

# ITTE Conference Abstracts, 2017

## 2017 Abstracts

**Dr Helen Boulton**

Format:

Research Paper – 12 minutes with a further 3 minutes for questions

Title:

Using mobile technologies for game-making across disciplines

Abstract:

Computer games as part of education is a well-established topic for research, suggesting that creating games is linked to a range of cognitive and behavioural outcomes. Creating games in all subject disciplines is becoming increasingly possible due to the increasingly higher status of computing in schools across Europe and the prevalence of visual programming languages such as Scratch and Pocket Code now available for mobile technologies. The use of games within education is not new; in a systematic review of 129 papers Connelly et al. (2012) found that playing games impacts across a range of areas including engagement, cognitive ability and, most commonly, knowledge acquisition and content understanding.

The research presented in this paper is from a feasibility pilot study examining the impact of game making in traditional primary and secondary school classrooms (5-18 years) in the United Kingdom (UK). The research, funded by Horizon 2020, is part of a wider European project. In the UK the project has introduced game making into disciplines such as Religious Education, Science and History. Data indicates that although not all students found this a positive experience, computational thinking skills have increased, and students, disaffected with their learning, have re-engaged with learning, increasing their persistence and resulting in a deeper understanding of subject knowledge. In addition initial results suggest that game making has the potential to increase engagement with classroom learning and lead to increased learner satisfaction within lessons. Non-computing teachers have gained in confidence in developing game creation in their subject discipline, increasing their awareness of computational thinking. Barriers identified include teacher familiarity with programming as a means to teach non-STEM subject knowledge, a potential to decrease knowledge acquisition during the process of familiarisation with the teaching tool and a need for software developers to consider design for children with SEND.

## **Dr Alison Hramiak**

### Format:

Research Paper – 12 minutes with a further 3 minutes for questions

### Title:

Time Travel for Beginners ...or How Technology Can be used For Historical Research

### Abstract:

#### Introduction

Using an educational historical research project about the life and work of Ada Byron, Countess of Lovelace (1815-1852) this paper explores the use of technology in educational historical research, and the tensions that arise when undertaking educational historical research.

Although communications technology offers new ways of connecting researchers both to each other and, in this context, to their sources this can often be a double-edged sword. It can negate the need to actively locate and read primary sources in their physical form for this type of research, replacing this with digital views and digital images that can be cut and pasted. While this is convenient, it can remove some of the learning steps that come from physically engaging with primary sources, such as making notes and discussing them with the experienced librarians who curate them, as well more subtle issues such as the physical quality of the media in which the sources are contained.

When we think about teaching and learning, the digital medium tends to be the one of choice for most of our students at some point in their learning career (S. Gorard & N., 1999). By examining both types of approach for educational historical research, it was possible to examine how technology can help or hinder this type of research.

#### Methods and Approach

This research uses a small-scale case study approach in which a mixture of traditional and technological methods were used to locate and analyse the primary sources for the historical aspects of the study. The case study approach was particularly suitable because of the specificity of the contexts (Hammerness & Matsko, 2013). It was also felt that the combination of methods added rigour to the research allowing a systematic approach to this type of enquiry (S. T. Gorard, C., 2004)

The sources were located either by physically finding and reading them, with the help of more experienced historical experts – custodians of the collections from which the sources were taken, or they were located digitally, read and used from online sources, without any expert help in interpreting them or focussing the research enquiry lines. These methods were then compared and contrasted with respect to their efficacy (as it were) for this type of educational research.

#### Findings

Findings from a comparison of these methods indicate a significant difference in the processes between analysis of physical primary sources and digital primary sources. The research shows that although technology affords us much convenience through the digitisation of historical documents that can be easily accessed on line, having such convenience may not necessarily be the best way forward for all types of research. It was possible to compare and contrast the methods used for the research, and to determine how and why they are useful both in their own rights and collaboratively, when used in conjunction with each other.

There are clear messages here about the tensions in higher education related to the requirement for sudden impact that students of this type of research cannot always provide, despite studying in a world that is often driven by such requirements. The research also serves to indicate how we might use these tensions to demonstrate to our students that the old (traditional methods) and the new (the digital age they are familiar with) can be synergistic when used together.

