Subject Inspection of Science and Chemistry
REPORT

Coláiste Iosagáin, Portarlington, Co Laois
Roll number: 68068R

Date of inspection: 26 & 27 November 2009
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE AND CHEMISTRY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Coláiste Iosagáin. It presents the findings of an evaluation of the quality of teaching and learning in Science and Chemistry 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, 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 deputy principal.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

There is good provision and whole-school support for the study of science subjects in Coláiste Iosagáin. Three Leaving Certificate science subjects and a Leaving Certificate Applied module in Agriculture/Horticulture are provided as optional subjects in senior cycle. Science is also provided in Transition Year and Junior Certificate science is a compulsory subject for most class groups in junior cycle. However, students assigned to a learning-support class in junior cycle do not study Science. In order to ensure a broad and balanced educational experience, it is recommended that opportunities for the study of Science should also be provided to the students in the learning-support class.

The facilities, which include three laboratories and a demonstration room, available for the teaching of Science are very good. The laboratories and associated preparation rooms are well organised and maintained to a good standard. The provision of information and communication technology (ICT) resources, such as data projectors, for the teaching of science is excellent.

The time allocation to science subjects is in line with syllabus guidelines. All class groups are allocated an appropriate mix of single and double periods.

The deployment of teachers is good. Teachers are allocated to classes on a rotational basis and continue with their assigned class groups throughout junior or senior cycle.

The provision for Science in Coláiste Iosagáin is complemented by a range of extracurricular and co-curricular activities such as the school’s involvement in Science Week events, the Green Schools initiative and the creation of links with third-level institutions. The use of displays and notice boards on the corridors outside the science laboratories to raise the profile of Science within the school is to be commended.

PLANNING AND PREPARATION

The science department in Coláiste Iosagáin is well organised. For example, in each year of junior cycle a number of class groups are timetabled concurrently in order to create smaller class groups for Science. The collaboration and planning among science teachers in maximising laboratory
access for all class groups is to be commended. Although all science teachers contribute to the work of the science department, one teacher acts as subject co-ordinator. Good practice is evident in the sharing of this role among the members of the department.

A good level of planning for the provision of Science is evident in the regular formal and informal meetings of science teachers and in the on-going development of a science department plan. The plan outlines schemes of work for each year and subject and the science department’s views on issues such as homework, textbooks, and the promotion of science. The science department is to be commended for carrying out an analysis and review of the outcomes for students in state examinations as part of the subject planning process.

The yearly schemes of work for Junior Certificate Science and Chemistry are appropriately based on the relevant syllabuses. However, the Transition Year programme is composed of a selection of topics from each of the Leaving Certificate courses in Biology, Chemistry and Physics. These topics alternate on a weekly basis with students studying a different subject area each week. The subject plan indicates that extracts from the relevant Leaving Certificate textbooks will be used as course materials and that the teaching and learning methods to be used are ‘traditional methods of teaching the text, backed up by teacher input, illustrations, specimens, demonstrations, investigation and experiments.’ Other than giving students some exposure to the three senior science subjects, no overall rationale for the Transition Year science programme was evident. Hence, it is recommended that the science department review the Transition Year science programme with a view to devising a thematic programme designed to achieve specific aims or outcomes for students. The creation of cross-curricular links with other subjects or initiatives within the school such as the Green Schools campaign could be useful starting points. In devising such a programme, the exploration of any Leaving Certificate material should be in a way that is original and stimulating and significantly different from the approach taken during the Leaving Certificate programme.

Planning for the development and use of resources is good. For example, laboratory equipment and materials are well organised and appropriately stored. An annual budget is available to the science department and a clear system is in place for the ordering of new or replacement stock. The development of ICT resources for use in the teaching and learning of Science is to be commended. Each laboratory has a computer with internet access and a data projector which facilitates the use of ICT during lessons.

It was evident that a lot of preparation had been carried out for the lessons observed. For example, all of the resources needed for the lessons were ready in advance. Worksheets and notes for use during the lessons had also been prepared in advance.

