Developing professional knowledge and expertise in educational technology: legacy, change and investment (Editorial)

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Editorial

Developing professional knowledge and expertise in educational technology: legacy, change and investment

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Abstract

This editorial reviews the curricular and pedagogical development of the international MSc TELIC programme and the work of the TELIC community since its inception in 2000. This review is used as the site of analysis to map the research undertaken and the professional practice that has emerged. Issues associated with the role, effects and implications of technology in education are examined in the light of this mapping of a professional curriculum. The notions of learning enhancement, innovation and change that are prevalent at this time in professional contexts, and which shape understandings and actions of TELIC professionals, are used to reflect on contributions to this issue and what they indicate about the state of play in the community and beyond. The paper concludes by considering what response we might make to the need for knowledge building in the professional field of educational technology and how to investigate it.

Keywords: *professional knowledge, curriculum; community; technology enhanced learning; innovation; change*

Introduction

It is with great pleasure, and some relief perhaps, that we present this first issue of the journal. It has been 2 years in the planning, and as we discuss below, 15 years in the making. The research articles, practice papers and reviews here are written by alumni and students of the international masters in Technology Enhanced Learning, Innovation and Change (TELIC) at Sheffield Hallam University (SHU) in the UK. In setting up this journal we have two intentions:

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1. to offer a space where new researchers from the TELIC community can share and develop their ideas, research and academic writing
2. to provide a legacy, and an investment, for the work of the community

In this preface to the issue we discuss how the curriculum and pedagogy of the TELIC masters[2] has evolved to produce a collaborative enterprise; how this has developed a research community and a network of professional practitioners; and how together this group prepares to practice in and research the professional field of educational technology.

An evolving professional curriculum and pedagogy

The International Masters programme in ELearning Multimedia and Consultancy (ELMAC) began in 2000 and was developed from the TRIPLE M (Multimedia Education and Consulting) Advanced Curriculum Development (CDA) Project supported by the European Commission (EC) under the SOCRATES programme (1998–2001). The programme at that time involved an active partnership between Arnhem–Nijmegen University of Professional Education (HAN) in the Netherlands and Sheffield Hallam University in the UK. Taught and studied part-time, the programme aimed to meet the needs of professionals whose work involves the development and/or implementation of technology enhancements to learning and teaching in a variety of education and training contexts. It aimed to enable participants to:

- Develop and communicate knowledge and critical understanding of pedagogical innovation and change management issues as applied to the use of innovative, technology enhanced, learning solutions
- Critically appreciate the social, organisational and cultural factors that influence the effectiveness of innovative and technology enhanced learning environments in educational contexts
- Act as effective mediators and change facilitators at the interface between the needs of users and providers in the context of innovation in the workplace
- Contribute effectively to the development of learning solutions in terms of problem analysis, design and implementation within multi-disciplinary teams
- Articulate the professional development needs of new users and appreciate the support structures and strategies needed for their continuing development

[2] Formerly known as the international masters in E-learning, Multimedia and Consultancy (ELMAC). ELMAC was established in 2000 and became TELIC in 2008. This article refers to TELIC to mean both.

- Understand critically key approaches to educational research and utilise these effectively in the change process

The tutor team developed (and action researched) units of study on *Open and Flexible Learning Environments (OFLE)* (Owen et al., 2005), *Digital Media Applications (DMA)* (Hudson, Hudson and Steel, 2006) and a project based work process in *Project Studies* (Hudson, Pountney and Woldinga, 2005). The pedagogy developed from an emphasis on interaction, communication and collaboration (Hudson and Pountney, 2004; de Vries and Woldinga, 2004), originally using computer conferencing software, *FirstClass* (Hudson, 1999). Pedagogy evolved during this time in which phases of learning were identified within the course and a shift from *tutor-directed*, to *tutor-supported* to *tutor guided* activity, thus encouraging *orchestrated interdependence* by students deepened through critical reflection on the learning process (Hudson, Owen and van Veen, 2006). This was informed by social practice theory as offered by Lave (1996) with a view of learning as an aspect of participation in communities of practice (Lave and Wenger, 1991). The pedagogy involved dependence on technology for learning and teaching where technology is integrated, as illustrated in Figure 1.

