



Interactive white(board) elephants: A case of change mismanagement

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The introduction of interactive whiteboards (IWBs) in secondary schools around Australia is currently being heavily promoted for the purposes of transforming the delivery of education through innovation and technology (Gillard, 2010). In such a climate, the evaluation of case studies exploring the effectiveness of the implementation of new technologies for the purposes of teaching and learning can help guide others contemplating or embarking on this process. While much of the literature reports positive outcomes in the adoption of IWBs in the secondary classroom, this paper provides a balance by exploring a case of change mismanagement which has led to the existence of electronic white elephants. The paper also explores the potential of modified force field analysis (FFA) as a decision-making and evaluation instrument for the process of technological change within educational contexts.

Keywords: interactive whiteboards (IWBs), secondary schools, change management, modified force field analysis (FFA).

Introduction

white elephant (noun): “a burdensome possession...whose cost (particularly cost of upkeep) is out of proportion to its usefulness or worth”. (Wikipedia, 2011, n.p.)

Undergirded by beliefs that secondary students should be educated in modern learning environments (DEECD, 2010), combined funding under the Victorian State Government’s \$1.9 billion *Victorian Schools Plan* and the Federal Government’s *Building the Education Revolution (BER)* has enabled the placement of interactive

whiteboards (IWBs) in the classrooms of both public and independent secondary school systems. As a former Federal Minister for Education has stated:

Technology and innovation are transforming the way education is being delivered in our schools. In classrooms everywhere, the use of interactive whiteboards has become widespread and the importance of having access to technology in schools is growing. (Gillard, 2010, n.p.)

However, prior to this recent governmental push, some stakeholders in Victorian secondary schools had already embraced the implementation of IWBs in a whole scale manner. What lessons can be learned in terms of change management? This concise paper explores the case study of the implementation of IWBs in an independent secondary school in Victoria from 2005 onwards, through the use of a modified variant of force field analysis (attributed to Lewin, 1951). At a time when the employment of IWBs is being heavily promoted in the secondary education sector in Australia, this analysis provides a timely addition for those embarking on this process.

Interactive Whiteboards (IWBs)

Interactive whiteboards (IWBs) – also referred to in the literature as interactive electronic whiteboards (IEWs) – are defined as “large, touch-sensitive screens, which control a computer connected to a data projector” (Gillen et al., 2008, p. 243). In addition to the necessary hardware – the computer, the projector and (most usually) a Smartboard or ‘tablet’ – there are many types of software available for teaching interactively with IWBs, such as *ClickView* (<http://www.clickview.com.au/home.php>) and *ActivInspire* (<http://www.prometheanworld.com>). IWBs provide not only a surface to project Internet access, digital images, video, graphics and audio onto, but also a surface upon which the students and/or the teacher can interact using the whiteboard pens and pointers to alter the images and to work interactively.

In their review of the existing IWB literature, Higgins et al. (2007) discerned that publications on IWBs relate predominantly to three main areas: descriptive studies about the initial adoption and implementation of IWBs in classrooms, the pedagogical impacts of the IWB implementation on both teachers and students, and the empirical evidence relating to learning and achievement following this implementation. The majority of the literature falls into the first of these categories, relating to descriptive studies about the initial adoption and implementation of IWBs in classrooms.

From the learner’s perspective, the benefits listed in the descriptive studies for the adoption of IWBs in classroom settings include the possibility for whole-class learning (Tanner et al., 2005); inspiring and motivating students (Hui-xian et al., 2009); increasing student task engagement (Hodge & Anderson, 2007); provides an ideal environment for visual learners (Lacina, 2009); develops thinking skills and assists interactions between students (Hodge & Anderson, 2007); and the big screen is easily visible for all (Slay, Siebörger & Hodgkinson-Williams, 2007). From the teaching perspective, IWBs are reported to reduce the burden on teachers (Hui-xian et al., 2009); and some specific subject areas such as ESL, science and maths have reported the increased benefit from the introduction of IWBs (Lacina, 2009). Lacina (2009), however, cautions that decisions to implement IWBs are often made based on descriptive studies which list such benefits, without the consideration of scientific studies, studies that focus on the drawbacks of implementing IWBs, or the school itself in terms of its collective ability to successfully adopt IWBs.

