



Report from TWG3: Teacher Professional Development

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Introduction

Technical Working Group 3 considered teacher professional development for use of information technologies to promote 21st Century Learning in elementary and secondary schools, addressing the following element of the Call to Action from Edusummit 2009:

To develop and use models for teacher professional development on technology use in schools and classrooms at the pre- and in-service levels

In the group discussions at Edusummit 2011 it was agreed that the target for action should be refined to focus on teacher professional development for improved learning and teaching through effective use of IT. This refinement highlights the central importance of enhancing learning and teaching and clarifies the focus on the integration of new technologies within all disciplines, rather than being limited to IT/Computing as subjects. This is what Twining (2008) describes as using IT as a 'Learning Tool' on the Focus dimension of the Computer Practice Framework (See Figure 1).

Figure 1 The Focus Dimension within the Computer Practice Framework (Twining 2008 p.566)

Category	New definition
IT	Using computers in a way that helps children to develop their IT¹ skills, knowledge and understanding. The emphasis here is on using a computer to extend the children's knowledge, understanding or skill in computer use itself. E.g. Learning how to operate the mouse. Learning how to use the word processing software.
Learning Tool	Using computers in a way that supports any aspect of children's learning other than IT itself. This would include the following three areas: <i>Curriculum Tool</i> - Using computers as tools in a way that helps children to develop skills, knowledge and understanding in another curriculum area (i.e. other than IT). The emphasis here is on using the computer as a tool to enhance their learning in another curriculum area rather than in the area of IT itself. E.g. To develop the language skills involved in drafting and re-drafting. To extend their ability to interpret data (e.g. using a graphing package that they already know how to operate to help them answer a scientific question). To provide access to the curriculum (e.g. for children with 'Special Needs'). <i>Mathetic Tool</i> - Using computers as tools to develop children's ability to learn and enhance

Category	New definition
	<p>their approaches to learning. E.g. To encourage collaboration. To help children reflect on their own learning processes. To teach children to teach each other how to use particular programs.</p> <p><i>Affective Tool</i> - Using computers as tools to support and enhance the affective aspects of children's learning. E.g. To develop their confidence and/or self-esteem (for example by allowing a child who may be perceived as 'less able' to teach other children how to use a new program). Using computers to help motivate children.</p>
Other	<p>Using the computer in a way that is not covered by IT or Learning Tool. <i>Other</i> thus includes objectives that do not relate directly to learning outcomes and/or where no learning is apparent. Objectives for using computers that fall within this category may be focussed on practical aspects of the learning situation or the larger context in which the computer use is taking place. E.g. Using computers in order to respond to pressure to do so from children, their parents, colleagues and/or external agencies. Allowing children to use the computer as a reward or holding activity whilst the teacher is working elsewhere. An example of this would be allowing children who have finished other work to 'go on the computer'. Using a computer in order to make the teacher's workload or classroom management easier or more enjoyable. Using computers as a mechanism for presenting the school in a good light or in order to be seen to be using them. <i>Other</i> would apply where no learning is evident.</p>

Obstacles to success

TWG3 identified a number of issues that were seen to constitute obstacles to effective teacher development. These included a lack of consistent vision for what might constitute success, poor match between needs and provision; exclusion of significant voices from decision making; potential misalignment among government policy statements, institutional cultures, and individual professional responsibility; and failure to successfully harmonise context, policy, practice, and research.

Teacher professional development intended to promote 21st Century Learning often arises from visions for success that are inconsistent. When some leaders and participants aim to *transform learning* through the professional development effort and others aim to use the effort to *improve performance of learners in the current system* of schooling and accountability, success is unlikely. Time devoted to ensure that professional development is targeted to support a **shared vision** is time well spent before the experience is designed and implemented. Shared vision has been recognized as the first of several necessary conditions for leveraging technology to enhance learning (International Society for Technology in Education, 2008).

Teachers (and learning) are often treated so generically that resulting professional development is not experienced as relevant. Socio-economic context, age-level assignment, subject or content specialization, and prior experience are all critical characteristics of teachers to consider when designing professional development. Typically, elementary teachers are 'in the business' for a whole different reason than are secondary teachers, and motivation impacts the kind of professional development that a teacher finds engaging. Skills to be developed must match content, technology and pedagogy with the desired learning to ensure an effective professional learning experience.

