From Brussels to Belmullet: Policy and Situational Factors Influencing the Introduction of Interactive Whiteboards into Primary Classrooms in Ireland

Damian Murchan & Keith Johnston

School of Education, Trinity College, Dublin

Introduction to Interactive whiteboard use in primary schools

Ascertaining the extent of interactive whiteboard penetration and use in primary schools is a somewhat inexact science in the absence of formal census. With estimates of 12% of classrooms worldwide having interactive whiteboards Arora (2012). There is no full audit and any such census is likely to be quickly dated, given rapid changes in schools' action in this area. Promethean Ireland, one of the main providers of the hardware to Irish schools estimates that 8000 people are members of their online website Promethean World, most of whom are likely to be teachers (Sunday Business Post, 2010). Though the distribution across first and second level is not available, the known greater density of IWBs in primary than in post-primary schools suggests that the majority of the 8000 are primary teachers. Estimates in 2010 suggest that 40% of *schools* were using whiteboards (Sunday Business Post, 2010), up from the 16% estimated in 2008 (Judge, 2008).

As with figures on computer use in *schools*, where detail may not be as comprehensive in relation to individual teachers' use of ICT, survey statistics in relation to IWBs often report the percentage penetration of ICTs in the school system (i.e. the proportion of schools that have IWBs) rather than the percentage of classes within those schools that use the technology. In this vein, a national study reported that during the 2005/2006 school year IWBs were "present in a small number of *schools*" (DES, 2008: xv), Shiel and O'Flaherty (2006) quantifying this as 1.8% of schools with IWBs in 2005 (down from 2.4% in 2002), with 36.4% data projectors, more than a doubling of the 2002 figure, thereby possibly explaining the slight drop in IWB use. More recently, Judge (2008) reported that in one area of Dublin, 35% of *schools* were using IWBs, yet the penetration within schools was not reported. More recent estimates for the Drumcondra area of Dublin (in the catchment area of a local education centre) suggest that percentages of schools using IWBs were 35% and 47% by 2008 and 2010 respectively (Kearney, n.d.). Schools' interest in IWBs may be gauged somewhat by one provider's promotional figures suggesting that 96% of teachers believe that use of IWBs increase pupils' motivation and attention, 85% believing that they result in increased pupil participation and 84% believing that they promote teamwork and the sharing of resources (Traceboard, n.d.). In relation to ICT more broadly and computers in particular, by 2001, almost all *schools* were using computers for educational purposes to some extent, whereas in contrast, this EU study (European Commission, 2006) noted a high

penetration of computer use by *teachers* in schools in Ireland with 82% of teachers having used a computer in previous 12 months.

So, through a series of government initiatives, including the influential Schools IT 2000 initiative in 1998 and subsequent iterations of the policy, the intention has been twofold: to ensure that appropriate ICT is available in schools (provision) and to encourage the use of that technology by students, facilitated by teachers (curricular use) In this regard, it is the "teacher, after all, who guides instruction and shapes the instructional context in which the internet and other technologies are used. Teachers must be comfortable with technology, able to apply it appropriately, and conversant with new technological tools, resources and approaches." (Web-based Education Commission, 2000: 39). By 2006, 87% of primary *teachers* reported that they had used a computer in class in the previous 12 months, with 63% of them reporting that they had used a computer to present or demonstrate, this figure perhaps heralding more widespread subsequent use in the form of data projectors/screens and interactive whiteboards. In addition, by 2006, about one in 8 teachers were using computers in a quarter or more of their lessons, with the possible inference to be drawn that some of that use was in relation to presentation or demonstration. Nine out of every 10 primary schools surveyed felt that pupils are more motivated and attentive when computers and the internet are used in class. Given that this was in advance of the major push in relation to projectors and IWBs, it suggests that already primary teachers saw the potential of using ICT to visually support their teaching and learning. The same study used an index of "teacher readiness" to use computers in class. This Access-Competence-Motivation model consisted of Access to hardware and the internet; competence in using and applying the computer software and internet and teachers' beliefs in the educational efficacy of computer use. Taken together, notwithstanding that 91% of teachers feel that pupils are more motivated and attentive when computers and the internet are used in class, Ireland ranks relatively poorly (19 out of 27 European countries) in terms of teachers' readiness to use computers in class. It is interesting, in light of the present paper to note that schools' contribution to ICT purchasing, in excess of grants provided by the DES averaged €2129 in 2005. This additional funding was secured through other school funds, local fundraising, parental contributions and commercial sponsorship (Shiel and O'Flaherty, 2006).

Ascertaining schools' expenditure on IWBs is equally opaque. From the industry side, the presence of so many of the main hardware providers in the Irish market is indicative, in part, of the buoyancy in the market. The presence of big companies and brands such as

Genee Powerboard, Hitachi, Touch IT, smartboard, Epson, Promethean, 3M and others suggest the seriousness of the market. One provider, Promethean, saw its UK and Ireland revenues fall 21% in 2011. However, as the UK (where the majority of classrooms already have interactive whiteboards) and Irish figures are bundled together, it is difficult to gauge the position in Ireland, though possible to speculate that whereas the UK accounts are problematic, this is not the case in Ireland. Outside the UK and North America, Promethean's revenues were up 20%.