Drawbacks to the introduction and use of IWBs, on the other hand, relate to the lack of a critical perspective in the adoption (Moss et al., 2007; Lacina, 2009); the cost of the technology and installation (Slay, Siebörger & Hodgkinson-Williams, 2007); the keeping of IWB classrooms up-to-date (Debolt, 2008); lack of adoption by staff (Moss et al., 2007); ICT literacy and ICT competency for staff and students alike (Slay, Siebörger & Hodgkinson-Williams, 2007); teachers’ own computer incompatibility with the IWB (Lacina, 2009); and questions over the true value of multimedia content for teaching and learning (Slay, Siebörger & Hodgkinson-Williams, 2007). Of this, Smith et al. (2005, p.91) note that “[t]here is insufficient evidence to identify the actual

impact and the potentials of [IWBs] upon learning either in terms of classroom interaction or upon attainment and achievement”.

Implementing, managing and evaluating technological change

Introducing technological change in educational institutions can be a challenging process and is made more so when key stakeholders – especially those required to enact the change – are not involved in the decision-making process and can lead to poor outcomes. In part this relates to power relations within an organisation (Robertson, 2008). Bovey and Hede (2001) argue that failure in the adoption of change is directly related to the resistance of employees. As Goolnik (2006, p.11) has noted, in order to overcome resistance to change in adopting new technologies for teaching and learning, teaching staff need to be fully involved and have ownership of the change, have a full understanding of their new roles in relation to the implementation of the technological change, and have a belief that the change implementation will produce ascertainable results.

One historically influential figure in terms of change management is Kurt Lewin (1951) who proposed the model of ‘force field analysis’ (FFA) to inform any change process, including the decision making process, implementation options, planning and evaluation. According to Lewin (1951) a field is defined as being “the totality of coexisting facts which are conceived of as mutually interdependent” (p. 240). Based on the Gestaltist principle of looking at the various and constituent aspects which make up a whole, force field analysis (FFA) evaluates the push and pull dynamics of fields and their weighted forces within in given situation. The model rates forces for and against a proposed change in terms of the strength of that force and thereby, the degree of control each force individually and cumulatively exerts over the proposed change. Equilibrium is the point at which forces for change equal forces against change. This model remains current to assessing the implementation of change in situations relating to new technology as it helps to focus discussions, assess progress, and provide a visual interpretation of the differing forces influencing any potential change issue in an organisation or institution.

Case study: Change mismanagement

In 2005, the senior management (leadership team) of an independent secondary school in rural Victoria decided that the implementation and installation of IWBs and the supportive technologies would provide an educational advantage to students enrolled in the school over others in the region. The decision for this technologically-modern learning environment was promoted as a key aspect in the school’s marketing strategy. Teaching staff were not involved in this decision-making process. Following the decision to implement, and over a three-year time span from 2005 to 2008, every classroom in the school was fitted out with an IWB and accompanying technology. This equipment was purchased in an ad hoc basis, dependent on the flow of funds, product availability, and technician availability for the installation process. Though staff professional development on the use of IWBs was also initially provided by the school, staff attendance was not compulsory.

Since deployment, the uptake of the new technology has been minimal with there being only two IWB ‘champions’ amidst the 100+ staff who use the technology regularly plus a small number who view the IWBs as a teaching and learning opportunity. By contrast, the majority of staff view IWBs as an additional burden on their workloads. As part of this, there are a number of senior teaching staff who have expressed their reluctance to take up new technologies unless they are compelled to. This has been one of the largest of the factors against change. Second, over time the professional development and training processes for staff development has by and large fallen apart due to this disinterest. Third, there has also been a long history of technological problems in the school which, in turn, have greatly reduced the uptake of new technologies such as the IWBs because staff cannot use their existing technologies effectively. Fourth, added to personal technology problems of staff, as the projection systems used in the school have been implemented in an ad-hoc fashion, the result is that there is a different basic configuration in each room, leading to staff confusion. For example, in addition to the differing

brands of overhead projectors, each room has different types of cable inputs, different places for cable input, different power switches to turn on various components, and different types of speaker systems. The result is that in the school, there are no two rooms which have the same hardware configurations. As an overlay, most staff have timetable allocations for different classrooms on different days and so cannot always count on being in the same room for the same subject. Growing frustrations from the staff using the IWBs did lead to a management decision process in 2010 to create a uniform interface in the school (the JED interface <http://www.jedmicro.com.au/>) between the staff laptops and the various hardware for more effectively managing projection in the classrooms. Yet this is but one solution to the growing number of challenges.