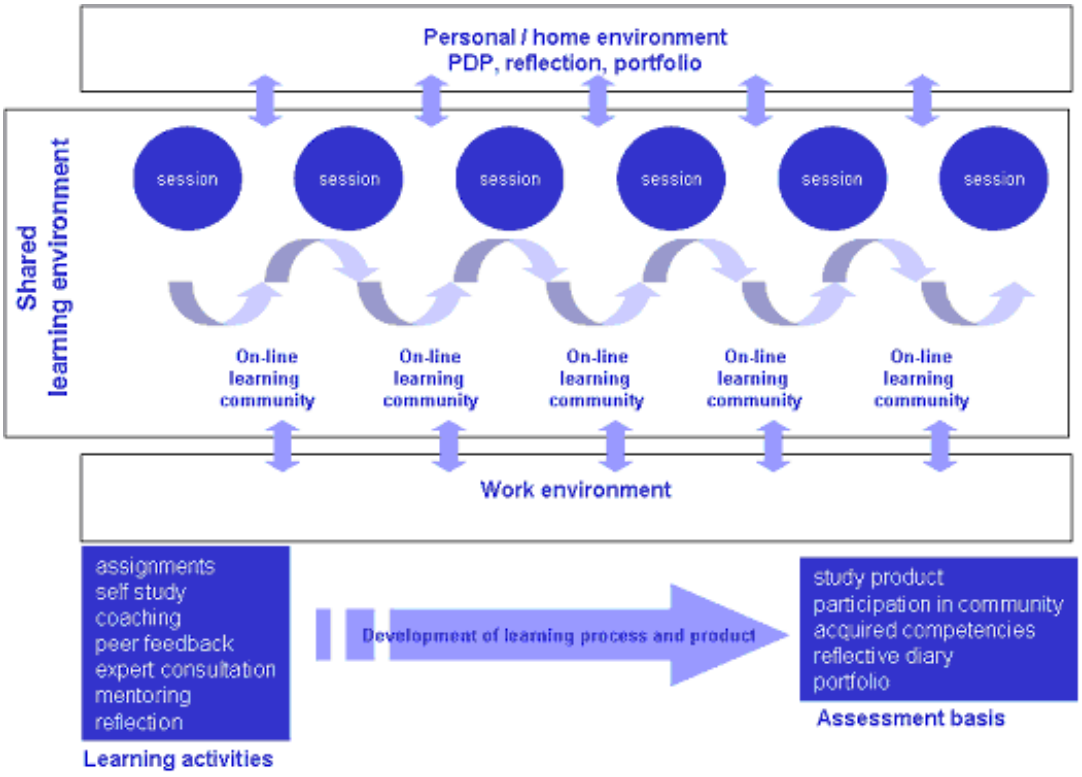

Figure 1: Course approach to integrated, mutually reinforcing environments and tools (de Vries and Woldinga, 2004)

Since 2000 the TELIC programme has made use of *cutting edge* technology for learning, teaching and assessment, including virtual learning environments, videoconference and e-portfolio. The excellence of this course has been acknowledged in two ways: first the course achieved 100% student satisfaction in the Postgraduate Taught Student Experience (PTSE) survey[3], including very high scores in all areas and 100% for dissertation support. Second, external examiners' reports have highly praised the course for having 'world-leading pedagogy' and a 'profound influence on the professional development of the students as evidenced in students' accounts'[4]. Furthermore, the course has led pedagogical developments in blended online learning in its home institution, combining local sessions, independent studies, international group-based assignments and a project-based approach involving authentic work-based problems. This learning process is illustrated in Figure 2.

