

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Physics
REPORT**

**De La Salle College,
Newtown, Waterford.
Roll number: 649500**

Date of inspection: 1 October 2010



**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 PHYSICS**

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in De La Salle College, Waterford. It presents the findings of an evaluation of the quality of teaching and learning in Physics 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 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 evaluation, and the response of the board will be found in the appendix to this report.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

De La Salle College offers Science as a core subject with mixed ability class groups. Senior physics classes are also mixed ability. Physics, Chemistry and Biology are offered in modules as part of the optional Transition Year (TY) programme. There is very good science provision at senior cycle with Physics, Chemistry, Biology and Agricultural Science offered each year. Senior cycle option bands are determined by an open choice of subjects. Students are well supported in making an informed choice with differential aptitude testing (DATs), an information evening for parents and students, and input from the guidance counsellor. The uptake of science subjects at senior cycle is very good. In the current year there are two class groups studying Physics in each year of senior cycle.

Time allocation to Science at junior cycle and to the range of science subjects at senior cycle is satisfactory. The distribution of lesson periods across the week is good.

There are currently three teachers in the physics department in the college. In addition, the college facilitates student teachers and provides an ongoing mentoring programme for all new teachers. Teachers are well supported in attending in-service courses and in pursuing relevant continuous professional development (CPD) courses. Membership of a professional organisation is supported by the college.

Six well-equipped laboratories are in operation. Laboratories are well maintained and well utilised. Equipment is stored in an orderly and safe manner. All laboratories have access to preparation and storage rooms. In addition, the laboratories are enhanced with many relevant models, posters and charts and students' work is also on display. Information and communication technology (ICT) facilities in the form of laptop computers, data-projectors and interactive whiteboards have been progressively increased in the science laboratories since the inspection in Biology and Agricultural Science in 2006. School management plans to increase laboratory capacity in future years and is commended in this regard.

The college has a health and safety policy which was reviewed in 2006. It is recommended that this policy be reviewed and updated regularly. There are good health and safety practices in the science laboratories. Safety equipment was in evidence. Laboratory rules are on display. However, an audit of chemicals should be conducted following which an upgrade of chemical storage practice and facilities should be implemented in line with best practice and Department guidelines. This issue was also highlighted in a previous subject inspection report.

Students are encouraged to partake in a number of co-curricular and extra-curricular activities including participation in the BT Young Scientists' Competition, science quizzes and visits to workshops and events in third level institutions.

PLANNING AND PREPARATION

Formal science department planning meetings are convened once per year. Science teachers also meet informally on an ongoing basis to collaborate on many aspects of science provision. Topics discussed include access to laboratories, equipment required and examinations. The role of co-ordinator of Science should be developed to reflect best practice in schools. The development of this position on a voluntary rotating basis would provide further focus for the development of science education in the college. Possible duties might include: chairing, and maintaining minutes of subject meetings; liaising with school management; sourcing resources for the teaching of Science. Physics is currently coordinated in an informal way.

Individual planning was very good with some teachers having developed yearly plans for their subjects. Schemes of work based on textbook chapters have been developed and agreed. It is recommended that the schemes of work for each year group be linked to relevant sections of the syllabus. The schemes of work for Science would benefit from the inclusion of active methodologies, resources and formative assessment strategies for each section of the course. Effective advance planning was evident in the lessons observed. Practical and ICT equipment were set up and ready to use. Lesson content was well planned, leading to successful learning outcomes as evidenced during the evaluation.

An agreed common plan, including agreed schemes of work, for junior Science and senior Physics should be developed. A template and guidelines for subject department planning is available on the website of the School Development Planning Initiative, www.sdpi.ie. Collaborative long-term planning for Science at junior and senior cycle should be developed to include agreed targets. Areas worthy of inclusion are: the uptake of science subjects at senior cycle, laboratory provision, the monitoring of state examination results, the sharing of best practice and the sharing of ICT resources. While the content of the TY plan is good as it includes many applied aspects of the subject, it is recommended that an agreed subject department TY plan be developed for Science using the Department guidelines on writing the TY programme.

TEACHING AND LEARNING

Lessons were well structured and lesson objectives were shared with students at the outset of some lessons. It is recommended that this good practice be extended across all lessons. There was very good continuity with prior learning with many lessons commencing with recall and revision so that there was a smooth transition to new material. The pace of lessons was in the main appropriate; however, in some instances students should have been provided with the opportunity to consolidate their learning. For some lessons, the assignment of a student research task on the theme of the lesson in advance would have provided the opportunity for further classroom discussion and interaction and would have enhanced the student learning experience.

Students were motivated to learn throughout lessons observed with a very good atmosphere for learning and a positive classroom rapport. Individual and group support was given as necessary and students tackled the assigned tasks with confidence and enthusiasm. Affirmation of students was evident in all lessons and this consolidated the positive atmosphere and led to high levels of participation. Concepts were explained with clarity, and learning was reinforced by making it relevant to students' everyday experiences.

