

Institution: The University of Hull		
Unit of Assessment: Education (UoA 23)		
Title of case study: Transforming teachers' professional learning with mobile technologies		
Period when the underpinning research was undertaken: 2009 to 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Kevin Burden	Role(s) (e.g. job title): Professor in Digital Education	Period(s) employed by submitting HEI: 1999 to present day
Period when the claimed impact occurred: 2014 to 2020		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact (indicative maximum 100 words) Research undertaken by the University of Hull's Kevin Burden, leading an international team of researchers, has identified the transformational benefits of mobile technologies and the challenges and barriers that prevent educators from fully exploiting these as learning tools. The research was used to develop a unique framework for mobile learning (iPAC) and an online mobile learning toolkit. The use of these resources has transformed how educators think about mobile technologies and how they teach, prepare and train pre-service teacher (PSTs) and in-service teachers. These impacts are evidenced across four continents and were recognised with the award of 1st prize at the international ECEL e-Learning Excellence competition in 2019.		
2. Underpinning research (indicative maximum 500 words) Phase I (2009-2012): In 2009, Burden and colleagues from the University of Technology Sydney (UTS) published research demonstrating the largely untapped potential of mobile technologies (e.g. personal phones and tablet devices) as tools for teaching and learning, whilst also identifying significant barriers to their wider adoption and use (3a). This research highlighted the need to underpin teachers' use of mobile technologies with sound theoretical principles and more effective professional development, focusing on the specific affordances of mobile devices that add value to learning. In 2012 Burden and colleagues from UTS developed iPAC, an original socio-cultural theory of mobile learning (3b). iPAC highlights 3 distinctive features or 'signature pedagogies' of mobile learning: <u>Personalisation; Authenticity and Collaboration</u>. <u>Personalisation</u> relates to the amount of choice learners have (agency) and the extent to which the use of mobile technologies makes learning more customised and individualised. <u>Authenticity</u> relates to how mobile technologies make learning more contextualised and more meaningful for learners by using more professional-like tools and tasks, and enabling learning outside of the formal classroom. <u>Collaboration</u> covers the ways in which mobile technologies support more conversations between learners, helping them to create and share digital artefacts as part of their learning experience. iPAC demonstrates how these features are mediated by a more flexible understanding of time and space (context), liberating learning from single spaces or time constraints such as the classroom and the timetable. It provides educators with a lens to explore different ways of using mobile technologies, extending and developing new pedagogical activities in both formal and informal settings (3c). Phase II (2013-2020): After 2012, the research team used the iPAC framework extensively to identify and evaluate how teachers in schools and teacher educators in universities use mobile technologies. These studies revealed the prevalence of personal mobile devices in schools and universities (often as high as 90%) but also highlighted how educators lacked the confidence and skills to use mobile technologies effectively. This was often manifested in infrequent or inappropriate use of mobile technologies, or use in traditional ways that replicated existing practices and added little in the way of extra value to the learning (3d). Subsequent research		

linked these findings to negative attitudes and beliefs about mobile learning which act as a brake, inhibiting educators from adopting innovative and more engaging pedagogical approaches in their classrooms (**3e**). The research revealed institutional barriers to the wider adoption of mobile learning including access to suitable technology, negative mindsets on the part of institutional leaders and decision-makers, and a lack of professional development resources to support the wider training of educators (**3f**).

Summary of Key Research Findings (KRFs):

KRF1: *teachers lack sound principles and frameworks around which to design effective mobile pedagogies.*

KRF2: *Personalisation, Authenticity and Collaboration are key and distinctive features of mobile learning that need promoting further because they transform learning.*

KRF3: *teachers lack the skills and understanding to fully exploit the full range of benefits that mobile technologies can offer for learning.*

KRF4: *institutional barriers, including a lack of suitable professional development, and uncertainty by decision- and policy- makers, inhibit the take up and use of mobile technologies by educators.*