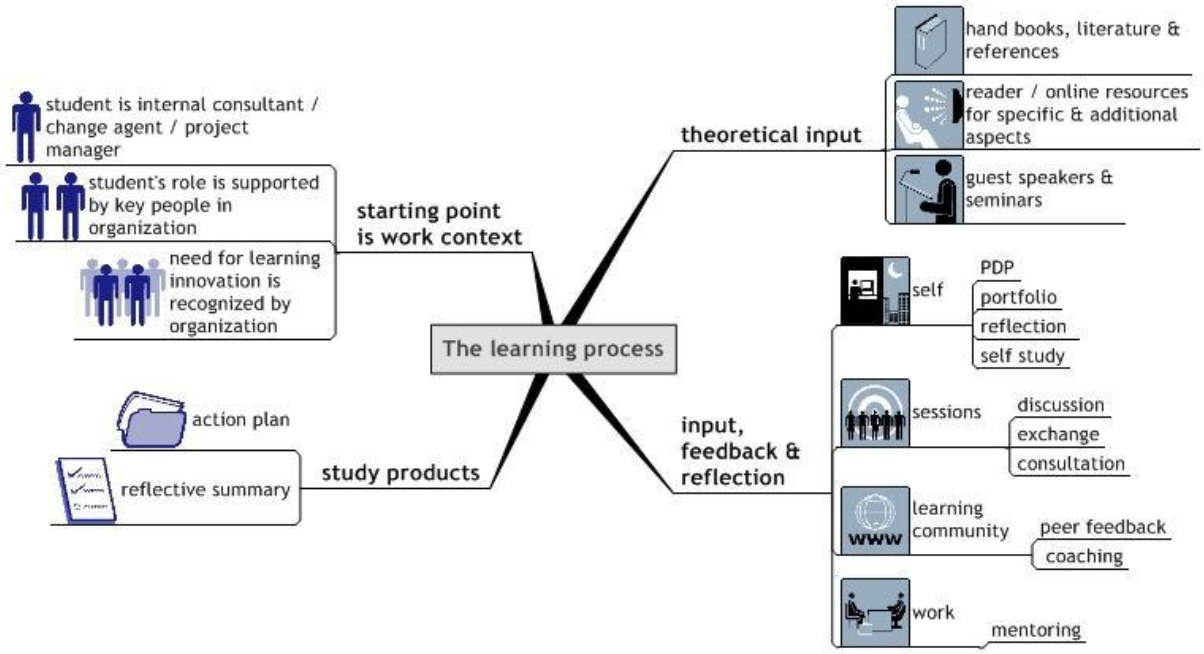

Figure 2: Course pedagogy for blended learning (de Vries and Woldinga, 2004)

In 2008 the ELMAC masters was revalidated as the masters in Technology Enhanced Learning, Innovation and Change (TELIC). The *Research Methods and Enquiry* unit developed in the ELMAC course (Hudson, Owen and van Veen, 2006) was integrated into four units, with two strands: the application of technology enhanced learning (TEL) and TEL

[3] Launched in 2009, the HEA's annual Postgraduate Taught Experience Survey (PTES) is the only UK sector-wide survey to gain insight from taught postgraduate students about their learning and teaching experience – see https://www.heacademy.ac.uk/consultancy-services/surveys/ptes.

[4] Comments written by Professor Marilyn Leask, Bedfordshire University, External Examiner's Report, 2010

environments; and the management of innovation and change (IC) in the workplace. The programme continued to cater for an expanding, diverse and dispersed group of students[5] who were professionals working mainly in the field of education: secondary and primary school teachers, head teachers, lecturers and staff from vocational and higher education, e-learning and multimedia developers, staff and middle management from learning departments in sectors such as health care, IT, police force, the armed forces and consultancies. The tutors were keen to support the development of a workforce of critical practitioners through a flexible approach based on an effective pedagogy in a fast moving field. In 2010 a collaboration between SHU and the ED+ICT, University College Leuven-Limburg, saw the increase in Belgian students taking the TELIC programme and the hosting of two conferences in Hasselt (2011 and 2015).

