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# Examining E-Learning in Schools through the Organisational Change Model

Ng Pak Tee, David Ng Foo Seong & Hung Wei Loong

## Abstract

*In the Singapore education system, e-learning is fast becoming the next frontier for schools. E-learning has the potential to add great value to education, allowing modes of learning that have never been possible in the traditional classroom context. However, before we hail e-learning as the definitive step forward in education and plunge headlong into it, educators have to understand e-learning and its implications in school leadership, management, curriculum, resources and pedagogy. While a well thought through approach will bring great gains to a school, blindly plunging into it may bring great pains because the process of change can be fraught with subtle pitfalls. Using the Organisational Change Model, this article provides a framework for schools to systemically and systematically consider the issues related to the implementation of e-learning in schools and the process of change. It argues that school leaders should consider the goals, business, culture, processes, and enablers (working tools) seamlessly and coherently in order that e-learning could be anchored in the school to bring real sustainable benefits.*

## Introduction

In the twenty-first century, organisations must have the capacity to learn and change in order to sustain their competitive advantage. Learning must also involve ways different from the traditional classroom teaching and formal training that we have been used to. The exponential growth of information and the availability of user-friendly technologies have ushered in e-learning with the promise for a means to provide *anywhere, anytime, any pace* and even *anything* learning. While different people have different ideas about what constitutes e-learning, it has been generally understood as a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms and digital collaboration, delivered by a variety of electronic media, including the intranet, Internet, interactive TV and satellite (Steed, 1999).

In the Singapore education system, e-learning is fast becoming the next frontier for schools. Minister for Education Teo Chee Hean said, "The IT revolution is changing the way we live – the way we work, study and play. The next century

will witness the increasing use of information and knowledge as engines of production and economic growth. We have to prepare ourselves and our children to be discerning and astute users of information as well as creators of knowledge." (Teo, 1997)

Undoubtedly, e-learning opens up new frontiers and has the potential to add great value to education, allowing modes of learning that have never been possible in the traditional classroom context. However, before we hail e-learning as the definitive step forward in education and plunge headlong into it, educators have to understand e-learning and its implications on school leadership, management, curriculum, resources and pedagogy. While a well thought through approach will bring great gains to a school, blindly plunging into the world of e-learning may bring great pains.

In the industrial and commercial world, indeed, the frequent promises of *anywhere, anytime, any pace* learning made by various service providers delivering e-learning packages appear to paint a rosy picture that organisations will be willing partakers of such liberalised learning opportunities. A further look into organisations receiving such learning and training suggests otherwise.

*... the mood is anxious. Many employees hesitate to sign up for e-learning, and when they do, their participation is spotty. So is persistence. Materials that go online languish there, suffering from a lack of maintenance and relevance. Students long for the good old days, when instructors cared about them and entertained them with war stories. (Rossett, 2002, p. 3)*

In the study by the ASTD and Masie Centre (2001), it examined participation in 30 courses at 16 companies in the US. It reported that one of the great benefits of e-learning was that it empowered individuals to learn as and when they wanted. The flip side was that the one who chose to learn online might also choose not to. The study revealed that only 69% of the employees commenced classes that were compulsory while only 32% started voluntary classes. According to the recent ASTD/Masie study, the answer to the question "If we build it, will they come?" was inclining more towards *no* rather than *yes*. E-learning success, it appeared, was by no means automatic despite the advancement of increasingly sophisticated and user-friendly tools.

The experience of the industrial and commercial organisations should provide an impetus for schools to reflect more deeply about e-learning. While it is worthwhile to explore the possibilities offered by e-learning, the process of change is fraught with subtle pitfalls. Here, in this article, e-learning does not refer to merely using IT in education. It refers to a whole new pedagogical paradigm in which, empowered by the advancement in information and communication technology (ICT), students acquire knowledge through a virtual medium in a manner best suited to them. In an e-learning environment, the teacher plays the role of coach and facilitator rather than a knowledge dispenser. Using the Organisational Change Model (Ng, 2001), this article provides a framework for schools to systemically and

systematically consider the issues related to the usage of e-learning in schools and the process of change.

## The Organisational Change Model

The Organisational Change Model (refer to Fig. 1) is a model that helps leaders and managers manage change in a systemic manner. It says that in an organisational change, leaders and managers should consider the goals, business, culture, processes and enablers (working tools) seamlessly and coherently in order that the change could be anchored in the organisation to bring real sustainable benefits (Ng, 2001). This model urges school leaders keen to implement e-learning to think the issue through carefully from the angles of goals, business, culture, processes and enablers, making sure that these factors have been seamlessly and coherently addressed before plunging into a large scale change.