3. References to the research (indicative maximum of six references)

- a. Aubusson, P., Schuck, S., & **Burden**, K. (2009). Mobile learning for teacher professional learning: benefits, obstacles and issues. *ALT-J, Research in Learning Technology*, Vol. 17, No. 3, pp. 233-247 - DOI: <https://doi.org/10.3402/rlt.v17i3.10879>
- b. Kearney, M., Schuck, S., **Burden**, K., & Aubusson, P. (2012). Viewing mobile learning from a pedagogical perspective. *Research in Learning Technology*, Vol. 20, Issue 1 - DOI: <https://doi.org/10.3402/rlt.v20i0.14406>
- c. iPAC website: <https://www.ipacmobilepedagogy.com>
- d. **Burden**, K. & Kearney, M. (2017). Investigating and critiquing teacher educators' mobile learning practices. *Interactive Technology and Smart Education*, Vol. 14, No. 2, pp. 110-125 - DOI: <https://doi.org/10.1108/ITSE-05-2017-0027>
- e. **Burden**, K., Kearney, M., Schuck, S., & Hall, T. (2019). Investigating the use of innovative mobile pedagogies for school-aged students: A systematic literature review. *Computers & Education*, Vol. 138, No. 1, pp. 83-100 – DOI: <https://doi.org/10.1016/j.compedu.2019.04.008>
- f. Kearney, M., **Burden**, K., & Schuck, S (2020) *Theorising and Implementing Mobile Learning: Using the iPAC Framework to Inform Research and Teaching Practice*, Springer: Singapore

Grants and awards indicating quality of underpinning the research

- g. PI - Burden: Erasmus+ Key Action 2 Grant (2014-1-UK01-KA200-001796), *Mobilising and Transforming Teacher Education Pedagogies*, 2014-2017, **€448,000**
- h. PI - Burden: Erasmus+ Key Action 2 Grant (2017-1-UK01-KA201-036781), *Designing and Evaluating Innovative Mobile Pedagogies*, 2017-2020, **€442,000**
- i. PI - Burden: British Council Institutional Links Grant (275892740), *A Vietnam-UK Centre of Excellence to design, construct and research the pedagogical impact of mobile digital textbooks in education*, 2017-2019, **£79,940**
- j. **1st prize** awarded at the **5th international ECEL e-Learning Excellence Awards** (Copenhagen 2019)

4. Details of the impact (indicative maximum 750 words)

A. Pathways to impact

To deepen and broaden the impact of the research beyond academia, Burden worked with colleagues in Australia and Europe to develop and share the iPAC framework with **teacher educators** in universities and **digital champions** in schools. This was achieved through the development of a free, online **mobile learning toolkit (5a)** funded through a large EU grant in 2014 (**3g**). The toolkit includes an extensive range of survey tools, instruments and teaching resources to enable teachers and teacher educators to apply the iPAC framework in their daily practice, including a large number of video exemplars hosted on a dedicated YouTube channel. Additional impact was generated with:

- the launch in 2019 of a dedicated iPAC website for educators (**3c**)
- a series of practical workshops and training events in Vietnam (funded through the British Council (**3i**))
- the creation of a mobile app (funded through a large UE grant (**3h**)) to demonstrate how to teach with the iPAC framework
- an extensive series of workshops, seminars and virtual presentations across Colombia, delivered with the Universidad del Norte, Barranquilla.

B. Impacts in the current REF period

Impact 1: Educators now underpin their use of mobile technologies with sound principles based on the iPAC framework (linked to KRF1 and KRF2)

Since its launch in 2016, it is estimated that the **mobile learning toolkit (5a)** has been accessed over 32,000 times and the video resources on the associated YouTube channel have been watched 36,794 times (**5b**). Over 500 **teachers/teacher educators** across 74 different countries have used the iPAC survey tools (part of the toolkit) to evaluate their own use of mobile technologies in the classroom. 67% have a more positive attitude about using mobile technologies in the classroom and 60% claim it has changed the way they teach and organise learning (**5c**). Over 85% of respondents reported feeling more **confident** about how to use mobile technologies in their daily practice (**5c**) as illustrated by this comment from a teacher in Barranquilla, Colombia: *“learning about the iPAC framework have (sic) made a great impact in my teaching practice. Now I feel more confident using technology in my classes.”* (**5d**). The worldwide impact of the toolkit was recognised in 2019 by the award of **1st prize at the prestigious European ECEL e-Learning excellence awards** at which the judges commended the toolkit for its practical value in supporting educators to plan and design mobile learning pedagogies (**3j**, **5e**).

The mobile learning toolkit and the iPAC framework have been used to better prepare teachers to use mobile technologies. For example, in the German state of Baden-Württemberg, at least 1,000 teachers from 55 schools have used the iPAC framework as part of an integrated CPD programme, the *e-Teach the Teacher* project (**5f**). The organisers of this project claim it has had a significant impact on teachers' attitudes and willingness to adopt mobile technologies: *“When I do training with teachers I have to explain [justify] why I am using mobile devices...but when I show iPAC then immediately the people are silent because they realise there is a method behind this....and it is deeper than just gaming or playing with apps.”* (**5g**).