Developing expertise in a professional curriculum

The professional roles of students taking the TELIC programme are ones that involve the use and development of technology for learning and teaching in workplace contexts (see Table 2 below). In this sense educational technology, as the effective use of technological tools in learning (in which e-learning is a subset), can be seen to involve a field of professional practice in which specialized knowledge is applied and which involves a form of practical expertise (Bernstein, 2000). The extent to which TELIC is a professional/vocational curriculum can be partly gauged according to how it addresses the professional needs of its students. The description of the course above does not articulate a curriculum as a clear syllabus of content and there are two reasons for this: the first is because of the wide range of student work contexts; and second, that professional knowledge in relation to these contexts needs to draw from and integrate a number of other sectors including education, management, psychology and technical science (and hence is more difficult to pin down). In other words, professional knowledge is always sectoral, and professional practice is always in a context with a purpose outside of itself (Young and Muller, 2014: 13). The orientation of professional practice to purpose (its *telos*) characterizes the TELIC curriculum and the emphasis on project work in students' real world' tasks and an increasing demand to face new, evermore more complex, practical problems. This becomes, then, the question of what specialist knowledge a TELIC professionals needs to acquire and how this builds on and progresses what has gone before: the idea of *epistemic ascent* from novice-hood to expertise (Winch, 2014: 59).

[5] There have been 113 students since 2000, studying online from their home bases, mainly in the UK, the Netherlands, and Belgium, but also from Germany, Sweden, the Middle East and North Africa.

Developing a research community and professional research interests

The curriculum for professional education is concerned with the ability to reason, judge and act in complex and unpredictable work situations. This involves project management abilities in addition to the techniques, skills that are specialized to educational technology. The topics selected by TELIC students at the dissertation stage of the course have tended to reflect both the concerns of the workplace and to some extent the current developments in technology. Research undertaken by Mahmoud (2008) into the research themes addressed by TELIC students examined 24 dissertations, 30 journals, and 83 international research themes, and showed the research themes addressed by the students to represent roughly half of the surveyed international research themes in e-learning and education. Of these themes *electronic personal development planning (e-PDP); e-portfolios*; *strategies for competence based curricula*; and *blended learning frameworks* were found to be top of the list of international research themes which have been addressed by student dissertations. It is interesting to compare these to the trends and predictions of the Horizon Report (New Media Consortium) in roughly the same period. An overview summary of these predicted technologies 2004-15 (Kernohan, 2015) is shown in Figure 3.

Figure 3: Summary of Horizon Report predictions 2004-15 (Kernohan, 2015)

The effect of workplace concerns on research foci

These predictions of emerging technology can be mapped to the research topics of the 84 TELIC dissertations[6] since 2000 (see Table 1). The large number of studies (55 / 84) address *extended learning* (2004) and can be seen to focus on workplace issues that have a general focus on a virtual learning environment (VLE), rather than to examine a particular learning technology or tool *per se*. It is understandable perhaps that *cutting edge* topics such as *augmented reality, learning analytics, wearable technology* and *adaptive learning technologies* are yet to be researched by the TELIC community. Notably, however, none of the dissertations completed to date (or in progress) directly address or focus on the predicted topics of *virtual worlds* (2007), *mobiles* (2009), *mobile computing* (2010), *open content* (2010), *electronic books* (2010, 2011) or *tablet computing* (2012). This is surprising given that these technologies are currently active in educational contexts.