The outcome of this process has in turn brought about a situation in which the IWBs have in fact become 'white elephants' in the school. Now six years after the commencement of acquisition, the IWBs are, in the majority of cases, gathering dust in most classrooms, when they are not being used as glorified display boards or even a coat-rack. Further, the required financial cost over and above the initial outlay to now further update the technology is out of proportion to its current use within the school. This issue is found frequently in organisational change in cases where change has been compelled from above within the management structure and then effectively resisted from below. This case provides a classic example of change mismanagement in the uptake of educational technology. A much more effective change management strategy would have been to gain much greater support from the ground up from those at the teaching-learning interface – the teachers– and having them be a key part of the drive for change and the training process as well. As Goolnik (2006, p. 11) has written: the “[r]esistance to change is therefore likely to be overcome if...previous issues can be adequately addressed; academic staff are fully involved/have full ownership in the design, development and carrying out of these changes; they have to have an understanding of their new roles; and the results eventually produced are truly ascertainable”. In spite of the history of implementation of IWBs in this case study, management in the school are still keen to pursue the upgrade of the facilities.

Research methodology and results

A small group of concerned teaching staff within the school applied a modified force field analysis (FFA) (McLaren, 2004) to better understand the compounding factors (the forces for and against change) within the technological change process within the school. Under Lewin's (1951) original FFA model, these forces would be balanced indicating a quasi-stationary point of equilibrium in the change continuum. McLaren's (2004) modified FFA as used in this case study indicates that a change action is actually in motion and the negative direction this is taking. The teaching staff informants ranged from an IWB 'champion', through to those who were IWBs supporters, plus disinterested staff. The results of the modified FFA of the change in process (Table 1) reflect the imbalance between the forces for and against change in the ongoing decision to implement IWBs in the school. The modified FFA graphically emphasises the forces against change clearly outweigh those for change, highlighting the flawed basis for the continued drive for implementation and uptake of IWBs in daily teaching and learning. It also suggests that for positive change to occur from a management perspective, pressures against must be first decreased.

Table 1: Case study reanalysis (2010) using the modified FFA template

Should IWBs continue to be implemented as a whole school initiative?												
Forces <i>for</i> change	Score					Score					Forces <i>against</i> change	
	1	2	3	4	5	5	4	3	2	1		
Management's desire to improve student learning outcomes	■	■	■	■	■	■	■	■	■	■	Existing staff workload	
Management's desire to promote the school as technologically-savvy	■	■	■	■	■	■	■	■	■	■	Staff resistance	
Staff 'champions' (early adopters)	■	■	■	■	■	■	■	■	■	■	Lack of staff training and on-going professional development system	
	■	■	■	■	■	■	■	■	■	■	Technological problems in the school	
	■	■	■	■	■	■	■	■	■	■	Ad hoc purchasing of non-compatible hardware	
	■	■	■	■	■	■	■	■	■	■	Ageing IWB hardware and software requiring updating	
	■	■	■	■	■	■	■	■	■	■	ICT support and resources	
	■	■	■	■	■	■	■	■	■	■	Intellectual know-how and skills	
Total (a) forces for change →	11					35					← Total (b) forces against change	
Overall effect of change (a – b)	11 – 35 = -24										Case for change = -24	

However, it is to be noted that the FFA approach is not without its critiques. While the instrument helped provide teaching staff with a greater understanding of why the push for implementation and uptake of IWBs in the school was failing, the senior management who had been responsible for decisions in and around the implementation of the IWBs were not involved in this process. The greatest criticism of FFA is the subjectivity of the instrument, as reflected in its use within this case study. For the research to provide a scientifically balanced picture, it would have needed to represent the opinions of all the key stakeholders involved in the school: students, teaching staff, parents, administrators, IT technicians and the school board. This small investigative study indicates that a full study could be of significant benefit to the school before any further decisions and expenditure are made regarding the integration of IWBs or any other new technologies.

Conclusion

The implementation of any technology requires the involvement of a representative of all stakeholders in the decision making processes, in addition to their commitment and engagement in the implementation of any such decisions. Particularly in cases for the implementation of widespread technological innovation within an organisation, a coordinated approach to managing change is likely to enhance educational outcomes, financial effectiveness, educational pedagogy, professional engagement and organisational health. Failure to embark upon a coordinated approach sets the scene for change mismanagement as reflected in the presented case study.

The use of the modified FFA within this case study suggests that for successful change management with the introduction of this new technology to occur, the existing pressures against change must first be decreased. Further, the authors propose that this model can be applied to analysing the organisational 'terrain', and assessing and managing the process of proposed technological change in all educational sectors.

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