

A guide to effective technology integration

Doug Loader

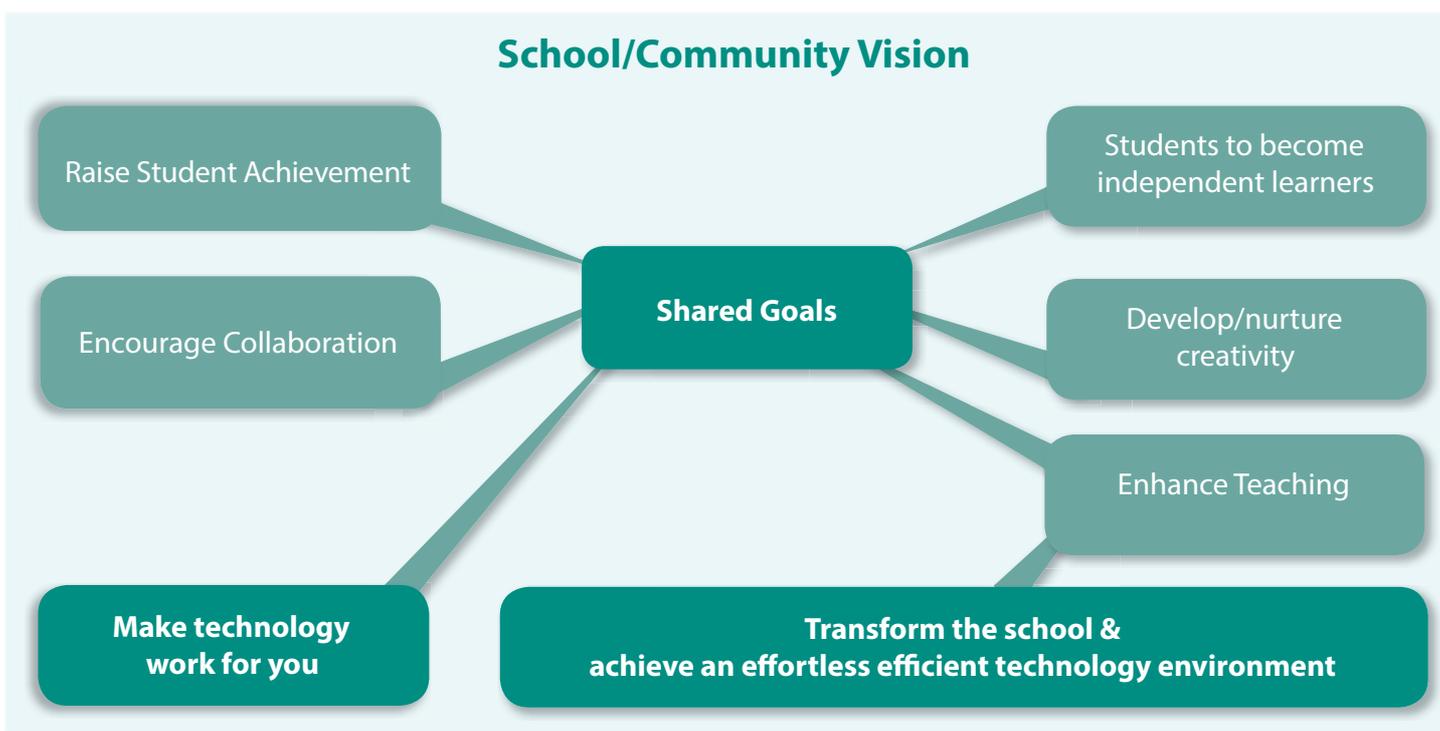


Diagram 1

Embracing technology is a decision that has been taken out of our hands. Like it or not management teams must evaluate hardware, build infrastructure, employ specialists and up-skill teaching staff to best realise this acquisition.

Alternatively, you may believe that adding a compulsory 1 to 1 computing model will simply distract from the traditional teaching and learning environment. Now this is true, diversion from effective pedagogy is a distraction we could do without. But it is evident that our students already exist in a world where technology is ubiquitous and I believe that executed properly, your technology adoption plan can not only enhance education but create an efficient and productive school.

