The Le@rning Federation and the *Victorian Department of Education and Training* trial of digital curriculum content with Indigenous students

February 2006

Dr Olivia Clarke - Program Implementation Advisor, The Le@rning Federation

Louise Bowe - Senior Project Officer, eLearning Unit, Department of Education and Training, Victoria

Introduction

The Le@rning Federation (TLF) undertakes trials in conjunction with jurisdictions and sectors to investigate approaches teachers adopt when integrating the new online curriculum content into teaching and learning activities in a range of educational, socio-economic and geographic contexts. This trial, in November and December 2005, explored the pedagogical application of TLF online content in five Department of Education and Training (DE&T) Victoria schools in the Gippsland region attended by Indigenous students. The project built on the commitment of the Victorian government to enhancing education opportunities for Indigenous students and was aligned with three current initiatives of DE&T: introduction of the new Victorian Essential Learning Standard (VELS), the Koorie Literacy Strategy and the Digital Content and Creation initiative.

This trial with Indigenous students was conducted simultaneously alongside a trial of TLF digital content with ESL, including newly arrived ESL, students in the Western Metropolitan Region of Melbourne. Many of the findings from each trial, despite the different cohort of students, are similar and reference to the report of that trial is beneficial.

Purpose of the trial

- increased understanding about the capacity of online resources to support Indigenous student learning

- teacher professional development in the use of online content to support quality teaching and learning

- units of work and/or lesson plans incorporating TLF learning objects

- practical pedagogical advice for teachers on integrating ICTs and learning objects in classrooms with Indigenous students

- materials to support the TLF and Victorian DE&T websites e.g. digital case studies, snapshots of use.

Summary of findings

Teachers and Koorie educators involved in the trial clearly believe TLF digital content can support the learning needs of Indigenous students. The extensive use of visuals, voice-over audio support, immediate feedback, engaging interactive learning contexts focussed on clearly defined concepts and skills, opportunities to revisit and redo the learning activities are features of the digital content which seem to be of most support to Indigenous students.

However, successful learning outcomes are not solely dependent on the learning objects. This trial shows that well designed learning tasks where all students – Indigenous and non-Indigenous - have the opportunity to participate in a range of related offline activities with a judicious mix of instruction, exploration, practice and reflection both individually and in groups – are the cornerstone for success.

The trial

Three primary schools (Liddiard Road Traralgon, Morwell, and Drouin) and two secondary schools (Traralgon and Drouin), each with varying numbers of Koorie students and each with Koorie educator support, were selected to participate. The Principals nominated two teachers from their schools to participate in the trial. An initial workshop, jointly conducted by Olivia Clarke, (TLF Program Implementation Advisor) and Louise Bowe (Senior Project Officer, eLearning Unit, DE&T) was held at Lowanna College, Moe in November. In attendance were the classroom teachers, the three Koorie Educators, and Mathematics and Koorie regional support personnel.

During the workshop, participants explored the suite of TLF digital content, discussed ways in which the content might be incorporated into aspects of curriculum being taught in Term 4 and ascertained access and delivery arrangements for the content at their schools. Infrastructure support to the schools involved in the trial was provided by the DE&T eLearning unit and Greg Gebhart, Multimedia and Information Technology Manager, Lowanna College.

Following the workshop, teachers developed lessons or units of work incorporating the digital content and used them with students. During the classroom implementation phase Olivia and Louise visited each school to observe and record lessons in action. A second day-long workshop was held in December in which participants shared the work they had done and reflected on the use of digital content, in particular its usefulness in meeting the learning needs of the Koorie students in their care. Interviews and roundtable discussions with teachers were also recorded and transcribed. A number of products have resulted from the trial:

- This report which documents the trial process and outcomes

- A DVD which complements the report. The DVD contains digital stories with perspectives from Koorie educators, teachers and students about learning with the TLF online content

- Units of work in which learning objects have been integrated together with snapshots of exemplar classroom practice.

