An Roinn Oideachais agus Scileanna

Department of Education and Skills

Subject Inspection of Science
REPORT

Listowel Community College
County Kerry
Roll number: 70500P

Date of inspection: 9 February 2011
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Listowel Community College. It presents the findings of an evaluation of the quality of teaching and learning in Science and makes recommendations for the further development of the teaching of this subject in the school. The evaluation was conducted over one day during which the inspector visited the laboratory and observed teaching and learning. The inspector interacted with students and the teacher and examined students’ work. 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 science teacher. 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

Listowel Community College is a participant in Delivering Equality of Opportunity in Schools (DEIS), the Department of Education and Skills’ action plan for educational inclusion. The school offers the Junior Certificate School programme (JCSP) and the Leaving Certificate Vocational Programme (LCVP) to post-primary students. In addition the school offers a number of Post Leaving Certificate (PLC) courses.

Given that the school is small, management endeavours to provide for the development of scientific literacy among the student cohort to the greatest extent possible. Science is a core subject in junior cycle. Biology is offered to senior cycle students. Certification of student achievement is considered important. In this context, and to facilitate the delivery of a flexible senior cycle learning programme, Further Education and Training (FETAC) modules are offered in a number of subject areas. All students who study Biology also study Physiology and Anatomy as one of their FETAC level five modules. This is positive. The time allocation for the delivery of Biology is appropriate. However, the time allocated to Junior Certificate Science is significantly below that recommended in the syllabus. This should be rectified in future timetabling.

Class groups are of mixed ability. Decisions regarding the appropriate level for students in Junior Certificate examinations are taken in the third year of junior cycle. This is good practice. Currently student participation at higher level in the Junior Certificate science examination is low. One element of the school’s DEIS planning is to monitor examination attainment of the students. Targets have been set and an action plan has been devised. In this context, the school should endeavour to achieve increased higher-level participation in the Junior Certificate science examination.
The school has one laboratory with an adjoining preparation and separate storage area. Until recently the school had two laboratories. The decommissioning of one laboratory has resulted in some of its scientific resources being stored in the remaining laboratory and in the preparation and storage area. It is therefore recommended that, overtime, the school conducts an audit of its equipment and resources and uses this opportunity to organise them appropriately in the preparation and storage area. The science department has a good level of ICT resources to support teaching and learning.

All biology and science lessons occur in the laboratory. Some childcare lessons for PLC students also take place in the laboratory. While acknowledging that the teacher is a qualified science teacher, nevertheless it is recommended in the Department of Education and Skills’ publication *Safety in School Science*, published in 1996, and subsequently amended in 2001, that subjects other than science subjects should not be taught in the laboratory. Therefore, the school should adopt this policy to the greatest extent possible.

There is a good level of safety equipment in the laboratory. The school has a separate chemical store. A flame-resistant cabinet has been purchased for the storage of flammable chemicals. To ensure safe storage, all chemicals should be colour coded and segregated in accordance with Department guidelines. The school is currently reviewing its safety statement. This work should be advanced and should include risk assessments that are specific to the science area.

Some scientific posters are displayed in the laboratory and samples of students’ own work are also exhibited. This is good practice as it assists in providing a scientifically stimulating learning environment.

The school places very good emphasis on the continuing professional development (CPD) of its teachers and the approaches to CPD are very positive. Whole-staff CPD has included topics such as assessment for learning (AfL) and instructional integration. Listowel Community College is currently participating in a school-based curriculum development initiative in co-operation with the National Council for Curriculum and Assessment (NCCA). This initiative involves exploring the development of flexible learning profiles for senior cycle students. It is in this context that students study FETAC modules. The science department is also participating in a partnership project, based on teaching Science using an investigative approach, with the National Centre for Mathematics and Science Excellence Teaching and Learning (NCE-MSTL) and Kerry Education Service (KES). The commitment of the science teacher to participating in such projects that enhance teaching and learning skills is very positive.

**Planning and Preparation**

Good work has been achieved in compiling a comprehensive science planning folder. The work outlined includes the aims and objectives of the syllabus, the subject plan, student-education plans and cross-curricular links. The subject plan includes the list of topics and mandatory experiments with monthly or half-termly time frames. It is recommended that the plans be broadened in time to include details of the resources used for specific topics, as well as revision work, when and where appropriate. This task could be carried out on a phased basis, taking, for example, one year group per annum.

Given that there is only one teacher teaching Junior Certificate Science in Listowel Community College, it is very positive that the participation in the NCE-MSTL and KES science-
investigation project has facilitated the collaborative development of a programme of work for first-year Science. This programme is used by the participating teachers from KES schools and includes individual lesson plans. This approach to collaborative planning is very good. It is also good to note that co-curricular activities are planned to support the teaching and learning of Science. These include science-week activities and invitations to visiting speakers.

Lessons observed, as well as the planned programmes of work, were found to reflect syllabus requirements. Short-term planning was very good in the department and preparation for classes was noted as being at a very high standard. The very good level of advance planning facilitated seamless transitions from one phase of the lessons observed to the next.