Another possible gauge of market activity is the number of publishing companies setting up online businesses. Recently most of the major publishing companies serving the Irish school market have established a significant online presence (C.J.Fallon, Educational Company of Ireland, Folens). Websites promote the putative benefits of online resources, many of which are accessed in schools via IWBs. For primary students, benefits cited centre on availability of additional curriculum material and resources, capacity to customise and save resources and lessons, stimulating, interactive lessons and exciting and meaningful learning, along with the availability of textbooks online, particularly in large format. (Folens, n.d.). Requirements to access this online material are computer, broadband internet and a projector or any IWB. There is a heavy emphasis in marketing the products on encouraging the attention of students, with some emphasis also on interactive elements considered to be either coming up to the "board" to demonstrate or engage with the images and /or engaging with the games provided.

Policy context

Any consideration of the introduction and implementation of a specific technology such as the IWB can usefully take place against the backdrop of general state policy for technology in education so as to identify, if possible, its specific basis in policy. In the Irish context ICT policy for schools is a relatively recent phenomenon with the introduction of the *Schools IT2000* (DES, 1997) policy in 1997 the first and to-date only full policy for the provision of technology in schools. Whilst there was some interest in this area prior to this it remained a relative minority interest although it is possible to define the periods of development which led to this policy in terms of their emphasis on learning about technology as distinct from learning with technology, or both, and by the origins of initiatives from those pioneered by enthusiastic teachers or lobby groups such as the CESI to those initiated by the Department of

Education and its related agencies. Buettner (1997) outlines how the role of computers in education in several countries has followed a distinct pattern moving from a focus on programming to basic applications to the more recent focus reflected in *Schools IT2000* on curriculum integration. Although developments within Ireland have been reflective of these key stages McGarr (2008) argues that rather than being guided by policy, computer and technology use in the Irish context has instead evolved within a policy vacuum and that developments over the past three decades have served only to 'nudge' technology use in the general directions outlined. The persistence of such a policy vacuum can see seem during much of the mid 2000's in particular when many schools were actively exploring and investing in IWB technology.

The follow-up policy to Schools IT2000 entitled *Blueprint for the Future of ICT in Irish Education* (DES, 2001) ran from 2001 to 2003 and effectively committed more funding to the priority areas identified under *Schools IT2000* as distinct from identifying any new policy directions. Following on from this it was not until 2008 that a further policy statement was issued by the Irish Department of Education and Science when it launched *Investing Effectively in ICTs in Schools, 2008-2013,The Report of the Minister's Strategy Group* (DES, 2008). As the availability of funding was curtailed due to national economic circumstances a further industry-led document entitled *Smart Schools=Smart Economy* (DES, 2009) was published in 2009 based on funding which was €100 million less than originally projected in the 2008 document (€152 million rather than €252 million). Although some of the funding committed has been relayed to schools neither of these documents have been afforded the status of official Government policy although the implementation agency with responsibility for ICT (the NCTE), has continued with implementation and the expenditure of related funding notwithstanding the policy vacuum which as argued above, has been in existence from the cessation of the *Blueprint policy* in 2003 although the DES Statement of Strategy 2003-2005 (DES, 2002) provides some guidance in relation to the continued implementation of the Blueprint framework during this corresponding timeframe.

Whilst the Schools IT2000 policy delivered a basic level of infrastructure at the time and enabled many teachers to partake in basic skills training in respect of ICT, the lack of sustained investment has been reflected in a number of recent studies which provide some indication of the current status of technology within Irish schools. On a national level the DES Inspectorate Evaluation (2008) found that whilst teachers are positively disposed towards ICT use has been impeded by limited access to equipment, broadband and technical

support. This report went on to document limited use and limited optimum use of technology in respect of teaching and learning at both primary and post primary levels. IWBs were found to be relatively uncommon in schools at the time of data collection (2005/2006) being present in approximately 5% of schools surveyed at both primary and post-primary levels. Although recommending further investigation regarding the potential of this technology this report comments on the prohibitive nature of the costs involved and recommends prioritising the installation of computers and data projectors initially.

Similarly the 2006 EU Report *Benchmarking Access and Use of ICT in European Schools* paints quite a depressing picture of ICT use in Irish schools when compared with European counterparts with the data collected indicating that Irish teachers were well below the average in term of frequency of use. The teachers surveyed indicted positive attitudes towards technology in respect of student motivation and attention but flagged the need for better infrastructure, support and maintenance to allow this to take place. Based on the data collected Irish teachers ranked at the very bottom in Europe when it comes to teacher satisfaction with ICT infrastructure. There was no specific data collected in this study in relation to IWB penetration or use.