The schools and teachers

The criteria for selection of schools from the Gippsland region were that each had Indigenous students in their student cohort. The schools, Koorie educators and classroom teachers providing data:

Traralgon Primary School (Liddiard Road) – Koorie educator: Vera Harrold

- Year 3/4 Jane Lawrence

- Year 5/6 Chris McLennan

Morwell Park Primary School - Koorie educator: Zak Haddock

- Prep Sheryn Boskma

- Prep Nella Mangiafico

Drouin Primary School – Koorie educator: Terry Marks

- Year 1/2 Cara Brasier

- Year 6 Sue Doyle

Drouin Secondary – Koorie educator: Terry Marks

- Year 10 Maths Nella Scalora

- Year 7 Science Kathleen Collins

Each school is well-resourced with computers and all teachers involved had used ICT to varying extent in their teaching and learning programs. Only two teachers had used TLF digital content prior to participation in the trial. The learning objects were accessed from the Curriculum server on the school network and teachers also had access to them on their DE&T-provided laptop computers.

All year levels from Prep to Year 9 were represented in the trial. However, this trial of computers and digital content for learning was far more successful in the three primary schools than in the secondary schools. Each primary school classroom had between 6- 8 computers and access to the library or laboratory computers if necessary. The teachers in both secondary schools relied solely on bookable laboratories for computer access. With the more rigid timetable arrangements in the schools it was more difficult for these teachers to align the use of digital content in the computer labs to an appropriate learning sequence. One teacher allowed her students to explore several learning objects in the allocated time, but had not integrated them into a learning sequence, so data from here was not appropriate for the purposes of this trial.   End of year activities also unexpectedly tied up two of the teachers. Thus the data presented on classroom use mainly comes from the primary teachers.

Indigenous students and the role of Koorie educators

'Koorie' is the term Indigenous Australians in New South Wales and Victoria use to refer to themselves and is used as such in this report. Ten to twenty percent of students at the six trial schools have a Koorie background and between two and six Koorie students were part of each of the trial classes. The trial cohort of students reflected the full range of ability levels – one student was the 'top' student in one class, some needed no academic support, whereas others needed extensive support. Some struggled more with Mathematics, others with Literacy. Irregular attendance of some Koorie students was a concern for the classroom teachers.

The Koorie educators supported all Koorie students and integration aides were used where necessary. Koorie educators operate within the Victorian Koorie Education Policy - Yalca: A Partnership in Education and Training for the New Millennium. (http://www.vaeai.org.au/policy/index.html). Koorie educators work in-class alongside students, sometimes they withdraw them individually or in small groups for specific learning tasks. Some modify teacher worksheets with Koorie cultural content. The Koorie educators encourage deeper understanding of Koorie culture for all students. They liaise between parents and the school on matters of attendance; reading and completing administration forms, sometimes on health matters. Some provide after-school classes and home-work support. All of the Koorie educators had good computer skills and felt confident in their ability to support students with computer-based tasks, especially in the primary years.

TLF digital content

For the trial, classroom teachers selected digital content from the Mathematics and numeracy, Literacy and Science suite of TLF learning objects and integrated them with a range of other learning activities to meet specific learning outcomes. The TLF learning objects selected for the trial included:

Mathematics and numeracy

Musical number patterns (Years 1-6) - explores concepts of addition, counting, number lines, rhythm and number patterns. Students develop the understanding that patterns consist of repeating elements or groups of elements, are predictable, and can be represented in different forms, including sounds. The *Musical number patterns* series contains five objects with increasing levels of difficulty.

*The number partner (*Years 2-4) – this interactive tool encourages students to explore different ways to break up numbers between 10 and 30 into pairs to assist development of efficient mental arithmetic strategies**.**

The part-adder (Years 2-4) – with the use of an interactive slider tool, students learn different strategies to add two numbers between 10 and 100. *The part-adder* series contains four objects with increasing levels of difficulty including options for students to create their own sums.

Wishball (Years 3-6) – the game format of this series of learning objects encourages thinking about place value and provides opportunities for mental addition and subtraction. With feedback, students are challenged to develop more effective problem-solving strategies. The series contains ten objects with increasing levels of difficulty.

Bridge builder (Years 5 - 9) - the bridge-building context encourages students to explore the links between spatial and number patterns, tables of values, graphs and rules expressed in words or as algebraic formulae. At the time of trial, only one of the *Bridge builder* series of five were available.

