. The subject department has accumulated a wide variety of projects and uses this database of resources to structure students’ practical-skill development. It was reported during the evaluation that project work is often differentiated according to students’ abilities in order to maximise students’ completion of assigned work. This is a positive strategy and is encouraged.

The subject plan, a plan that is based entirely on the School Development Planning Initiative’s (SDPI) template, is adequate. The subject department should now look to improve this planning in order to tailor the plan specifically to CTI Clonmel’s needs. An example would be to identify all students in need of additional educational assistance and detail the interventions and supports required for each student to further integrate them into metalwork and engineering lessons.

As part of this review, the subject department should also look to develop a strategic plan for the improvement of the delivery of the subjects in the school. This long-term plan should initially identify key targets, for example: improving students’ literacy, increasing uptake and attainment at higher level in Certificate examinations, and analysing the impact of the subject department’s homework and assessment procedures. These targets should be incorporated into a SMART planning model and regularly monitored to assess the success of any strategies implemented to achieve the desired targets.

Teachers’ preparation for all lessons was of a high standard. A wide variety of useful resources were prepared in advance of lessons and incorporated at appropriate times during lessons. The collaboration at subject department level has resulted in the subject department’s accumulation and sharing of useful visual teaching aids and topic-specific ICT presentations. This co-operation among the members of the subject department is commended.

**TEACHING AND LEARNING**

The quality of Metalwork and Engineering teaching observed during the course of the subject inspection was good. All lessons observed had clear learning outcomes and were consistent with planned programmes of work. In some instances these learning outcomes were revised prior to the end of class. When this occurred it had the effect of reinforcing the lesson content and also helped the teacher ascertain the level of student understanding. All members of the subject department should make efforts to recapitulate the key learning outcomes of lessons.

Lessons focused on appropriate levels of theoretical content and practical skill development. Best practice was observed in a junior cycle lesson where these elements of the syllabus were integrated and delivered in an organised manner. This lesson consisted of practical student activity, teacher demonstration and the reinforcement of lesson content using work cards. This suitable blend of teacher and student activity is commended and should be further developed throughout the subject department in order to maximise students’ engagement in cognitive tasks such as quizzes, worksheets and cloze tests. One particular area for development should be extending the methods employed to challenge students. One instance where this could be implemented is when students are encouraged to label diagrams of tools or machines. When taking part in this type of activity, students could be paired and asked to agree upon their preferred answers. The teacher could then initiate discussion and dialogue when correcting the
task. By introducing a competitive element within the confines of pair or group work, further engagement in the topic may be achieved and a more active learning environment could be developed where students are allowed to take more responsibility for their learning.

Almost all lessons included some form of writing task. The efforts to include both reading and writing exercises in a practical learning environment are commended. Further possibilities should also be explored to maximise students’ literacy development. These strategies include using keywords, dictionary exercises, labelling tools, equipment and machinery and using word-boxes to assist students when completing exercises.

Demonstration was the primary method utilised to teach the correct use of hand and machine tools. This was in most cases successful. In some instances the size of the group reduced the effectiveness of the demonstration. The area used for demonstration and the size of the group should be carefully considered in order to maximise the benefits of this useful methodology.

All lessons benefitted from the teachers’ maintenance of a suitable pace and tempo. Teacher activity was almost always short in duration but focused on a specific element of the lesson. This pacing contributed to the positive student behaviour encountered during the inspection. All interactions between teachers and students were warm and friendly and a positive atmosphere was evident.

ICT was incorporated into some lessons in a most useful manner. Excerpts from online video content were streamed allowing students to visualise complex concepts such as the four stroke cycle in an internal combustion engine. Presentation software was also utilised effectively to display large diagrams and to recapitulate key terms.

Students demonstrated good practical skills and a large variety of students’ projects were available for review. These projects were of a very high standard and are a useful resource especially when employed to encourage prospective students to choose the subjects and to ensure that existing students are aware of the high standards expected of them in their practical work. When questioned by the inspector, students demonstrated a good knowledge of lesson content. Over the past number of years the majority of students have taken ordinary level papers in the Certificate examinations. Attainment at this level is very good, particularly at junior cycle. The subject department should, as part of its long-term strategic planning, implement strategies aimed specifically at gradually improving student uptake of higher level in Metalwork. This goal could be achieved by further addressing students’ literacy difficulties in the subject area and by introducing innovative homework and assessment strategies.

**ASSESSMENT**

Students are formally assessed in end-of-term written examinations. In addition to these assessments informal practical assignments are assessed on an ongoing basis throughout the year. Upon completion of these assignments students are given formative feedback to help them identify areas for improvement. It was reported that considerable encouragement is given to students to complete their projects and this has also contributed to the positive rapport evident between teachers and students. The inclusion of additional end-of-topic assessments in some instances may help to inform teachers’ practices and facilitate the tailoring of lessons to suit individual students’ abilities. These assessments should be introduced in an innovative manner and could be used in conjunction with homework exercises to ascertain and plot students’ progress throughout the year on a more regular basis.
Students maintain their written work in subject folders supplied by the school. To ensure that these folders are being maintained adequately, the subject department should formalise their procedures in relation to the correction, monitoring and storing of these folders with a view to assisting students in the compilation of useful records of their work. One possible intervention to encourage the ongoing maintenance of these folders could be to incentivise it with a proportion of students’ end-of-term grade allocated to a complete and up-to-date subject folder.

**SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- The Central Technical Institute, Clonmel is committed to the promotion of Metalwork and Engineering in all of its second-level programmes.
- The time allocated to Metalwork and Engineering is very good.
- The initiatives provided by the school to support incoming students are highly commended.
- The subject department is comprised of a complementary group of teachers with a diverse skill set.
- Preparation for lessons was of a high standard.
- The quality of teaching observed during the evaluation was good.

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

- The subject department should tailor its generic subject plan to suit the school’s specific context.
- A strategic plan for Metalwork and Engineering in the school should be developed.
- During lessons, teachers should focus on ensuring that all students are encouraged to reach their full potential, active learning strategies are incorporated into theoretical aspects of the curriculum and that recapitulation is used to reiterate key points.
- The monitoring and correction of students written work should be formalised with a view to further encouraging students to maintain good quality records of their work.

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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Appendix

School response to the report

Submitted by the Board of Management

Area 1: Observations on the content of the inspection report

We would like to thank the Inspectorate for the draft report of the subject inspection of Metalwork and Engineering in our school on 15th September, 2010.

We are most appreciative of the many positive comments and commendations made about the delivery of these subjects in the school. In particular, we are happy that our commitment to promoting the subjects was noted and that the allocation of time given to them was commended. We are pleased that the report commented so favourably on the skill set of the teachers, the fact that their preparation for lessons is of such a high standard, the support they give to incoming students and the good quality of teaching. Because of the fact that metalwork and engineering are delivered across both second level schools and also at PLC level we appreciate the recommendations that we do further work in developing our own in-house subject plan.

We are very pleased at receiving helpful feedback on incorporating, in a very practical way, differentiated teaching methodologies. We are currently implementing the recommendation to formally give feedback to students on their written work. Finally, we wish to thank the inspector for the friendliness, openness, affirmation and helpfulness during the visit.

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

The Metalwork and Engineering Department are in the process of developing a strategic plan for the subject. We are currently implementing the recommendations to formally give feedback to the students on their written work. Since this inspection the Metalwork/Engineering staff have participated in in-service delivered by:-

A. The J.C.S.P. team in relation to literacy and numeracy (8th December, 2010)

B. The S.E.S.S. team in relation to appropriate methodologies relating to our student cohort. (15th Feb 2011)