The more recent *Investing Effectively* and *Smart Schools=Smart Economy* documents were published at a time of significant interest and investment in IWBs by school based personnel, however across the two documents there is only one direct reference to IWBs. This statement contained with the *Investing Effectively* document (p.21) recognised the potential of this technology but goes on to flag how investment in it should be depending on an existing positive culture and access to technology within schools and projects limited deployment given the high costs involved:

> Interactive Whiteboards (IWBs) offer opportunities for student participation and increased
> classroom activity. Effective investment in this technology is dependent on an existing
> positive ICT culture in schools, teachers who are experienced in using ICT in the classroom
> and on an existing desirable level of ICT access throughout the school. Given the current high
> costs of IWBs their deployment will necessarily be limited (DES, 2008, p.21)

A number of 'critical success factors' are identified with respect to infrastructure including broadband, technical support and school networking as well as interactive digital content and content creation tools. Other factors identified as critical to creating a 'learner-centred education' (p.13) include the provision of professional development to support integration,

6

mechanisms to disseminate good practice and supporting strategic leadership especially within schools. The Smart Schools=Smart Economy report bases its vision for digital learning around the provision of 'teaching-computers coupled with educational software and digital projection' (DES, 2009, p.5) and recommends addressing five core areas namely classroom infrastructure/technical support, teacher professional development, ICT planning, digital content growth and enhanced broadband for schools as the means for realising its vision for a technology enhanced education system. Consistent with the view articulated in the *Investing Effectively* report IWBs are not prioritised for investment or implementation. This prudent approach to IWB investment is very much in contrast to the UK where significant funding has been allocated as part of the Primary National Strategy in particular with the effect that as early as 2004 63% of primary schools in England and Wales had at least one whiteboard installed. By 2006 94% of primary schools had purchased at least one IWB (Becta, 2006) and there were an average of six per school by June 2006 (BESA, 2006). It is estimated that in the period 2003-05 alone the UK Government provided ring-fenced funding of UK£25 million for IWBs (Koenraad, 2008). The recent Ofsted report 'ICT in [UK] Schools 2008-11' commented that IWBs are being used routinely in many schools and that 'excellent use' of IWBs to recap and review, and to introduce new learning in a highly motivating and stimulating format, is a feature in schools where teaching was deemed to be good or outstanding (Ofsted, 2011, p.13).

The analysis of ICT policy presented above indicates that there has been limited reference or provision for the use of IWB in policy provision to-date. As has been the case with a number of technology related developments over time the drive towards IWB has, in the absence of such policy, emerged from the bottom up being driven by school based practitioners in the context of localised decision making and management structures. Based on guidelines distributed by the NCTE, schools are free to purchase technologies such as IWB using government grants only when a certain level of infrastructure deemed by the NCTE to be essential is already in place in schools which given the proliferation of these boards as indicated by the data above points towards the significant level of independent fundraising undertaken by schools to secure these technologies and the value placed on their presence by teachers and school principals.

A review of documentation available via the NCTE website indicates a very clear position on the part of this agency regarding the adoption of IWBs by schools, consistent with the statement contained in the DES *Investing Effectively* document. From the NCTE

perspective IWBs are not seen as a priority but as an optional extra which it recognises has value and potential when what it deems an essential level of infrastructure is already available in schools. A clear preference for the adoption of classroom computers and digital projectors is indicated in the mostly recently available NCTE documentation dating back to 2009. There is no indication that this position has changed since then although some provision for professional development of teachers in respect of IWBs is now in place by virtue of two courses offered nationally in a number of outreach centres (NCTE, 2012).

According to the NCTE Advice Sheet 16 (2009);

> Given the cost of an IWB package, schools, in the first instance, should equip each classroom with a baseline technology configuration before purchasing IWBs. Schools need to be confident that the expenditure incurred per classroom, from an overall school ICT planning perspective, represents good value for money. In short, schools which have classrooms without digital projectors should first purchase good quality short□throw digital projectors, a teaching computer (laptop or desktop) with a long range (8□10 metre) wireless keyboard and mouse for each classroom. Digital Projectors can initially be used with a PC or laptop for whole class teaching, large image presentation, access to online resources etc, but can also later be used with wireless tablets or IWBs if these are introduced by the school.

This Advice Sheet goes on to issue the following very clear recommendation to schools, highlighted in bold text in this document;

> Fixed, short□throw digital projectors and teaching computers should be installed in as many classrooms as possible rather than installing a limited number of interactive whiteboards in a greatly reduced number of rooms. Digital Projectors provide excellent value for money and are essential to ICT□enabled classroom learning. It is worth noting that digital projectors are a prerequisite for subsequent interactive whiteboard purchase and, so, do not militate against purchasing an IWB later.