Impact 2: The research has changed how educators teach, encouraging them to use a greater variety of mobile learning pedagogies (linked to KRF2 and KRF3)

In three **teacher education institutions** around the world – UTS, Australia; Karlsruhe University of Education, Germany (PHK) and the National University of Ireland, Galway (NUI) - the research has transformed how teacher educators prepare **pre-service teachers** (PSTs) to use mobile technologies (**5h**). Since 2016 each institution has incorporated the mobile learning toolkit into their core curriculum for PSTs requiring all students to demonstrate their practical competency in designing and delivering lessons using mobile devices. In PKH this involves 500 PSTs every year who use the mobile learning toolkit to design, teach and evaluate at least one lesson using the iPAC framework (**5h**). In NUI, the iPAC framework constitutes a core mandatory element for all PSTs – a total of over 1,500 since 2017. The Deputy Head of School (NUI) states *“Professor Burden’s research and the iPAC Framework crucially have helped to inform...how we prepare our student teachers to make the most of the potential of mobile learning in their classrooms...and is directly changing and augmenting classroom practices in the use of mobile technologies in schools nationally.”* (**5h**). It has also enabled educators and teachers in Ireland to better understand and design online and mobile learning during the recent COVID-19 pandemic: *“His research has come front-and-centre in our thinking about education during COVID-19, and the redesign of learning and teaching in teacher education and – as a consequence - classrooms in Ireland.”* (**5h**).

Similarly, teacher educators in Vietnam (the University of Education, Hanoi; DaNang University of Education) have changed how they assess their students by requiring each to produce an e-Book based on the principles of iPAC (**5i**). This change is also evident in Australia where PSTs at UTS use the iPAC framework and the mobile toolkit to create what the Director of Professional

Experience describes as “a highly successful and participatory assessment task...that ‘speak directly’ to the value of PSTs making their own eBooks.” (5h).

In **schools** evidence shows that learning about the iPAC framework changes how teachers teach. Teachers give their students greater choice about how they learn (Agency); more opportunities to co-create digital artefacts (Collaboration); and opportunities to use real world tools to perform meaningful tasks, often outside of the formal boundaries of the classroom. These findings relate directly to KRF2 since they are frequently associated with one or more of the three iPAC constructs. For example, one teacher in Rennbuckle School, Germany describes how “my lessons are more project oriented with a lot more self-regulated learning scenarios where students have to keep doing something for themselves.... (e.g. learning to play a guitar).” (5g). This was also commented upon by many teachers in Colombia who are using the iPAC framework as part of a professional development programme offered through the Universidad del Norte: “the iPAC framework showed me that students also play an important role in their learning process. Being able to choose what they want to do, how they want to do it, and where they want to do it is part of their process.” (5j).

Impact 3: The research has changed how institutions prepare and train new and existing teachers in the use of mobile technologies (linked to KRF3 and KRF4)

Between 2017-20 Burden was invited to lead workshops on iPAC for teachers/teacher educators across northern Colombia. Over 200 educators attended these workshops and have subsequently used the iPAC framework in their classrooms. The Universidad del Norte has incorporated the resources into their core curriculum for the trainees and teachers they work with and has recently received funding from the Ministry of Science, Technology and Innovation (Colciencias) to develop an app based on the framework to support reading comprehension and language skills for rural students across Colombia (5j).

In Australia, the iPAC framework has been adopted by the Association of Independent Schools in New South Wales to help train teachers in the use of mobile technologies across all of their 480 schools (approx. 24,000 teachers) during the recent COVID-19 pandemic (5k).

5. Sources to corroborate the impact (indicative maximum of 10 references)

- a. Mobile Learning Toolkit website: www.mobilelearningtoolkit.com
- b. YouTube channel viewing statistics and Google Analytics website statistics for Mobile Learning Toolkit (www.mobilelearningtoolkit.com)
- c. Survey of iPAC users, conducted October 2019 to December 2020 [Impact 1]
- d. Transcript excerpt from video interview with teacher in Colombia about iPAC (video file available on request) [Impact 1]
- e. Evidence of first prize at ECEL e-Learning Excellence Awards 2019 (certificate and screen shot from website) [Impact 1]
- f. *e-Teach the Teacher* training book [Impact 1]
- g. Interview with the project lead for the *e-Teach the Teacher* project (audio file available on request) [Impact 1]
- h. Testimonials from Heads of two teacher education institutions (NUI and UTS) and transcript excerpt from audio interview with Head of Education, PKH, Karlsruhe (audio file available on request) [Impact 2]
- i. Combined pdfs of e-Books produced by students and teacher educators in Vietnam [Impact 2]
- j. Testimonial including confirmation of grant for app development from Head of TESOL at Universidad del Norte, Colombia [Impacts 2 and 3]
- k. The Association of Independent Schools of New South Wales's Evidence Institute: *Conversations: Exploring Digital Pedagogy. The role of the iPAC framework 2020* [Impact 3]