Science

Food chains: the farm (Years P-2) - Students are able to explore and create simple food chains that show the flow of energy from the sun to plants and on to animals typically found on a farm. The *Food chains* series contains six objects focussing on food chains found in different habitats.

Literacy for students at risk

Dream machine: similes (Years 5 - 9) *-* in the process of designing their own fantasy bike, students are guided to recognise and use similes to create imagery that enhances the meaning and aesthetics of a description.

Trans-Tasman challenge (Years 5 - 9) *-* students explore holiday destinations in Australia and New Zealand by viewing a range of written and visual texts, including maps and photograph, and then take action based on the information contained in the texts. This series has three learning objects, which progressively increase in difficulty.

Key findings

This section draws on discussions at the two workshops; interviews and round table discussions with teachers and Koorie educators; classroom observations and student responses in an online survey. In reporting the findings, extensive illustrative use is made of the voices of the participants where appropriate. The responses are grouped around the use of a particular learning object in an effort to identify features of the digital content which may help student learning and the pedagogical practices teachers adopt in using them with students.

The DVD which complements this report contains vision of classrooms in action, as well as audiovisual capture of the perspectives of teachers, Koorie educators and students.

1. **Classroom teachers were very enthusiastic about the role of digital content in general to engage, and motivate students and to support their learning.**

    And my kids absolutely love going to the computer room. They just think it's fantastic being able to use the computers. And it was just another different tool for helping with their learning. It was really the same concept we'd been doing in the classroom except they were going into the computer room to do it.

    (Sheryn, Prep teacher. The number partner)

    They really loved them and we developed lots of different counting strategies, on how to work it out. Some children told you that they had to count the little bar until they got there. Some children picked up if they were counting by fives they had the five counting pattern and they knew how to do that. Some children just told you that they just knew it. And they knew what they were doing.

    (Nella, Prep teacher, Musical number patterns)

    the children were engaged the entire time, and they just retained so much of the content from that lesson because it was presented in four different ways, so those that were on the computer were gaining an understanding and then when they swapped they could use the understanding that they had gained, and the group that worked on an activity before the computer used the computer to consolidate, so they were using the activities to introduce, consolidate and extend.

    (Cara, Prep/1 teacher, Food chains)

    they enjoyed working through it - it wasn't a chore at all. If you did this on the board they might get a bit bored with it and whatever, but they were still keeping in mind their bike and they were going to end up with this great thing … And there's great excitement about them. They loved looking at each other's different designs and talking about it. It's a terrific program. And it's been really good for their writing.

    Learning objects are an exciting development in education. They have been quickly embraced by the children and can be used as an initial stimulus or to support and enhance classroom programs in a variety of KLA's. The objects I have used have been great for small group discussion and decision making around the computer. …The objects have easy to understand instructions and allow children to work through at their own pace individually, partners or small

groups. I like using them and the children have had positive and excited responses to them.

(Chris, Year 5/6 teacher, Dream machine)

I really did like this particular one, not because it was easy … the kids don't think they're learning, they think they're playing a game. As soon as they get on a computer it's kind of like there's no pressure associated with that. Even my lower ended kids thought, 'Well, I'm only fiddling around - a truck moving triangle beams across to make a bridge.' I really like that part of it.

(Nella, Bridge builder Years 5 – 9)

It's related to them. It's about Australia. It's about cool words that they use. It's got a bit of their language in it, so it's something that they're engaged with straightaway. The Australian content. The idea that it's using an Australian accent, Australian type speaking. It's really good. And the audio is excellent.

(Chris, Year 5/6 teacher, Dream machine)

These teachers' comments support the findings from all other published reports: that TLF learning objects are highly engaging and motivating for students (see Notes).

2. Classroom teachers and Koorie educators expressed enthusiasm about the digital content in supporting the learning needs of Indigenous students

When asked about the digital content in supporting the learning needs of the Koorie students in particular, both the classroom teachers and the Koorie educators were of the same positive view. The objects offer the Koorie students a much more interactive, multimodal learning environment than a text-based pen and paper approach. They allow self-paced exploration and increased sense of ownership of their learning, and opportunities to experience success with a resulting boost to self esteem. Importantly, an increased focus and positive engagement with learning, resulted in noticeable improved learning outcomes.

