Abstract

For many practising teachers, the push to integrate ICTs across the curriculum has become yet another example of those top-down impositions that only distract them from their primary task of teaching. While the spirit behind that push may well have been to encourage teachers to use ICTs as powerful tools for enhancing, or even transforming, their teaching, for many it has had a very different effect in practice.

This position paper suggests that it is time to move beyond the ‘integration of ICTs across the curriculum’, and redefine the success of a school’s implementation of ICTs in terms of user empowerment. In contrast to the more technology-centred emphases on access, or even on use, this re-definition needs to place its primary emphasis on the extent to which the implementation actually empowers the school community in its practice – as determined by its users.

This more user-centred definition of success, especially when applied at an individual school level, and to the school as a whole, can then be used as the basis for both a user-centred model to guide the on-going development of a school’s implementation, as well as a formative, user-centred process for evaluating its effectiveness.

While research has established the potential for ICTs to be used as empowering tools by both teachers and students (Becta, 2004; Jonassen, 2000), findings also verify practitioners’ concern that this potential is rarely achieved in the typical school day or typical classroom (Cox, Abbott, & Webb, 2004). Research has focused on discovering the factors that have led, and continue to contribute, to the discrepancy between the potential and the reality (Ertmer, 1999, 2005), and most recently studies have been focusing on the need to improve professional development for teachers (Cox et al., 2004; Lloyd & Cochrane, 2006; Phelps, Graham, & Kerr, 2004), which has long been in need of a paradigm shift from basic skills training to transformative development, especially in the use of ICTs (Lieberman, 1995; Schibeci, MacCallum, Cumming-Potvin, Kissane, & Miller, 2008).

However, it is the central premise of this paper that there is another significant area that also needs urgent attention. This area has more to do with the school’s implementation of digital technologies, and most to do with what is the main focus of that implementation. In particular, it has to do with the prominence of technology-centred, generalised implementations that create barriers to empowering use by teachers and students (Fabry & Higgs, 1997), and with the need to move to a more user-centred, personalised implementation.

Some schools have successively overcome most of the obviously-technical problems of earlier implementations, such as lack of computers, lack of power in those computers, lack of software, lack of infrastructure, lack of technical support, lack of user-skills training, and lack of helpdesk support (Becker, 2000). However, the tendency is to assume that these implementations are now useable and useful (and thereby empowering), and that it is simply a matter of integrating ICTs across, and into, the curriculum. Research from the field of Human-Computer Interaction (HCI) has consistently shown that such technology-centred assumptions are generally unfounded (Davis, 1989; Vankatesh, 2000).

So the discrepancy between the potential for ICTs to empower teaching and learning, and the realities of the typical classroom, persists (Cuban, 2001). This problem is a very practical one that many school
communities face, and one they have difficulty knowing how to solve. They may recognise the importance of ICTs in modern culture, and the consequent importance of students understanding them and being able to use them effectively and critically. They may even subscribe to the idea that ICTs can be used to transform teaching and learning. However, they still have a disquieting sense that, in practice, their existing implementation is not having the sort of impact they expected (Staples, Pugach, & Himes, 2005).

Rarely, however, does this lead to an overt questioning of the practice of ‘integrating ICTs across the curriculum’ – it is simply assumed that the more widely and deeply that ICTs are integrated across and into the curriculum, the more successful will be the school’s implementation. Unfortunately, integrating ICTs does not guarantee better teaching and learning. In fact, in situations where such integration has been imposed upon users without adequate consultation or respectful consideration of their concerns and needs, it may well be that it has led to token usage on the one hand, or outright resistance on the other, rather than empowerment of the users.

**A ‘new’ concept of successful implementations**

The position taken in this paper, and the research-in-progress from which it is drawn, is that it is time to move beyond simply assuming that the level of integration across the curriculum is a good indication of the success of a school’s implementation of ICTs. It is time to start assessing the success of a school’s implementation according to how well its core users are being empowered to carry out the core business of the school (MCEETYA, 2005), and making this criterion the central one in the design and planning process. The question then becomes: how do we assess user empowerment? The position taken in this paper, and in the research on which it is based, is that the answer is relatively simple: by determining the extent to which the implementation is user-centred, and personalised to the particular way that the school does school.

Since this position has come directly out of the author’s professional practice over nearly 30 years as teacher and ICT implementer, and ICT consultant, it is naturally driven by the philosophy underlying that practice, and in particular by two emphases of that philosophy: firstly on the uniqueness of the individual, whether student, teacher, class, or school; and consequently on making users, whether students, teachers, classes or schools, absolutely central to any effective design or evaluation process. Whether applied to the pedagogical aspect, or the technological aspect, this dual emphasis on personalisation, and on user-centredness, is at the heart of empowering users.