Table 1: Horizon Report predictions mapped to TELIC Masters dissertations

NMC Horizon Report Predictions (2004-15)	**No.**	**TELIC Masters Dissertations (2000-15)[7] with a main focus on these technologies** (total=84)
Learning Objects (2004)	1	Middleton (2005)
Multimodal Interfaces (2004)	5	McCarter (2005); Verhoeven (2009); Geenen (2009); Schols (2009); Patel (2014)
Knowledge Webs (2004)	2	Schimmel (2004); Timmers (2014)
Extended Learning (2005)	55	(see Table 2 for breakdown by context)
Social Networks (2005)	6	Diamond (2005); Thuss (2009); Gibbs (2011); Jans, R. (2011); Beckingham (2015); Bruggeman (2015)
Educational Gaming (2006), Games Based Learning (2012)	4	Hendriks (2007); Eijkenaar (2007); Jans, S. (2011); Palmaers (2014)
New Scholarship / Publication (2007)	2	Mahmoud, M. (2008); Thomson* (2013)
Cloud Computing (2009)	2	Wells (2009); Stosiek (2012)
E-portfolios (2012)	2	de Vries (2006); Kenny* (2013)
Visual Data Analysis (2010)	1	Guest* (2011)
MOOCs (2013)	1	Wright*(2015)
Flipped Classroom (2014)	3	Gillin (2015), Bennett (2015); Vincent (2015)

* Article / paper in this issue

There is a possible link here between a lack of expertise within the tutor group and the students as to why this is the case. There is also the sense that the need for a TELIC professional to be responsible for his/her own learning goes beyond the level one might

[6] Of these 84 masters graduates two have completed PhDs in an associated discipline and two are studying for a PhD at this time.

[7] These are unpublished Masters in TELIC dissertations. 2015 studies are in progress.

expect of a postgraduate, purely academic, degree in that much of the technical know-how is self-taught and reliant on 'keeping up' with the knowledge base of fast changing technology. The extent to which the TELIC programme fully addresses global concerns and trends in educational technology can therefore be seen to limited and at present a potential only.

Research methodologies chosen to address professional problems

The methodologies used in the TELIC dissertations are predominantly qualitative, with quantitative data used to supplement and inform rather than lead interpretation (see Vrielink, and van Meurs in this issue). Case study is the prevalent approach to research (e.g. De Vriendt, and Slootweg in this issue) with only a few exceptions. Constructivist grounded theory is adopted by two researchers (Kenny, and Guest in this issue) but there no purely narrative or ethnographic research design, few critical realist studies, and the emphasis is mainly on a socio-constructivist epistemology. Research methods used are those one might consider to be standard and conventional and the typical format of the dissertation itself is a text document apart from one video submission (Cherifa Hendriks, 2007) and two submitted as online blogs (Frank Thuss, 2009 and Chris Thomson, 2013).

The indications therefore are that TELIC researchers prefer to research the digital world in a straightforward and uncomplicated way, choosing the dominant socio-constructivist paradigm in education to investigate their professional concerns and contexts. While the reasons behind this require further investigation a number of questions emerge. Why is it that after 15 years of investigating the field understandings of the knowledge structure of the field – the 'know-how' as well as the 'know-what' - are only partial while at the same time shifting and dynamic (as indicated by the Horizon Report predictions in Figure 3 and the pace of change this shows)? Also, why are we not able to show how knowledge has developed progressively and cumulatively, even in a collaborative and supportive community like TELIC? One explanation is offered by examining the field of educational technology itself, along with the structure of knowledge and the discourses associated with it. Czerniewicz (2010) points to the horizontal knowledge structure of the educational technology field, where new topics and tools are added on segmentally rather than building on previous knowledge (i.e. hierarchically). The 'new lamps for old' nature of technology change results in the field having what Bernstein (2000) calls a 'weak grammar' in which the legitimacy of the field is not clear (i.e. no one is able to say what counts as legitimate knowledge). It is possible,

therefore, that TELIC researchers, researching in complex, interrelated and poorly defined workplace settings, and faced with a high stakes assessment situation, may prefer to 'play it safe' with their dissertations.