TEACHING AND LEARNING

There was a very high quality of teaching in evidence in the lessons observed. Lessons were well structured and paced, and the teacher was cognisant of students’ abilities. A review of the work previously covered set the scene in each lesson. To assist students in clearly understanding the learning that is to take place in the lesson, it is recommended that the intended learning outcomes be outlined at the outset. It is also recommended that these learning outcomes be reviewed during and at the end of the lesson to allow the teacher to ascertain the extent of individual student’s learning.

Lessons were student-centred and a range of methodologies was employed. Students’ engagement and active participation was facilitated through the successful planning of lessons that resulted in short student activities being interspersed with whole-class questioning and teacher explanation.

A PowerPoint presentation was used effectively in one lesson to support students’ learning. Images of various parts of the digestive system and important points on digestion were demonstrated clearly. It is suggested that, when using a diagram of the digestive system as a means of reviewing students’ knowledge, the labels of the component parts should be inserted following questioning of students as part of the review process. In this lesson, a number of the students constructed a representation of the digestive system which portrayed the different organs. This construction, which was completed on a phased basis, was used very effectively to direct and support students’ learning.

The use of a discovery-based learning approach to teaching Science in both practical and theory lessons increased student motivation and enthusiasm, and facilitated collaborative work among students. There were some very good examples of linking the lesson content to the everyday life experiences of the students, thus making the subject tangible and relevant.

During practical work all students were actively engaged, worked safely and applied themselves. Students were confident and capable in setting up and completing tasks, and their practical skills were well developed. It was good to see student use of temperature probes. The students worked in pairs and the teacher moved around the laboratory providing individual attention and support to the students, where necessary. Collaboration among the students as they worked facilitated learning to a greater extent.

Effective questioning was employed to evaluate students’ prior learning, to reinforce recently learned subject matter and to predict possible approaches to the student investigation. The teacher supported the students as they developed their answers. This is good practice.
The use of JCSP strategies to assist in enhancing students’ literacy is good practice. There was good focus on key words in the lessons observed. These were displayed on a key-word poster and, in one instance, students recorded these words in a key-word notebook, a practice that is encouraged.

A very positive atmosphere pertained that was conducive to students’ learning. A very good rapport was evident between students and the teacher. Interactions among students and between the teacher and students were grounded in mutual respect. Examples of good practice noted during the lessons included the encouragement and affirmation students’ efforts by the teacher.

Students exhibited a genuine interest in their science lessons and were encouraged to work hard and achieve their best. Students engaged fully with the work being undertaken in each of the lessons visited. In speaking to the inspector, they displayed levels of knowledge and understanding of concepts and facts relevant to the respective lessons and consistent with their age and abilities.

ASSessment

A range of assessment modes is used to assess student competence and progress. These include written homework assignments and twice-yearly formal examinations. A good number of worksheets had been completed by the students in one class group and overall the standard was good. These written assignments help to reinforce student learning.

Students recorded their practical work in laboratory note books. There was some evidence of monitoring of homework and of the work in practical note books. Consideration should be given to the use of the desirable practice of teacher annotation, which reflects assessment for learning (AfL) strategies. In this way students will understand how they can improve.

Informal assessment of students’ progress formed an integral part of each of the lessons observed. This was achieved through whole-class questioning and when the teacher interacted with students on a one-to-one basis while they completed their work. This is very good practice.

The science teacher is cognisant of the students’ participation in the JCSP programme. This is evident because students complete the science-related profiling statements. This is positive as it assists students in tracking their work and in monitoring their learning.

Student attainment is measured using strategies agreed as part of the school’s DEIS action plan. This is positive as it helps the ongoing monitoring of students’ progress. The inclusion of practical work in the scheme of continuous assessment is commended as it provides motivation for engagement by all students with the practical element of the course.

The results of assessments are carefully recorded by the teacher and shared with parents at parent-teacher meetings. This is good practice. Students’ progress is also conveyed to parents by means of twice-yearly school reports. The student journal provides a valuable channel for communication.
SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Science is a core subject in junior cycle.
- The participation of the science teacher in professional learning programmes is very worthwhile.
- Lessons are well planned.
- A high quality of teaching and learning was observed in the lessons visited.
- The use of a discovery-based learning approach to teaching Science in both practical and theory lessons was very effective.
- A very good student-teacher rapport was evident in the lessons and the atmosphere was conducive to learning.
- The inclusion of practical work in the scheme of continuous assessment is good practice.

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

- It is recommended that the school conducts an audit of its equipment and resources and organises these appropriately in the preparation and storage area.
- Chemicals should be colour coded and segregated in accordance with Departmental guidelines.
- The science plan should be further developed.
- Intended learning outcomes should be shared at the outset of all lessons and revisited during the recapitulation phase to ascertain students’ progress.

Post-evaluation meetings were held with the principal and the science teacher at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

Published June 2011