I'm certain that most bursars and principals are either squirming at the thought of the enormous IT budget or pondering whether or not the whole process has, in fact, been beneficial. After all, it is very hard to measure the success of your investment. In this short article I will share with you my views on technology integration. I will address the pedagogical implications, but most importantly point you towards a simple model you can use to measure your financial investment.

People make a community, and I measure a great school by its pragmatic staff and students. Learning is a product of good student interaction with their teachers. Pastoral care, student/teacher wellbeing and a strong community were the lessons I valued the most at school, and preparing a shared vision across your whole school community is your first challenge. Every teacher, student and parent needs to be behind your vision of creating a "21st Century Learning Environment".

Goal setting

What are your goals? Why do you want to spend all this money on modern technology and risk the adverse consequences of a digital world? The biggest gamble is that school grades diminish, your chosen tech investments become quickly outdated and the budget is depleted.

First find some common goals amongst staff. You may decide on something simple, for example:

- Our aim is to increase numeracy and literacy levels
- We want to provide teachers with admin and research tools
- To Increase communication between staff/students/parents.

Whatever you settle on, it is worth reviewing

these goals periodically. For example each term (when reviewing spend) I would suggest involving teachers to assess classroom use and address your goals to see if you need to realign your focus.

I have included Diagram 1 above showing considerations which I always keep in mind as I work at school or deliver PD.

Diagram 1

The two points at the bottom of the diagram are the most pertinent. The first is to make the technology work for each distinct user, no matter how basic/advanced, no matter which learning area, you must be able to accommodate the individual. No teacher or student is left behind in the drive to achieve your vision.

The second key point is paramount. I believe we are in a transitional stage with technology, a place where adoption is hindering general productivity. We know when we have achieved successful technology integration – it is when we use technology without even thinking about it.

When you make a telephone call with your mobile phone, rarely do you think about the process of unlocking, filing through names and tapping the green 'call' button. You likely never

wonder at the marvel of taking a photograph and sharing it with a friend. These processes are ingrained and simple. The devices we use are all around us, they are ubiquitous and the outcomes obtainable.

Technology's presence in education should be no different. I despair at the complexity of some tasks that should be ingrained in us. Creating voice memos, editing pictures, creating video, sharing and collaborating with your colleagues on a global scale. Tasks like these can assist the teaching and learning process, these workflows can aid in the retention of information. Ultimately these tasks will be expected of students as they enter university and the workforce.

Borrowed from Dr Rueben Puentedura the term "Transformation" as a result of technology adoption, is a stage you want to aim for in your journey.

The SAMR model

Dr Puentedura hit on a model with which you should be familiar. This is a system you can use to measure your application of technology, or its level of use.

Diagram 2

The first level is the lowest level of use: Substitution

Technology acts as a direct tool substitute with no functional changes. A common example is a typewriter being exchanged for a word processor (albeit with a screen) and being used in exactly the same way. No cut and paste, no spell check, just direct substitution.

The next level: Augmentation

At this level you are using the same tool with some functional improvement. Improvements may include the spell check or instant dictionary definition, cut/paste and placement of images etc. Already at this secondary stage we are seeing a much higher level of productivity from the individual.

The third level: Modification

This level slightly alters (but doesn't change) the task at hand. For example, previously, your typewriter was being used to produce a text report. But now we have additional technology tools available, we could create the report in a spreadsheet. This would allow you to automatically calculate sums and create graphs for immediate visualisation of the information. We may choose to email the spreadsheet to colleagues instead of print it. Our report (previously a fixed paper document) has now seen significant task redesign. This results in substantial productivity increase.

The fourth level: Redefinition

At this level, we look beyond ways of just modifying the process **which still has the