Classroom teachers

The Koorie children in my class like a lot of visuals, a lot of hands-on, a lot of visuals. The learning objects are very colourful, very visual, simple instructions. They found them really exciting and we were able to get involved in the literacy ones quite readily, select from the menus and go through the modelling that goes with the learning object and the end results were better sentence structures and sentences and descriptive writing. And reluctant writers were more willing to start using the learning object rather than a piece of paper and a pencil.

(Chris, Year 5/6 teacher, Dream machine)

We have a little boy who lived on a farm at Doveton and everything was a rooster. Everything related to a rooster. And so he'd draw a peacock and that was a big white rooster. He didn't have the language for a peacock. I found when he was doing the Food Chain, he was talking about doves and owls, he was referring to them as a dove and an owl, whereas beforehand they would have been roosters because he didn't have that experience. So I think that's really important because it's another experience that he's had, a positive experience.

(Cara, Prep/1 teacher, Food chains)

I used these four kids then - one of them was Gladys, my Koorie girl - to grab another person from the second reading group and show them the program - to use them to say, 'Well look I can do this, I can show them how to get into it, and what to do,' which they really loved. So they were the teacher and they found that was really great. And I've used them at other times with children from other grades who were walking down the front of my room and saw these bikes and started looking at them. And I said, 'Well, Gladys can show you.' And Gladys was able to get the confidence to say, 'Yes, I can do this,' and to build her self-confidence.

(Chris, Year 5/6 teacher, Dream machine)

I had a young boy called Bob who's quite literacy challenged. He's moved around a lot and he hasn't had a lot of experiences and he came staring at the windows of our Dream Machine bikes and he was quite taken with all the different designs. And I just asked him if he'd like to create his own. His response was very short but he got quite excited about being able to do it on the computer - he didn't like his computer experiences. One of my children showed him how to get on to the learning object and we showed him the steps involved, and he spent a good twenty-five minutes creating his futuristic bike plus the written passage that went through it that he could take that back and share with his class. So that interaction of it and the visual was quite good in getting him to write - it was more than he would normally write in the classroom. You'd be lucky to get a few words; this way we got a whole passage about something that he'd created. He was quite excited about it. - He wasn't even in my class, he was from another class.

(Chris, Year 5/6 teacher, Dream machine)

And I think they're excited because there's a lot they've achieved and a lot of strategies they've used. Whereas sometimes they're not willing to put their hand up in class; they'd rather sit around and listen to everybody else. But they're getting excited about what they're doing and they want to say how they've reached the highest number in Wishball, how they achieved the dream bike.

(Chris, Year 5/6 teacher, Dream machine)

Koorie educators

The kids really love being on computers … And the kids with the learning objects, especially over in the 5/6s - like Gladys, she just did it like that. It's incredible. she blew me away actually … She loves being on there and you can see that she's really improved by being on the computer. And the same with the 3/4s.

… I think they just like being on a computer more than anything … they're solving problems and their maths - that makes them more interested in their maths because - you know what maths is like - I hated maths growing up - but when you've got something like that on the computer, I think they understand it a lot better.

Vera, Koorie educator

They really concentrate, they really focus, because they're looking at the screen, it's not a book where they have to flick through … and hearing it - like they can hear it and then they look at it and they think, 'Hey I know, I can do that' and then they just click on to it. So I found that's really working for the kids, that interaction.

I find with the girls and the texts, if they work together, they feed off each other, and I think they get more out of it, and if they really get stuck then, they'll ask for help but I find that this interacting with each other and working it out is great … I think it will make them engage more in the future. Like I said, it's that interacting with each other, talking about it, sharing that idea, yeah, so I think it's got to be great ...

Terry, Koorie educator

I think it's fantastic. I mean for thousands and thousands of years my people have always learnt visually or through articulation. And having learning objects like this that really do foster the ways that we've been raised and culturally the ways that we've been raised to learn. Where you're not picking up a book and flicking through a page, you're actually having the voice of whatever language or whatever accent - and the varying accents in the learning objects are very

important, I've found. You've actually got people talking to you, which is easy for my mob to learn anyway.