Introducing e-learning in a school environment is a big change. Members of staff resist when the various factors have not been adequately or coherently addressed. Based on the Organisation Change Model, before embarking on e-learning, the following important questions, though understandably non-exhaustive, need to be asked.

### Goals

What are the goals of introducing e-learning in the school? How do these support the achievement of the larger goals of the entire school? In other words, school leaders have to define the relative goals of e-learning in the context of the larger organisational goals.

Thinking through the goals is crucial because school leaders need to know the reasons why e-learning is congruent to the school's goals and vision. How else can the leaders explain the initiative to the teachers and get them excited? Cliches and platitudes will not go very far in encouraging staff members to get on

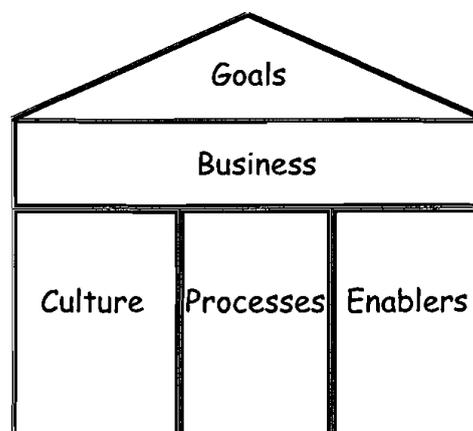


Fig. 1. The organisational change model.

board. E-learning represents a radical departure from the traditional way teachers have taught in the classroom. Are teachers convinced why they have to make the paradigm shift?

Sometimes, schools implement e-learning strategies because they *seem* to be the right direction to go. However, implementing e-learning for the sake of e-learning will not go far in terms of benefiting the students. The implementation of e-learning needs to go beyond students sitting in front of a computer using the Internet and teachers putting their material on a website. Otherwise, it is difficult to justify that the school has achieved a higher level of pedagogical excellence through e-learning environments and that the students have achieved a higher level of learning. At the end of the day, is the investment of time and financial resources in e-learning actually justified by its return?

### **Business**

The business of a school is education – developing students in their knowledge, understanding and thinking and developing their character and instilling good values. Even when school leaders have thought through the goals of implementing e-learning in school and they are harmonious with the overall vision of the school, school leaders still have to think about the actual business of running e-learning programmes in school. Are the proposed e-learning programmes supporting the espoused goals? Is e-learning an integral or incidental part of the school curriculum and programme?

An e-learning strategy should assess the appropriateness of the new environment to the school and how e-learning can be an organic part of the school business. Though many schools are exploring e-learning, learning online will not suit every class and every topic. E-learning is not a one-size-fits-all solution. Depending on the nature of the subject area, teachers have to determine whether e-learning is a suitable platform. For example, in art lessons, there is only a certain limited degree through which learning can be facilitated through e-learning environments. Students need to see their teachers at work and learn alongside their teachers, trying their hands and getting guidance on their project pieces. E-learning in this case may have only a limited scope.

Moreover, school leaders have to think very carefully about another possible pitfall. When we survey most of today's e-learning efforts, *e-delivery* seems to be prevalent rather than *e-learning*. Information is delivered through a virtual platform but that does not mean that learning is taking place. Learning is focused on knowledge, which is person-related. A person is said to learn when he knows a skill or knowledge of a practice or trait. But information can just be databases (Brown and Duguid, 2000). In the field of learning, the notion of constructivism is recently emphasised and such a focus is seemingly lacking in many e-learning modes, which currently emphasise information delivery. So school leaders have to reflect: are we emphasising so much about the mode of content delivery that this

has distracted us from the actual learning of students? This defeats the business of a school.

### **Culture**

Culture is basically the implicit and explicit social and cultural dimensions of values and core beliefs that a school practices and adheres to. Simply understood, it is the way we live our lives here in the school. A school's culture is a critical factor in the success or failure of e-learning. According to social cultural psychology (Wertsch, 1998), culture deeply influences personal behaviour. Is the school culture conducive to bring about success in using e-learning? Is there a mindset issue among staff members towards e-learning? Some staff members of a school may be fearful of technological advancement because of their inability to cope well with it. How do they feel about their role in an e-learning environment?

E-learning is not only an individualised tool but a platform which affects the social community of the school. Using e-learning is a learning process in itself for the school. Are people learning and supporting one another in the process? Is there a learning culture in the school to support the learning process? Does the school have an open-sharing culture where practitioners usually group themselves into communities where sharing and an interchange of ideas and solutions are facilitated?