Some further cautionary advice to schools is offered in the latter stages of this document advising that whiteboards should not be introduced to schools without careful consideration at senior management level of the location, positioning, resultant access and curriculum application. Attention is also drawn to the need for technical support and the steep learning curve in the initial stages. Finally it is warned that 'The interactive whiteboard can be an expensive 'blackboard' if not properly managed' and that 'An IWB cannot compensate for poor preparation or management of learning. Whiteboards "are tools and, like all ICT tools, they need committed, ICT literate teachers to facilitate and develop their use' (Howard, 2001). It is interesting

to note that this cautionary perspective is articulated only in the most recent version of this Advice Sheet and that previous versions released in 2008 and 2007 indicated a more neutral and certainly less cautionary viewpoint in respect of IWBs. This is an indication of now NCTE thinking was developing at this particular period of time, one in which the proliferation of IWBs within schools was certainly increasing. Perhaps this indicates a desire to 'stem the tide' based on the viewpoint that many of the issues highlighted were not being addressed in schools prior to purchase. This is further reinforced in the 2009 & 2010 NCTE Advice for Schools and Classrooms document in which it is stressed that digital projectors and teaching computers should be prioritised as the recommended classroom configuration and that in the event of purchase teachers should have prior experience of using a range of ICT equipment and resources in the classroom and should also attend professional development in the effective use of IWBs.

The need for significant teacher preparation time was also flagged as a measure in respect of possible 'superficial use'. More recently an EU level project (The EU Scribe Project, 2010) which involved NCTE input and representation highlighted the significance of leadership and organisation and of making informed choices in respect of white board adoption. This is reflected in the 2011 NCTE ICT planning framework eLearning Roadmap which provides a framework intended to facilitate planning for ICT at the school level. In addition to 'leadership & planning' four other areas for consideration are highlighted, namely 'ICT in the curriculum', 'ICT in the curriculum', 'professional development' and 'ICT infrastructure'. Whilst in respect of 'ICT infrastructure' examples are outlines across a continuum from 'initial' to 'eMature' there is no direct reference to whiteboards and consistent with 'policy' outlined previously the examples drawn relate to 'teaching computers' and digital projectors.

ICT-related curricular developments over recent years have focused on the development of an ICT framework which makes no specific reference or recommendations regarding IWBs although a number of the school-based case studies which fed into the development of this framework made reference to the use of whiteboards in the context of their existing practice. According to the framework document the ICT Framework offers a structured approach to using ICT in curriculum and assessment by identifying the types of learning using ICT (including knowledge, skills and attitudes) appropriate for students during the period of compulsory education (NCCA, 2007, p.5). It is intended not as a separate

9

curriculum area or syllabus but as a guide to teachers to help them embed ICT in curriculum and assessment across the subjects of the curriculum. Current NCTE courses for teachers in relation to IWBs identify the learning outcomes within this framework to which the course corresponds. The NCCA Guidelines for ICT in the Primary Curriculum (2004) were published prior to availability of this technology and as yet there has been no updating of these guidelines to reflect developments since initial publication.

Influence of "pull factors"

Given the lack of a 'policy imperative' the proliferation of IWBs within schools may be seen as an indication of the belief in this technology at the school and teacher level. It may be argued that there are certain pull factors based on the perceived benefits or affordances of IWBs which have positively influenced the adoption of this technology in spite of the DES and the NCTE favouring expenditure and implementation of 'teaching' computers and digital projectors. Based on an analysis of UK based research over the past eight years these factors may be distilled into two categories; the first category relating to perceptions regarding teachers and teaching and the second category relating to its perceived impact on learners and learning.

Somekh et al. (2007) attributes the enthusiastic adoption and rapid uptake of IWB's by UK teachers to the fact that it is immediately useful to teachers being compatible with the whole class approach to teaching. This may be contrasted with previous and concurrent attempts to employ technology in the classroom which require a more significant shift in the locus of control from teacher to learner being underpinned by a constructivist approach to teaching and learning. In this regard it may be argued that the affordances of the technology are compatible with teachers' beliefs and practices especially in relation to the value of whole class teaching. Whilst the most recent version of the Irish DES Primary School Curriculum is predicated on a constructivist philosophy the whole class approach to teaching still retains a significant place in Irish primary schools classrooms and the compatibility of the IWB with this approach may be seen as one of the main influencing factors underpinning the acceptance and adoption of this technology from the ground up. According to Somekh et al (2007) teachers require two to three years to amend their practices to take full advantage of the capabilities of the IWB; that initially teachers assimilate it into their existing practices but that over time they change these practices so as to take fuller advantage of the capabilities

offered by the technology. This may be explained as an example of organic diffusion whereby teachers initially adopt a technology of their own accord because it is compatible with what they do already and hence non-threatening, but that as they become comfortable with the technology over time they amend their practices to greater effect, in some cases adopting practices which they may been unwilling to employ if imposed from the outset. Visible evidence of the greater effect is significant in wider diffusion of such an innovation within a learning organisation.