In the context of developing and evaluating a school’s implementation of digital technologies, these emphases lead to two core premises, presented here in relatively simplistic terms: the first is that, since there is no one right way of ‘doing school’, there is no one right way of ‘doing ICTs’ in schools. The second is that, since schools are first and foremost about people, and only subsequently about ICTs, a school’s implementation of digital technologies must also put people first.

These premises highlight two extensions to re-defining the success of a school’s implementation according to how well its core users are being empowered to carry out the core business of the school. The first is that success should be understood as the extent to which a school’s implementation is personalised to that school’s particular way of doing school. This contrasts with the idea that there is a particular type or style of implementation that can be considered appropriate for every school. The second premise is that success should be understood as the extent to which a school’s implementation is user-centred, in the sense that the users and their needs are explicitly placed at the centre of its design and evaluation processes. This contrasts with the more technology-centred approaches, which place the perceived need to use ICTs at the centre of those processes.

The tendency over the years, and continuing to greater or lesser degrees in schools today, has been to tie the idea of ‘successful’ implementations to more technology-centred criteria, such as the:
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- number and/or type of computers and/or type of operating systems
- specific uses of computers: objects of study, tutors, productivity tools, thinking tools
- ratio of students to computers
- placement of computers: labs, classrooms, libraries; aggregated and/or distributed
- level and extent of infrastructure
- level of technical and helpdesk support
- level of students’ and/or teachers’ competency in computing skill-sets
- level of actual use by teachers and/or students
- level of ICT integration into the teaching and learning environment
- the extent to which ICT integration is transforming teaching and learning

While positive results on each of these criteria can and do contribute to a successful implementation of ICTs, the position taken in this paper is that they do not (no one of them, nor any combination of them) constitute the best criterion for determining the success of the implementation. The essential criterion is something qualitatively different – the extent to which the implementation empowers the users in carrying out the school’s core business. To over-simplify the point, if the school’s core business is to use ICTs, then these technology-centred criteria are the most important; but if its core business is elsewhere – for example teaching and learning – then the essential criterion is in a different category altogether, and is far more important than any technology-centred criteria.

Making empowering users the main criterion for success does not exclude any of the items in the above list from consideration. In practice, the research on which this paper is based indicates that when a school takes a user-centred approach that focuses on personalising the implementation to the school’s particular way of doing school, most of the issues highlighted by a predominantly technology-centred approach still arise. However, because of the primary emphasis on a user-centred approach, those issues remain in their proper place as subservient to the essential issues of empowering users in carrying out the core business of the school. Education stays in the driver’s seat, and technology stays under the hood.

Personalised – to the school’s particular way of doing school

"The crucial ingredient is a commitment to knowing the minds – the persons – of individual students." Howard Gardner

Taking account of individual differences is a recurring theme in education, and in the use of ICTs to enhance teaching and learning (Chen, 2009; Gardner, 1999; Reeves, 1994). The current author has long structured the teaching and learning in his classes around that principle, and started using ICTs in the late seventies purely as a means to enhance what he describes as a personalised teaching and learning environment. This personalising of teaching and learning arose from the previously-mentioned emphasis on the uniqueness of each student, where such uniqueness is an expression of the complex interplay of the student’s many characteristics and experiences.

The choice of the term personalised, rather than individualised, is intentional, and due mainly to the latter’s connotation of working alone. The phrase individualised teaching and learning typically refers to students working on their own, especially when in the context of computer-directed instruction, so the research literature will also occasionally present it this way (Goodman, 1995). By contrast, a personalised teaching and learning environment places a heavy emphasis on groupwork and peer mentoring, so personalised is used here to refer simply to the fact that, since each person is a unique combination of many different characteristics, their individual differences should be taken into account (Hargreaves, 1994).

Taking account of individual difference is also a recurring theme in the field of Human-Computer Interaction (HCI), and more recently the emerging field of Human-Centred Computing (HCC). In web design, for example, personalisation is playing an increasingly prominent role. Here too, personalising
relates to the uniqueness of the person using the device or application. Personalising your search results, your desktop, your social networking homepage, and your avatar, so that they reflect your preferred ways of working and your own unique personality – these are features that are expected, even taken for granted, by an increasing proportion of technology users, so that an increasingly common complaint from users when reviewing a new technology is its lack of personalisation.

