**UNDERGRADUATE SUMMER VACATION SCHOLARSHIP AWARDS – FINAL SUMMARY REPORT FORM 2017/18**

***NB: This whole report will be posted on the Society’s website therefore authors should NOT include sensitive material or data that they do not want disclosed at this time.***

**Name of student:**

Orla McCorry

**Name of supervisor(s):**

Dr Paul M. Rea

**Project Title: (no more than 220 characters)**

Creation of an E-Tutorial to Support Learning Embryology

**Project aims: (no more than 700 words)**

The aims of this project were as follows:

1. To enable and facilitate a co-creation approach of developing educational and training materials. In other words, a student will create materials for use by fellow colleagues, thus identifying key areas which are challenging and difficult to understand and identifying areas where additional resources were required. In this instance, the 3D applications and development of the embryo from early stages has been well established as difficult for students to engage with. The core elements of knowledge and understanding of embryo development would be central to the learning materials created.
2. Therefore, by using industry standard software (Articulate 360, including Storyline) an e-tutorial on embryology will be created by a student, for students to use, enhancing engagement of a challenging area of the anatomical curriculum for science, medical, dental and allied health professional students alike.
3. The first four weeks of development of the embryo will be developed into an interactive e-tutorial to enhance engagement of the end stage user. This will focus on fertilisation, implantation, differentiation, gastrulation, neurogenesis, somitogenesis and organogenesis.
4. By using engaging visuals, colourful layouts and simple to use interactivity and detailed text and descriptions of clinical applications, this will engage the end stage user. It will also complement existing resources, and will contain self-testing at key stages to check progress and improve consolidation and retention of knowledge, with provision of detailed feedback.

**Project Outcomes and Experience Gained by the Student (no more than 700 words)**

The main outcome of this project was the creation of an e-tutorial detailing the first four weeks of embryology; a learning resource that is engaging, interactive, clear and comprehensive. This tutorial can therefore be used by students to reinforce course material, while working at their own pace.

This learning resource is intended to support taught content, emphasising the key details of early embryological development. This tutorial has been created using the intended learning objectives of the Level 3 BSc Honours Anatomy course from the University of Glasgow but can also be transferable to dental and medical students, and anyone who is learning embryology.

As well as the creation of a fully interactive, visually engaging e-tutorial for embryology, another key outcome of this tutorial was the creation of self-test quizzes. These provide the student with the opportunity to check on knowledge acquisition and understanding at their own pace, and can reinforce and revise content they are learning. By providing immediate feedback to the user, including when an answer was incorrect, provides an instantly engaging end product.

A secondary outcome of the project was the creation (by Orla McCorry, the funded student) of an original bank of embryological cartoon diagrams that are easy to understand. These were created using Easy Paint Tool Sai, hand drawn and annotated by Orla McCorry and provide a unique resource which are easy to view, accurate and provide the end user with simplified diagrammatic images of complex processes, during the first four weeks of embryo development. This ensured there were no issues sourcing and using images from other sites, and related copyright regulations.

This six-week project has given me invaluable experience. I have gained a greater insight into the teaching aspect of a scientific career. A lot of work is required to be able to make a resource intended to educate fellow students; from storyboarding the project and researching information, to drawing diagrams and creating quizzes. I now feel very confident in the course content and the process of e-tutorial creation encouraged me to learn even more. An embryology specialist also reviewed the e-tutorial, and this improved my communication skills and interactions with different staff members.

The e-tutorial was created using industry standard software called Articulate Storyline 360. Learning how to use the software in the creation of the e-tutorial significantly improved my digital literacy and inspired me to learn more about the software, the use of digital technologies in education, and therefore apply this knowledge in the development of the tutorial.

In addition, I created informal peer review sessions to ask other students what they thought of the tutorial and adjusted the project accordingly. By interacting with my peers and identifying ways to improve the tutorial ensured I had a more holistic understanding of the creation of educationally validated training resources. I thoroughly enjoyed creating this learning resource and feel very inspired to create more e-tutorials and possibly work toward a career in science education.

Please state which Society Winter or Summer Meeting the student is intending to present his/her poster at:

Summer Meeting 2019

**Proposed Poster Submission Details (within 12 months of the completion of the project) for an AS Winter/ Summer Meeting – (no more than 300 words)**

Digital technologies are increasingly becoming part of our daily routine. Indeed, these also have become adopted into the educational setting, including that of anatomy, and provide a useful adjunct alongside traditional teaching methodologies. This project uses a co-creation approach to improve student engagement with course materials, empowering them to be involved in designing subject specific resources. By using industry standard software (Articulate 360) a fully interactive, visually engaging e-tutorial was created based around the intended learning outcomes of the embryology teaching undertaken within the third (junior) year of the BSc Honours Anatomy degree at the University of Glasgow. The areas that the e-tutorial creation centred around were fertilisation, implantation, differentiation, gastrulation, neurogenesis, somitogenesis and organogenesis.

In addition to this, we used Easy Paint Tool Sai to draw individualised simple cartoon like diagrams to improve and simplify understanding of complex embryological processes during the first four weeks of development. Informal feedback was gained from peers by user testing, and was reviewed by a specialist in embryology teaching and research with pointers given for improvement. This feedback was applied to improve the functionality of the tutorial. By enabling the student to collaboratively develop resources has been shown to improve higher order cognitive engagement and loading, thus improving understanding of the subject area, in this case embryology. This project demonstrates how to involve the student in creating subject and curriculum specific digital tutorials and the processes surrounding this.

**Brief Resume of your Project’s outcomes**: **(no more than 200-250 words)**.

*The title of your project and a brief 200-250 word description of the proposed/completed project. The description should include sufficient detail to be of general interest to a broad readership including scientists and non-specialists. Please also try to include 1-2 graphical images (minimum 75dpi). NB: Authors should NOT include sensitive material or data that they do not want disclosed at this time.*

Digital technologies are increasingly becoming part of our daily routine. Indeed, these also have become adopted into the educational setting, including that of anatomy, and provide a useful adjunct alongside traditional teaching methodologies. This project used a co-creation approach to improve student engagement with course materials, empowering them to be involved in designing subject specific resources, from a challenging curricular area, that of embryology. By using industry standard software (Articulate 360) a fully interactive, visually engaging e-tutorial was created based around the intended learning outcomes of the embryology teaching undertaken within the third (junior) year of the BSc Honours Anatomy degree at the University of Glasgow. The areas that the e-tutorial creation centred around were fertilisation, implantation, differentiation, gastrulation, neurogenesis, somitogenesis and organogenesis. Fully interactive quizzes were incorporated into the design of the e-tutorial, as well as simplified cartoon like images, to convey complex information into a more visually digestible format. Enabling the student to collaboratively develop resources has been shown to improve higher order cognitive engagement and loading, thus improving understanding of the subject area, in this case embryology. This project demonstrates how to involve the student in creating subject and curriculum specific digital tutorials and the processes surrounding this.

**Other comments: (no more than 300 words)**

 *Signature of student Orla McCorry Date 10//07/2018*

 *Signature of supervisor* Dr Paul Rea *Date 02/08/18*

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