1. INTRODUCTION
The University of Edinburgh, acting through the Scottish Sensory Centre (SSC), based within the Moray House School of Education, has been collaborating with a team of 24 scientists, mathematicians, sign linguists and teachers since 2007 to create, define, catalogue and develop British Sign Language (BSL) signs for Science and Maths, to build an online resource for deaf people and their teachers, interpreters and communication support workers.

The Scottish Sensory Centre (SSC) is now seeking an expert technical partner to design and build an App for smartphone devices and tablet computers that will improve access for deaf students and their teachers/support staff to the STEM in BSL glossary.

The App development project will be split into two phases: Preliminary and Execution. The SSC would like to begin work on the Preliminary phase immediately upon awarding the contract. The Execution phase will follow quickly, with completion and launch in January 2017. Commitment to meet the SSC launch timeline is a critical component of project success.

1.1 Request for Proposal Process and Procedures

a. Process
The table below outlines the major activities and the procurement schedule. These dates are subject to change without notice.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Targeted Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue Request for Proposal (RFP)</td>
<td>29th April 2016</td>
</tr>
<tr>
<td>Response Due</td>
<td>20th May 2016</td>
</tr>
<tr>
<td>App developer selection</td>
<td>Last week of May 2016</td>
</tr>
<tr>
<td>Start work</td>
<td>Immediately</td>
</tr>
<tr>
<td>App launch</td>
<td>January 2017</td>
</tr>
</tbody>
</table>

b. Mandatory Requirements
This request for proposal includes both mandatory and desirable requirements. Proposals not meeting all the selection and award criteria will be rejected without further consideration.
c. **Proposal Preparation**
All proponents are asked to organise their proposals in the manner and order as shown below.

1. Introduction
2. Availability for Immediate Start
3. Commitment to Launch Date
4. Expertise and References
5. Proposed Services
6. Proposed Roles and Resource(s)
7. Sub-contracting arrangements (if any)
8. Financials
   a. Preliminary Phase
   b. Execution Phase
   c. Exclusions
   d. Conditions and Assumptions
   e. Warranties
9. Additional Information

Proponents are advised to limit their services proposal to 30 pages all inclusive. Proponents are welcome to submit additional supporting materials but are advised that only the 30 page proposal will be evaluated. Proposals should be provided in Word or pdf format (electronic).

Proponents are solely responsible for their own expenses in preparing, presenting or delivering a proposal.

The proposals shall be signed by an authorised official of the bidder’s organisation whose name and capacity shall be typed or printed below his/her signature.

d. **Presentations**
A selection of Proponents may be invited to provide a presentation of their proposed services in the form of a Q and A session on 2nd June 2016. Only Proponents invited to present will be offered this opportunity. Invitations will be issued the SSC and the time and date of the presentation will be determined mutually between the SSC and the Proponent. An agenda will be issued with the invitation.

2. **BACKGROUND**
Scottish Sensory Centre’s STEM in BSL Glossary
The Scottish Sensory Centre is funded by the Scottish Government and provides a programme of continuing professional development for teachers of deaf and visually impaired children, classroom assistants and mainstream teachers. Since 2004 the SSC has hosted the STEM in BSL Glossary, which has now over 1,400 technical terms and definitions in BSL online.
Figure 1: Scottish Sensory Centre’s BSL Glossary website
http://www.ssc.education.ed.ac.uk/BSL/list.html

The project has been supported by the following organisations:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Supporting Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DONG energy</td>
<td>Royal Academy of Engineering</td>
</tr>
<tr>
<td>Edinburgh Mathematical Society</td>
<td>Royal Observatory Edinburgh</td>
</tr>
<tr>
<td>Education Scotland</td>
<td>Science &amp; Technology Facilities Council</td>
</tr>
<tr>
<td>ESRI UK</td>
<td>Scottish Government</td>
</tr>
<tr>
<td>Institute of Physics and Engineering in Medicine</td>
<td>SQA</td>
</tr>
<tr>
<td>Institute of Physics</td>
<td>STEM Disability Committee</td>
</tr>
<tr>
<td>Lognostics</td>
<td>Strathclyde University Alumni Fund</td>
</tr>
<tr>
<td>London Mathematical Society</td>
<td>The Geological Society</td>
</tr>
<tr>
<td>Natural England</td>
<td>The Royal Society</td>
</tr>
<tr>
<td>NERC</td>
<td>VMSG</td>
</tr>
<tr>
<td>OMV</td>
<td></td>
</tr>
</tbody>
</table>

