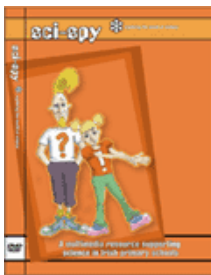


Sci-Spy

NCTE / RTÉ
Multimedia Education Resource



Sci-Spy DVD

Evaluation Executive Summary



www.sci-spy.ie

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1. Introduction

Sci-Spy, the multimedia primary science resource produced by NCTE (National Centre for Technology in Education) and RTE (Radio Telefís Éireann) as part of the **IMMERSE** initiative, was piloted and evaluated in primary schools in May/June 2004. This executive summary of the larger evaluation report briefly outlines the background to the project, the methodology of the evaluation and discusses the curriculum aspects of the programme in relation to science in the primary school. Summaries and recommendations in relation to each aspect of the programme are presented. The closing comments discuss the findings in relation to terms of reference of this evaluation.

Sci-Spy is an interactive media resource based on the primary science curriculum for 5th and 6th classes. The programme consists of 30 short films on DVD (each 6 minutes in length) and an interactive website with factsheets, interactive games, quizzes and experiment sheets. The programme has been designed to support teachers in the adoption and delivery of the new primary science curriculum. Each of the four strands of the science curriculum is covered to some extent, along with other science themes which are topical and interesting to pupils. This resource is broadband dependent.

2. Acknowledgements

The evaluation team wish to acknowledge the time and assistance that the teachers and children in the six pilot schools provided during the pilot period and also during the school evaluation visits.

3. Methodology

This evaluation set out to study the following **Teaching and Learning Objectives**:

- Identifying teaching methodologies and approaches used during the pilot (in particular changes from traditional methods).
- Observing student motivation and attitudes to learning using the media rich materials.
- Observing learning - Does interaction and engagement with these materials lead to any observable improvement in understanding/comprehension of certain concepts among individual students?
- Assess teachers' views of the appropriateness, relevance and usability of the materials with regard to the science in the primary curriculum.
- Does the availability of relevant and targeted interactive materials lead to:
 - (a) greater utilisation by teachers
 - (b) significant student usage
 - (c) greater support and facilitation for school principals/ school management

The evaluation was based on a multiple case study approach. The conceptual framework underpinning this approach revolved around the classroom teachers and the children and focused on the extent of use of the

Sci-Spy materials, the quality of innovation (if any), and the nature and extent of change in teaching and learning styles.

Six primary schools around the country were selected to participate in the pilot. The schools were based in Dublin, Limerick and Ennis. All schools chosen had access to ISDN or Broadband facilities and represented a cross-section of Irish primary schools, both urban and rural of mixed gender.

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|--|---|
| 1. St. Brigid's N.S., Castleknock, Dublin (6 th Class) | 4. St. Nessan's N.S., Mungret, Limerick (5 th class) |
| 2. Jobstown N.S., Tallaght, Co. Dublin (4 th Class) | 5. Lisnagry N.S., Limerick (5 th Class) |
| 3. Bayside N.S., Sutton, Co. Dublin (2 nd Class, Junior School) | 6. Ennis N.S., Ennis, Co. Clare (5 th Class) |

All school visits took place during June 2004. Participating teachers were interviewed, using an agreed open-ended questionnaire, designed by the evaluation team. Copies of the questionnaire were provided to all teachers prior to the evaluation visit. Children were interviewed in groups of three to five for 20 to 30 minutes and they were observed using the **Sci-Spy** website in a lab or classroom setting. Children were given time to browse the site and visit links of their choice.

4. Limitations of this evaluation

- This study is limited by the number of schools and teachers participating in the pilot phase.
- The time frame of the study was very short.
- The timing of the evaluation clashed with many events in the participating schools, i.e., school tours, preparation for final class assessments, changing classes
- Some minor technical problems with the Internet service in some schools
- Lack of video streaming of all films on **Sci-Spy** website

Bearing in mind these limitations, the evaluation team has confidence in the findings and recommendations presented in this executive summary report.