Miller et al. (2004) propose that teacher's progress through three stages of pedagogical development with respect to establishing teaching with the IWB. In the first stage, termed *supported didactic* the IWB is used to enhance traditional board focused didactic teaching. In the second *interactive* stage the teacher uses some of the capabilities of the board to stimulate questioning and the involvement of students. The third *enhanced interactive* stage sees a move from instructional to interactive teaching where the technology is used to stimulate and develop interactive learning. Similarly Beauchamp (2004) proposes a transition framework based on work with primary school teachers moving from the IWB as substitute for the traditional black or white board through five stages to 'synergistic' use where 'both teachers and pupils are able to construct meaning and dictate the direction, momentum, and scale of the next step in the lesson' (p.344). Related to this Somekh et al (2007) found that few teachers possess the skills to use the IWB to its fullest extent initially but develop these skills through exploratory use over a two year period. This signals the need for relevant CPD to scaffold and expedite teacher's use of this technology. From a wider perspective successful adoption of this technology may act as a catalyst for wider technology use by teachers employing techniques and practices which were initially outside their personal comfort zones.

The decision or willingness by teachers to adopt can also be attributed to their perception that it increases their efficiency in relation to planning and resources preparation in particular and that this in turn contributes positively to their levels of job satisfaction. Smith et al. (2005) identify a number of perceived benefits to teachers as follows: flexibility to access and draw on a range of plans and resources, ease of access to and creation of multimedia presentations, efficiency with respect to the ease of integration of resources and related transitions, supporting the planning and development of resources which can be saved and reused saving time in the long run, modelling ICT skills in an integrated context, and facilitating interactivity and participation in lessons. Much of the literature addresses the pedagogical change which may or may not occur when the IWB is available in the classroom

drawing a distinction between technical and pedagogical interactivity with respect to its use. Hennessy et al. (2007) take the position that teachers may value what they deem as the 'surface features of the IWB' which they see as those associated with pace, motivation, involvement, participation and collaboration. Smith and Higgins (2006) identified the challenge of developing more interactive pedagogy which is based on the technical interactivity of the IWB. They outline how there is a potential connection between the technical affordances of the equipment and interactive teaching but not a necessary one.

From the learner and learning perspective much of the positivity regarding the implementation of IWBs is based on the perspective that they can indeed facilitate a more interactive, multi-media based approach to learning and that there is a motivational factor which results in greater levels of pupil interest and attention. From a teacher perspective this may translate positively in terms of classroom management. Whilst the data on the perceived motivational factor may be somewhat anecdotal Somekh et al (2007) presents data linking use to attainment in which pupils who had been taught using the IWB for more than two years showed greater progress in English and mathematics. The two year threshold was seen to be significant as it allowed teachers sufficient time to modify their practices to fully capitalise on its affordances. Pupil gains were found to be less significant in areas such as science where the level and degree of use was much less developed. This was found to be true for average and high attaining students.

Smith et al. (2006) compared lessons with and without IWBs in seventy projects primary schools in the UK and found that IWB lessons contained more whole class teaching and less-group work. The lessons involving IWB had significantly more open questions and answers from pupils and moved at a faster pace. In respect of attainment this study found a statistically significant difference in mathematics and science at the end of the first year but by the end of the second year there was no significant difference between pupils experiencing IWBs and those not. Taken together the findings of Somekh et al (2007) and Smith et al. (2006) indicate how the IWB has an effect on classroom practice but that evidence in respect of its impact on attainment is inconclusive. This is further supported by the work of Moss et al. (2006) who found similar results at secondary levels where the motivational factor was initially welcomed by students but was short-lived and statistical analysis showed no impact on attainment after one year of use. The potential effects on classroom practice with regard to pace and interactivity are not regarded as exclusively positive; for example, Jewitt et al. (2007) contest that 'a multimodal, interactive and a fast paced pedagogy are not necessarily

12

good in and of themselves' (p.316) and that careful consideration is needed of when and how to make use of this technology.

Influence of "push factors": Curriculum and implied policy

Sponsored initiatives

Emphasis is evident amongst professional development providers on supporting curriculum through the application of ICT. In terms of centralised professional development, the Professional Development Service for Teachers PDST, as a merger of formerly separate PD agencies, provides support to schools, working in co-operation with the education centre network. With a remit to provide a "cross-sectoral support service for schools and teachers" the original principles of the Primary Professional Development Service (primary education forerunner to the PPST) provide clues about its mission, including empowerment of schools and improved learning outcomes for pupils (PPDS, n.d.).

An agency not merged into the PDST is the NCTE, where there is a distinct brief in relation to promoting and supporting the integration of ICT in learning and teaching (NCTE,.n.d.). However, inevitable crossover exists between the role of both agencies. Whereas the primary brief of the NCTE is in relation to ICT, including the aforementioned policy of promoting use of data projectors and screens, practice within the PDST/PPDS has centred on IWBs also. During the 2008/2009 school year, PPDS advisors working with teachers identified key factors associated with and affecting supporting curriculum implementation in schools. In relation to visual arts, the advisors reported that "interactive Whiteboards (IWB) and data projectors are being increasingly used for the looking and responding strand unit in visual arts" (PPDS, 2009: 70). In relation to geography, they noted that "ICT supports the teaching of Geography through the availability of maps, aerial photographs and images online through the effective use of the IWB." (PPDS, 2009). This suggests an early positive outlook in relation to IWBs that was followed up in some policies subsequently. Manifestations of this orientation towards IWBs can be found in dedicated courses covering areas such mathematics, PE and writing that emphasized IWBs as a key learning tool (PPDS, 2009).