Methodologies were varied and frequently involved students in active learning. Teacher inputs were short, clear and concise. The board was frequently used effectively to highlight key words and concepts. For example during a lesson on heat and temperature, students' critical thinking skills were developed with the aid of a variety of related methodologies including investigation, animation, key words and formulas and revision worksheets. This is very good practice. The consolidation of learning of material through themed worksheets on the lesson should be developed.

ICT was used effectively to enhance student learning. The use of the ICT resources available was maximised. Animation was used very effectively as an aid to teach concepts in Physics at senior cycle. Teachers are encouraged to further plan for increased integration of ICT into their lessons.

Short practical investigations and demonstrations formed the core of some lessons evaluated. In one lesson evaluated on the theme of optics, students examined their own images in a concave mirror while observing the theory of the formation of images through animation. The mathematical concepts were explained with clarity and through worked examples on the board. In another lesson on refraction, a good demonstration and discussion on the real and apparent depth method of measuring the refractive index of water was discussed. The development of students' skills of observation, measurement and calculation were reinforced during a lesson on the theme of image formation in a plane mirror. It is recommended that further opportunities for students to get 'hands-on' practical experience be developed during some lessons.

There was effective use of questioning in all lessons observed. Questioning was used as an effective strategy to heighten interest in many instances. Students exhibited confidence in answering questions on their work and student outcomes in terms of skills and knowledge, as observed, were very good.

Student academic achievement is good. The uptake of higher level Science and the proportion of students receiving a good grade in this subject at both higher and ordinary level is high and has remained consistently high over recent years. The college caters very well for physics students at both higher and ordinary level. It is recommended that a policy be developed on advising students to take the appropriate level at Leaving Certificate to help ensure that each student is rewarded with a grade commensurate with his ability at the appropriate level.

ASSESSMENT

Teachers maintain good records of students' completion of homework, assessments and attendance. Formal school examinations take place at Christmas and summer. Third and sixth year classes sit pre-examinations in February. In addition, there is continuous assessment of students on completion of each section of the course. TY students complete class assessments.

There is clear emphasis on regular homework, class testing and revision. Homework was assigned during all lessons evaluated.

Communication with parents takes place through parent-teacher meetings, the school homework journal and information nights. Reports are sent to parents after each formal examination. Homework journals examined during the evaluation were in the main well utilised and maintained.

Students with additional needs are well supported with close liaison between science teachers, parents, school management and the learning support and guidance departments. Individual support is provided where needed. The Junior Certificate Schools Programme (JCSP) with its small class groups supports a wider cohort of students.

Practical notebooks examined in the course of the evaluation were generally of a high standard. In an effort to further improve the quality of students' written practical records, it is suggested that notebooks be further monitored to ensure that students take full cognisance of teachers' annotation. It is very good that students are assigned ten percent of the marks allocated to school examinations for the satisfactory completion of assigned practical activities.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- There is very good provision with Science offered as a core subject at junior cycle and in TY. Physics, Chemistry, Biology and Agricultural Science are offered at senior cycle.
- The uptake of science subjects at senior cycle is very good with two class groups studying Physics in each year of senior cycle.
- Students were motivated to learn throughout lessons observed with a very good atmosphere for learning and a positive classroom rapport.
- Individual and group support was given as necessary and students tackled the assigned tasks with confidence and enthusiasm.
- Affirmation of students was evident in all lessons and this consolidated the positive atmosphere and led to high levels of participation.
- Concepts were explained with clarity, and learning was reinforced by making it relevant to students' everyday experiences.
- Methodologies were varied and frequently involved students in active learning. ICT was used effectively to enhance student learning.

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

- The health and safety policy should be reviewed. It is also recommended that an audit of chemicals be conducted following which an upgrade of chemical storage practice and facilities should be implemented.
- Planning for laboratory access should be improved.
- An agreed common plan, including agreed schemes of work, for junior Science and senior Physics should be developed. A template and guidelines for subject department planning is available on the website of the School Development Planning Initiative www.sdpi.ie.
- It is recommended that an agreed subject department TY plan be developed for Science. This plan should be drawn up using the Department guidelines.
- Collaborative long-term planning for Science at junior and senior cycle should be developed to include agreed targets.

Post-evaluation meetings were held with the teachers of Physics, together with the principal, 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

The Board of Management welcomes the very positive report on teaching and learning of Physics at the school. It reflects the high standards and dedication of the subject department. The report was very fair and balanced and it is a comprehensive overview of the quality of teaching and learning of Physics at De La Salle College, Waterford. The Board of Management wishes to congratulate the College Headmaster and teaching staff of the Physics department.

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 Board of Management will continue to provide the necessary support and resources that will facilitate the College Headmaster and Staff in the implementation of the findings and recommendations of the inspection Report.

All suggestions and recommendations as per report (Page 5) will be implemented as a means of building on existing strengths and to address areas for development.

The Board also wishes to acknowledge the courteous and professional manner in which the Inspector carried out the subject inspection and is of the opinion that the inspection process and outcomes will greatly benefit the school in its SDP.