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1. 3D Online Education initiative

1.1 Introduction

The purpose of the 3D Online Education guidelines (‘the guidelines’) is to provide an overview of the 3D Online Education initiative. The guidelines outline the initiative’s objectives, key outputs, implementation timelines, total funding that is available, the governance arrangements and reporting and evaluation requirements to assist the funding recipient in delivering the initiative.

The 3D Online Education initiative will demonstrate innovative uses of high-speed broadband and digital technologies in the delivery of learning, particularly in science, technology, engineering and mathematics (STEM) subjects, using 3D technologies. In the process, it will help to create new alliances between the Commonwealth Scientific and Industrial Research Organisation (the CSIRO), commercial partners and educational institutions to facilitate the more rapid take-up of broadband enabled 3D learning initiatives across Australia.

The rollout of Australia’s high-speed broadband infrastructure offers an opportunity to revolutionise the way in which services are being delivered in these priority areas. With regards to the 3D Online Education initiative, this project will be underpinned by the rapid development of tele-immersion and tele-presence technologies to deliver interactive digital education and content.

Incorporating 3D experiences into online and classroom learning has the potential to significantly enhance the effectiveness of education. A 2010 study of the use of 3D teaching and learning conducted by four Boulder Valley schools in Colorado found that 3D technology stimulated high student interest in, sustained focus on and solid retention of learning content.1

The outcomes of the initiative will be delivered in collaboration with the Australian online education industry to enhance the depth and breadth of its education products. Students and teachers will be able to use a variety of contemporary internet-enabled devices such as laptops and tablets to take part in virtual education experiences, utilising such enhanced products, to complement the teaching and learning experience.

The goal is to bring 3D immersive learning into the classroom and home and provide an interactive learning experience, enhancing education through the use of technology. The outcomes of this project will be used as a basis for expanding the use of 3D learning techniques in education more generally.

1.2 Outline of the 3D Online Education initiative

1.2.1 Summary of initiative

The 3D Online Education initiative will leverage high-speed broadband to transform how and where education services are delivered and enhance the learning experience of students. It will provide an immersive learning experience to students across Australia.

The use of 3D technologies will provide a fun, supportive and effective online simulated environment where students of targeted ages and abilities in different geographic locations can come together to interact and learn.

It is expected that the initiative will provide:

- an interactive 3D virtual learning environment that allows students in different locations to come together to interact with real life objects
- an environment for the delivery of science, technology, engineering and mathematics (STEM) Australian Curriculum subjects to Year 7 to 9 students
- a flexible, rich, live, interactive education environment for students and teachers, where they are able to see each other and the virtual structure.

### 1.2.2 Initiative description

The initiative will be led by the CSIRO in close collaboration with commercial partners including education software companies, education content experts, Internet service providers and local education authorities. The CSIRO will develop key technologies for the new environment and enter into contractual arrangements with:

- an education content expert for the development of Australian Curriculum content
- an education software company for the development of a deployment solution for the 3D virtual environment.

Information on the contractual arrangements and role and responsibilities of partners will be detailed in a comprehensive project Implementation Plan to be submitted as the first milestone deliverable after the funding agreement has been executed. The Department of Broadband, Communications and the Digital Economy will provide the CSIRO with a template for the Implementation Plan.

The initiative will use high-speed broadband to demonstrate an innovative approach to the delivery of classroom and online education services. Students and teachers will participate in these virtual education experiences using contemporary internet-enabled devices to enhance and complement the teaching and learning experience.

The CSIRO will use mobile 3D mapping technology that they have pioneered to create a virtual environment with recreations of real world artefacts to provide familiarity and relevance. This technology has been extensively field tested by the CSIRO. Learning modules tailored to enhance STEM skills will be created using Australian Curriculum content. Students and teachers located anywhere in Australia and throughout the world will participate in the virtual environment using avatars to interact and collaborate on problem solving.

For example, a small group of students might work collaboratively to carry out the mathematical calculations associated with successfully traversing the trapeze in a virtual circus tent. Students could then be tested before receiving feedback and engaging in more complex learning modules.

