ANZAGG 3D Meeting Minutes

Wednesday 16 March 2022

# Roll call with self-introductions

Meeting chaired by Leona Holloway, Monash University

10 attendees from Monash University, SPEVI, SASVI, ACT Department of Education, NextSense, BLENNZ, NSW Department of Education, Victorian Department of Education, Mountain Lakes Public Library

# 2. Icebreaker – What have you been designing/printing in the last month?

Printed an animal and plant cell at double size and painted with acrylic paints. They will be distributed with accompanying tactile graphics.

Printed a duck from Thingiverse.

Recycled an old peg board and has 3D printed some soccer goals and pegs with different shapes to represent the position of players on a soccer field.

Designing an abacus, which will be cheaper to print than to purchase. A 13mm diameter 3D printed rod is strong enough. The 3D printed frame is being combined with wooden beads. It will be trialled today.

Printed a model of the Sydney Opera House from Thingiverse.

3D printed street crossings now available on Thingiverse at [www.thingiverse.com/leonah/collections/street-crossings](https://www.thingiverse.com/leonah/collections/street-crossings).

Monash Uni Inclusive Tech has a new maker space in Clayton with add-ons for the Ultimaker 3D printer, a formlabs resin printer, a CNC milling machine, a huge laser cutter and an embroidery machine (for use embroidering braille and tactile graphics).

# 3. Upcoming Events

## 3.1 Community Care Smart Assistive Technology Collaborative Webinar, 23 March

Sarah Hayman and Leona Holloway will present a webinar on the 3D printing linkage project for the Community Care Smart Assistive Technology Collaborative in Queensland.

## 3.2 CTEBVI Conference 7-9 April

Ka Li will present at the [CTEBVI online conference](http://www.ctevh.org/conference/) on the topic of accessible Lego instructions.

## 3.3 Access Elvis, Bendigo Art Gallery, 23 April & 20 May

The Monash Inclusive Tech team is supporting accessibility for the “[Elvis: Direct from Graceland](https://www.bendigoregion.com.au/bendigo-art-gallery/exhibitions/elvis-direct-from-graceland)” exhibition at the Bendigo Art Gallery. We will be sharing a range of multisensory materials at two exclusive sessions for people who are blind or have low vision on [Saturday 23 April](https://www.bendigoregion.com.au/bendigo-art-gallery/bag-events/access-elvis-tour-for-visitors-who-are-blind-or-have-low-vision-0)  from 9am to 10.30am and [Friday 20 May](https://www.bendigoregion.com.au/bendigo-art-gallery/bag-events/access-elvis-tour-for-visitors-who-are-blind-or-have-low-vision) from 5.30pm to 7pm. Bookings online. The main 3D materials will be a 3D printed model of Elvis’ first home in Tupelo and a hand-built model of Graceland. Other items will include Elvis dancing on a refreshable tactile display, braille badges, and interactive music activities.

ACTION: News of this event to be shared via SPEVI list and SVRC bulletin

## 3.4 Melbourne Knowledge Week, 11 May

Monash Inclusive Tech will be teaming up with the Australian Braille Authority and SVRC to present 3D printed materials for touch readers at [Melbourne Knowledge Week](https://mkw.melbourne.vic.gov.au/) with a “come and try” collection of our materials and a braille bombing event on Wednesday 11 May.

## 3.5 Round Table Conference, 16-18 May

The [Round Table Conference](https://printdisability.org/conference/2022-conference/) has lots of presentations relating to accessible graphics this year:

* Resources from braille and large print services – Kim Barber
* Inclusive gallery design – Erica Tandori and Matthew Butler, Monash University
* Laser cutting accessible material – Trent Betts, Vision Australia
* 3D printing for touch readers – Leona Holloway and Ruth Nagassa, Monash University
* Tactile Playgrounds – Dagmar Reinhardt, University of Sydney

# 4. Draft Guidelines

Published guidelines: <http://printdisability.org/about-us/accessible-graphics/3d-printing/>

## 4.1 Guidelines on other methods for producing 3D models

Now published at <https://printdisability.org/about-us/accessible-graphics/3d-printing/other-methods/> .

## 4.2 Design considerations when creating 3D models for touch readers

Design guidelines for 3D prints for touch readers is the last section to be completed. Has anyone has settled on standard or minimum thickness and spacing when designing their 3D prints?

* One member prints bases at 2.5 to 3mm thickness. They generally want the base to be as thin as possible while still being sturdy. In the case of the plant and animal cells, they had to make the base thicker so that the holes in the cell wall would be obvious by touch.
* Another member prints bases at 2.4mm high with 30% fill.
* suggested a 0.9mm bevel or fillet on corners to avoid any sharp points. It also helps to avoid an “elephant’s foot” (spreading) when printing). In OpenSCAD, you can use cylinders in corners to give rounded corners.
* A 0.3mm difference in size is recommended for pieces that need to fit together, however this may need to be adjusted depending on your printer.

# 5. Other Business

## 5.1 Survey of 3D printing adoption for producers and teachers

Leona is conducting a survey to gather ideas from producers making and teachers using 3D prints for education.

## 5.2 Tactile rulers

Visio have offered to send us some sample tactile rulers. Everyone is keen to try them as we are receiving lots of requests.

## 5.3 New research paper on tactile materials in education

Phutane, M., Wright, J., Castro, B. V., Shi, L., Stern, S., Lawson, H. M., & Azenkot, S. (2022). Tactile Materials in Practice: Understanding the Experiences of Teachers of the Visually Impaired. *TACCESS*. Available from <https://arxiv.org/abs/2202.12280>

* conducted semi-structured interviews with 21 TVIs and a diary study with eight
* By themselves, 3D models were ideal teaching material for students in elementary grades as they closely resembled the real world. According to teachers, many students explored 3D models to develop a conceptual understanding of the topic and build independent learning skills. When used with tactile graphics, 3D models highlighted salient elements of the graphic by adding a layer of depth, allowing students to process information much more easily, and resolving issues surround tactile graphic overload.
* 3D models were difficult to create, obtain, and modify. None of the interviewed TVIs had access to a 3D printer

## 5.4 What information needs to accompany a 3D print?

A member organisation is putting together a pack of 3D prints to send out to teachers and students. Have others done the same and if so, what sort of information do you include with the 3D models? Instructions for teachers? Lesson plans? Tactile graphics? Should accompanying information be written or audio?

One member said that when sharing 3D prints, they will refer to a written introductory description of the model and also have some extra facts on hand in case of questions, e.g. what is the scale, what are all of the features on the model, contextual information, etc. They may also have a print image with labels that she can refer to.

Another member has provided audio descriptions. Should the extra information be audio or written? It depends on the model.

Flowcode is an easy way of creating QR codes.

# 6. Next Meeting

20 April 2022