Teachers, school and system administrators, students, parents, and community leaders all have legitimate stakes in the success of our education systems but too often many of these voices are missing from discussion that might influence the direction of professional development. Professional development that is aligned and encouraged from the top, bottom, and middle is most likely to be successful. Important levels of support include:

- *Policy/Government* – vision, influence of assessment, essential conditions, sustainability;
- *Organization/Institution* – shared vision, coaching, adaptive PD, culture of a learning organization, sustainability; and

- *Individual Professional Responsibility* – shared vision, new teaching strategies, career-long learning, professional learning communities, mentoring.

Successful teacher professional development should acknowledge and embrace principles drawn from knowledge of the context of teachers' practice, policy imperatives, emerging pedagogical practice, and current research. Failure to attend to any of these multiple sources of information may result in professional development efforts being less relevant and effective.

Imperatives for action

There was general agreement among the members of TWG3 that teacher professional development should be seen as forming a continuum, from pre-service to in-service and life-long professional development. The emergence of mobile digital devices with ubiquitous network access has increased interest in mobile and informal learning as alternatives to traditional formal training. Recent research points toward the importance of informal elements such as collegiality for encouraging reciprocal learning between beginning and experienced teachers (Patrick, Elliot, Hulme & McPhee, 2010) and to the value of informal practice-based learning networks for sustained professional development of teachers (Hanraets, Hulsebosch & de Laat, 2011; Bradshaw, Twining & Walsh 2011). Other research has confirmed the value of teacher cooperation for professional development while highlighting the importance of support at all levels within a school (Schulz-Zander & Eickelmann, 2010).

There was also agreement that IT changes the nature of disciplines. For example, the nature of history today has been changed; the sorts of questions historians can ask, the ways in which they can access and manipulate data, the techniques they have for analysing artefacts, and the methods for communicating and representing their understandings have all been changed by new technologies. The same is true for all disciplines. It is widely acknowledged that in order to teach effectively one needs to have the relevant discipline expertise. Thus specialist subject teachers in schools need to understand how IT has changed the nature of their disciplines. The Technological Pedagogical Content Knowledge framework (TPACK) for teacher knowledge (Mishra & Koehler 2006) is one way of viewing the knowledge required for teaching that explicitly recognises the importance of the knowledge that exists at the intersection of knowledge of discipline content and knowledge of IT application. Achieving and maintaining currency in this important element of Technological Content Knowledge presents a challenge for teachers at a time when both discipline knowledge and IT are advancing rapidly.

There was also general agreement that IT offers new approaches to supporting learning; it changes pedagogy. These changes often align better with new understandings of how children learn (e.g. social constructivist, socio-cultural) and as such represent what Cuban (1998), drawing on Watzlawick, Weakland and Fisch (1974), defines as second-order change, which he contrasts with first-order change:

"First-order changes, then, try to make what already exists more efficient and more effective, without disturbing the basic organizational features, without substantially altering the ways in which adults and children perform their roles. ... Second-order changes seek to alter the fundamental ways in which organizations are put together. ... Second-order changes introduce new goals, structures, and roles that transform familiar ways of doing things into new ways of solving persistent problems."

(Cuban 1998 p342)

This intersection is also recognised in the Technological Pedagogical Content Knowledge framework (Mishra & Koehler 2006) and presents further challenges for teachers to adapt their pedagogy to reflect new understandings of learning and teaching, evolution in the particular field of study, and the availability of new IT. The TPACK framework is being

applied as the basis for an Australian national project to enhance graduating teachers' capacity for working with IT (Education Services Australia 2011).

These discussions raised a question about what the aims of teacher professional development should be – a question about our educational vision.

Vision and other teacher professional development issues

The importance of having shared visions in education is well documented in the literature (Fullan, 1992; National College of School Leadership [NCSL], 2003, 2004; DfES, 2004), as is the lack of agreement underpinning IT use in education (dICTatEd 2007; Twining 2007). The overarching question which needs to be answered before one can decide on the most appropriate approach to teacher professional development is whether the focus of that development should be on transformation of teaching/educational practices or (more simply) doing the same things better. The Mode Dimension of the Computer Practice Framework (Twining 2008) represents the possible ways in which IT might impact on the curriculum and pedagogy as consisting of three categories as shown in Figure 2.