The STEM in BSL glossary contains BSL signs for different mathematical and scientific terms. Each entry provides a BSL sign in a video format (.mp4) for a mathematical or scientific term which in turn links to a
movie that explains the term in BSL, a definition, and another that provides an example of how the term can be used in BSL, within the context of a science discussion or experiment. Written English translations also accompany the BSL movies and often images too.

You can access to definition and example video clips (Figures 3 & 4) and related terms by clicking on these terms on the right side of the SIGN webpage (Figure 2).

**Figure 2:** Screenshot of SSC glossary website showing the sign for Magnetic Field in the Physics section. You can gain access via the QR code.

**Figure 3:** Screenshot of SSC glossary website showing the definition for Magnetic Field. English text is found below the definition video with an image.

**Figure 4:** Screenshot of SSC glossary website showing the example for Magnetic Field.
The Scottish Sensory Centre’s online BSL Science Glossary is an evolving resource; to date there are 1,400 signs for different scientific terms across Astronomy, Biology, Chemistry, Geography, Mathematics and Physics along with BSL video clips of definitions and experiments. Geography and Maths are the most recent subjects we have focused on. Identification of appropriate words and terms for development focused on school subject syllabuses from across the UK, textbooks and in-depth discussions with subject specialists. The following specific topics and subtopics are now in the Glossary:

**Table 3: Specific topics and subtopics in the Glossary**

<table>
<thead>
<tr>
<th>Topics</th>
<th>Sub-topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomy</td>
<td>deep sky objects, solar system, stars, star constellations, stargazing and other terms</td>
</tr>
<tr>
<td>Biology</td>
<td>adaptation; cells; ecosystems; genetics; humans and the environment; nervous and hormonal systems; photosynthesis and respiration; protein and enzymes; reproduction and inheritance; specialised and non-specialised cells; transport and exchange</td>
</tr>
<tr>
<td>Chemistry</td>
<td>acids and alkalis; reactions of acids; atoms, elements and the periodic table; how atoms combine; carbohydrates; chemical reactions; corrosion; fertiliser; fuels; hydrocarbons; making electricity; metals and non-metals; plastics; properties of substances; separation; solution and solubility; state of matter</td>
</tr>
<tr>
<td>Geography</td>
<td>geology; geographical information systems (GIS); glaciology; maps; rivers and weather</td>
</tr>
<tr>
<td>Maths</td>
<td>algebra; arithmetic; geometry and trigonometry; probability and statistics</td>
</tr>
<tr>
<td>Physics</td>
<td>electricity; electromagnetic spectrum; electronics; energy; force; health physics; heat; light and sight; measurement; movement; nuclear physics; radiation; sound and waves; telecommunications; telescopes and space physics</td>
</tr>
</tbody>
</table>

Sign developmental work is conducted by a working group consisting predominantly of contributors from within the Deaf community with expertise in science, maths - at degree or PhD level - teaching, deaf education and BSL linguistics. The participants discuss each scientific concept, including definitions, applications and contexts to establish how best to represent it in BSL. The new signs have been developed to be visually representative and to conform with the principles of BSL linguistics. We hope this will help the teacher or sign language interpreter to convey the term and the learner to understand the concept of a scientific term.