Now, using the term personalisation with respect to students and users might make sense, since students and users are persons, with personalities, but how can we speak of personalising a school’s implementation of digital technologies? We could revert to using the term individualising, or even customizing, but in both cases something is unnecessarily lost. Human collectives, such as classes, or schools, can certainly be considered unique, and even described in terms of their own ‘personalities’. Just as we can speak of personalising our teaching and learning to better meet students’ different learning needs, and of personalising our technologies to suit our preferred work strategies, or to reflect our personalities, we can also speak, for example, of personalising the use of ICTs to better meet classes’ different needs, or to suit their preferred ways of working, or to reflect their ‘personalities’. Whether we are thinking vertically, so that an early primary class uses ICTs very differently from a secondary Graphics Design class, or horizontally, so that one grade four class uses ICTs quite differently from the grade four class next door, it is simply inappropriate to think that one size fits all.

Personalisation explicitly and holistically takes into account the complexity and uniqueness of the collective, just as it does the complexity and uniqueness of the individual. Thus personalising an implementation of digital technologies to the school’s particular way of doing school is a natural progression from the belief in the uniqueness of the ‘personality’ of each school, which is itself the result of the complex interplay of the school’s many characters and characteristics.

Coda: Despite attempts by education systems globally to create or even describe one, there is clearly no single right or best way of ‘doing school’. This is not just an observation about the different school systems that have arisen over the years. It is an acceptance of the simple logic that each school, even within the same system, ultimately will be a unique application of the general principles espoused in that system. This logic is based on the fact that each school is made up of a unique combination of unique individuals, with their own particular sets of characteristics. This emphasis on addressing the inherent complexity and uniqueness of schools has been appearing in the more contextually-sensitive, or ‘ecological’, approaches found in some recent research (de la Teja, Ganesan, Lundgren-Cayrol, & Spector, 2003; Hennessy, Ruthven, & Brindley, 2005).

User-centred – not technology-centred

"The old computing was about what computers could do, the new computing is about what users can do. Successful technologies are those that are in harmony with users' needs." Ben Shneiderman

Closely related to the need to personalise the implementation to the school’s particular way of doing school, is the need to make sure the implementation is user-centred. While personalisation focuses on aligning the implementation with the unique personality of the school, user-centredness focuses on ensuring that the core users are explicitly placed at the centre of the planning and evaluation processes. A process can be user-centred at a number of different levels (Preece et al., 1994), but here the focus is on putting users’ needs first. If the purpose of the implementation is to empower its core users in carrying out the core business of the school, then the needs of the users must be the first priority. In this paper, then, a school’s implementation of digital technologies is considered user-centred primarily to the extent to which the users’ need for an empowering implementation is at the heart of the design and function of that implementation.

In other words, user-centred is used here to refer to an approach that explicitly puts the users at the centre of the process, placing first priority on the users’ needs, and only subsequently moving onto the
potential use of ICTs to meet those needs. This is in direct contrast to what is referred to in this paper as a technology-centred approach, which starts with the assumed need to use ICTs, then seeks ways to use them. The key contrasts between a technology-centred approach and a user-centred approach can be seen at many levels (Table 1). At the most basic level, the first says “We need to use ICTs”; the second says “We have a job to do.” The first asks “How can we put these ICTs into use?” The second asks “How can we do this task better?” The first assumes that ICTs are inherently useful, usable and learnable, then tries to find some uses and users. The second wishes that ICTs were much more useful, usable, and learnable, so that all users could simply use them to do a better job. The first assumes that ICTs are successfully transforming teaching and learning. The second assumes that transformed teaching and learning will include the wise use of ICTs.

Table 1. Contrasting the Technology-centred Approach with the User-centred Approach

