

# **Investigating the Pedagogical Approaches Required to Maximise the use of Devices in a BYOD or 1:1 Environment**

**Sabbatical Report  
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## **ACKNOWLEDGEMENTS**

- To my supportive husband and children who carried on with life at home while I visited a number of schools around the country!
- To my colleagues, who have been so open to have me support them over the last 7 ½ years and who I have worked with to implement the 'structural' aspects of BYOD.
- To the schools I visited - thank you for being so open and honest with your various journeys on the BYOD or 1:1 pathways that you have each been on. Your willingness to not only allow me to visit, but the time your school leaders gave up to show me around and to explain your processes was hugely valuable and insightful.
- To the Oamaru Intermediate School Board of Trustees who supported my undertaking of this Sabbatical. I am very grateful for the opportunity to have explored this without the distraction of usual school life and 'busy'ness. As I leave you for another learning environment, I intend for there to be (and hope that you can use) information in here to continue the development of the use of devices in classes.
- To TeachNZ who enable these sabbaticals to happen. The ability to explore an area of interest **and** of purpose is undeniably invaluable. Also with my change in work circumstances leading to a change in my sabbatical timing, TeachNZ made this very easy to do.

## **EXECUTIVE SUMMARY**

Schools that were implementing transformative teaching approaches had many of the following points in place within the school:

1. A clear vision for teaching and learning evident in the school - through practice, discussion with teachers and students, and in visual representations.
2. Schools enabled teachers who were confident to be able to 'trial' approaches to learning and activities - and they knew that if things didn't work, then it was OK to adapt and try again.
3. BYOD and 1:1 programmes were always supported with other reliable hardware:
  - a. PCs/laptops
  - b. Pods of netbooks, chromebooks or iPads - depending on school device choice
  - c. Casting equipment - such as AppleTV or Chromecast (or similar)
4. Learning activities were primarily based around creation and collaboration activities - where students were in control of the learning process and were receiving a very defined, differentiated programme.
5. Learning activities were authentic and purposeful. There were very few 'drill and skill' sites or games being used.
6. Transformative practices included more than the use of devices. Also enhancing the teaching and learning were:
  - a. the use of various classroom spaces and a variety of furniture within a classroom or learning area,
  - b. constantly varying the groupings of students as individuals, pairs or groups,
  - c. classroom expectations where students were in control of much of their learning direction,
  - d. much work based online - usually through the use of Google docs or individual blogs
  - e. teachers modelling the use of ICT in their teaching - demonstrating how the tools can be used to enhance the lessons being taught.

## **BACKGROUND AND RATIONALE**

As the Deputy Principal with the responsibility for ICT leadership in the school I had led an intensive school wide process over about 3 years, all with the intention of BYOD in mind. This had all been outlined in a very clear ICT Strategic Plan (2012-2014) and had involved significant financial support from the BOT.

This had been very much an infrastructure based process and involved:

- The installation of a robust and reliable wireless system (October 2012)
- The purchasing and leasing of a variety and reasonably large number of mobile devices - netbooks, laptops, iPads, tablets (2012-2014)
- The introduction of an LMS available to all students, teachers and parents (April 2013)
- The installation of UFB through N4L (December 2013)
- The introduction of Google Apps for Education to all teachers and students (April 2014)
- The completion of our school network to a reliable standard through SNUP (School Network Upgrade Project) (July 2014)

Only once all these were in place could we consider BYOD as an option. My reason for this was that the infrastructure had to be sound and reliable in order to minimise the 'frustration factor' for teachers and students.

I felt confident when we introduced BYOD in June 2014 that our infrastructure was going to enable the implementation of BYOD to happen seamlessly . . . I was wrong!

As most schools in this time, we have teachers with a range of strengths and confidence within their teaching. This includes with the use of ICTs. They are all certainly competent users of ICT and I expected this to flow into their classroom programmes. It didn't do so as I had expected. What I hadn't counted on was the shift in pedagogical thinking and practice that was also required in order for devices to transform teaching and learning in classrooms. This shift does not happen with the arrival of devices into the classroom.

Initial uptake of BYOD in our school was at about 45% of our students. This ranged from some classes having about 60% of students with their own devices, to having about 10% (or 3) bringing devices daily. Classes were also equipped with 8-9 school owned devices to enable greater access to everyone. With the variable number of student owned devices arriving, teachers who had been excited about what they were going to be able to do with the introduction to BYOD, very quickly became frustrated with the low level of uptake. This then halted plans that they had of using devices and so . . . my sabbatical was born . . .

I knew from professional readings and online forums what was needed, but I wanted to see what this looked like in action. What were schools that had successful BYOD (or 1:1) programmes doing to transform their teaching practice, in order for devices to enhance the learning of students?