The bandwidth required to stream the proposed interactive 3D learning environment to students, teachers and educators is extremely high. To ensure real-time interaction, the use of a high performance broadband network with minimal delay is critical to performance.
1.2.2.1 Year 1

In the first year of the initiative, the CSIRO will:

- develop a prototype interactive 3D learning environment and capture real world images and objects that will be incorporated into the virtual environment as high-definition 3D-rendered graphics. At least three real world objects will be mapped into the virtual environments for use within the online learning modules.
- work with the education content expert partner to develop Australian Curriculum content for learning modules on science and engineering subjects tailored for an early secondary school student audience (Year 7 to 9).
- work with the education software partner on a deployment solution for the 3D learning environment.
- identify and negotiate with at least three high-speed broadband-connected schools to participate in testing and feedback before the learning modules are refined.

Full details of Year 1 deliverables, criteria for successful delivery, names and location of participating schools, and the number of participating students and teachers will be included in the Implementation Plan.

1.2.2.2 Year 2

In the second year, it is expected that the CSIRO and partners will:

- develop new virtual environments and learning content for additional STEM subjects. This will focus on enhancing live interaction among students and teachers within the environments.
- deploy the initiative to more high-speed broadband-connected schools and to students in high-speed broadband-connected homes.
- develop a business model to sustain the initiative beyond the period of Australian Government funding.
- upscale the initiative to ensure future commercial success.

Full details of Year 2 deliverables, criteria for successful delivery, names and location of participating schools, and the number of participating students and teachers will be included in the Implementation Plan.

1.3 Funding recipient

The 3D Online Education initiative will be delivered by the CSIRO as the funding recipient, in collaboration with commercial partners.

The CSIRO has been selected because of the highly specialised nature of the technologies involved in the initiative and the organisation’s ability to bring additional resources and funding to the project, including from commercial collaborators. The aim is to seek cash and/or in-kind support for the Government’s $2.5 million (GST exclusive) contribution, subject to final commercial arrangements negotiated by the CSIRO.
The CSIRO is Australia’s leading science organisation and is well placed to develop and implement a 3D Online Education platform. The CSIRO has an existing world-class 3D acquisition system and a 360-degree immersive viewer, which supports the acquisition of real world environments in both scene and structure, for incorporation into 3D immersed learning modules. The CSIRO also has an enormous reach across urban and regional Australia and extensive connections with schools and academia.

In addition, the CSIRO has the existing expertise, capability and resources to deliver the desired outcomes, cost effectively and in the required timeframes, and to maximise the contributions of partner organisations.

1.4 Objectives

The objectives of the 3D Online Education initiative are to:

• demonstrate an innovative approach to high-speed broadband-delivered online education services
• increase engagement amongst school students in the STEM subjects
• provide an engaging, supported and effective online 3D learning environment for students and citizens
• establish the collaborative relationships with schools and commercial partners that will enable this initiative to become self-sustaining at the conclusion of the Government funding.

1.5 Outputs and activities

In achieving these objectives, it is expected the CSIRO will work closely with education software companies, education content experts, internet service providers and local education authorities. The activities and outputs to be achieved are to include, but are not limited to, the development and deployment of:

• 3D virtual learning environments that incorporate real world images and objects and take full advantage of the capability of Australia’s high-speed broadband infrastructure investment
• learning modules for the virtual environments that are built on Australian Curriculum content for STEM subjects.

Full details of outputs and activities will be included in the Implementation Plan.

1.6 Commencement and duration

The Government will provide funding over two years (commencing in 2013–14 financial year and concluding 30 June 2015) to run the initiative.

It is expected that delivery of the 3D Online Education initiative will commence on the signing of the funding agreement with the Government.
1.7 Right to vary the guidelines

The Department reserves the right to vary these guidelines, including without limitation, in light of changes to government policy. The Department will notify of any changes to these guidelines. There is no binding agreement on any party until a funding agreement is agreed and signed by the Departmental delegate and the CSIRO’s authorised representative.

