

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Science
REPORT**

**Ballymahon Vocational School
Ballymahon
Co. Longford
Roll number: 71690F**

Date of inspection: 1 March 2010



**AN ROINN DEPARTMENT
OIDEACHAIS OF EDUCATION
AGUS SCILEANNA AND SKILLS**

**REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE**

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Ballymahon Vocational School. 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 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 report; a response was not received from the board.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

Ballymahon Vocational School is a co-educational post-primary school with a current enrolment of 195 students. The school provides the Junior Certificate programme and the Junior Certificate School Programme (JCSP) for junior cycle students. Senior cycle students are offered a choice of following the Leaving Certificate (Established) or Leaving Certificate Applied (LCA) programmes.

Whole-school support for the sciences is strong, as evidenced by the fact that Science is a core subject for all junior cycle classes. Two class groups are formed in each year and these are streamed, according to students' ability, for the duration of junior cycle. The lower of the two first-year classes is divided into two groups, facilitating more focussed support for some students, and the two groups may be combined on occasion and team teaching used to provide for the learning needs of all. JCSP students are integrated into the second-year and third-year classes. It is recommended that consideration be given to adopting a mixed-ability approach to class arrangement as this is more equitable for students, and available research suggests that outcomes for students are superior. Science classes are allocated four periods per week, including a double period, which is in line with syllabus recommendations. Class periods are well distributed throughout the week.

There are currently four qualified teachers of science subjects in the school and all are deployed in line with their qualifications. It was evident from the outset of the inspection that the science teachers are keen to promote positive attitudes towards the sciences and to encourage students to achieve to the best of their abilities. Teachers are assigned to classes on the basis of continuity, a very good practice which facilitates long-term planning.

Management actively supports teachers' attendance at relevant continuing professional development (CPD) courses and is commended for its commitment to in-service training. Two of the science teachers are members of the Irish Science Teachers Association, one of whom is

serving as a branch officer. One teacher is a member of the Irish Agricultural Science Teachers Association.

The science department actively encourages involvement by students in a variety of co-curricular and extracurricular activities. These activities include participation in the BT Young Scientist and Technology Exhibition, science quizzes, NUI Maynooth laboratory revision days, visiting speakers and a commendable school-based gardening competition for first-year and second-year students. A prize, in honour of a former principal, is awarded each year to the top performing Leaving Certificate student in the sciences and Mathematics. The science teachers are commended for their work in making science a stimulating, exciting and interesting subject for students.

There is one science laboratory in the school with an associated storage and preparation area. The laboratory is well equipped and adequate for its purpose. The storage and preparation area is well stocked. Chemicals are properly stored using the recommended colour-coded system, although the store would benefit from improved ventilation. Management has provided a laptop computer and data projector for the laboratory. It is recommended that the positioning of the data projector be reviewed in order to maximise the visibility of the projected image. Not all science classes are held in the laboratory and a small number of other classes, which are taught by a science teacher, are accommodated there. However, science classes are always prioritised for access and all class groups have weekly access at a minimum. A display of charts and posters, including some student-generated displays, helps to create an appropriate learning environment in the laboratory.

Good attention to health and safety issues was observed during the inspection. Safety equipment available in the laboratories included a first aid kit, gas and electricity isolation switches, fire extinguishers, fire blankets and white laboratory coats. The good practice of displaying short, simple, safety notices around the laboratory is also evident. The school has a health and safety statement which was drawn up with appropriate consultation. This statement is reviewed annually, in keeping with best practice.

PLANNING AND PREPARATION

Collaborative subject department planning is very good and is evidence of a high level of collegiality. Formal planning meetings are held each term and frequent informal meetings are also held to manage ongoing issues. The science department is ably co-ordinated by one of the teachers who has held the position for a number of years. It is suggested that the position of co-ordinator be rotated occasionally in order to afford other department members an opportunity to lead the department. It is recommended that minutes of department meetings be kept in order to record decisions taken and responsibilities assigned, and to monitor the development of the department.

Science department members have compiled folders which contain the planning documentation for the implementation of the Junior Certificate science course. These folders are comprehensive and thorough. An excellent and detailed schedule for the delivery of course content, for each week of the three-year cycle, has been prepared. The plans are appropriately based on the science syllabus. References to learning outcomes, methodologies, assessment and resources are included among the documents. This is indicative of a good level of reflective practice and all concerned are commended for their work. There is good awareness within the science department of outcomes in the state examinations and there is a desire to build on and improve these.

In order to enhance the planning already completed, it is recommended that the science department examines strategies for the implementation of *Assessment for Learning* techniques in the classroom.

Individual teacher lesson planning was of a high standard and teachers were well prepared for class. It was evident that the science department had carried out considerable advance preparation for the inspection and lesson plans were presented for all the lessons observed. Teachers were familiar with the topics taught and prior preparation of the resources, materials and apparatus required for demonstration and student-centred investigative work was also evident. Such short-term planning and preparation is commendable and contributed to the quality of both the teaching and learning that was observed.