**Anthony Barnett**

Format:

Research Paper – 12 minutes with a further 3 minutes for questions

Title:

Technology Enhanced Learning in the early years: a systematic review of published research 2006-2017

Abstract:

This paper is an outcome of a successful application for an ITTE Research Fellowship Programme award. The paper will outline the methods used when conducting a systematic review of literature relating to technology enhanced learning in the early years during the last decade. The review encompasses selected topics based on a range of digital technologies in the context of the Early Years Foundation Stage (EYFS). The framework for approaching the literature review includes reference to the EYFS Characteristics of Effective Learning and Areas of Learning. Key findings from the review will be presented. A full version of the literature review will be published as a journal article. Additionally it is envisaged that dissemination will also take place within a range of undergraduate and postgraduate courses at the University of Worcester and with our network of teachers via, for example, TeachMeet events.

**Dr Matthew Kearney**

Format:

Research Paper – 12 minutes with a further 3 minutes for questions

Title:

Mobile Learning in School Maths and Science Education

Abstract:

Mobile technological adoption in schools is occurring without an empirical understanding of the complex, dynamic relationship between these technologies and the epistemological and pedagogical systems that underpin teaching and learning. This study investigated how middle school teachers in Australia are using mobile devices to support their teaching. Driven by the strong 'political will' in many countries to improve maths and science learning and to build the capability of the workforce for future job markets in these important disciplines, the study used the context of maths and science education. The researchers developed a survey instrument based on three distinctive mobile pedagogical constructs and used it to interrogate current mobile learning practices in school maths and science. The study is part of a larger project aiming to investigate the learning contexts, technological designs, epistemologies and pedagogies that promote or inhibit quality teaching and learning with mobile devices in schools.

**David Hicks, Thomas Tucker, David Cline, Todd Ogle**

Format:

Research Paper – 12 minutes with a further 3 minutes for questions

Title:

Introducing Mixed Reality (AR and VR) to Support Teaching and Learning History via a Transdisciplinary Course

Abstract:

This practice paper describes a course that connects digital technologies to content, pedagogy, and student learning and brings together faculty from teacher education, instructional design, visual arts, public history, and computer science to examine the pedagogical affordances of mixed reality - Augmented and Virtual Reality - to support learning in both formal and informal learning environments. This paper provides a brief theoretical and practical overview of the course - Inquiry Based Learning with Digital Technologies - before describing the transdisciplinary experiences that brought together students from education, visual arts and public history to build / evaluate a series of cultural heritage projects. These projects focused on teaching and learning about local histories including the university campus, a historic plantation adjacent to the campus, and a local dilapidated site that was previously an African American school campus. A unique feature that tied together these projects is what we call ARCHIE (Augmented Reality to Compel Historical Inquiry Education) as a way to introduce students to the potential of AR (and VR) to support inquiry based learning. While Saye and Brush (in press) note: "technology is no panacea for the challenges students and teachers face when engaging in disciplined inquiry", they make clear that "(t)he challenge remains ... to expand our

understanding of how technology-enhanced learning environments might be best ... used to increase the likelihood of powerful ... learning” settings (p. 229). Our course design heeds this call with a focus on introducing to prospective teachers the potential of mixed reality (AR and VR) as a “cognitive tool or pedagogical approach, [that] aligns well with situated and constructivist learning theory as it positions the learner within a real-world physical and social context, while guiding, scaffolding and facilitating participatory and metacognitive learning process such as authentic inquiry ...” (Dunleavy and Dede 2014, p.737).

Dunleavy, M., & Dede, C. (2014). Augmented reality teaching and learning. In J.M. Spector et al. (Eds.), Handbook of research on educational communications and technology (pp.735-745). New York: Springer.

Saye, J., & Brush, T. (in press). Using technology-enhanced learning environments to support problem-based historical inquiry in secondary school classrooms. In T. Brush & J. Saye (Eds.), Successfully implementing problem-based learning in classrooms: Research in K-12 and Teacher Education, (pp. 197-238). West Lafayette, Indiana: Purdue University Press.

## **Dr Chris Shelton**

### Format:

Research Paper – 12 minutes with a further 3 minutes for questions

### Title:

Teaching inclusive computing lessons: curriculum, pedagogy and attitude.

### Abstract:

This paper will discuss how we can prepare student teachers to teach computing inclusively. It will identify key groups of pupils who may be excluded from school computing lessons and discuss the need for student teachers to identify these groups and individuals and cater for them.