1.8 Timeline of key events

The following implementation timelines are proposed:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late July 2013</td>
<td>Execution of the funding deed</td>
</tr>
<tr>
<td>Late July 2013</td>
<td>CSIRO expression of interest tender process completed</td>
</tr>
<tr>
<td>Early August 2013</td>
<td>Initiative commencement</td>
</tr>
<tr>
<td>Early August 2013</td>
<td>Conceptual mock-up to be available for demonstration/presentation if required</td>
</tr>
<tr>
<td>August 2013</td>
<td>Contracts with major commercial partner(s) signed</td>
</tr>
<tr>
<td></td>
<td>Initial schools for trials identified</td>
</tr>
<tr>
<td>September 2013</td>
<td>Implementation Plan completed</td>
</tr>
<tr>
<td>February 2014</td>
<td>Initial design of interface completed</td>
</tr>
<tr>
<td>March 2014</td>
<td>Initial field installation and data collection completed</td>
</tr>
<tr>
<td>June 2014</td>
<td>New modules completed and initial testing underway with school students</td>
</tr>
<tr>
<td>December 2014</td>
<td>Completion of new additional modules</td>
</tr>
<tr>
<td>March 2015</td>
<td>Final release of 3D modules to schools</td>
</tr>
<tr>
<td>Second calendar quarter 2015</td>
<td>Review and evaluation</td>
</tr>
<tr>
<td>June 2015</td>
<td>Completion and provision of final report</td>
</tr>
</tbody>
</table>

1.9 Authority

Legislative authority for the program was provided through the Executive Council on 11 July 2013.

Targeted grant funding will be provided to the CSIRO. Payments will be made based on the achievement of milestones under a grant funding agreement to be agreed with the CSIRO. The Minister for Broadband, Communications and the Digital Economy will approve the spending associated with the program. The grant funding agreement will be executed on behalf of the Government and payments under the agreement will be administered by the Department.
Payments for the 3D Online Education initiative will be made as part of Program 1.2 Digital Economy and Postal Services of the Department of Broadband Communications and the Digital Economy as described in the Department’s Portfolio Budget Statements 2013-14, Budget Related Paper No. 1.3 at page 28.

2. Funding

2.1 Australian Government funding

The Government will provide total funding of up to $2.5 million (GST exclusive) over two years as a grant (consistent with the Commonwealth Grant Guidelines) to develop and implement the 3D Online Education initiative. It is not intended that the Government will fully fund the initiative and it is expected that the CSIRO and its commercial partners will provide cash and/or in-kind contributions.

The Government funding provided must only be used to facilitate activities that are considered consistent with the purpose and intent of this initiative. The use of funding for purchasing assets, international travel and leasing activities is not permitted.

The Government requires, through provision of this funding, cash and/or in-kind contributions from the CSIRO and its partners. These contributions will include, but are not limited to staff, property, equipment, travel, access to infrastructure, services, personnel time, project management, expertise and professional advice.

The total Government cash contribution is set out below (GST exclusive) and will be paid on the successful completion of milestones as set out in the funding agreement.

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>2013/14 ($m)</th>
<th>2014/15 ($m)</th>
<th>total ($m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administered funding</td>
<td>$0.405m 1</td>
<td>$0.9m 3</td>
<td>$2.5m</td>
</tr>
<tr>
<td></td>
<td>$0.945m 2</td>
<td>$0.25m 4</td>
<td></td>
</tr>
</tbody>
</table>


A budget for the initiative is to be agreed and included in the funding agreement.

2.2 Funding recipient and partners

The 3D Online Education initiative will be delivered by the CSIRO (as the funding recipient) with the support of commercial partners, which may include education software companies, internet service providers and local education authorities.

The CSIRO will be expected to liaise, negotiate and enter into agreements with commercial partners to record the respective obligations and liabilities of the parties, including the means by which the commercial partners agree to support the CSIRO and the distribution of the Government funding by the CSIRO.
The CSIRO will be required to provide the Government with a financial plan detailing how and to what degree cash and/or in-kind contributions from themself and their partners will be achieved over the activity period, including signed letters/agreements from their partners outlining their commitments to and support of the initiative. The CSIRO will also be required to provide a methodology for valuing in-kind contributions.

A standard form template for a funding agreement is provided at Attachment A.