Individual terms were only approved once the group had reached an agreement and often these terms were refined or redrafted following further discussions both during and after the working sessions. Once agreed, approved terms are recorded along with clear definitions, explanations and useful materials e.g. photographs, film clips and diagrams.
The BSL Glossary team provides regular workshops at the SSC for teachers of deaf children, sign language interpreters and science teachers. Through public engagement events, the group has also brought the new signs to the wider Deaf community and engaged many in science education.

Sign languages globally have very different grammars and sets of possible handshapes. British Sign Language (BSL), for example, is different from American Sign Language (ASL) and Irish Sign Language (ISL) even though the wider community shares a spoken language, English. Although there are other sign language glossaries of technical terms, these are for different sign languages such as ASL. Our glossary is the one of the very few globally which contains definitions in sign, making it a unique resource for deaf young people to use to assist with their school studies.

We have good evidence from Google Analytics statistics that the STEM in BSL Glossary website is being regularly accessed by nearly 5,500 users per month on average. The demand peaks in the week and declines at the weekend and school holiday periods.

Positive feedback has been received from deaf students and professionals using the glossary. They say it is a useful resource not only for professionals, such as teachers of deaf children and sign language interpreters, but for deaf students too. However, we believe that more deaf students and teachers/support staff would use the Glossary more if they could find it more easily on their smartphone or tablet computer via an App. Teachers often tell us it is difficult to access the Internet in some schools, particularly when supporting deaf children in class or tutorial settings. Deaf young people have told us that the current website is quite unappealing and they would prefer the flexibility of using the glossary via their smartphone.
We want the App to be modern and appealing to young people and accessible by subtopic within a subject area and also can be used on any smartphone and tablet computers. We would like this App to cover Astronomy and Geography with a total of 580 video clips showing the signs, definitions and examples.

Table 4: Number of video clips of SIGN, DEFINITION and EXAMPLE per topic

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sign video clip</th>
<th>Definition video clip</th>
<th>Example video clip</th>
<th>Total video clips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomy</td>
<td>96</td>
<td>92</td>
<td>0</td>
<td>188</td>
</tr>
<tr>
<td>Geography</td>
<td>181</td>
<td>181</td>
<td>30</td>
<td>392</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>580</td>
</tr>
</tbody>
</table>

3. OBJECTIVES

a. Scope of Services
The Scottish Sensory Centre is seeking an expert technical partner to design and build an App for smartphone devices and tablet computers that will improve access for deaf students and their teachers/support staff to the glossary - specifically to the Astronomy and Geography glossaries. We will invite a group of young deaf people to work with the App developer and SSC team, particularly during the design and testing stages. Communication access will be provided via the SSC.

The project will be split into two phases: Preliminary and Execution.

Preliminary phase scope of work:
- Software architecture design
- Application wireframes
- Functional specifications
- Technical specifications
- Technical advisory services
- Plan for execution phase

Execution phase scope of work (to be finalised during Preliminary phase):
- Agile sprint-based technical build of App
- Unit testing
- Support for deployment and hosting
- Warranty period support
- Performance tuning and bug fixing

App Requirements
- We would like the App to be suitable for a range of smartphones devices/tablet computers and operating systems (iOS and Android). The version used should have the best possible up-take and be available to most people.
- We would like the App to be available from the App Store (iOS) and from Google Play (Android).
- We would like the App suitable for iOS platform to be available first.
- We would like the App to be modern and appealing to young people and adults with lots of visual images.
● Ability to display a Homepage showing two separate topics - Geography and Astronomy (visual images) - with symbols showing the links to “App information”, “How to use this App”, “Search”, “Help”, “FAQ” and “About Us” at the top or bottom of the homepage.

● On the “How to use this App” page, we would like to have English text along with BSL video clips explaining how to use the App.

● We would like to use the HD option for watching BSL video clips for better quality.