TEACHING AND LEARNING

Good quality teaching and learning was apparent in all the lessons observed. Teachers demonstrated a patient and caring student-centred approach and a positive, supportive learning environment prevailed. The topics taught were in line with planning documents and included forces, speed and velocity, solutions and solubility. Good continuity with prior learning was always apparent and opportunities were created to link content to students' experiences. Lessons were well paced and purposeful and good progress was made in all instances. Lessons were well structured and a pattern of presenting new material, followed by allowing students an opportunity to put new learning into practice was evident. In order to build on existing good practice, it is recommended that students are always presented with the learning objectives at the outset of the lesson. These objectives should then be revisited at the close of the lesson when progress is being reviewed and learning consolidated.

Teachers demonstrated good classroom management skills. Good classroom routines were in place and students were aware of what was expected of them. Students were challenged by lesson content and they responded well. Their behaviour was very good and a good level of participation and engagement was evident. The quality of rapport between teachers and students was very good.

A variety of appropriate and well-chosen methodologies and active teaching strategies were used to encourage student participation and facilitate learning. These included the use of ICT, questioning, teacher talk, student practical work, handouts, discussion and student writing. There was good evidence of differentiation in the manner in which lessons were conducted. The use of subject-specific terminology was good in all lessons. In one lesson, in particular, good emphasis was placed on ensuring that students knew the various definitions associated with the topic being taught. Students were assigned homework, appropriate to the lesson content, at the close of all lessons. This homework was designed to assist students in learning and understanding the topic in question.

Questioning of students was used extensively and effectively in most instances and students generally responded knowledgeably and with confidence. The use of questions to establish levels of prior knowledge, to assess the quality of learning on an ongoing basis and to assist in the exposition of new material was evident. Questioning also provided teachers with opportunities to apply a differentiated approach. Questions ranged from simple, lower-order, recall-type questions to more difficult higher-order questions which encouraged students to think at a deeper level. A mix of global and directed questioning techniques was used. It is important to ensure that all

students are included in these interactions and an occasional tendency to allow students to dictate the pace of interactions should be avoided.

Student practical activity, which was well managed and was carried out efficiently and safely, was a feature of some of the lessons observed. It is commendable that an investigative approach was taken to this work. Students demonstrated a good level of skill when carrying out their various tasks and they displayed a mature approach to their work. Plenary sessions were conducted prior to the practical work when clear instructions were given to students. Students were given an opportunity to review what they had done and to rationalise their findings in a review session, following the practical activity. This is good practice. It is recommended that students are encouraged to wear the available laboratory coats whenever practical work is carried out.

ASSESSMENT

Arrangements for assessing and monitoring student progress and achievement in Ballymahon Vocational School are very good. The level of student understanding is assessed on an ongoing basis, during lessons, through questioning of students, examination of homework and general observation of students, as observed in class by the inspector. The level of students' engagement and interest was good and students demonstrated a positive attitude towards Science. The quality of student learning was good. They successfully carried out the different tasks assigned to them during the lessons and they displayed a good level of knowledge and understanding during interaction with the inspector.

Students were frequently affirmed for their efforts during the course of in-class interactions with teachers and they responded in a positive manner. However, it is equally important that they are affirmed and encouraged in relation to written work. Therefore, it is recommended that teachers apply the principles of *Assessment for Learning* to the monitoring of students' laboratory notebooks, workbooks and other written work on a regular basis and provide advice to students on how their work may be improved, where necessary.

A comprehensive system of formal assessment and reporting is in use. First-year, second-year and fourth-year students are formally assessed at Christmas and prior to the summer break and a progress report is sent to their parents on both occasions. Parents of students in third and fifth year are provided with progress reports at Christmas. These students also sit mock certificate examinations in the spring, at which time progress reports are also sent to their homes. Additional testing is at the discretion of individual teachers. In-house examination papers are designed to mirror the structure of certificate examination papers and, in Science, ten percent of the available marks are applied to the students' laboratory notebooks.

Good practice by teachers in relation to monitoring and recording student attendance and attainment was evident. Sufficient information is recorded to facilitate teachers in building up a profile of each student and to enable them to provide accurate and comprehensive reports on their students at parent-teacher meetings.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Science is very well supported in Ballymahon Vocational School, with good provision of resources, deployment of teachers and allocation of time.
- A professional approach to teaching was evident from the level of collaborative subject department planning.
- Opportunities for continuing professional development have been encouraged by management and availed of by teachers.
- Teachers have provided students with opportunities to participate in a variety of extracurricular activities.
- Good quality teaching and learning was apparent in all the lessons observed. Teachers demonstrated a patient and caring student-centred approach and a positive, supportive learning environment prevailed.
- A range of carefully considered teaching methodologies was used to good effect. This stimulated interest and helped to motivate students.
- A comprehensive system of formal assessment and reporting is in use in Ballymahon Vocational School.

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

- It is recommended that consideration be given to adopting a mixed-ability approach to class arrangement in junior cycle.
- It is recommended that the positioning of the data projector, in the laboratory, be reviewed in order to maximise the visibility of the projected image.
- It is recommended that minutes of science department meetings be kept in order to record decisions taken and responsibilities assigned, and to monitor the development of the department.
- It is recommended that the science department examines strategies for the implementation of *Assessment for Learning* techniques.
- It is recommended that students are encouraged to wear the available laboratory coats whenever practical work is carried out.

Post-evaluation meetings were held with the teachers of Science and 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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