At the end of the day, for e-learning to be successful, it has to set itself into the culture of the school. That is to say, e-learning becomes part and parcel of the way teachers teach and students learn. It is simply part of the everyday life in the school and no one is very nervous about it or threatened by it. In other words, e-learning would ultimately have to be pervasive at all levels of the school. Behavioural changes (for example, individuals log onto the e-learning platform willingly for any teaching, learning or job-related tasks) need to be observed at all the different levels of the school in order to claim success. Old mental models of pedagogy have to be discarded for new ones. It is a big challenge to school leaders to get teachers who have been teaching in the traditional way very successfully to perform a paradigm shift and embrace a whole new way of educating their students. This of course will take time. But it is something that school leaders will have to bear in mind in the change process.

### **Processes**

Processes refer to the workflow of the organisation in fulfilling its business. An effective and efficient process is necessary for an organisation because it makes the work for employees easy and value is delivered to the customers in the most direct way.

It is very important to consider the processes involved in e-learning. People resist when the processes are so messy and tedious that their lives are made

more difficult in learning through a virtual medium. School leaders have to examine either how e-learning would fit into the current processes in the school or what processes would require re-engineering in an e-learning environment. The key question to ask is whether the processes associated with using e-learning are streamlined so that teachers and students find it easy to operate and learn in an e-learning environment. Sometimes, despite the claims of advance technology to improve efficiency, processes such as getting the laboratory and equipment ready make life even more difficult for teachers and students. This sounds like a small issue, but it is precisely such small and sometimes overlooked issues that get people frustrated. Also, if the teacher is just using the web to upload and download notes that the students can easily read from a book in a matter of a few minutes, the teacher may have just made the learning process less efficient and effective for the students.

Essentially, we are asking: starting from a need to learn on the part of a student to the final outcome of the content learnt and practised, could we find the most streamlined process to bring the learning value to this student, leveraging on the power offered by the e-learning technology?

E-learning has the potential to cut cost significantly, as well as improve communication, responsiveness, accuracy and timeliness. But schools should understand the applications and then choose those that best fit the learning needs of the teachers and students. Schools should first assess which learning functions require the most time to administer or the students most difficult to reach. Then, schools should determine how an e-learning platform could enable its students to learn more efficiently, accurately and in a timelier manner. Everyone wins from a process that results in increased satisfaction, greater operational efficiency and decreased costs.

### ***Enablers***

Enablers are the resources and tools that support the business. People cannot perform effectively and efficiently unless they have good tools to work with. A chef will pull his hair out if he has to prepare a big meal and all his knives are blunt and he does not have the right kind of stoves and pans. So, in implementing e-learning, school leaders have to ask: are the enablers (working tools, e.g. IT systems, network speed, infrastructure and bandwidth, PCs for the teachers) supporting e-learning efficiently and effectively?

For example, bandwidth is a critical consideration to any content delivered across a network. E-learning content will be competing with other network traffic. It is important to know network capacity and which data gets priority for available bandwidth. People get turned off if it takes a long time to get access to learning materials or for an answer to emerge from the system. If access is through the Internet, the access speed will depend on the type of connection people will be using. Certain desktop PC specifications can limit the kind of media used for training content. Moreover, the server and network have to be robust. Problems with the

server and network will create major disruption to the learning process. Like all technologies, e-learning technology depends on IT support. This can be provided in-house or outsourced to an Application Service Provider (ASP). Either way it is important to know what the needs are and what support is available to learners. Learners get turned off when they need technological help and do not get it.

Moreover, in order that e-learning is a way of life for the teachers and students, they have to have constant access to computers and the Internet. People are frustrated when they want to do a learning-related task just to find a computer unavailable. So again, school leaders have to ask: do teachers have their own computers with unlimited access to the e-learning environment? How about the students? What about access from home?

### ***Systemic Considerations – A Holistic Look***

According to systems thinking (Senge, 1990), the performance of the entire organisation as a system depends on how the parts fit in, not just on how they perform separately. If the factors do not gel, we may have a recipe for disaster rather than success. So, in implementing e-learning, are the goals, business, culture, processes and enablers seamlessly and coherently addressed?

For e-learning to be successful, educators need to have a deep understanding of the interdependent nature of learning and an appreciation of the interrelated impact of change actions. The introduction of e-learning is not merely an IT issue. It goes beyond providing an IT laboratory and some software packages. Piecemeal efforts at e-learning will be frustrated by bottlenecks everywhere. When a school requires its teachers and students to change in both their thinking and behaviour towards e-learning, but fail to redesign the systems and structures around them, the new behaviour goes unsupported and un-rewarded, and the old teaching methods creep back, in the midst of heightened cynicism.