5. Teachers' Views of the Sci-Spy Resource

Teachers experience of **Sci-Spy** was positive and enthusiastic. It was praised as a resource created for Irish schools and using children in Irish schools. Several teachers remarked at the children's positive response to seeing their peers on the DVD programmes. The website and DVD motivated the pupils and teachers felt that the content was appealing to both boys and girls. All teachers stated that **Sci-Spy** has developed their confidence in teaching science and that it has developed their background knowledge on scientific topics. It was welcomed as a new resource and particularly as it enables the teachers avail of multimedia approaches in science for the first time.

5.1 The website

The teachers interviewed allowed the children access the websites in the school computer room or, in one case, on the classroom computer. Under teacher supervision, the children, working in pairs, moved through each section of the website. The teachers made the following observations:

- Teachers of 5th and 6th classes considered that the information presented was interesting for the pupils.
- Information presented was interesting for the pupils but very surprised at the lack of interactivity given the media involved.
- Slides, pictures or diagrams could be used to minimize the reading.
- The Fact Sheets could be visually more attractive.
- Teachers considered that the Fact Sheets promoted independent learning but this was only the case with more able readers.
- Teachers considered that pupils with lower reading ability were easily put off the pages of text and that graphics or images could have been used to explain more difficult concepts.
- Teachers considered that small print size was difficult for pupils to read.

5.2 Teachers' Notes (*available on the Sci-Spy website*)

All six teachers responded positively to the Teachers' Notes. Where available very they were considered to be comprehensive and worthwhile. Teachers liked the manner in which they addressed both content and process.

5.3 DVDs

In most schools the pupils viewed the DVDs on a large screen. In one school it was relayed on to computer monitors and pupils watched the monitors. Teachers were satisfied with the quality of the sound and pictures on the DVDs. All teachers were of the opinion that the DVDs captured the pupils' imagination and made the information accessible to them. The DVDs were well structured and the use of narrative, graphics, experts and text and the experiment were praised as a variety of means to convey the information. However, some teachers felt that the DVDs didn't take the children's prior knowledge or understanding into account and some students were more familiar with the content than others.

All six teachers were satisfied with the level of challenge presented by the content of the DVDs. However, several teachers remarked on the emphasis on information in the DVD and would have preferred a more interactive presentation. It was seen as a programme more concerned with passing on information than developing skills. One teacher remarked that the approach allowed children prioritise learning content knowledge over skills development.

All six teachers liked the ideas presented in the experiments on the DVDs. They provided ideas that the teachers and pupils developed themselves. All teachers were positive about the opportunity their pupils had to see other children engage in experiments.

However all teachers also had reservations about the experiments. Teachers recognised that the experiments on the DVDs exposed children to the skills and acknowledged that it was up to the individual teachers to identify and emphasise these skills. As a result of their science curriculum inservice and planning days, the teachers involved in the pilot were aware of the dual content and process approach to teaching science and felt that the teachers using **Spi-Spy** would need to use the resource in a manner that emphasises the processes of working scientifically.

It was suggested that an interactive feature on the DVDs and integrating questions into the DVDs would help in this regard.

Pausing the DVD and asking questions and or comments was suggested as a method of involving pupils in reflecting on the information being presented. Another suggested that the DVD could outline the materials and steps in the experiment and that the pupils would view the DVD once they had conducted the activity themselves. One teacher saw it as a process involving children verifying scientific knowledge rather than developing their own knowledge. Children were often disappointed when their own experiments didn't work out exactly like those shown - getting the same outcome was important to them. One expressed the fear that teachers would show the experiment as a means of covering a topic without involving the children in an experiment themselves.

Teachers used the DVD in the same manner - show the episode and the experiment then discuss it and do the experiment themselves. When discussing the DVD teachers suggested using it differently to overcome the drawbacks expressed above. Maintaining the discovery and prediction dimension to science was a concern to teachers. Several suggested that the Experiment is a resource which they would view separately from the pupils to become familiar with the organisation and process of the investigation.