… It's not so - so academic - in a good way. It's not so cut and dried.' It's 'This is how to do it and, Oh, you slipped up there, go back and re-read that and have a guess. If you need to, go back and read it again, and if you need to, it'll give you a hint.' Which is very much the way that culturally we've always learnt. It's very appropriate. And I find that the Koorie faces and the voices - my kids respond wonderfully well.

… my kids are very musically orientated - to be able to put together especially with the number patterns, and the monster one that you've got there, where they're actually in charge of creating their own - this is the sound I want, this is how it's going to be; they respond to that fantastically - they're not being told what to do, they're owning.

Zac, Koorie educator

3. Features of the digital content that support student learning

Teachers commented on particular features of learning objects which support all students.

3.1 Voice-over audio support

Teachers stressed the value of voice-over audio support on learning objects and believed that without it, learning tasks can be difficult for some students

It helps the children who may struggle with reading texts. They can hear the text and understand it and still get the learning from the learning object without having to read the text on screen.

(Chris, Year 5/6 teacher, Dream machine)

… I found that the audio support was the biggest advantage because I could leave my kids and go and work with another small group and I knew that they were still working and engaged in the activity.

… And if they're reading and listening at the same time, they'll pick up the words, they'll pick up what it means.

(Cara, Prep/1 teacher, Food chains)

I've got a boy that's fantastic at Maths but struggles with reading so he was lost on some of those activities because he couldn't read the introduction but to have the audio there would be fantastic because I know he can do the actual learning object.

(Jane, Year 3/4 teacher, Wishball)

3.2 Immediate feedback on learning

Teachers appreciated the immediate feedback which leads students towards the correct response; makes it safe for students 'to have a go' and helps teachers' classroom management:

… it was very quick in giving them feedback because, as I said, when you've got a class and you're going around, and you're marking work, and you've got little Johnny who is sitting over here who is having problems, and you don't get to Johnny till ten minutes later, Johnny's either completely wiped what he's learnt out, or hasn't learnt anything, whereas this was immediate. As soon as they had finished that pattern and clicked on that little 'OK', they got a smiley face which they were so excited about or they got a 'Let's try again'. None of them stopped and said, 'Oh I've made a mistake.' And it was lots of learning: why did you make a mistake? where did you do it? how could you do it better? That learning and that feedback that they were receiving was immediate, so it was good reinforcement that they had done a great job.

(Nella, Prep teacher, Musical number patterns)

The objects provide immediate reinforcement, immediate feedback to the children, which is really wonderful, and it's positive, and even if they make an error, it's in a positive way that they ask them to rethink how they went about solving the problem.

And there's no immediate feedback from a sheet of paper whereas with a computer you get, 'Yes, you've made a great choice. Move on.'

(Chris, Year 5/6 teacher, Dream machine)

Some of my kids even made mistakes just to see what would happen so that's fun, that's enjoyable.

(Jane, Grade 3/4 teacher, Wishball)

3.3 Different levels of complexity in a series of learning objects.

Teachers comment that the different levels of complexity in a series, or series with different examples of the same concept are advantageous in mixed ability classes. This enables the teacher to appropriately align a learning object to the specific learning needs of students or to provide more extensive understanding of a concept.

… with my top group I went to Wishball Challenge Whole Numbers and with one group they only could add on that one - they couldn't take away.

(Jane, Grade 3/4 teacher, Wishball)

The pairs were really mixed; some of them had high level kids with not so good kids, and so that was a challenge in terms of which of the levels to put them on. Most of the kids started at Level 1 because it was the natural thing to do. Having completed that, they then went on to Level 2 and Level 3. Some of the pairs went through all three challenges and did them all; others just chose to do one or two, and that was fine.

(Sue, Grade 6 teacher, Trans-Tasman challenge)

So, it's got a real lot of scope for people to use. It gets harder if you keep going through. It hides the ones. So for my high kids they didn't need to count

(Sheryn, Prep teacher, The number partner)

One teacher had selected the only learning object to be published to date from the Building bridges series in Mathematics. She recognised however, how useful the full range of learning objects for her mixed ability class would be

It could lead into geometry - regular polygons and non-regular polygons, triangles, quadrilaterals and so on. I think on the learning object does do that, but the only one that was available to us at the time was the triangles, and it would have been really good I think if the kids have the chance to go through and build the bridges using a four-sided shape and a five-sided shape.