Further evidence for the promotion of IWBs by the support agencies can be found in Phase 2 of the Cross Border Digital Creativity Project (CBDCP2), a joint venture between the PPDS (Monaghan education centre) and the North Eastern Education Library Board

(NEELB) in Northern Ireland. This project, funded by the DES and Northern Department of Education aimed to provide a media based platform for the continuous professional development of all teachers. A main feature of this programme was the production of a number of video vignettes from schools promoting and illustrating various aspects of best practice in teaching and learning north and south (Primary Professional Development Service (n.d - TruckTV). Video sequences were developed with the assistance of the "truck" (an outside broadcast truck owned by the Northern NEELB mobile digital creativity centre). One of the videos ("Interactive Thinking") focused specifically on describing the successful incorporation of IWBs into a number of schools. The message to viewers is clear: IWBs bring benefits to teaching and learning, in the words of one teacher interviewed they let them "take time, work collaboratively, review, reflect ..high quality resource [and] labour saving." Principals note how IWBs transform children's motivation, revolutionise classrooms leading to the conclusion that IWBs are invaluable in class. Overall, this video, designed to record bideo of effective teaching and learning in classrooms and share best practice in schools, equates interactive thinking with interactive whiteboards.

Funding for other CPD courses

A review of inservice professional development courses available to teachers provides insight also into possible influences and interests in relation to IWB take-up and use in Irish primary schools. Much CPD for primary teachers, outside of formal state-sponsored initiatives by the DES and delivered by the PPDS, takes the form of summer courses. These courses are designed to advance " teachers' pedagogic and management skills, in the context of the work of the primary school" (DES, n.d.) and a centralised listing of courses means that a teacher has access to the list of all courses offered at local, regional and national levels.

Listings for current and future courses provided through the Association of Teacher Education Centres in Ireland highlight the emphasis on IWB within the professional development arena. Whether the availability of the courses creates the interest amongst teachers in the topic or whether teacher interest creates the demand for the courses is difficult to determine with precision. Table 1 illustrates they types of short courses available at present to teachers in relation to IWBs through a selection of education centres and institutions nationally. Offered in a number of education centres, these courses, offered at night, typically last from 1 to 3 sessions with 2-3 hours per session.

Table 1. Selected CPD courses with content relating to Interactive Whiteboards and their use

Course Title	IWB Main Emphasis	IWB Secondary Emphasis	Provider
Interactive whiteboard advanced	✓		Kilkenny EC
An Introduction to Sourcing & Creating PowerPoint Presentations for your IWB	✓		Monaghan EC
The right click: - Teacher-friendly uses of ICT[1]		✓	Marino Institute
Using a visualiser in the classroom		✓	Kilkenny EC
Getting started with your Laptop and Digital Projector		✓	NCTE / Monaghan EC
ICT & Language in the Primary Classroom		✓	NCTE/MLPSI Kilkenny EC

[1] Summer course offered by MIE. 5 days duration.
General Source: Website of ATECI. http://www.ateci.ie/news/88-new-cpd-courses.html
EC = Education Centre

Some courses are specifically oriented around IWB use, focusing on the hardware, software and educational applications. For example, the advanced course offered by Kilkenny education centre focuses specifically on IWB software by one provider (Promethean), detailing the specific features of the software (e.g. action buttons, hide and reveal) and how to develop and administer quizzes. Monaghan ECs course on Creating Powerpoint presentations for the IWB is designed to enable teachers to use Presentation software with their IWB to enhance the effectiveness of classroom instruction. The focus is both on the creation of powerpoint (adding text, clipart, digital photos etc) and how to download and edit them for use with the IWB, in addition to sourcing ready-made powerpoint presentations online for display on the IWBs.

Other courses offer broader knowledge and skills development in relation to ICT use in classrooms more broadly. These courses aim to develop teachers' general ICT skills, including the use of IWBs or projectors. For example, the NCTE offer a 3-session course in Monaghan and Kilkenny focusing on literacy, numeracy and special educational needs. Recognising the demand to create ICT resources for teaching and learning, the modules focus on using internet sites for teaching and learning, digital cameras, creating digital stories, using digital images and sound. The modules note that "the skills learnt and content covered in [the] course are also applicable to interacitive whiteboards" (ATECI, n.d.),, a comment

used also in relation to the Laptop and Digital projector course in Monaghan. The 5-hour course (2 sessions) course in Kilkenny (ICT & Language in the primary classroom) focuses on the use of ICT in English, Gaeilge and English as a Second language. The course, though not focusing on IWS, recognise the applicability of the content and skills to this medium. The week-long summer course in Marino Institute of Education focuses on effective use of the interactive whiteboard, powerpoint and photo story, ICT projects, audio and video recording and creating a class blog.