5.4 Recommendations from the teachers in the pilot phase

- Enhance interactivity of website (particularly Introduction and Fact Sheets) with a view to making the concepts involved more accessible to pupils and with a view to creating a balance between factual scientific knowledge presented and the development of scientific process skills
- Develop a Teacher's Notes section to outline how the resource may be used to attend to both these concerns
- Review the experiments presented on the DVD to ensure that they are safe in the context of whole class engagement and use materials and apparatus available to primary schools
- Review the experiments on the DVD with a view to enhancing their contribution to the explicit development of the pupils process skills. Teachers' Notes accompanying the DVD could illustrate how this could be achieved.
- The Quiz on the Website is very popular - more questions would be a worthwhile addition
- Develop the Teacher Notes section for all topics
- Include more than one activity in the Investigation section

6. Conclusions (in relation the terms of reference of this evaluation)

- *Identifying teaching methodologies and approaches used during the pilot (in particular changes from traditional methods)*

All teachers used the traditional method of viewing the DVD first followed by discussion and finally allowing the children to undertake the experiments. The web site was used effectively by all teachers. The children were given free access to the site and allowed choose their own topic for study. However one teacher designed an activity exercise ensuring the children followed a strict path on the web and were not allowed free access to all of the site.

- *Observing student motivation and attitudes to learning using the media rich materials.*

During the classroom/lab observation sessions the children were highly motivated and participated fully in the activity. Children enjoyed conducting the various investigations related to each topic. When asked, pupils voted 'Quiz Time' as their favourite section of *Sci-Spy* website. The children were also attracted by the interactive nature of the quizzes. The quizzes facilitated learning through providing instant feedback to children after each question was answered.

- *Observing learning - Does interaction and engagement with these materials lead to any observable improvement in understanding/comprehension of certain concepts among individual students?*

Observation of the pupils by the researchers clearly indicated that the website material stimulated the children to engage in a large degree of discussion, and argument, on the website material, particularly when the quizzes were being attempted.

- *Assess teachers' views of the appropriateness, relevance and usability of the materials with regard to the science in the primary curriculum.*

The *Sci-Spy* resource enabled teachers to use multimedia to teach science - for most teachers for the first time. The website and DVD were tools which appealed to the pupils and motivated them. All teachers commented on the motivational value of DVDs set in an Irish context.

The website is planned in a manner to facilitate the teacher leading the class through each section simultaneously or allowing for pupils to work through sections at their own pace. However the website, particularly the Introduction and Fact Sheet sections, were seen by all teachers to emphasise content knowledge; they were seen as wordy and long and it was a challenge to ensure that pupils read through them. However, the Fact Sheets enable more able readers to engage in independent learning.

- *Does the availability of relevant and targeted interactive materials lead to:*
 - (a) greater utilisation by teachers*
 - (b) significant student usage*
 - (c) greater support and facilitation for school principals/ school management*

For the purpose of this evaluation all teachers did utilise the material on DVD and Web, albeit in a limited way owing to the limitation of time. The students in the classroom also used the website as directed by

class teachers and on their own initiative. However, children did not use the site at home or outside of school time. The site was viewed as a school / education site and not as an entertainment site. Owing to the limitation of this study the evaluation team cannot discuss the value of the material re. school management.

7. Closing Comments

The creators of the **Sci-Spy** multimedia resource have performed a wonderful service for the children and teachers in Ireland's primary schools. Science is presented as an exciting subject and young visitors to the **Sci-Spy** website can choose from an extensive and comprehensive list of interesting topics.

The organisation of the site not only helps children to make meaning of the various strands and their component topics, it also serves to provide teachers with a clear framework through which they can understand, organise and deliver a comprehensive programme of Science. At a time when many teachers are a little apprehensive about the delivery of a new Science Curriculum, they will be enormously grateful for the arrival of such an exciting and useable resource.

This **Sci-Spy** resource represents the beginning of an exciting era of home-grown multimedia resources for Irish Primary Schools. While there is certainly scope for improvement, particularly in terms of increased interactivity and more extensive use of graphics on the **Sci-Spy** website, the **Sci-Spy** resource has set an impressive benchmark for the future design of educational material in Ireland.

In closing, it must be stated that this innovative multimedia resource, while welcomed and praised by all teachers in the pilot study, will only succeed if teachers and schools are given the necessary resources to use the material. Schools will need LCD projectors, Broadband connection or at least ISDN quality. Teachers will benefit from inservice on the use of this resource through the network of Education Centres throughout the country.