



A case study:

Science Physics, Chemistry, Biology
Multimedia Courseware Development

For Curriculum Development Department,
Ministry of Education,
Negara Brunei Darussalam

Written by Roger Frost

Developing Multimedia



A real life Case Study:

Experience, and the idea that success also comes from learning from others, are incredibly useful. When a definitive guide to developing e-Learning technology has been written, its usefulness may be measured by its stories of successful projects. If there is a word that the guide should use often it will probably be 'experience'. Let us remember that tomorrow's technology builds on today's technology.

Some Definitions:

Malaysia is a country with its own impetus towards becoming a knowledge economy. As a user and a developer of e-learning technology, it's a land alive with good case studies.

How E-Learning enriches learning:

Electronic learning or e-Learning can use tools like multimedia, digital libraries and collaborative tools. E-Learning allows teacher and student to be far away from each other and it also allows students to learn outside a formal timetable. E-learning can enrich a course that uses books and lecture to learn or used to deliver an entire course. As an example, the Open University of Malaysia, caters for students who are widely dispersed, or who already have full-time jobs. OUM uses 'distance' and 'open' learning. They use e-Learning as part of a learning strategy, and hence use the term 'blended learning' to describe what they, and indeed lots of institutions do.

A bold decision

In the early 2000's another very different example of e-Learning arose from another bold government level decision. Its objective was to ensure that Malaysia's future scientists could engage with a world community that used the English language. Malaysia therefore chose to switch the teaching of science and mathematics from Bahasa Melayu into English.

The imperative

At the time, Malaysia's teachers could be divided into a mature group who had been

schooled in English and a younger group who had been taught in Bahasa - and were teaching daily in Bahasa. The imperative was to enable the teaching force to deliver a curriculum in English. The system would need to move sharply to support the younger part of the profession.

Towards Empowerment

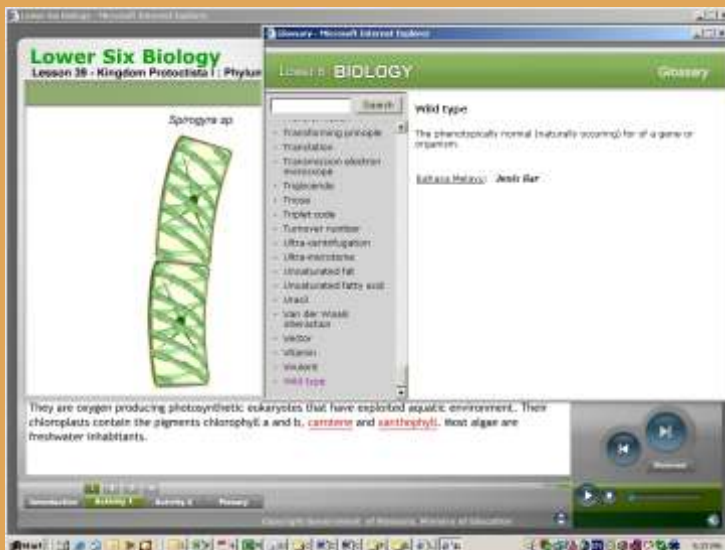
Their solution was to develop an e-learning platform that would empower thousands teachers to teach outside of their native tongue. They would develop multimedia to enable the teachers to deliver with the help of visuals, text and voice-over. The multimedia would not 'take over' all teaching: The 'blended' result would also have teachers using their own experience and techniques.

The strategy

To develop a plan, IT experts, curriculum authorities and other stakeholders were brought together. One of the first courses to be developed was for Form 6 which is the school years from age 16 to 18. The multimedia would follow industry standards and use Macromedia (now Adobe) based content. It would work in various browsers and able to run on Apple, Windows or Linux. The planners recognized a need to unify projects for other school years and they devised a specification for a common content player for these projects. The content player, as it happens, turned out to be exceptionally practical and a model of clarity. In synchrony with the development, teachers would be provided with a laptop, projector and training.

Not Just Any Multimedia :

The scale of what lay ahead will have seemed daunting. They needed to develop multimedia that would fill lessons that lasted about an hour. The lesson would have worksheets to print, several activities, maybe twenty learning objects, explicit learning objectives, text with voice-over, and a science words glossary where a click would show a translation in Bahasa. The task ahead was to make 50 lessons for each of two years for biology, chemistry and physics.



