

The Leonardo Effect™

Art and science working together



The Leonardo Effect™ is a teaching methodology developed by art and science education lecturers in Belfast. It has taken the British Isles by storm since the completion of a pilot involving primary schools in London, Bristol, Swansea, Belfast, Glasgow, Ballymena and Bray, Co. Wicklow. Here, **Deirdre Robson, Ivor Hickey** and **Mary Flanagan**, from St Mary's University College in Belfast, describe one of the pilot projects, on flight, discussing how children worked like 'little Leonardos' and the effect it had on their learning and art practice in schools.

Background

Art and science have a lot in common and, to the surprise of many people, are great fun when taught together, as the 'Little Leonardos' found out when they explored the topic of 'flight', during the Leonardo Effect™ pilot. In addition, treating art and science as equally important subjects greatly enhances the role of art in the minds of teachers and learners and raises its status in education. As one teacher commented: 'I often feel that the art I

plan is ... just an aspect of other topics or seasonal activities and worry that the children don't really gain anything meaningful from it. In this instance the art was so central to the learning and the project that the children's achievements far exceeded my expectations.'

The pilot, carried out in schools across the British Isles, was funded by the National Endowment for Science Technology and the Arts (NESTA), and entailed children working creatively in the mode of Leonardo da Vinci, without the hindrance of subject labels or following pre-prepared schemes of work. It was very well received. As one teacher commented, 'This enthuses children and brings the best out of the teaching and learning experience.' Children described it as 'brilliant', 'exciting', 'amazing', 'class', 'great'.

What is the Leonardo Effect™?

The Leonardo Effect™ is a new form of interdisciplinary teaching centred around 'synchronised integration' of subjects. This means recognising such commonalities between art and science as observing, experimenting, visualising and creative thinking.

Integrating the curriculum is a minefield, the danger being that some subjects, especially arts subjects, can be reduced to a supporting role. We found that through identifying commonalities we could create a mechanism to ensure genuine integration. This involved the use of joint learning intentions or outcomes for lessons, where one learning intention addressed the learning in both subjects.





'They weren't afraid of failure.'

However, joint learning outcomes should not be contrived and used only where appropriate. It may seem difficult, but as one teacher commented, 'It really works and you get the hang of it quite quickly.' An example of a joint learning outcome used in one school was: *Closely and carefully observe the butterfly using a viewfinder and discuss what you can see with your partner.*

An information-gathering task such as this is equally applicable to art, science and arguably literacy too. As one teacher observed, 'Their observational drawing skills have noticeably improved, as they are using their scientific knowledge to inform their drawing.'

Involvement with science doesn't take the fun out of art or reduce its accessibility for children. Children love working visually, and enjoy the independent thinking this brings. First impressions of the children's work from the Leonardo Effect™ scream 'art', but on closer inspection the science is there in large quantities. We found that children's genuine understanding of many topics such as camouflage was more apparent in their visual representations than in the usual written form recorded in exercise books. Teachers found it to be assessable too. In visual form there are also the added benefits for children's education of self expression, creativity, imagination, etc. Isn't it about time art blew its own trumpet? During the pilot, teachers repeatedly referred to unexpected results: 'I can't believe he did that, he would normally be in the bottom five in the class.' Or since completing the pilot: 'They can tell you all about flight, they remember everything.'

Influence of Leonardo da Vinci

Leonardo da Vinci believed that first-hand experiences were critical to his motivation and the development of his ideas, and the Leonardo Effect™ emphasises the importance of first-hand experiences in stimulating curiosity. Typical examples in the pilot included: feeding birds; visiting an airport; listening to bird song; asking a beekeeper questions. These experiences stimulated children's thinking, which resulted in wonderfully imaginative self-generated questions such as: Where do birds live in East London? Why does that bird stand on one leg? How does a bee buzz? Teachers reported that it was a 'voyage of discovery' for themselves and the children in pursuit of answers to questions.

What about teachers' planning?