(Nella, Bridge builder Years 5 – 9)

3.4 Revisit, replay, redo for enjoyment and mastery

So we made our bike again and that was good to revisit this - and they don't have a problem with that. They enjoyed it so much they were able to do it a second time, and it was good too because they had their original bike in front of them so they were actually rebuilding the exact replica. And that's a good skill in itself …

And you can replay them [the simile examples] *again and that's a good feature. That the kids can go back and revisit them again if they just want to reinforce that.*

we revisited that [the structured writing sample] *probably two or three times before we moved on because they weren't just quite sure - being a slower group*

(Chris, Year 5/6 teacher, Dream machine

3.5 Print options

The print options available at strategic points in the learning objects were used for classroom display, motivation to others, record of learning and as a basis for class discussion.

4. Digital content used in flexible ways to support learning.

Teachers used the learning objects in quite different ways to support a range of pedagogical purposes. The use of the content effectively supported individual, small group and whole class approaches and allowed for different simultaneous learning tasks – online and offline - and in rotation for small group work.

- teachers first demonstrated the task to the whole class using a digital project before students worked on the computers individually or in pairs

- in one class a teacher used an Interactive whiteboard for demonstration, then students in turn showed and discussed their different pathways through the learning objects with the whole class

  I had three children come out to complete them and it was really interesting that each child that had completed it had worked it out in a different way.

  … And it was the discussion, there was a buzz in the room - it was just exciting

  (Nella, Prep teacher, Musical number patterns)

- students worked through the learning objects individually, or in small groups of 2 or 3 at one computer as part of a sequence of other learning tasks

  With my prep grade I use Food chains the farm activities. I divided the children into 4 groups and the kids worked through a range of activities that catered for a variety of learning styles, one of which was the learning object. The other activities were a match game on the floor where the kids turned over the cards and matched the pictures. There was another one outside in our corridor where the students worked together to create a food chain using puppets and other props. And the third activity was a cut-and-paste activity on a table.

  (Cara, Prep teacher, Food chains)

- introduced to a small literacy group first with teacher and Koorie educator support; this group then showed another literacy group, who in turn showed another until all students had completed the learning object and associated tasks.

  I started with a small literacy group working together as a group to build a machine. There was great high interest especially with the vocabulary being spacy and futuristic. It led into writing passages of work on using similes - we did a lot of work as a group on similes, and we used the similes from the program to create a passage that described these bikes using similes, and to enhance their writing of written sentences, like improving their descriptive writing …

  I got the students from this literacy group to show the next literacy group how to access the program and what it was doing. They read their descriptive writing to the class and showed them - of course with the pictures being very exciting, it got the other students ready and dying to have a go themselves. And then they in turn showed another group and eventually all the groups have been through the program, having to go from our struggling writers to our extended writers. (Chris, Grade 6 Teacher, Dream machine)

- As a culminating activity for a topic, including providing opportunities for cooperative work, discussion and reflection on learning.

> *It was sort of the end product. We did a lot of work coming up to it, teaching the strategies of using Wishball, of looking at the tens, the hundreds, the thousands, breaking down whole numbers. So there were a lot of activities on that before we actually got to Wishball because that goes up to the number of thousands.*
> *… A lot of hands-on, a lot of modelling, using the overhead projector so it had the activity and went through it with the kids and modelled it. It prompted a lot of strategies that way so the kids were able to have a class discussion and share their strategies on how to play Wishball. A lot of small group work.*

- Discipline-focussed discussion in small and whole class situations

So they had learnt different strategies on how to go about solving their problem and we were able to talk about, 'Well, were they right - who was right, who was wrong,' and things like that. The discussion that they were having was really wonderful …

(Nella, Prep teacher Musical number patterns)

You wouldn't find that sort of activity around the old sheet work. With this it dictates, it enables three or four kids to sit around the computer terminal and discuss their strategies and how they might best tackle it, and then do it, and celebrate if they're correct.

And they need to work together, don't they, whereas with a sheet they can do that independently. Whereas with the computer task they do complete it more successfully. They need to work together.

if I had just done that [sheet work] *without the learning object, we probably wouldn't have had the language and the talk.*

(from the roundtable discussion)

- Students individually did the learning object (Bridge builder) and completed a worksheet designed to complement the activities in the object.