● For each main topic - Geography and Astronomy - we want to be able to gain access to the subtopics.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Subtopics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomy</td>
<td>deep sky objects, solar system, stars, star constellations, stargazing and other terms</td>
</tr>
<tr>
<td>Geography</td>
<td>geology; geographical information systems (GIS); glaciology; maps; rivers and weather</td>
</tr>
</tbody>
</table>

● We would like a visual navigation tool which will allow the user to zoom into images to gain access to the video clip showing the BSL sign for a specific term (for an example map -> zoom -> river -> fish) and a list of dictionary terms (for example: R - river, F- fish,...). We prefer to have the visual navigation page as the first choice. [http://www.ssc.education.ed.ac.uk/BSL/astronomy/solarsystemgraph.html](http://www.ssc.education.ed.ac.uk/BSL/astronomy/solarsystemgraph.html) - here is a good example - Interactive Solar System where you can click on a specific planet to take you to the video clip for the specific sign for this specific planet.

● We would like to be able to replay the BSL video clip.

● We would like to be able to have an option to go to the DEFINITION or EXAMPLE video clips after watching the SIGN video clip or return to specific TOPIC page or HOMEPAGE, or INDEX.

● When watching video clips of the definitions or examples, we would like to be able to read the English text (transcriptions of the BSL video clips) to allow wider access for the audience.

● We would like for each topic, there is a link to the Index page.

● We would like a page showing an index of all EXAMPLE video clips.

● For each page showing the BSL video clips, we would like to be able to tweet or post to Facebook.

● Ability to upload latest news about the glossary.

● We would like App to be compliant with new system hardware releases.

User

● Ability to navigate through the App confidently

● Ability to easily find the videos for a specific term - SIGN, DEFINITION, EXAMPLE.

● Ability to easily find the videos that are new.

● Ability to have the videos to be available when there is limited access to the Internet (e.g. the school network may not allow the device to be connected to the internet).

● Ability to receive notifications when there are new videos uploaded.

SSC Web and Resources Administrator

● Ability to manage one copy of the videos and that videos are available on the website and from the App. If you tweak one video or add a new video, we would like it instantly available from the website and from the App.

● Ability to integrate the videos on the website into the App.
• Ability to easily add new videos to the website and App simultaneously (SSC’s web administrator) without having to update the App separately.
• Ability to avoid breaking the App when adding new videos.

b. Outputs and Milestones
i. Output
At the end of the development project, the SSC would like to launch a leading educational tool for young people and their teachers/support staff.

ii. Milestones
SSC would like to begin work on the Preliminary phase immediately upon awarding the contract. The Execution phase will follow quickly, with completion and launch in January 2017. Commitment to meet the SSC launch timeline is a critical component of project success.

<table>
<thead>
<tr>
<th>Event</th>
<th>Responsible Party</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial meeting to discuss the design of the App and technical requirements at Moray House School of Education, University of Edinburgh</td>
<td>App developer and SSC team</td>
<td>May 2016</td>
</tr>
<tr>
<td>Evaluation of draft design</td>
<td>SSC team and panel of young deaf people</td>
<td>June 2016</td>
</tr>
<tr>
<td>Second meeting to agree/ finalise the design of the App</td>
<td>App developer, SSC team and panel of young deaf people</td>
<td>July 2016</td>
</tr>
<tr>
<td>Development of App</td>
<td>App developer</td>
<td>July - November 2016</td>
</tr>
<tr>
<td>Testing of App - frequent reviews of the App as it is being developed (for example, after each Scrum Sprint or two/four week Kanban)</td>
<td>SSC team and panel of young deaf people</td>
<td>August - November 2016 Every 2-4 weeks</td>
</tr>
<tr>
<td>Uploading App to Apple Store and Google Play</td>
<td>App developer</td>
<td>End of November 2016</td>
</tr>
<tr>
<td>Launch of App</td>
<td>SSC team and University of Edinburgh</td>
<td>January 2017</td>
</tr>
<tr>
<td>Testing of App and Bug fixing</td>
<td>App developer</td>
<td>&gt; December 2016</td>
</tr>
<tr>
<td>Interim report on the progress of developing the App</td>
<td>App developer</td>
<td>August 2016</td>
</tr>
<tr>
<td>Final report</td>
<td>App developer</td>
<td>January 2017</td>
</tr>
</tbody>
</table>

• The initial meeting will be held at Moray House School of Education and further meetings can be face to face or online via Skype/Oovoo.
• Communication support during meetings will be provided by SSC.
• Dr John Ravenscroft will be the Project Lead.
• The appointed App developer will be liaising with Dr Audrey Cameron (STEM in BSL glossary Project Manager) and Sheila Mackenzie (Web and Resources Administrator). The SSC’s App Development
Project Team and a panel of young deaf people will be involved in the design and testing of the App processes.