It was only after teachers listened to pupils' ideas and experiences that the direction of the children's learning began to take shape. Some children were more interested in mechanical flight, others in insects or birds. Some even wanted to investigate Leonardo da Vinci, and several were curious about what it might feel like to fly. A preconceived scheme of work would clearly not have been applicable and would only have stifled children's creativity and feelings of ownership. Instead, teachers and pupils worked together through the Leonardo Effect's™ distinctive stages and planned on a short-term basis. Children gathered information, developed ideas, and created, which essentially

represents good art practice. However, with art experience for children continually squeezed and art training for teachers reduced, we have found that this is not always the case in schools. Equally, science education is not always as creative and explorative as it might be. Teaching this way ensures real benefits for children's science and art education. It also demands creativity and flexibility on the part of teachers, highlighted as being important in revised curricula. Teachers found it challenging but enjoyable from the start.

'Having no fixed target or end result at the beginning of the project due to its open-ended approach allowed a greater diversity of learning.'

Children began observing and gathering information in many different ways. They watched videos; used camcorders; used sketchbooks like a modern-day Leonardo da Vinci codex; played with kites; spoke to experts; researched from books; shared ideas with one another and without doubt took ownership of their learning very quickly. One teacher remarked that there was not a single child that failed to be engaged, while a principal commented that they learned more in a week than they normally would in a term. Many teachers said that they were very surprised by the detail and quality of children's drawings in these situations, one stating that 'they studied the subject more carefully, taking time to look at shape, line, tone and texture.'



While developing ideas, children carried out more focused investigations, depending on their areas of interest, for example: exploring the structure of wings and making comparisons with human arms; experimenting with materials to design and make wings, inspired by the story of Icarus and the drawings of Leonardo da Vinci; creating camouflage habitats; exploring patterns; speaking with a designer, and so forth. Teachers commented on the children's willingness to experiment.

Making time for development of ideas proved invaluable, and facilitated some of the most in-depth thinking. Children became more confident as collaborators and contributors. Transferable skills flourished, prompting one teacher to say: 'Sometimes the quality of the discussion was truly amazing. They wanted to answer their own questions, so they wanted to read.' One child also commented: 'I like the fact that we can find things out for ourselves.'

The 'little Leonardos' went on to apply their knowledge and understanding in the design and making of an imaginary flying creature or machine.

They found this the most exciting part. Ironically, it was also the most challenging. The application of knowledge involved many skills, including recall, interpretation, creativity, synthesis and organisation, yet – whether it was because of children's ownership; the multiple access points inherent in art; visual and kinesthetic learning experiences; commitment or interest – they rose to the challenge and easily surpassed it.

Extension activities were encouraged, to facilitate the embedding of knowledge and the making of further connections to other areas. Examples from the pilot included: play writing, animation, Leonardo da Vinci school assembly, flight show in costume, fictional stories, story boards and audio recording. In one school, the children kept a video diary of all activities, and another involved the children in planning an exhibition for pupils, parents, governors and teachers. One teacher felt that the educational gains from this phase were 'to consolidate learning and ... make their writing meaningful'.

Learning outcomes

What the Leonardo Effect™ has shown is that working like Leonardo da Vinci promotes quality learning opportunities for children in art, without art playing a supporting role, and reaps immense rewards for science, literacy, transferable skills and pupil engagement. When the 'little Leonardos' were asked, 'Is there anything you do not like about the Leonardo Effect™?', it was expected that they would highlight literacy-type activities, but not a single child did so. Only a few comments were forthcoming, a typical response being:

'Yes – I did not like that we had to finish the project.'

Thanks to **Paula Campbell** from St Joseph's Primary School, Crumlin, in NI, who worked as project officer on the pilot, and to all the wonderful schools that made the Leonardo Effect™ happen.

If you would like to implement the Leonardo Effect™ in your region or gain further information on the Leonardo Effect™, please email: info@leonardoeffect.com. To download the initial results of the pilot, go to: <http://gtcni.openrepository.com/gtcni/handle/2428/15215>. For further information, visit www.leonardoeffect.com