Drawing on a literature review of inclusion in computing and ICT lessons, it will discuss the features of a computing curriculum that will engage and motivate all learners; a range of inclusive (and exclusive) pedagogic strategies; and why we need to be aware of the attitudes that teachers express towards pupils.

The presentation will also identify gaps in practice and research and allow opportunity for attendees to discuss the next steps towards ensuring inclusive computing education.

**Paballo Mokenela**

Format:

Research Paper – 12 minutes with a further 3 minutes for questions

Title:

Adoption and implementation of blended distance learning: A case study of the National University Lesotho

Abstract:

Despite the affordances of technology in the 21st century education, unsuccessful and unsustainable ICT innovations in higher education institutions have been reported in sub-Saharan Africa and other developing countries. Identified challenges in adopting and implementing blended learning include lack of explicit ICT implementation policies; inadequate ICT infrastructure; limited ICT support and skills of tutors and learners. Notwithstanding these constraints, scholars have argued that blended learning innovations that are sensitive to contexts can be successful. Like other institutions of higher education, the National University of Lesotho (NUL) aims to adopt the use of technology in teaching and learning. This case study therefore explores ICT structure, strategy, support, technology experiences of tutors and learners, as well as existing pedagogy to develop a contextually-relevant blended distance learning pedagogic model for NUL. The action research adapted Graham, Woodfield and Harrison's (2013) framework for institutional adoption and implementation of blended learning in higher education. Data were collected from key administrators (6), IT specialists (2), tutors (30) and learners (209) selected through purposive and convenience sampling, using questionnaires and interviews. The findings revealed inadequacies in ICT strategy, structure, support, and skills of tutors and learners. Identified best practice which could be enhanced through ICT included interactive tutor-facilitated face-to-face instruction, interactive print-based instruction, collaborative learning through formal groups, and independent learning. Amid the identified ICT limitations, the study concluded that it was feasible for the university to adopt and implement blended distance learning. The paper argues that evidence-based blended distance learning pedagogic models which consider all stakeholders in higher education structures can succeed. It proposes a contextually-relevant blended distance learning pedagogic model for Lesotho higher education and similar contexts. The study also suggests a revised version of Graham, Woodfield and Harrison's (2013) adoption framework applicable in various contexts.

**Dr Christina Preston and Dr Sarah Younie**

Format:

Research or Practice Paper (12 minutes with 3 minutes for questions)

Title:

Powerful CPD through video and web-based tools: enhancing teachers professional practice

Abstract:

High rates of attrition amongst early career teachers indicate that practice in the classroom is challenging and that current professional development models are not meeting their needs. The initial findings of this IRIS and MirandaNet Fellowship research suggest that in a positive, reflective learning culture, coaching teachers using web-based audio and video tools offers an opportunity for the profession to enhance practice. The research concentrates on an aspect of web-based video coaching called 'in-ear' coaching. In this model, the teacher wears an ear-piece so that the coach who is not in the classroom (or even from some more remote location) is observing through a video link and can make suggestions about the teacher's practice in real time. Research into in-ear coaching has already reported positive impact in Australia, the Netherlands and the United States. This qualitative UK study begins to set a European standard by outlining contexts in which in-ear coaching is effective.

**Alison Iredale**

Format:

Research or Practice Paper (12 minutes with 3 minutes for questions)

Title:

A review and synthesis of the use of social media in Initial Teacher Education

Abstract:

Several previous studies have sought to review the literature surrounding the use of technology in teacher education.

This literature review takes a specific focus as it addresses the use of social media in initial teacher education. It seeks to explore what constitutes effective use of social media in supporting the development of new teachers in all sectors of teacher education, including Primary, Secondary and Lifelong Learning.

We seek to develop and share a deeper understanding of the complex interplay between digital technologies and the participation and collaboration of pre-service teachers in initial teacher education. This review draws upon previous reviews into the use of ICT in formal educational settings and frames the review in relation to two theoretical frameworks, that of Pedagogical Content Knowledge (Shulman 1986) and Technological Pedagogical Content Knowledge (Mishra and Koehler 2006). In addition, it seeks to combine these theoretical frameworks with the relatively recently emergent thinking around the rhizome in teaching and learning (Cormier 2008, and Deleuze and Guattari 1987). The findings of the review and synthesis will provide a significant contribution to the development of effective teacher education and training across the UK curriculum.