Figure 2 The Mode Dimension within the Computer Practice Framework (based on Twining 2008 p.567)

Category	Definition
Support	Learning objectives (excluding those relating specifically to <i>IT</i>) remain the same but the process is automated in some way. <i>Support</i> is thus about improving efficiency and effectiveness without changing curriculum content.
Extend	Curriculum content and/or process are different, but these changes <i>could</i> take place in a classroom context <i>without</i> a computer or related information and communication technology.
Transform	Curriculum content and/or process are different, and these changes <i>could not</i> have taken place in a classroom context <i>without</i> a computer or related information and communication technology.

There was general agreement that pre-service professional development needed to develop students' capability to use IT in ways that *transform* practice whilst preparing them to work effectively within the current system (e.g. using IT to *support* and *extend* practice). In order to do this it was agreed that pre-service professional development needed to include a focus on underpinning principles and theories of education, relating to: the philosophy of education; learning theory; and change management. There was a concern that in some countries these elements had been weakened or removed from both pre- and in-service professional development in order to allow more time to focus on developing particular 'skills' (such as teaching synthetic phonics). This has reduced the ability of teachers to make informed decisions about educational practices. Indeed it was argued that in some countries where teachers' underpinning theoretical understanding had been eroded (e.g. England) it was hard to continue to justify calling teaching a profession.

Other characteristics of professions were also felt to be absent in some countries. These included:

- a requirement for regular updating and re-accreditation;
- engagement with cutting edge knowledge and practice within the field, as both consumers and producers of research; and
- an independent professional body, which ensured that appropriate standards of competence and practice were adhered to.

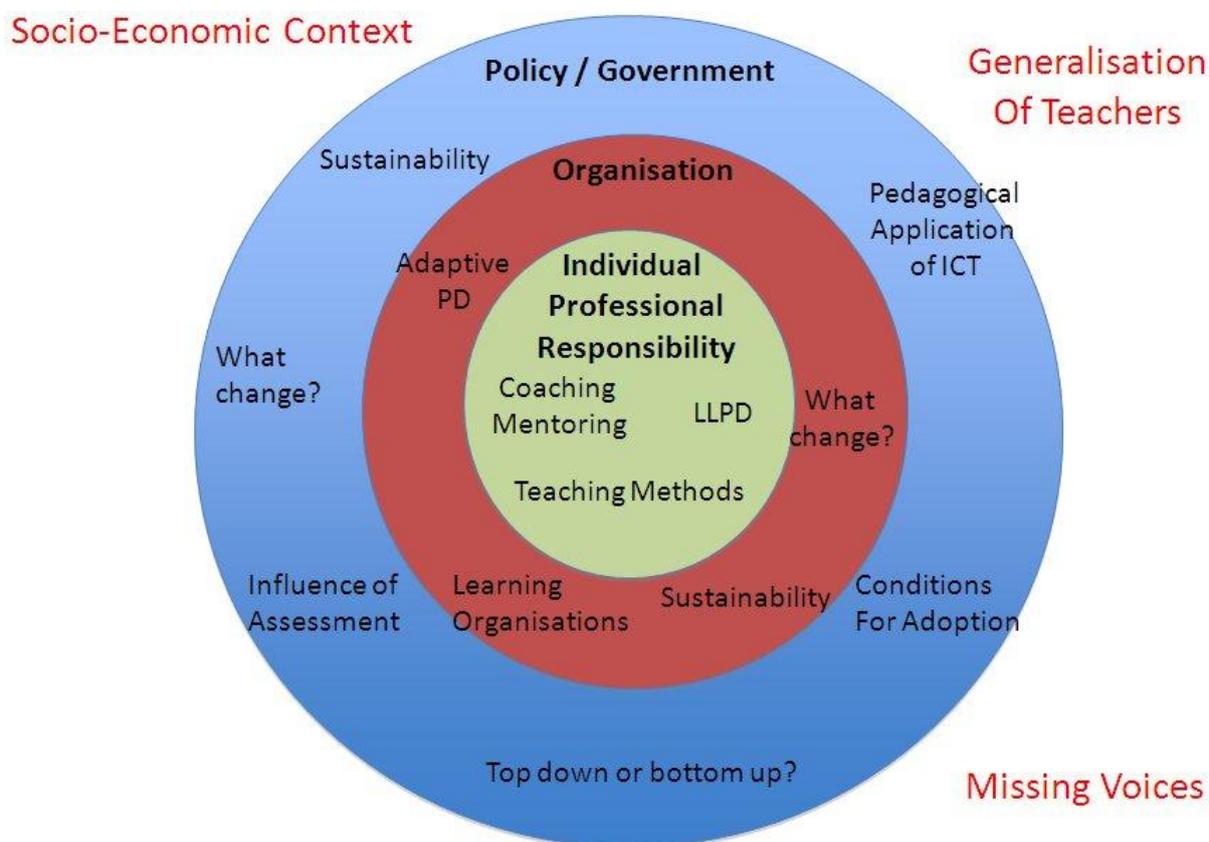
Numerous other issues were discussed and are summarised in Figure 3. It was evident that issues applied at a range of different levels. These reflect Kozma's (2003a) levels, as reported in Hinostroza, Labbé, López & Iost (2008 p.86)