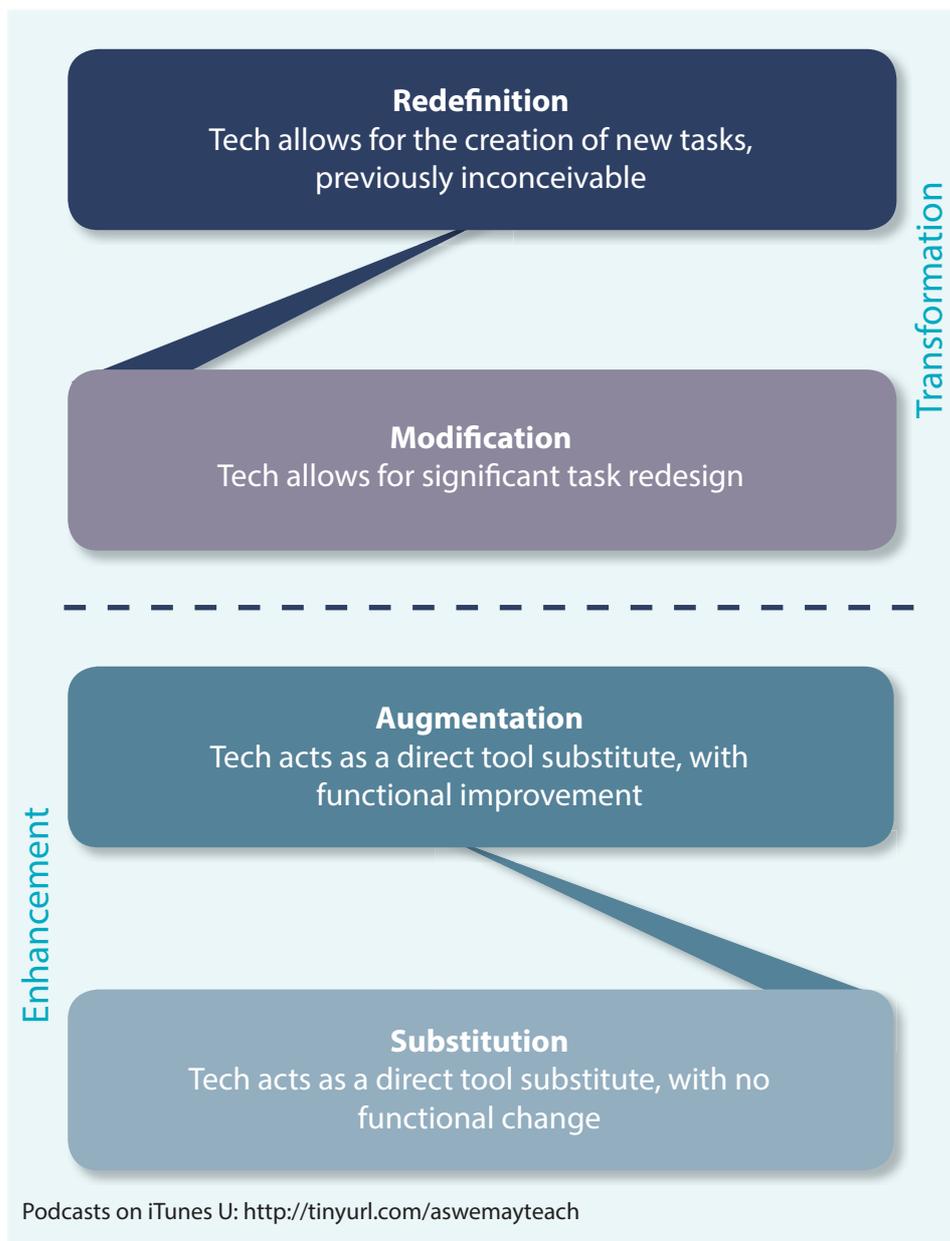


Diagram 2

fundamental task at its heart**. Is this the best way to perform the task? The Redefinition level will use available technology to completely redesign tasks.

We are no longer producing a simple report. Information that would originally have been compiled by an individual could now involve many contributors; collaborating in real time on the same document.

An example might be to use a public document on Google Docs allowing for instant global collaboration on the project. The project could include photographs, graphics, even video,

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added from many different devices. Spreadsheet calculations will cascade through a document and be available for all decision makers in a moment. Immediately the task has seen the removal of multiple steps, and many more users are viewing and editing the document, increasing communication, accuracy, and productivity.

Applying this model into education is having astounding results. It is a fairly simple idea but one that has really helped me to evaluate where I am at, and what I could be achieving. But it can also be used to gauge your school's level of technology use, and to measure the success of your investment.