**Helen Caldwell and Anna Cox**

Format:

Research or Practice Paper (12 minutes with 3 minutes for questions)

Title:

How can technology facilitate high quality social learning in an online environment within the field of teacher education?

Abstract:

This project seeks to bring together the significant body of work related to technology-enabled communities of practice to inform content creation, capture and dissemination of learning within teacher education. It explores the efficacy of technology-enabled learning communities in order to illuminate the processes and pathways by which learning occurs. The work is presented as a MESH guide or digest, which combines a research summary with pedagogic strategies and case studies from practice.

**David Longman and Dr Sarah Younie**

Format:

Research or Practice Paper (12 minutes with 3 minutes for questions)

Title:

Mobile Learning: A Professional Development Perspective

Abstract:

This paper is the completion of an ITTE Knowledge Mobilisation Fellowship awarded in 2015. The initial topic of the proposal was cast in rather broad terms referring to 'learning supported by personal devices'. Two main factors have led this project in the more specific direction suggested in the title:

- (i) ITTE is first and foremost an organisation concerned with the professional development of teachers both in-service and perhaps more importantly the initial development of new recruits;
- (ii) the radical curriculum changes that have taken place in the specific area of ITTE's subject expertise and activity continue to challenge our community to reformulate the professional characteristics of the digitally capable teacher.

**Miles Berry**Format:

45 Minute workshop

Title:

Using questions to assess computing

Abstract:

The education inspectorate were highly critical of the assessment of England's old ICT curriculum, and it's unclear whether assessment of the new computing curriculum is any better, but Computing At School (CAS), on whose board the presenter serves, and other organisations have been working hard to support teachers in this area.

After discussing the difficulties inherent in assessing computational thinking and coding, we explore a number of approaches to assessing these. We consider how learners' projects, or portfolios, can be evaluated against assessment criteria, including the use of the Dr Scratch tool to support such assessment. We look at how comparative judgement might provide a more robust approach to summative assessment. We look too at assessing program correctness and how this can be automated.

We consider some contexts in which multiple choice questions might provide a reliable and efficient approach to both formative and summative assessment. Participants are introduced to the Project Quantum, a CAS supported project that is developing crowd-sourced item bank of questions to assess computing. We explore the range of questions available, consider what makes an effective, diagnostic question, attempt to write some questions ourselves and review those written by other participants.

The workshop concludes with a discussion digital badges as one approach to rewarding and tracking achievements, and of self- and peer review in the context of coding and computational thinking.

**Jocelyn Wishart**Format:

45 Minute workshop

Title:

Animating in Teacher Education

Abstract:

It has recently become possible for students to create a short stop-motion animation in a teaching session in an hour or so using Plasticine, Smartphones or a tablet with a camera and freely downloadable software. Research has shown that making such 'claymation' animations as a means of teaching in school science can be very engaging, both prompting peer discussion about the science and showing up students' misconceptions for the teacher to act upon (Wishart, 2016). In creating a 'claymation' by using Plasticine to model a process, capturing these changes on camera and creating an organised sequence to play back to others, students need to unpick and think through the process being taught. In science this could be, say, enzyme action, molecular bonding, transfer of momentum, even a life cycle. In geography it could be, say, erosion or volcanic action. In English, animations can be used to dramatize a text being studied. The list is limited only by the students' imagination.

Hoban and Nielsen (2013) consider that the models, their images, any voiceover and the final playback from multiple, linked representations of the process being animated combine to enhance understanding, with meaning building from one representation to the next. I found though that, of all the activities involved, students report the associated discussions to be most help to understanding the science being taught (Wishart, 2016). Another study has shown that the learning activities involved in creating stop-motion animations can support science teacher trainees both by enabling them to consider and reflect on their own science understanding in depth and also by encouraging them into thinking through the process of communicating the underpinning science to others (Wishart, 2017).

Participants in this workshop will trial making an animation for themselves and so learn more about the benefits of and challenges to teaching in this way.

**Elizabeth Hidson and Mareike Oesterle**

Format:

45 Minute workshop

Title:

VEO Europa Video Enhanced Observation Workshop

Abstract:

VEO Europa ([www.veoeuropa.com](http://www.veoeuropa.com)) is an Erasmus+ funded project using an innovative technological approach developed at Newcastle University - the VEO app ([www.veo-group.com](http://www.veo-group.com)) to support initial teacher education and CPD through video enhanced observation. The research project involves 400+ teachers, teacher educators and trainee teachers in five countries and is due for completion in September 2017.

