Strategies to address issues related to the reliability and sustainability of virtual worlds for learning

The following table summarises a range of issues related to the reliability and sustainability of using virtual worlds for leaning and proposes some strategies to address them. These issues and strategies were identified by teachers and students in this trial as well as other educators nationally and internationally who contributed to the project either directly through the online wiki or indirectly through professional learning networks.

Issue	Possible strategies
1. Assessing students in a virtual world What can be assessed? How can evidence be recorded? What happens when students go off-task?	• Be clear about learning purposes and desired outcomes. • Consider the many ways of capturing evidence of learning processes and performances of understanding in virtual worlds. • Facilitate students to capture evidence and reflect on learning. • Be prepared to acknowledge students who gain understanding, knowledge and skills in areas not directly related to your identified learning outcomes. • Allow students to learn and reflect through play.
2. Inadequate bandwidth Can online virtual worlds be used when inadequate bandwidth compromises user experience?	• Design learning activities to suit available bandwidth. • Use existing viewer tools to improve quality and performance. • Consider implementing a local (inside firewall) instance of OpenSim (with possible Hypergid access to external virtual worlds). • Consider desktop or USB instances of OpenSim for building and design tasks not requiring multi-user access.
3. Costs Access to virtual worlds is expensive.	• Choose cheap options that allow for later expansion and shop around. Consider open source solutions such as OpenSim. • Where possible collaborate with other educational institutions and share access to virtual worlds and educational resources. • Join a community of Australian educational institutions using virtual worlds.

4. Firewall restrictions It's too hard to organise access through local firewalls. Voice won't work through the firewall.	▪ Allow several months to resolve access issues at an institution. ▪ Consider alternative network access or local installs of OpenSim (including OpenSim on a USB memory stick). ▪ If voice is required consider using Skype, both for in-world communication and to support remote training. ▪ Consider arranging sessions for when students are at home and can use voice if they have adequate access.
5. Getting started It takes too much preparation to start something so different.	• Consider starting slowly and learning with students. • Use the extensive range of existing help documentation and videos found online. • Identify and encourage students who can help others as early as possible. • Encourage students to source or produce their own help documentation. • Consider producing quick 'how to' sreen captures customised for local needs. • Join a learning network with other educators using virtual worlds. • Allow time for play within a structured learning plan.
6. Hardware and hosting Organising hosting of virtual worlds is a difficult task. Which options exist to implement virtual worlds?	• Start by exploring existing virtual worlds and using 'sandboxes'. • Establish a presence by renting a region in an existing virtual world. • Establish a team with strong ICT support before considering hosting own virtual world. • Consult educator communities in virtual worlds when looking for a hosting solution that meets needs for privacy, reliability, price and performance. • Consider implementing a range of complementary services at your institution including using open source software. For example existing virtual worlds, standalone installations, USB memory stick installations, local network, hosted OpenSim providers.
7. Hypergrids What is a hypergrid and should we use it?	▪ Consider linking individual virtual worlds through hypergrid technology.

8. Pedagogy Which learning and teaching approaches suit virtual worlds?	▪ When considering which teachers to invite to use virtual worlds look for complementary learning and teaching approaches such as collaborative learning, student-directed learning, problem-based learning, project-based learning or enterprise-based learning.
9. Acceptable Use Policy What new policies are required for students and teachers using virtual worlds?	• Consider the possibility that existing ICT Acceptable Use Policy (and behaviour management policy) may be sufficient. • Induction sessions for staff and students are highly recommended - as are information sessions for parents of younger students. • Consider producing information sheets that address frequently asked questions.
10. Software – Viewer Choice Which virtual world viewer will meet our needs?	• Consider using the Impudence Viewer if you are planning to use virtual worlds other than Second Life. • Consider manually changing graphics settings to suit computer specifications and bandwidth.
11. Transferability – Importing/Exporting Can objects and learning environments be moved from one virtual world to another? Can objects and learning environments be moved shared? Is there a way to backup work?	• Consider the possibility of moving owner created objects from one virtual world to another, including standalone/USB based installations. • Consider the possibility of moving region terrains, objects and scripts (OAR files) from one virtual world server to another. • Consider the possibility of moving inventory (IAR files) from one virtual world server to another. • Consider using software designed to backup owner created inventory items (and transfer to another virtual world). • Look for existing virtual world objects, IAR and OAR files that may meet your learning and teaching needs. • Consider collaboration with other educators/institutions to share virtual world learning environments and resources.
12. Volatility Virtual worlds are changing too quickly to invest time in learning, preparing learning resources and implementing virtual learning environments.	• Build skills in whatever virtual world meets your needs now because much of the knowledge and skills gained will be transferrable to other and newer immersive environments. • Join communities of educators using virtual worlds to keep an eye on trends.