**TEACHING AND LEARNING**

Many elements of good practice were evident in the teaching and learning of Science in Coláiste Iosagáin. For example, lessons were well structured and well managed and there was a good rapport between students and teachers. Students were attentive, well behaved and worked in a co-operative manner with their teachers.

Good use was made of ICT in the lessons observed to illustrate and explain the content. Other resources such as the whiteboard and worksheets were also well used to support student learning. The use of a word bank, highlighting difficult or new terms, to assist with the development of literacy skills in Science is to be commended.
Very good use was made of questioning strategies which encouraged the development of higher-order skills in some lessons. For example, the use of open-ended questions ‘why?’ and ‘what do you think?’ allowed students to engage with the topic in hand and to develop a deeper understanding. In these situations students were able to discuss and explain what they were learning.

Practical activities featured strongly in all of the lessons observed. These provided an opportunity for student-centred learning, particularly with regard to the development of practical skills. Students were confident and able to complete the tasks involved in a competent manner. Best practice was observed where the practical activities were investigative in approach and clearly linked with the relevant theory. However, in some cases, students had difficulty explaining what the aim or purpose of the activity was or linking it with relevant theory and course content. Hence, it is recommended that the science department prioritise the development and sharing of effective methodologies for the use of practical activities in the teaching and learning of Science as part of their subject planning. Such methodologies should build on the active involvement of the students, as observed in all of the lessons, in order to ensure the development of associated knowledge, understanding and attitudes.

In the majority of cases practical activities were completed with due regard to safety considerations. However, in some situations greater attention could have been given to planning for the safety requirements of completing the particular practical activity. For example, students were not under the direct supervision of the teacher at all times as one part of an activity had to be completed in the preparation room, and standard practice with regard to the use of Bunsen burners was not adhered to. Hence, it is recommended that consideration of safety issues should be built into the planning of all lessons involving practical activities. Where alternative safer methods of doing an activity are available, they should be used.

**ASSESSMENT**

Students’ progress is assessed on a regular basis, both formally and informally. For example, homework was either assigned or corrected in all of the lessons observed. The use of common end-of-year examinations is to be commended as it allows the overall progress of the classes within a particular year group to be assessed. However, the uptake of Science and Chemistry at higher and ordinary levels and the outcomes for students in state examinations are a cause for concern. The science department has completed an analysis of the outcomes for students in the 2009 examinations and it is recommended that the issues identified in this analysis be addressed as a priority.

The allocation of some marks, for the completion of practical activities during the school year, in Christmas and summer examinations is good practice as it highlights the importance of this aspect of Science to students. However, it was observed that in many cases the descriptions of practical activities completed by students had been transcribed from the relevant textbook. Hence, it is recommended that teaching strategies which facilitate the development of students’ own skills in the preparation and presentation of reports on scientific topics and experiments be adopted in the teaching and learning of Science.
SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- There is good provision and whole-school support for the study of science subjects in Coláiste Iosagáin. The facilities available for the teaching of Science are very good. In particular, the provision of ICT resources is excellent.
- The science department in Coláiste Iosagáin is well organised. A good level of planning for the provision of Science is evident in the regular formal and informal meetings of science teachers and in the on-going development of a science department plan.
- Many elements of good practice were evident in the teaching and learning of Science in Coláiste Iosagáin. For example, lessons were well structured and well managed and there was a good rapport between students and teachers. Students were attentive, well behaved and worked in a co-operative manner with their teachers. Good use was made of ICT in the lessons observed to illustrate and explain the content.
- Students’ progress is assessed on a regular basis, both formally and informally. The allocation of some marks, for the completion of practical activities during the school year, in Christmas and summer examinations is good practice as it highlights the importance of this aspect of science to students.

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

- It is recommended that opportunities for the study of Science should be provided to students assigned to the learning-support class group in junior cycle.
- It is recommended that the science department review the Transition Year science programme.
- It recommended that the science department prioritise the development and sharing of effective methodologies with respect to the use of practical activities, including the relevant safety aspects, and the development of students’ own skills in the preparation and presentation of reports, as part of their subject planning.
- It is recommended that the issues identified by the science department in their analysis of the outcomes for students in the state examinations be addressed as a priority.

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

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