The VEO app allows users to select a set of tags to use as a framework for the observation. The observer can film and simultaneously tag key moments for later review. Custom tagsets can also be created for specific purposes. The main feature of the VEO app is the video tagging of key moments of teaching practice to facilitate later dialogue through direct access to those tagged moments. Videos can be reviewed and optionally shared within the teacher's professional community. The aim is to facilitate pre- and in-service teachers' reflective practices, enabling them to become agents of their own CPD.

The aim of this workshop is to briefly introduce the research project and contextualise the use of the app with the different groups of participants. We will share case study material from the project to show the app being used, allowing attendees to consider how video enhanced observation might be used in their personal professional context.

The workshop is planned so that attendees will also have hands-on time to explore the app for themselves. They will be asked to either download the demo iPad app from the App Store (<http://apple.co/2nW0zLY>), or they may use one of the project iPads, which we will bring with us. Attendees will be provided with a brief guided training session and will then have the opportunity to try out the app with video footage, and review the tagged data. The workshop will conclude with a brief discussion session.

## **Dr Steve Kennewell and Dr Sarah Younie**

### Format:

45 Minute workshop

### Title:

Writing for publication and reviewing for journals

### Abstract:

This session starts with the premise that your writing is based on research, development or evaluation that you are involved in. Whilst material based on literature review or purely theoretical developments does get published in refereed journals such as Technology, Pedagogy and Education, those types of article will not be covered specifically in this session. Thinking about publication should start right at the beginning of any research work. Indeed, when identifying opportunities for research, considering outlets for publication may be even more important than finding sources of funding. Many excellent papers have been generated from research with no direct funding at all. Seek opportunities for enquiry that will lead to findings of interest to others, both in your own work and in the work of others with whom you could collaborate such as colleagues, teachers, students.

Consider in advance how to gain impact for the work, as this will affect how you collect and analyse data. Do you want to write 'stories' for newspapers, newsletters or professional journals? Reports for institutional managers or external funders? Papers for academic peers? Each of these will require different formats for the results, and if you do not collect appropriate data, your publishing potential may be limited. For each audience, consider what aspects of the work will be of interest, and how you can convince the audience to take notice of your findings and ideas.

**David Burden**

Format:

45 Minute workshop

Title:

Creating 3D and VR Immersive Learning Exercises

Abstract:

The aim of the workshop is to show attendees how easy it can be to create 3D and VR immersive learning experiences. The workshop will use the Fieldscapes system which was developed with InnovateUK funding by Daden Limited, supported by the Open University and the Field Studies Council. The lessons created can be used on mobiles and PCs in "avatar" mode, or with a VR headset - maximising their availability to students. The workshop is intended for any educator with an interest in how immersive technologies can be used with students and who wants to understand what is involved in creating such experiences. During the workshop participants will be able to create a simple "hello world" lesson, and experience it in VR.

**James Griffin**

Format:

Poster

Title:

Re-imagining the Classroom in Simulation

Abstract:

Persistent, large scale virtual learning worlds could revolutionise education. SpatialOS allows the creation of an environment where learners' actions really matter, but in which trainees can play out scenarios safely. An environment where the extensive, real-time biological, psychological and sociological data collection activity is easy, non-invasive and integrated with assessment for learning. An environment where every learner has access to Vygotsky's more knowledgeable other and metacognitive skill development is as carefully modelled as specialist

subject knowledge. We're at the tipping point: The technology now exists. We have the chance to redefine the classroom from the ground up.

**Khadijah Saad Algahtani**

Format:

Poster

Title:

The impact of Globalization and technology in adopt the Western ideas in Saudi Education

Abstract:

The Ministry of Saudi Education has recently tried to develop the learning process by applying many new plans and ideas such as TQM and SE and SI (Education, 2010). This initiative by the Saudi government is motivated by concern to meet the needs of national development and to face the external challenges of globalization and the noticeable progression in the information world, technology and knowledge. Developing the education system in KSA requires increased effectiveness in the context of globalization and its challenges by creating national capacities and qualified people. Saudi people need to use technology effectively to improve their learning and to increase opportunities for employment.