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<tr>
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<th>Technology-centred</th>
<th>User-centred</th>
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<tbody>
<tr>
<td><strong>First Priorities</strong></td>
<td>The implementation is predominantly about having and using ICTs</td>
<td>The implementation is predominantly about serving the school’s core business – teaching and learning</td>
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<tr>
<td></td>
<td>Thinking about ICTs in the school starts with the technology</td>
<td>Thinking about ICTs in the school starts with the pedagogy</td>
</tr>
<tr>
<td><strong>Improving teaching and learning</strong></td>
<td>More / faster / better ICT means better teaching and learning</td>
<td>Better pedagogy means better teaching and learning</td>
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<tr>
<td></td>
<td>Asking ‘How can ICTs improve our teaching and learning?’</td>
<td>Asking ‘How can we improve our teaching and learning (and how can ICTs help us do so)?'</td>
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<tr>
<td></td>
<td>ICTs transforming teaching and learning</td>
<td>Transforming teaching and learning, and using ICTs in that process</td>
</tr>
<tr>
<td><strong>Teacher Professionalism</strong></td>
<td>ICTs imposed on teachers’ pedagogies</td>
<td>ICTs empowering teachers’ pedagogies</td>
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<td></td>
<td>Top-down, often rushed, implementation of ICTs – little or no consultation or training</td>
<td>Consultative, gradual &amp; respectful implementation of ICTs – with ongoing support and coaching</td>
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<td></td>
<td>Start with the assumption that teacher resistance to the imposition of ICTs is an example of obstinacy and recalcitrance</td>
<td>Start with the assumption that teacher resistance to the imposition of ICTs is an example of pedagogical professionalism</td>
</tr>
<tr>
<td><strong>ICT’s role in the curriculum</strong></td>
<td>Enforced integration of ICTs into and across the curriculum</td>
<td>Making ICTs available in all curriculum areas as potentially useful, powerful, or transformative resources</td>
</tr>
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<td></td>
<td>&quot;somehow putting this magnificent solution to work&quot; (Roszak, 1994, p51)</td>
<td>Solutions to pedagogical problems will include the wise use of ICTs</td>
</tr>
<tr>
<td><strong>Useability &amp; usefulness</strong></td>
<td>Assume that ICTs are inherently useable and useful</td>
<td>Users determine the useability and usefulness of ICTs</td>
</tr>
<tr>
<td><strong>Failure of ICT implementation</strong></td>
<td>Starts with the assumption that teachers and students are the problem when ICT implementations do not improve teaching and learning</td>
<td>Starts with the assumption that the implementations of ICT are the problem when they do not improve teaching and learning</td>
</tr>
</tbody>
</table>

The main problem with a technology-centred approach is the tendency for its emphasis on the obvious potential of ICTs for empowering teaching and learning to dominate rather than serve a school’s educational goals. As ICT gradually becomes a more prominent entity in a school, there is a tendency for it to begin moving from servant to master – to become almost an end in itself. By contrast, a user-centred approach keeps the users’ needs central. Even as the user-centred approach moves from users’ needs onto potential uses of ICTs to meet those needs, which it must, it persistently focuses on the ICTs’ ability to meet the users’ needs, rather than being distracted by a perceived need to use ICTs.

A user-centred approach is not without its own problems, however, since it can be seen as a way to simply uphold the status quo – even when it is obvious that the existing user environment needs to be
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transformed. One of the strongest arguments currently offered for taking a technology-centred approach is that the current teaching and learning environment needs transforming – and that ICT offers the way to transform it. This sounds like a strong argument indeed, particularly for those with a positive technological identity. Unfortunately, while digital technologies make wonderful servants, like most technologies, they also make terrible masters. The difference between a user-centred approach and a technology-centred approach is whether the technology is powering the transformation or driving it.

A final word about the users. The users can be understood at a number of levels. Individual persons constitute the most obvious level, which in this case includes staff, students and parents. However, since personalisation is seen here as applicable to the school as a whole, it is also reasonable to refer to the whole school as a user of the implementation. It is the school-as-the-user that ultimately determines, not only the purpose and use of its implementation, but also whether or not the implementation is empowering. The fact that this user consists of a complex collective of individual users, who may each play a role in determining these things, is seen as one of its strengths (Preece et al., 1994; Shneiderman, 1998).

From theory to practice

While ICTs offer great potential for empowering teaching and learning, the reality is that, far from empowering them, the still-prevalent technology-centred approach is having the opposite effect on a large proportion of teachers. Whether the imposition of ‘ICTs across the curriculum’ leads to token usage or outright resistance, forcing teachers to use ICTs that are still far short of the ideal of universal usability (Shneiderman, 2002) is simply inoculating them against genuine engagement.

The position taken in this paper is that it is only when a school takes a more user-centred, holistic approach that is personalised to the way the school does school that a successful implementation of digital technologies is likely to be developed – one that empowers the school’s teaching and learning. This re-defining of success for a school’s implementation of digital technologies, in terms of empowering its users in carrying out the core business of the school, provides a better foundation for evaluating its existing implementation, and for developing the implementation it needs.

Having re-defined success for a school’s implementation of digital technologies, there is a need for a practical, formative evaluation process that schools can use to assess just how successful is their existing implementation, and go about making it more successful. The other task of the research-in-progress from which this paper is drawn has been to develop such a formative evaluation process – a process which itself is naturally user-centred, and personalised to the way each school ‘does school’.

References