Whole School Evaluation process

As part of this study a sample of Whole School Evaluation (WSE) reports published by the Department of Education and Skills were reviewed. For the past number of years the DES has periodically published on its website WSEs in bundles (collections of WSEs published online on the same day). We sampled 50% of the bundles that were published by the DES between October 2008 and June 2011. Within each bundle, 20% of schools were sampled (i.e. 20% of the reports). A number of keywords were used in reviewing the WSE reports to check for references to IWBs. Keywords included: *ICT, technology, Interactive, whiteboard, IWB, projector, Laptop, computer.* Evidence of commentary on IWBs or projectors were categorised as one of: *cursory, some* or *significant.*

Overall, the review found that 22% of reports made some reference to IWBs. Mention of the technology tended to be descriptive, *there is an interactive board in each of the two classrooms* (DES, 2009: 18027T), occasionally taking on a sharper focus; *the interactive whiteboard is also used appropriately to illustrate lessons and sustain interest* (DES, 2009: 119780). More significantly, however, 70% of the reports made no reference at all to IWBs or projectors. Not that there was negative commentary, rather there was no allusion to the technology at all in the reports. Accordingly, we are led to conclude that the WSEs in themselves don't provide compelling evidence of a major policy push by the DES in relation to IWBs or even data projectors. This suggests that the impetus to install IWBs did not come as a result of schools being mindful of inspection by the DES Inspectorate and the associated published WSE reports.

Professional journals

Accordingly, the study also reviewed a selection of professional journals widely read by teachers and principals in the primary education system. Specifically, 29 issues of *InTouch*, the journal of the Irish National Teachers Organisation (INTO) were reviewed covering the period September 2008 to December 2011. Additionally, 20 issues of *Leadership+* the

journal of the Irish Primary Principals' Network (IPPN) covering the period September 2008 to November 2011 were reviewed. The review focused on auditing reference to IWBs and the presentation of this technology within the journals. Four types of reference were identified: (i) article, comment or editorial, (ii) advertisement for hardware, (iii) advertisement for software and (iv) professional development course. Table 2 presents data summarising the extent of such publication over the period reviewed.

Table 2. Audit of IWB-related material. *InTouch*[1] and *Leadership+*[2] 2008-2011

	Total		Mean per issue	
	InTouch	*Leadership+*	*InTouch*	*Leadership+*
Article, Comment, Editorial	16	9	0.55	0.45
Advertisement: Hardware	56	16	1.9	0.8
Advertisement: Software	18	8	0.6	0.4
CPD	16	0	0.55	0

[1] Journal of the INTO. 29 issues in period September 2008 – December 2011
[2] Journal of the IPPN. 20 issues. September 2008 – November 2011.

The data reveal a significant number of articles, commentaries and advertisements in relation to IWBs, with for example one or more hardware advertisements in 27 out of 29 issues of *InTouch*. Across the period examined, 56 hardware ads and 18 software ads were published in *InTouch*, representing a significant investment by the companies and sustained exposure to teachers. In addition, a steady stream of articles and commentaries maintained the visibility of such technology amongst primary teachers, the vast majority of whom receive *InTouch* on a monthly basis. One or more software advertisements were evident in 15 of the 29 issues.

Leadership+ is a monthly professional journal published by the IPPN and directed at primary principals and deputy principals. As such, it reaches key decision-makers at local school level throughout the Republic of Ireland. The review highlighted a significant number of advertisements (24) in the period examined, along with 9 articles. One or more hardware advertisements were published in 11 out of the 20 issues reviewed, along with one or more software ads in 7 of the issues. Additionally, the audit highlighted the role, through service

partnerships and sponsorship, that some IWB companies played in helping support conferences organised by the IPPN. Taken together, the publication data from both *Leadership+* and *InTouch* reveal a significant visibility for IWB technology in the main professional journals read by teachers and principals.

Conclusion

This study examined the policy and situational factors influencing the introduction of interactive whiteboards into primary classrooms, focusing especially on the period from approximately 2008 to 2011. Our interest included consideration of why primary teachers in Ireland have so enthusiastically adopted IWBs in their teaching. "Pull factors" identified in the literature include compatibility with whole class approach to teaching (Somekh et al., 2007), increased efficiency with respect to planning and resource preparation (Miller et al. 2005) and their capacity to facilitate a more interactive approach to learning, presumably related to increased motivation and engagement. Counter views centre on interactive technology not necessarily being interchangeable with interactive teaching (Hennessey et al. 2007; Smith et al. 2005; 2006), evidence of IWB-based lessons consisting of significant whole class teaching with less group work and conducted at a faster pace (Smith et al. 2005; 2006) and limited or inconclusive evidence in relation to impact on attainment (Somekh et al., 2007; Smith et al. 2005; 2006).

In the Irish context, this study found that whereas national policy focused on computers/projectors schools embraced instead the more expensive and vigorously advertised IWBs. State agencies such as the DES, NCTE and associated CPD providers gradually recognised the dramatic shift to IWBs and responded with CPD opportunities over time. Of particular note is the intense commercial advertising associated with the period in which IWBs have been adopted in primary schools. The fact that such advertising, accompanied by significant authored articles and commentary, was directed at teachers and principals through the main professional journals lends credence to the view that commercial influences helped shape local policy and practice at the school level in a way that national policy did not. Given the likely continued penetration of IWBs into primary education, further research is recommended.