### 2.3 Funding agreement with the Australian Government

A condition of funding is the execution of a legally binding funding agreement with the Government, as represented by the Department.

Funds will not be provided unless this agreement has been finalised and activities under the agreement have commenced. The agreement will include specific performance milestones, the payment schedule, reporting and auditing requirements. The Government does not make payment for any work undertaken before the signing of the agreement with the CSIRO.

Any variation to the funding agreement must be submitted in writing and agreed to by both the Government and the funding recipient.

### 2.4 Financial records

It is a requirement that all financial activity relating to the 3D Online Education initiative must be accurately recorded and that a robust records management process must be maintained throughout the duration of the program.

The CSIRO will be required to provide the Department with well-documented evidence that all funding received for the program (including both Government funding and partner contributions) has been properly expended in alignment with the initiative’s activities. The documentation required will include an income and expenditure statements asset register (when appropriate), regular auditing of accounts associated with the delivery of the 3D Online Education initiative and records in accordance with Australian Auditing Standards.

Failure to comply with the reporting requirements could result in the Government withholding program funds or termination of the funding agreement.

### 2.5 Taxation obligations

Government funding for the initiative will attract the Goods and Services Tax (GST). The Government will compensate for the level of GST in making contribution payments.
The grant will also be considered income and in most cases will be subject to income tax. It is recommended that the grant recipient seek professional advice on their tax obligations.

2.6 Accounting for funds

The funding agreement will set out the conditions under which the Government will make payments. At a minimum, the CSIRO must set up a separate 3D Online Education specific project account to keep record of the expenditure and income associated with any 3D Online Education initiative activity.

The details of account keeping processes and the treatment of any interest earned on funds provided as part of the 3D Online Education activity will be subject to the final funding agreement. Any unspent funds must be returned to the Department.

3. Governance and operational arrangements

3.1 Governance

It is expected that a steering committee led by the CSIRO and supported by commercial partners, will support the roll out of the 3D Online Education initiative. This steering committee should allow for inclusion of a departmental representative nominated by the Department.

3.2 Roles and responsibilities

The Department will be responsible for the administration of the initiative and the associated funding agreement. The Department will not take a direct day-to-day management role of the 3D Online Education activities. The Department will monitor the implementation of the initiative to ensure that the CSIRO meets the Government's objectives and accountability standards, as specified in the funding agreement.

The CSIRO will implement the 3D Online Education initiative in accordance with the funding agreement that will be signed with the Department. The CSIRO will be responsible for working with commercial partners and industry in a fair and inclusive manner in order to foster and maintain the partnership over the life of the initiative.

The steering committee will be responsible for the oversight of the initiative to ensure that relevant stakeholders are engaged.
3.3 Activity Plan, milestones and key performance indicators

The CSIRO on behalf of its partners must provide the Department with the following:

- an Implementation Plan for the initiative detailing milestones and key performance indicators (including metrics and targets). The Implementation Plan will need to be robust and achievable and address management arrangements, implementation issues, and deployment timeframes and risk management measures

- a communication plan and stakeholder engagement strategy promoting the objectives, outcomes and benefits of the initiative. The plan should also outline the strategies for achieving alignment of policy priorities and interest, and collaboration and commitment across the partnership

- a financial plan for each year detailing cash and in-kind contributions targets and how those will be achieved from commercial partners over the activity period. The financial plan should also include a detailed breakdown of costs, including major expenditure categories such as staffing, equipment and specific infrastructure, travel, administration, communications, and demonstrate value for money expected to be achieved by the proposed plan.

The Department will only make payments to the funding recipient in accordance with the payment milestones specified in the funding agreement.

A list of key performance indicators is included in Attachment B.

3.4 Publicity and media events

Under the funding agreement any publicity material, including online material relating to the initiative, will be required to acknowledge clearly and prominently the Government’s funding support. It is also a requirement that Government representatives be invited to participate in publicity and media events.

3.5 Intellectual property rights

The CSIRO agrees that the intellectual property rights contained in any written report to the Department become the property of the Department at the time of submission. The CSIRO also agrees that the Department may make further copies of the reports, and use the reports for the purpose of auditing requirements, complying with governmental and parliamentary reporting requirements and responding to requests for information by a House or a Committee of the Parliament of the Commonwealth of Australia.