Consider a hypothetical school that requires its teachers to implement e-learning without really thinking through a sound pedagogy for e-learning. Some teachers for the sake of doing it put some PowerPoint slides on a website and ask students to download themselves. At the end of the day, students are still studying from a set of notes that they now have to spend more time to download and print. Teachers also spend time putting up slides onto websites. In order to make sure students understand the notes and can answer examination questions, the teachers go through the notes in the classroom in exactly the same old way. Nothing has changed except that more time is spent needlessly!

In some other schools, e-learning projects fail, not because the school has not acquired the "best" e-learning packages from the market, but simply because teachers do not have a PC at their desk and they find it very troublesome to go to the IT laboratory to access their material and do their work. Other teachers are simply not ready to embrace the change in teaching paradigm because they feel a loss of control over the students' learning process.

It is good to think through the factors in the Organisational Change Model deeply and honestly before implementing e-learning. E-learning can easily fail if the right questions have not been asked in the beginning. Instead of assuming that e-learning will work in whatever context, school leaders need to first establish the "fit" between the organisation and the implicit dimensions in which e-learning environments function. E-learning is more than a fashionable adventure. E-learning can be a powerful means to break through the frontiers of education or it can be a real disaster in which e-learning equipment is side-lined as white elephants after the romance has gone.

## **Tapping the Strengths of E-learning**

To use e-learning beneficially for teachers and students, one has to consider the strengths of e-learning compared to the traditional mode of instruction to harness its power.

In the commercial world, many companies are moving into the e-learning business by putting text or traditional instructional materials online. Computer terminals are being used to deliver overwhelming amounts of content by "chunking" material from books and articles into bite-sized pieces. The myth is that these "chunks" are learning units that can be mixed and matched or accessed by users in a variety of ways. But if the material has been created in a linear fashion in the first place – just like traditional books have a fixed beginning, middle and end – the "chunking" into learning units does not achieve very much.

To take advantage of the interactive, learner-driven opportunities created by e-learning technology, a completely different approach to the design of content is thus necessary. Learning units have to be designed and produced for the students in a modular fashion so that they can be accessed in a way that serves the students' needs as precisely as possible. In judging an e-learning product, school leaders or teachers have to judge whether the package is "course-based" or "modular". If it is "course-based", the students will still have to plough through the whole course to get what they need. It is the traditional instructional model in electronic form. The student is, in effect, in a classroom where the e-learning package designer is in control and acts like the teacher. "Modular" packages, on the other hand, allow students to choose their learning path. Instead of presenting predetermined learning paths, it can cluster learning experiences that can be accessed in any way the student wishes. This creates immense flexibility and allows students to focus on exactly what they need. If a learner already understands something, he or she can start on something else, saving time and maintaining learner motivation.

Another strength of the e-learning environment is that it supports a problem-based approach. The content can have specific examples and contextual illustrations directly related to the topic. Case stories and illustrations of real situations directly related to the problem-solving skill can also be provided. Supporting information resources can also be made available to the student as he learns the content

and engages the problem-solving examples relevant to the topic. Jonassen's (1999) constructivist learning environments and Schank *et al.*'s (1999) goal-based scenarios are examples of how contextual case scenarios (in the context of problem-based approaches) can be used in an e-learning environment. The e-learning environment allows problems and resources to be made available to students in a consistent manner and the students can start work at any time because the material is always there.

In a school, e-learning can complement but not replace face-to-face instruction. Face-to-face interaction and exchange will always remain a valuable element of many learning experiences. It is very difficult to replace the teacher in their role as role models and value transmitters. It is important that students learn to work with people and not only with machines. It is important to bring people together so that they can see and experience one another, share stories, empathise and learn from each other in very personal and direct ways. Hence the challenge of e-learning is not to get everything online and communicate solely via modem, voice or video exchange. The challenge is to use e-learning where it works best and retain classroom or other face-to-face modes of instruction where they can bring real benefits to the students.

## **Conclusion: The Way Forward**

Before we think that e-learning has a gloomy future because there are just too many issues to be addressed, every breakthrough starts with a small first step. While keeping the bigger picture of the issues raised by the Organisation Change Model in mind, small initiatives here and there by enthusiastic school leaders and teachers will go a long way towards discovering a working model for e-learning in school. Try a small pilot and get feedback. Learn from the issues. Roll it out relatively slowly. Look for champions inside the school, people who are savvy with technology and who believe in e-learning. Make converts along the way. We may develop a winning formula for using e-learning profitably in school one day, one which truly fosters a learning community of among educators and learners.

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