References

Arora, J. (2012). *UPDATE 2-Promethean World expects global push to offset US woes*. Available at http://www.reuters.com/article/2012/02/28/prometheanworld-idUSL4E8DS3GM20120228

ATECI (Association of Teacher Education Centres Ireland) (n.d.) http://www.ateci.ie/news/88-new-cpd-courses.html

Becta (2006). *Survey of LAN infrastructure and ICT in schools: November 2005 to January 2006*. Coventry, UK: Becta.

BESA (2006). ICT *in UK State Schools 2006 – Summary Report*. London: BESA.

C. J. Fallon. http://www.cjfallon.ie/

Department of Education and Science (DES) (n.d.). www.education.ie.

Department of Education and Science (DES) (2008). *ICT in schools. Inspectorate Evaluation Studies*. Dublin: Evaluation Support and Research Unit, DES

Department of Education and Science (DES) (2009). *Smart schools = smart economy*. Dublin: DES

EDCO. www.edco.ie

European Commission (2006) *Use of computers and the internet in schools in Europe 2006*. Country brief: Ireland 6/2006.

Hennessy, S., Deaney, R., Ruthven, K. & Winterbottom, M. (2007). Pedagogical strategies for using the interactive whiteboard to foster learner participation in school science. *Learning Media and Technology, 32*(3), 283-301.

Irish National Teachers' Organisation. *InTouch*. Various issues 2008-2011. Dublin: INTO

Irish Primary Principals' Network. *Leadership+*. Various issues 2008-2011. Glounthaune, Cork: IPPN

Kearney, D. (n.d.) *Drumcondra Education Centre Interactive Whiteboard project*. (http://www.cbiproject.net/cbis_in_ireland.html)

Folens. (n.d.) available at http://primary.folensonline.ie/demo/

Miller, D.J, Glover, D. & Averis D. (2004). *MatchingTechnology and Pedagogy in Teaching Mathematics:Understanding Fractions using a 'Virtual Manipulative'Fraction Wall,* British Educational Research Association, Manchester. http://www.keele.ac.uk/depts/ed/iaw/docs/BERA%20Paper%20Sep%202004.pdf

Moss, G., Jewitt, C., Leva, R. (2006) *Evaluation of Schools Whiteboard Expansion (SWE) Project-London Challenge* http://www.dfes.gov.uk/research/data/uploadfiles/RR816.pdf

National Centre for Technology in Education. (2008). *Advice Sheet – Interactive Whiteboards. Advice Sheet 16*. Dublin: Author

Primary Professional Development Service (2009). *Annual report 2008/2009.* Available at: http://ppds.ie/images/stories/LatestNews/ppdsannual%20report%202008_2009.pdf

Primary Professional Development Service (2010). *Annual report 2009/2010.* Available at: http://ppds.ie/images/stories/aboutppds/ppdsannualreport2009_2010.pdf

Primary Professional Development Service (n.d). *Cross Border Digital Creatively Project 2 CBDCP2/Truck Project.* Available at: http://ppds.ie/index.php?option=com_content&task=view&id=106&Itemid=216

Shiel, G. & O'Flaherty, (2006). *NCTE 2005 census on ICT infrastructure in schools. statistical report.* Available at http://test.ncte.ie/documents/NCTE_2005_Census_on_ICT_Infrastructure_in_Schools.pdf

Smith H.J., Higgins S., Wall K., Miller J. (2005). Interactive whiteboards: boon or bandwagon? Acritical review of the literature. *Journal of Computer Assisted Learning, 21,* 91-101

Smith, F., Hardman, F., and Higgins, S. (2006). The impact of interactive whiteboards on teacher-pupil interaction in the National Literacy and Numeracy Strategies. *British Educational Research Journal,31*(3), 443-457

Somekh, B, Haldane, M. Jones, K, Lewin, C, Steadman, S, Scrimshaw, P. Sing, S., Bird, K, Cummings, J, Downing, B, Harber Stuart, T., Jarvis, J., Mavers, D., & Woodrow, D. (2007). *Evaluation of the Primary Schools Whiteboard Expansion Project. Report to the Department for Education and Skills.* Manchester: Centre for ICT, Pedagogy and Learning, Manchester Metropolitan University

Sunday Business Post (2010, August 29). *Parents and teachers buy into boards.*

Traceboard. (n.d.). *Why interactive whiteboards? Why TRACEBoard?* available at http://www.traceboard.ie/index.html

Tech Market View (2012) *Promethean.* Available at http://www.techmarketview.com/ukhotviews/archive/promethean-learns-benefits-of-internetional-spread

Web-Based Education Commission (2000). *The power of the internet for learning. Moving from promise to practice. Report of the Web-Based Education Commission to the President and the Congress of the United States.* Available at: http://www2.ed.gov/offices/AC/WBEC/FinalReport/index.html