With the exception of the written reports, it is not the intention of the Government to take ownership of any intellectual property developed as part of the initiative. However, it is a condition of funding that the CSIRO will be required to provide the Government with a licence to use the intellectual property. Arrangements relating to intellectual property will be provided for in the funding agreement.
3.6  Probity

The Department is committed to ensuring that the process for delivering the initiative is fair and in accordance with published guidelines.

The Government also needs to meet relevant public accountability criteria for its investment, in particular:

- the *Financial Management and Accountability Act 1997 (Cth)* and *Financial Management and Accountability Regulations 1997*, which require the proper use of Government resources (where proper means the efficient, effective, ethical and economical use of funds that is not in contradiction to Government policies)
- the Commonwealth Grant Guidelines, which establish a range of probity and reporting requirements, including that the administration of the grant achieves efficient, effective and ethical use of government funds and is designed to achieve value for money.

3.7  Conflict of interest

It is the responsibility of the CSIRO to ensure that there is no conflict of interest that exists or is likely to arise in the delivery of the 3D Online Education initiative.

If during the delivery of the 3D Online Education initiative, a conflict of interest arises, the CSIRO must immediately notify the Department of the conflict and provide full disclosure of the issue. The CSIRO and the Department will then decide on the best course of action to resolve the conflict.

3.8  Fraud

The Department is committed to the Commonwealth Fraud Control Guidelines. The CSIRO should familiarise themselves with the Department’s Fraud Control Policy Statement (which can be provided upon request). This will underpin their respective fraud and risk minimisation responsibilities when dealing with the Department.

Giving false or misleading information is a serious offence under the *Criminal Code Act 1995 (Cth).*

3.9  Compliance with laws

Applicants must comply with all applicable Government, state and territory laws, including without limitation, the following Commonwealth laws:

- *Equal Opportunity for Women in the Workplace Act 1999*
- *Racial Discrimination Act 1975*
- *Sex Discrimination Act 1984*
- *Disability Discrimination Act 1992*
- *Crimes Act 1914*
Personnel involved in delivering the 3D Online Education initiative must satisfy a police record check and a working with children check and maintain their eligibility to work with children throughout the activity period, as applicable in their state or territory.

The CSIRO will be required to provide evidence of police record checks and working with children certificates undertaken for all relevant personnel no later than 60 days after entering into a funding agreement, and will be required to undertake checks for new personnel. The Department will not provide legal advice on matters of compliance. All parties should seek their own independent professional advice on legal matters including compliance with any statutory obligations.

3.10 Confidentiality

The Department or the CSIRO will not use or disclose any confidential information without the prior written consent.

The Department’s obligation to keep an organisation’s information confidential will not be breached if:

- that disclosure is required by law
- that disclosure is by the Department to the responsible Minister
- that disclosure is required to meet the Department’s or the Minister’s reporting or accountability requirements as required by relevant legislation (including the Financial Management and Accountability Act 1997 (Cth) (FMA Act) and the Freedom of Information Act 1982 (Cth) (FOI Act)), the Australian National Audit Office or any other auditor, the Parliament of the Commonwealth of Australia and its committees, and the Commonwealth Ombudsman
- the information is, or becomes public knowledge, other than by breach of confidentiality by the Government or other unlawful means by the Government
- disclosure is to any of the Government’s officers, employees, contractors, consultants, advisers or agents and, if the information is confidential, those persons are under an obligation of confidentiality
- is disclosed in accordance with the terms of a funding agreement between the applicant and the Commonwealth of Australia and/or
- that disclosure is by the Department in response to a request by a House or a Committee of the Parliament of the Commonwealth of Australia.
4. Reporting and evaluation

4.1 Reporting requirements and payments

In order to achieve an appropriate level of accountability for the use of public funds while avoiding excessive compliance burdens, under the terms of the funding agreement, the CSIRO will be required to provide various reports to the Department including:

- six progress reports, which demonstrate progress against milestones and all key performance indicators for a given reporting period. Grant payments are based on satisfactory performance in meeting agreed milestones over the reporting period and expenditure of grant funding previously received
- audited financial reports in relation to income, financial position and cash for a given reporting period
- a final report describing the activities undertaken to achieve all agreed milestones and evaluating the outcomes of the initiative
- other reports as required by the Department.