Research represented in this issue

While the basis of how TELIC students choose their research methodology to research the digital world is unclear they are able to articulate their research questions in relation to professional problems and contexts. Their allegiance to these problems is evident in the lengths they go to analyse the needs of the organisation or educational setting in which they are situated, often as insider researchers. The research articles in this issue are based on completed dissertations and therefore are representative of research carried out in the TELIC community of students and alumni in that they are based in the researcher's professional context. For example, Reinder Vrielink, in his article writes about the appreciation of the use of the Blackboard VLE within the Police Academy in the Netherlands. He discusses the Technology Acceptance Model and suggests that in this case students of the Police Academy have significantly more behavioural intention and enjoyment in the use of Blackboard than teachers have. His argument is that management of institutions, together with students, should develop a shared vision how to use new technology.

Anita Kenny also researched the impact of the use of IT among her students in a UK further education college. Her research focuses on the effect of the introduction of online portfolio building and shows that in the online environment, students frequently used social interaction and 'learning friendships' to learn from each other. The creation of meaning within these social contexts and within the students groups formed an important part of the learning process. Kenny also notes that students were more motivated when they were able to work with computers.

Marianne De Vriendt's research looks at how new employees perceive the benefits and challenges of blended learning in the Flemish Employment and Vocational Training Agency in Belgium. In her case study she explored how employees perceive the use of blended learning and what the implications of the use of an online environment were for her own practice as a trainer. She concludes that it is hard to transform existing traditional face-to-face

based interaction into an online context and that it clearly shows that the roles of trainers and learners changed and required adjustments to practice.

Professional development was also the focus for Rene Slootweg in his role as a manager at Rotterdam University of Applied Sciences. He collected data of preferred learning habits and learning environment from managers and interviewed them about their own professional development. The case study shows that there is no clear learning profile of managers in HE and that managers most often use standard possibilities in training and development of staff.

An emphasis on the needs of learners is highlighted in the articles by Cristiaan van Meurs and Ian Guest. The study of van Meurs offers insight into a special programme developed in Belgium to help students with a disability how to cope. He examines the behaviour of these students and how behaviour was changed to adopt a new way of coping with disability. The use of coping styles such as *active tackling, palliative reacting, passive reaction, seeking social support* and *avoidance* was researched, offering students insight into their own coping strategies and giving the researcher insight into the pedagogy of the programme.
Similarly, a study at a UK school by Ian Guest investigates how teenage secondary students learn through using images. Students used a camera to capture images to tell the story of their learning. The article reveals that students don't see learning in the same way as the educator and how this affects the learning and teaching.

Reflection and reflective practice was the main subject in the research of Dave Weatherall. In his article he describes the result of a study among a large group of Malaysian students at Sheffield Hallam University into how reflective blogging is used in an undergraduate Level 6 Built Environment module. The results show that there is a pedagogical benefit in the use of reflective blogs for international students.

These seven research articles are representative of the research interests addressed in the TELIC research community. They each throw light on the professional practice of the researcher and therefore by association the research makes a contribution to the professional practice of the community. They are therefore, indicative of a search for knowledge for contextual purpose, and while this does not preclude theoretical knowledge it does not necessarily make it likely or possible. It remains important to continue to identify how theory

informs and anchors professional judgment rather than to merely describe the professional problem space.

Developing a professional community and its professional practice

From this broad analysis of the research interests of TELIC students, including the research articles in this issue, it can be seen that TELIC research is exclusively located in a workplace context. This partly explains the predominance of a generalized approach to technology (an emphasis on the VLE and the delivery of learning) in that researchers are faced with a conservative position on innovation and change in which their agency to introduce new ideas is limited. It also supports the idea of dissertations as *extended professional projects* with an emphasis on the professional as researcher at the centre of his/her own practice (Hudson, Pountney and Woldinga, 2005). These contexts are shown in Table 2 mapped to the dissertations that have been completed or are under way at this time. The majority of these are in education institutions (38) as opposed to public sector, consultancy or commercial settings (17).