1. Macro-level or system factors such as cultural norms, social context, educational policy, curriculum standards, etc.
2. Meso-level or school factors such as availability of IT infrastructure, IT integration plans, school leadership, innovation history, parental expectations, etc.
3. Micro-level or individual factors for teachers, such as pedagogical practice, innovation history, educational background, experience with technology, etc; and for pupils, such as experience with technology, social and cultural background, etc.

A major concern was the lack of representation of key stakeholder groups in WG3's discussion (and in wider discussions about education), including teachers and students.

Many of the issues discussed related to topics being considered by other working groups at EdusumMIT 2011 (e.g. Influence of assessment; Conditions for Adopting/barriers). Others were more clearly related to understandings of features of effective professional development.

Figure 3 Representation of additional issues



What we know about effective professional development

There is a general consensus in much of the literature on a number of features of effective continuing professional development (CPD). Thus, the UK Government Department for Education (DfE) (2010) reported (*emphasis added*) that:

A systematic review of research on professional development found that there are some key features of professional development which are linked to better achievement by children:

- Observation of teaching;

- Feedback to teachers;
- The use of *external expertise linked to school-based activities*;
- Scope for teachers to *identify their own CPD focus*;
- An emphasis on *peer support*;
- Processes to encourage, extend and structure *professional dialogue*; and
- Processes for *sustaining CPD over time* to enable teachers to embed practice in their classrooms.

... There is also convincing evidence that *collaborative* professional development is more strongly associated with improvements in teaching and learning. ...

(DfE 2010 p.10)

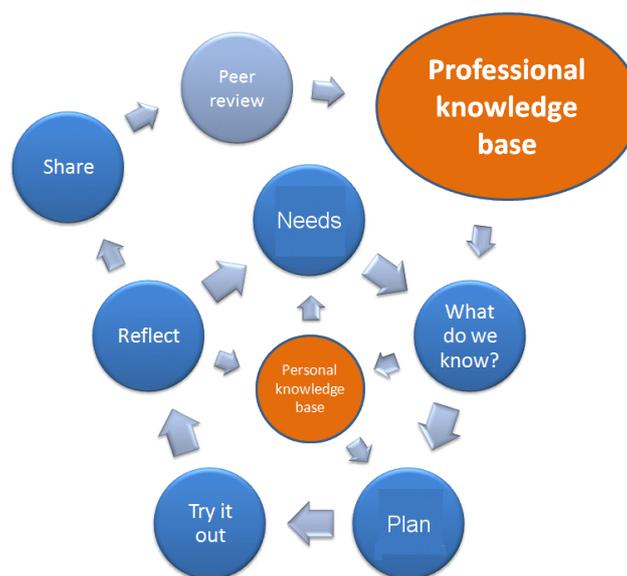
Whilst this DfE review appeared to be based on a small sample of sources, the features it identified align well with Twining's (2011) synthesis of the following literature: Cordingley, Bell, Isham, Evans, Firth (2007), Hall (2009), McCormick, Banks, Morgan, Opfer, Pedder, Storey & Wolfenden (2008), Murchan, Loxley & Johnston (2009), Ofsted (2006), Opfer, Pedder & Lavicza (2008), Pedder, Storey & Opfer (2008), and Williamson & Morgan (2009). Twining (2011) concluded that:

Effective CPD is:

- strategic and impact focused (Senior Leadership Teams, school development, self-review & performance management)
- context relevant (pupil/teacher/classroom/school)
- collaborative, experimental & reflective
- evidence/research informed
- sustained
- evaluated (in relation to planned impact).