All payments will be made to the CSIRO, not to individual commercial partners. The timing of Government payments will be determined in negotiating the funding agreement, but will be consistent with the annual allocations specified in Section 2 of these guidelines. Progressive payments will be made based on successful completion of agreed milestones as outlined in the funding agreement, and the funding recipient having submitted satisfactory reports of performance against those milestones and actual expenditure of grant money received.

4.2 Performance monitoring and evaluation

There will be ongoing monitoring and auditing by the Government to ensure compliance with the milestones and other conditions outlined in the funding agreement.

The CSIRO should be aware of the provision of Part 8 of the *Financial Management and Accountability Act 1997*, which provides the Auditor General or an authorised person with the right to have, at all reasonable times, access to information, documents and records.

A final evaluation will be conducted in 2015 to evaluate and determine the success of the initiative in meeting the Government's objectives. It is a condition of funding that the CSIRO agrees to participate in the final evaluation and any interim reviews. The CSIRO will be required to keep adequate records in order to participate in the evaluation. The CSIRO will provide an evaluation plan, including detailed metrics, as part of the Implementation Plan.

4.3 Acquittal

At the completion of the 3D Online Education initiative, the CSIRO will be required to provide the Department with an audited acquittal of funds. This will include a signed declaration of financial
acquittal, confirming that all funds were fully expended for the purposes of the initiative. Any unspent funds must be returned to the Department.

5. Additional information

5.1 Disclaimer

The Department and its officers, employees, agents and advisors:

- are not, and will not be, responsible or liable for the accuracy or completeness of any information in or provided in connection with these guidelines and other relevant documentation
- make no express or implied representation or warranty that any statement as to future matters will prove correct
- disclaim any and all liability arising from any information provided to stakeholders, including, without limitation, errors in, or omissions contained in, that information
- except so far as liability under any statute cannot be excluded, accept no responsibility arising in any way from errors or omissions contained in any information in the guidelines and documentation
- accept no liability for any loss or damage suffered by any person as a result of that person, or any other person, placing reliance on the contents of the guidelines or any other information provided by the Department.

5.2 Contact details

For further information on the 3D Online Education initiative visit www.dbcde.gov.au/all_funding_programs_and_support/digital_initiatives/3d_online_education or contact the Department of Broadband, Communications and the Digital Economy on (02) 6271 1719 or at nbndemonstrators@dbcde.gov.au
ATTACHMENT A

FUNDING AGREEMENT TEMPLATE

A standard form template for a funding agreement is available on request.
## ATTACHMENT B

### Objectives

Demonstrate an innovative approach to high-speed broadband-delivered online education services.

Increase engagement amongst school students in the STEM subjects.

Provide an engaging, supported and effective online 3D learning environment for students and citizens.

Establish the collaborative relationships with schools and commercial partners that will enable this initiative to become self-sustaining at the conclusion of the Commonwealth funding.

### Key outputs

**Key outputs**

Provide easily accessible, quality, 3D educational software programs to school students through commercial partner(s).

**KPIs**

- Number of “real world” environments /objects mapped / virtualized
- Number of developed 3D software modules and virtual services
- Uptake and adoption of these modules into 3rd party commercial products and services
- Number of participating school students (by school year and location)
- Degree to which the 3D software demonstrates the capabilities of Australia’s high-speed broadband infrastructure

Develop a sustainable business model for the self-funded continuation of the initiative beyond the Government funding period and for further development of the 3D educational software programs.

Deployment of a payment model for students and schools, which provides affordable access to interactive 3D applications on a sustainable basis

The education programs demonstrate the relevance of STEM for student, with a particular emphasis on the Australian Curriculum.

New training/learning materials available for students and teachers aligned with the Australian Curriculum

Students, teachers and educational institutions (primary, secondary and tertiary) contribute to the design and creation of the 3D learning environment