Table 2: Professional contexts for dissertations that address extended learning in educational contexts

Professional Context	**TELIC Masters Dissertation (2000-15)** (Total = 55)
Higher Education (15): UK (6), Netherlands (6) , Belgium (1), Oman (2)	Awouters (2005); Massoumi (2005) Alfarsi (2006); Purvis-Gisborne (2006); Suykerman (2007); Ambusaidi (2008); Mahmoud, F. (2008); van der Linde (2009); Wassdorp (2009); Berzenji (2010); Thompson (2012); Slootweg* (2013); Hundal (2013); van Pelt (2014); Weatherall* (2014);
Further Education (4) UK (2), Netherlands (2)	Kruisman (2007); Cresswell (2008); Dawson (2011); van Meurs (2014);
School (19) Primary education (4) Secondary education (15),	Gouda (2002); Enser (2004); McGreavy (2004); Vrielink* (2005); Knutsen (2006); Delbauve (2006); van Rooij (2007); Baur (2007); Hsu (2009); Sharma (2009); Beerens (2011); Veldhusien (2011); Elbers (2012); Coenen (2012); Crossley (2013); Adams (2013); Emsley (2013); Was (2014); Drijvers (2015)
Public Sector (8): Police (3); Health (2); Army (1); Education (1); Employment (1)	Yates (2006 - Police); van der Woert (2007 - Health); van Hulst (2007 - Army); Drijver (2007 - Health); Haigh (2008 - Police); Steel (2011 – Police); Parkes (2012 - Education); De Vriendt* (2014 - Employment)
E-learning Consultancy (2)	Jansen (2012); Bustamante (2009);
Commercial / Business (7) UK (2), Netherlands (5)	Karra (2005); van der Donk (2007); de Jong (2007); Drever (2008); van Nuland (2009); Archer (2012); Van Camp (2105)

* Article / paper in this issue

The extended professional project, then, becomes a weak form of action research in which the professional context dominates over development activity. This is not to dismiss the value of

the research activity for professional development. The practice papers in this issue tell of a number of ways in which the individual benefits from the peer group and the sharing of practice. Andy Wright, in this issue, discusses the thought processes and ideas about his proposed research into Massive Open Online Courses (MOOCs) and how this is emerging from his practice (his professional concerns) while being tempered by theory. Bram Bruggeman outlines his experiences as a new member of the TELIC community and his hopes and expectations of being a student at masters level. His story may develop into one of those developed by Chris Thomson in his paper on TELIC Stories (see http://www.telic-stories.co.uk/) such as Joy Drever's story about the 'massive leap' she made and the profound effect this had on her teaching style and her ability to empathise with students; or Sarah Archer's story about the effect her study and interaction with peers has had on her professional career (and winning an award). Thomson's dissertation research on digital storytelling underpinned his knowledge and expertise in helping his peers tell their stories.

Implicit here is the development of expertise, from the *neophyte* (Bram) developing facility with the knowledge propositions of the field into which he is entering; to the *intermediate position* of the developing professional (Andy) moving from practical to conceptual knowledge by making inferences about the topic he is preparing to research. For graduate Chris, expertise involves not only the knowledge of procedures in assessing new knowledge but also how to test and acquire it (Winch, 2014: 49). Here the field of practice for TELIC professionals is the specialized practical contexts in which they practice – they are professionals in action. Furthermore, their shared interests and concerns gives rise to collegial formations that underpin the pedagogy in the course and that are sustained beyond graduation.