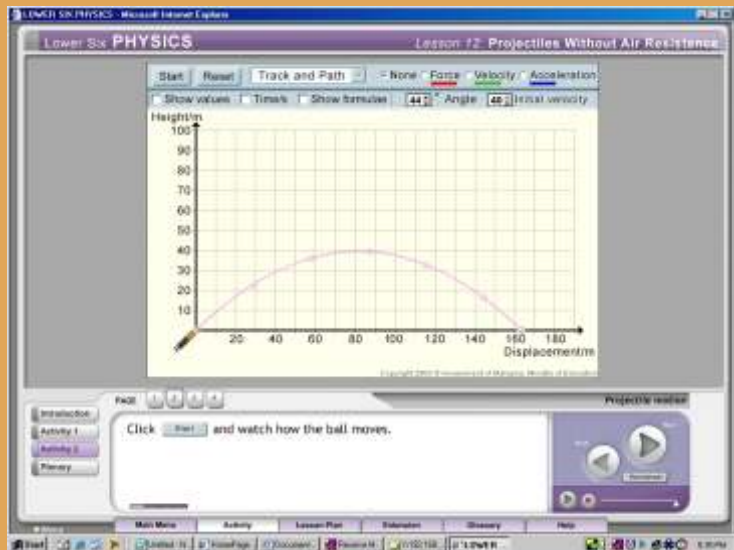
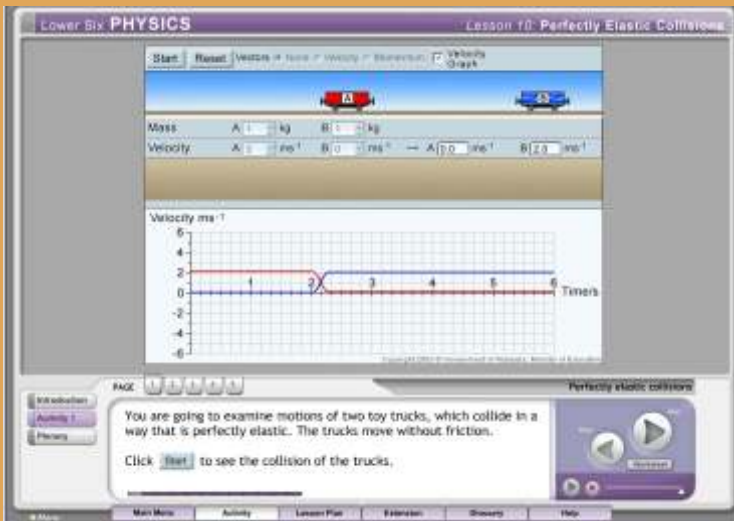
Adding that up what was needed was 300 hours of lesson time and thousands of learning objects. This would be delivered to every school in the country as 60 CD-ROMs the material was perfectly suited to online delivery, but these were early days. Aside from the planning, it would take two years to complete the three subject courses.

The specification required that the multimedia needed to embrace best ways to visualize science concepts. This in itself might be taken to mean that everyone tries their best but of course, it did not. It raised the challenge to find teaching and instructional design talent that has done similar before and was not doing this for the first time.



How does one find these people? The requirement to work in English may have been a driver to visit the London BETT show. This annual education technology trade event is a forum to find makers of e-learning, proof of their talent and gurus of the trade.

The project contractor employed London-based 'New Media Projects' a company making original multimedia with an understanding of what the medium ought to do. Although the company no longer exists today, back then New Media Projects were contracted to embrace the whole project including lesson writing, instructional design, coding and voice-over.



The work was done in the UK and sent to Malaysia where subject panels of teachers and lecturers would judge, advise and approve. These panels or 'quality control' panels were exemplary. Their scrutiny ensured the materials were to standard. An impressive number of people took part in them - so many that full-time assistants were needed for the logistics of making the panel meetings happen.