Selwood and Twining (2005) advocated the use of action research as an effective model for professional development. WG3 agreed that practitioner research (of which action research is one approach) maps well onto the key features of effective professional development. Action Learning (Revans 1998) is a related approach in which teachers are supported as they work on individual projects and has been used with success to support teacher development in the application of ICT (Schibeci et al. 2008).

Figure 4 The Vital Practitioner Research Cycle



A key element of research (including practitioner research) is that it involves the sharing of expertise. This is illustrated in Figure 4 which shows the Vital Practitioner Research Cycle

(see <http://www.vital.ac.uk>) in which finding out what other people know about how to address a particular need and sharing your learning with the wider community are integral parts of the process.

One of the challenges for teachers is for their expertise to be recognised and valued. Currently there is a lack of infrastructure in many countries to support teachers in collaborating beyond the boundaries of their own schools. One approach to tackling this which is emerging within the UK involves TeachMeets. These are informal, practitioner led events in which participants volunteer to give short presentations (2 or 7 minutes) in which they describe some aspect of their practice (see <http://www.youtube.com/watch?v=s9J4BzTHRfA> for a video explanation of what TeachMeets are; see <http://www.teachmeet.org.uk> for the main TeachMeet website).

Recommendations

Whilst many of the challenges cut across contexts, differences in education systems, cultural practices and beliefs mean that one needs to consider global, national and regional differences – our recommendations aim to ensure a minimum level of provision (which may be in place in some contexts already but not in others). The recommendations need to be applied at all three levels identified in Figure 3: government, organisation and individual. A general underpinning principle is that effective practice (using IT to enhance learning and teaching) requires an integration of discipline expertise, pedagogical expertise and IT competence (which includes technical skills).

The following specific recommendations for future policy, practice and research emerged from the discussions:

Policy

- Develop and document a shared vision for education and the role of IT & professional development which engages all stakeholders (social, commercial, civic, teacher associations) to encourage ownership
- Develop a minimum entitlement/requirement for professional development along a career-long continuum (pre-service, in-service and lifelong), which prepares and enables practitioners to develop and regularly update their expertise as education moves from traditional models, roles and practices to new and emerging ones.
- Ensure that at least 30% of funding for new educational initiatives is set aside for professional development

Practice

- Develop teacher educators so that they can act as good role models for their students.
- Use multi-disciplinary teams to develop courses (including discipline expertise, pedagogical expertise and technical/IT competence) while ensuring that these elements of knowledge are effectively integrated rather than treated as separate domains.
- Ensure that pre-service provision explicitly develops students' understanding of education theory, including philosophy of education, learning theory and management of educational change.
- Ensure that in-service professional development builds and extends participants understandings of relevant theory and how it relates to practice.

Research

- Funding for research should be focused on supporting practitioner research, particularly relating to IT and subject integration.
- Engage pre- and in-service practitioners in research about IT and learning/teaching.
- Develop better routes for sharing of expertise between practitioners, including the sharing of research findings and interesting practice.

Conclusion

Early on during TWG3 discussions consensus developed that research-based and experience-based knowledge for effective teaching – including effective professional development – is not adequately disseminated in a manner that impacts policy or practice. A major portion of this paper is devoted to models for professional learning, standards and expectations for professional practice, and imperatives for action to ensure that these well-established criteria are recognized and respected as important. However, one major reason for greatly expanding the policy and practice constituencies attending EduSummit 2011 was so that recommendations from the working groups could be “fast tracked” into policy and practice. Ways should be created for EduSummit sponsoring organizations such as UNESCO, IFIP, ISTE, Kennisnet and SITE to become conduits for channeling the best professional development practices into our existing schools.

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