5. Digital content works best when integrated into well planned lessons focussed on specific learning outcomes and used together with a range of other online and offline activities

Units of work and descriptions of classroom practice for: Wishball, Dream machine, Food chains, Musical number patterns and Bridge builder are in progress.

The units reflect the importance of structuring learning – the need to sequence activities and to judiciously mix instruction, activity, feedback and fun while moving students through experiential learning to explicit learning.

6. The student voice

All students, Indigenous and non-Indigenous were enthusiastic about using learning objects. As other studies report, students like them because they get to use the computer, the objects are fun, easy to use and they help them to learn.

I liked it because it is very fun. I like the program because it was colourful, easy to use and easy to understand. if I made a mistake I can do it again

It was good because it was fun and I like it really I did because it helped to do numbers.

It teaches you different ways to do things.

It was good fun because I could count by 11's

We think it's a great idea to learn and practice on the computer. We like using the computers because we don't have one at home.

We loved using this activity. We liked the way it got harder and made us think about what we have learnt and use that to continue through the higher levels. We created 9 different food chains. We want to do it again!

It was great fun and we learnt heaps about different animals and what they get their energy from.

Yes it is good because of it helps me work with graphs. And for people who are not that quick with work it is good because you can go your own speed.

7. Advice for successful teacher use

Teachers involved in this trial stressed that

- successful use of digital content is predicated on thoroughly understanding the affordances of the learning objects and the series to which they belong

- embedding the content carefully into a learning sequence rather than as a stand alone context-free reward

First of all, make sure that they've viewed the entire object and gone through the whole object themselves, and even be prepared to make mistakes to see what the program does if the children make an error, so that they're aware of what happens - that's a very important point.

… That it's not a stand-alone object. That you could do a lot of pre-work, three or four sessions before you actually get to use the object, or you could use the object to introduce a topic, that leads into other activities, that you just don't go, 'OK. Right. I'm going to do the Food Chain. Here you are kids! Off you go, do the Food Chain!'

8. Support for development of ICTs and Victorian Essential Learning Standards (VELS)

Learning objects provide a context for teachers and students to develop their ICT skills. Students, even young Preps, with minimum instruction learnt quickly to navigate file paths to the content, had no difficulty following instructions, successfully manipulated multiple documents and printed output to the appropriate printer. Even teachers with ICT backgrounds suggest that learning objects take the value of using computers to a new level.

The Department of Education and Training recognises the importance of ICT digital curriculum content to support whole school transformation. The introduction of VELs in 2005 addresses the changes associated with the development of a global knowledge based world and the importance of ICT in the development of our students as 21st century learners.

Digital learning resources play a central role in integrating ICT into the curriculum, developing innovative practices and transforming the way students learn.

Conclusion

This trial provides evidence that the use of TLF digital content is clearly engaging, motivating and supportive of learning for both Indigenous and non–Indigenous students. In addition, both classroom teachers and the Koorie educators who work closely with the Indigenous students report that some Indigenous students had a qualitatively different learning experience using the digital content. This was due not only to the characteristics of the digital content itself, but also to the supportive and complementary pedagogical approaches teachers adopted in using the content. Interactive multimedia curriculum resources, built on sound instructional design and pedagogical principles and that are well integrated into day-to-day teaching and learning practices have the potential to cross over cross cultural boundaries and support learning for all.

Notes

Several trials and reports provide early evidence that TLF digital content is engaging and motivating for students and supportive of their learning. All reports are available on The Learning Federation website: www.thelearningfederation.edu.au.

Freebody P. 2006 Early-stage use of The Le@rning Federation's learning objects in schools Results of a field review. January 2006

Freebody P. 2005. Does the use of online curriculum content enhance motivation, engagement and learning? The Le@rning Federation trial review

Clarke, O and Gronn. D 2004. Learning by design:TLF Mathematics and numeracy learning objects in classroom contexts in the Catholic Archdiocese of Melbourne.

Chapuis, L. 2003. Report on a Pedagogical Trial of Learning Objects in ACT Schools