It is here that we learn useful pointers to a successful e-learning project. This kind of advice is a challenge to absorb. One pointer is that making the best multimedia for the classroom and making best use of the medium are two different objectives. The best multimedia for the classroom requires inside knowledge of how a lesson works. The best use of the medium leads to making resources which must somehow be maneuvered into a lesson. For example, the resource must balance what must be learned and understand the pace of the lesson. Experience from inside a Malaysian classroom was needed to make what was wanted.

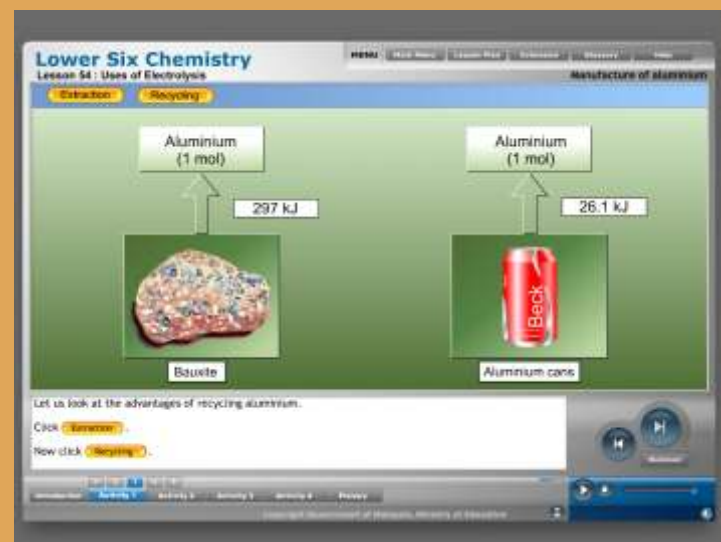
The second useful pointer is that a customer is good at telling a multimedia supplier what needs changing. Defining what is wanted requires experience. And when the customer is not one or two people, but the viewpoints of a panel, finding a consensus can take time.

So by the time the third CD was due for delivery, the vision for the product was still evolving. By then, after several revisions of the multimedia, the customer and 'New Media' parted ways and a new multimedia partner was sought.

The new partner was Chennai-based White House Business Solutions. With an IT staff of 300 people, White House e-Learning had stamina to see the major part of the project through to completion, as indeed they did. They had similar projects in their experience, and they set to work with the customer to improve the process. The result, I think, is a model to replicate.

The first change was to give teachers the role of lesson writers. Subject-specialist instructional designers, myself included, were recruited from the UK to advise on the use of multimedia. For example, before writing began, teachers might be briefed by an instructional designer as to how the topic could be enhanced. The teachers would then write the lesson and give it to the ID who would improve the interactivity and turn them into storyboards. White House would then turn the storyboards into multimedia with its voice-over commentary.

In the new regime, a quality control panel would adjust and approve storyboards before they were sent to production. A panel consisted of 5, 10 and even 20 people, and often the panel that approved storyboards was different to those that reviewed the multimedia. A crucial, simple improvement suggested by White House, was to ask that the same group of people take a lesson through to completion. From here on the system worked admirably with new ideas introduced at the storyboard stage, and exceptionally after the multimedia was made. Suffice to say



the project continued at a smoother pace. Month after month, a cycle of lesson and storyboard making, panel review, multimedia review and sign-off took it to a happy conclusion.

Looking back we see how the process of specifying and making multimedia evolved. The long time scale of the project not only allowed this to happen, it also allowed schools to influence the work since the project was running a few months ahead of its use.

Details of the Project:

Interactive courses for Lower Six
Physics, Chemistry and Biology
No of Lessons: Approx 200 Lesson
Duration of Development: 1 Year
Modes: Interactive and Autoplay

Credits :

Roger Frost is an experienced writer and trainer on technology in science education. He is the author of a multimedia package and BETT Award Finalist called 'Organic Chemistry Teaching Tools'. Frost advises on e-learning resources for publishers and was a subject specialist on the project just described. Those contemplating multimedia projects and products are welcome to make contact.

'Organic Chemistry teaching tools'

www.organic.rogerfrost.com

Roger Frost www.rogerfrost.com

White House Business Solutions has been the leading multimedia supplier to Malaysia producing thousands of multimedia learning objects over ten years. White House is based in Chennai with offices across the Middle & Far East, U K and U S A .
www.whitehouseelearning.com