All too often I hear, "But this is the way that we have always done it!" And that is the statement that you may come across as you move from modification to redefinition and try to change the actual task at hand. But I

The SAMR Ladder:

Questions and Transitions

- **Substitution:**
 - What will I gain by replacing the older technology with the new technology?
- **Substitution to Augmentation:**
 - Have I added an improvement to the task process that could not be accomplished with the older technology at a fundamental level?
 - How does this feature contribute to my design?
- **Augmentation to Modification:**
 - How is the original task being modified?
 - Does this modification fundamentally depend upon the new technology?
 - How does this modification contribute to my design?
- **Modification to Redefinition:**
 - What is the new task?
 - Will any portion of the original task be retained?
 - How is the new task uniquely made possible by the new technology?
 - How does it contribute to my design?

Diagram 3

would encourage your teachers to let go and put faith into new technologies and software. The *Redefinition* stage, in many instances can be the easiest to apply but the hardest to instigate.

As fate would have it Dr Puentedura visited Australia just a few weeks ago. He gave some great advice for those that choose to adopt the SAMR model in education.

He introduced a simple method to introduce the SAMR model to staff in the form of a short PD opportunity where a teacher can discover and begin to understand the model better. Dr Puentedura displayed this brilliant slide introducing the SAMR Ladder, and offered the following advice.

Diagram 3

Ask your teaching colleagues to create a SAMR Ladder so that they can visualise/plan their progress. Once your colleagues identify a task which they are performing at the substitution level, it helps them to recognise ways that they can enhance that task.

It is sometimes appropriate to maintain teachers at the substitution/augmentation stage for a long time; these enhancement levels are good. But you must treat them levels as transitional levels. It is not ideal to stay at the enhancement levels; as technology evolves we must evolve too.

At the modification level ask your colleagues,

“What is it that you have always wanted to accomplish in terms of educational goals that you couldn’t accomplish before?” This is a big question, and one on which you may need to offer some guidance. By keeping the core of the task the same but applying clear changes to certain aspects involving modern technology, (software or specific apps for example) can we accomplish those goals that the teacher would like to reach?

Finally, Is there a way that we could accomplish those original goals but with a different task? By actively replacing your original task with a new more efficient one, you will find that the underlying concept of the task itself becomes apparent, thus encouraging the student to explore concepts in more depth.

I would add that task redefinition can also remove constraints that may have existed before but were not addressed. At redefinition the task and its outcomes are clearer, the technology becomes invisible and the learning takes priority.

My example earlier in this article – making a telephone call on a mobile phone – demonstrates how a task can be transformed, simplified and made accessible to all.

The irony in the mobile phone call example is the symbol that represents our phone call is still an old analogue handset. We may be making a

video call but we still press the ‘handset’ icon. I guess old habits die-hard.

I encourage you to visit Dr Puentedura’s blog at www.hippasus.com to discover more.

A few weeks ago I was fortunate enough to hear Dr Sarah Howard speak at an Adobe education conference. Dr Howard is a lecturer in ICT and Education at the University of Wollongong and has been evaluating the Digital Education Revolution in secondary schools across NSW.

One of the facts Dr Howard has discovered in her research (focused on intern teachers in New South Wales) is that most teachers still have very low levels of digital literacy. Her data indicate that the assumption sometimes made, that young teachers are digital natives, is not correct.

Technology is used a lot but only in low level uses (i.e. Facebook, and Google search). If asked to perform a more complex task such as creating a presentation or editing a photograph most teachers would come unstuck.

Dr Howard concluded that not enough is done in teacher education to raise these essential skills. Teachers are simply not exposed to these sorts of tasks, digital literacies are not brought into the concept of teaching enough, if at all. The teacher identity itself needs to be re-addressed, it is not enough to simply say, “I’m not a techie person, this is not part of my job role.”

We have a duty to prepare students for a future where technology use is a given, and we need to empower teachers correctly. But we can be clever about this. Put the pedagogy first and carefully consider the goals of the teacher. Provide a solution that enhances the learning outcomes and doesn’t obstruct or distract.

It is because of this that your technology integration specialist should perhaps be considered more of a curriculum integrator (enhanced by technology). **ET**



Doug Loader is a technology enthusiast with a track record of delivering effective and working solutions in education and business. He is an Apple Distinguished Educator and has worked in education for over five years. Visit

his website for more articles, guides and opinions: www.iSupport.com.au.



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