One example of this extended learning is present in Richard McCarter's review, in this issue, of the 10 annual TELIC conferences that have taken place. In 2005 the course (tutors and students) was awarded a three-year grant by SHU to develop an annual student-led conference. The first was held at HAN in Nijmegen in 2005, and the 11th takes place in Hasselt in Belgium in May, 2015. Richard outlines the themes, activities and highlights of the conferences and how their geographical dispersal has added to the sense of being a community that is 'only as strong as its network'. This coming together of peers in conference realises the aim of the collaborative approach prized in the TELIC curriculum and pedagogy and is illustrative of students' and alumni willingness to share their work and to support the work of others.

Discussion: preparing for professional practice

In terms of professional practice in educational technology this journal issue highlights the need for practices, learning strategies and tools to continue to evolve, in close cooperation with their potential users, and linked directly to places of learning as the site of this production. The members of the TELIC Community bring their experience and their practice-based knowledge about technology in education. They discuss this more deeply in a social network and by doing this, they create new knowledge, they transfer knowledge and they adopt and adapt knowledge (Phelps et al, 2012). The discussion of knowledge is based on a prior and shared understanding that is discussed with others in a social context leading to a deepening understanding of professional concerns in networks (Schimmel, 2004; 2013).

The future, however, is sometimes unexpected and subject to the 'combinatorial' nature of technology and circumstance, as in the case of the *driverless car* - i.e. arising from and made possible by a convergence of technologies rather than in response to need (see Naughton, 2015). Change (and innovation) in this context is not a simple process (Fullan, 2001; Hargreaves, 2005) and it appears that digital practices (practice with and through technology) are emerging in unexpected ways (Davies and Merchant, 2014):

- Digital practices emerge alongside significant changes in social life.
- Digital practices, particularly those that take place in online spaces, foreground issues of identity and self-presentation.
- Digital competence is not evenly distributed.
  (Davies and Merchant, 2014)

For the TELIC professional social media is one example of how technology is disruptive and can enter by stealth (see Ian Guest's story in Chris Thomson's practice paper, this issue). In her discussion of *what it means to be a digital learner* Sue Beckingham considers the need for 'lifewide' digital learning. This is complicated by ideas around young people being digital natives' who know more than adults (Prensky, 2001), and while this position has been critiqued (Bennet et al., 2008), others apply the terms 'digital visitor' and 'digital resident' (White & Cornu, 2011), suggesting that inheritance is not the determining factor in being digitally literate, not even for the 'net generation' (Oblinger et al., 2005). Leaving aside this terminology it would appear that those who are regarded as digitally literate are those most likely to be successful learners (Gruszczynska and Pountney, 2013). The missing piece of this

puzzle is the way in which educational technology knowledge itself is 'specialised' according to whether it addresses the 'who' rather than the 'what' of digital literacy (Howard and Maton, 2011). This reflects a tension between digital literacy as a set of skills and competencies on the one hand and understandings that arise from how people interact and communicate on the other. These competing positions complicate knowledge building in educational technology (Czerniewicz, 2010) made worse by the lack of a knowledge base on professional development that works, or one that continues to shift slowly in response to change (Leask and Younie, 2013).

How ready are we?

This paper has highlighted the professional and research concerns that are important to TELIC at this time and how they have evolved and grown with the community. We continue to ask what the problems are that are important to us, that we have an allegiance to, and what theories and methodologies are available to give us a grip on these problem spaces? It is evident that the TELIC community has made an important contribution to the practice and research in the field of educational technology and can continue to do so. However, if we are to maintain professional expertise we require a clearer understanding of specialist knowledge in this field and how it builds and progresses over time. It is important in considering our future research questions that we acknowledge our legacy and continue to weigh the investment needed for this to carry on.

Postscript

The TELIC programme stopped admitting students in 2013 and its current cohort of students will complete their dissertations in 2016. There are plans for a 12th student conference in 2016 and this journal will continue to publish research articles and practice papers of members of the professional community.

Bio-notes: Richard Pountney has led the MSc TELIC course since 2005 and has taught on the programme since 2000. Herman Schimmel graduated from the MSc ELMAC course in 2005 and is the TELIC Journal manager.

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