- Rachel O’Neill will be responsible in setting up the panel of young deaf people.
- Ruth Simpson will be responsible for the administration of the project on behalf of the SSC.

c. Fees and Costs
Total cost for this tender is £25,000 including VAT.

*Rates and prices shall be deemed inclusive of all additional expenses howsoever incurred.*

4. SELECTION CRITERIA

a. Evaluation Team
A committee formed by the Scottish Sensory Centre will evaluate the proposals. Proposals will be evaluated based on the selection criteria laid out below. The scoring of the proponent responses will consider the Proponents’ description of their ability to meet or not meet these requirements.

The University of Edinburgh reserves the right to award the contract to the SSC’s own best interests, to make no award, and to reject any and all proposals, and to waive any informality in the bidding, at the sole discretion of the University of Edinburgh. The University of Edinburgh may hold any proposals submitted for a period of ninety days after submission, and all proposals shall remain effective for such period.

b. Selection Criteria
The successful proponent will be able to demonstrate extensive and current experience in:

- App development and deployment
- Designing and developing for a range of smartphone devices/tablet computers and operating systems (iOS and Android)
- Application usability standards
- Technical design for potential expansion in the future
- Agile development approaches - we would like frequent reviews of the App as it is being developed. For example, after each Scrum Sprint or two/four week Kanban.
- Experience in developing Apps with videos in Sign Language.

5. AWARD CRITERIA

- Clear understanding of this specific project requirements 10%
- Methodology and approach proposed 20%
- Specific expertise proposed for the service 20%
- Delivery/Timescales proposed 5%
- Quality of service 20%
- Availability for immediate start 10%
- Commitment to Launch Date 5%
- Price 10%
6. ADDITIONAL INFORMATION

The App development is funded by University of Edinburgh Alumni. The University of Edinburgh will own the copyright and source code for the App (including unit tests). The App developer is to ensure that all software licenses are adhered to and the App developer will assume responsibility for any copyright infringement.

Members of the Scottish Sensory Centre’s App Development Project Team are as follows:
* Dr John Ravenscroft – Deputy Head of School, Senior Lecturer at Moray House School of Education, University of Edinburgh and Director of the Scottish Sensory Centre.
* Dr Audrey Cameron – Project Manager/Principal Investigator of STEM in BSL glossary project at Scottish Sensory Centre, University of Edinburgh.
* Rachel O’Neill – Lecturer in Deaf Education, Director MSc Inclusive Education at Moray House School of Education, University of Edinburgh – consultant on STEM in BSL glossary project.
* Gary Quinn – Assistant Professor BSL Linguistics, Heriot Watt – consultant on STEM in BSL glossary project.
* Sheila Mackenzie – Web and Resources Administrator, Scottish Sensory Centre.
* Ruth Simpson – Administrator and Supervisor, Scottish Sensory Centre.
* Professor Judy Robertson – Chair in Digital Learning and Research Lead in Education Teaching and Learning at Moray House School of Education, University of Edinburgh – advisor on the STEM in BSL Glossary App development project.

For further information and to discuss further you should contact:
Dr John Ravenscroft: John.ravenscroft@ed.ac.uk

Tender submissions should be submitted by 9 am on 20th May and sent to:
Ruth Simpson: ruth.simpson@ed.ac.uk

7. SUSTAINABILITY

University of Edinburgh’s sustainability policy: http://www.ed.ac.uk/about/sustainability