## **PURPOSE OF MY SABBATICAL**

The purpose of my sabbatical was therefore to identify the pedagogical approaches that were being used to maximise the use of student owned devices in a BYOD learning environment. As my reading and preparation for my school visits developed I changed this to include 1:1 programmes, as not all of these were BYOD, some were school owned devices - but the approaches were all with the same intentions to improve learning opportunities and outcomes.

My main questions therefore developed into being:

1. What pedagogical approaches are teachers using to transform the learning opportunities when students are using devices?
2. What do the learning environments look like when students are actively engaged in 1:1/BYOD teaching environments?
3. What equipment is enabling the learning (both student owned and school owned devices)?
4. What school-wide systems enabled transformative learning to occur?

## **METHODOLOGY**

As outlined earlier, this wasn't a one off - this followed on from a clearly directed ICT strategic plan that primarily aimed to provide teachers and students with reliable infrastructure within which to work in. Within these three years I had also undertaken a lot of my own time to explore professional readings and online resources to support our implementation of BYOD. Where possible I also attended conferences or workshops that supported this.

My preparation included supporting the teachers in the development and direction (ie WHY do we want BYOD in our school? -it had to come from teacher needs/wants), and preparation and education of our parent community (as to why we were doing this, and what we expected of both them and of ourselves). My 2014 appraisal, completed by an outside provider, had also focused on my work in supporting the entire school community for what was intended to be a transformative time in our approach to teaching.

Due to changing my sabbatical from Term 2 to Term 1, my time on this was also shortened to a six week undertaking. This meant that I didn't have quite the same time to visit all the schools or experts I had intended to, or to undertake all the research I had wanted to, however in saying that - I could spend years visiting schools and researching this and might still come out with the same understandings - or wonderings!

So - my methodology was:

- to visit a range of schools (size, decile, school type) in Dunedin, Auckland and Christchurch
- to take time to read and research in regards to BYOD and 1:1
- To take time to observe the current practices at Oamaru Intermediate in order to clearly define 'where are we at at this point in time?'
- To organise and attend a teacher professional development day with our entire staff, led by Derek Wenmoth (CORE Education), based on Future Focused Learning.

## **FINDINGS**

To look at the focus questions, my findings based on my readings, visits and Professional Learning were interesting. There were definite commonalities between schools that were using 1:1 or BYOD programmes successfully, and the effective teaching practices that I observed.

### **1. What pedagogical approaches are teachers using to transform the learning opportunities when students are using devices?**

Approaches within classrooms were consistent with Moyle, Wijngaards and Owen as cited in Moyle and Owen's (2008) reference to active learning, collaboration and creativity. Students had indicated that they had a preference for active learning and that with the use of devices they had more control over their learning, opportunities to collaborate and for the teacher to be a facilitator rather than a teacher (p17).

Very few of the classrooms I visited were using Internet sites for drill and skill type activities. Instead students were creators of their knowledge, teachers were creating purposeful, authentic situations that enabled students to be creating outcomes of various types. The use of cloud based storage enabled a lot of this. Students were working collaboratively on documents, creating their own documents and then sharing them with teachers and classmates for feedback, or collaborating on the likes of Edmodo with students from other schools who had also carried out similar learning activities. Students who were using Ipads were rarely using them in 'game based' situations. They were using a variety of Applications that enabled them to demonstrate learning, to capture teaching sessions, or to create their own outcome that either demonstrated their learning or was used to teach another student.

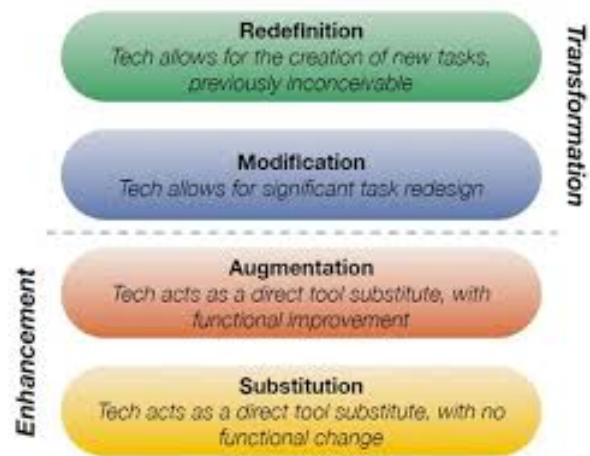
All of these support those of Sweeney (2012) who states that

*"BYOD really forces pedagogical issues to the fore . . . because if you cannot standardise the learning environment, you have to move beyond textbook substitution."* (p9)

Sweeney discusses the need for teachers to change their pedagogy and their attitudes towards how classrooms operate.

These classrooms also displayed clear evidence of differentiated learning. While students were well aware that programmes were being shaped to their needs, they were also clearly able to articulate their own learning capabilities. These environments displayed very high trust models towards students of all ages.

Three of these schools were using the SAMR model (right) to guide the redefinition of their learning tasks. Observations made showed that teachers were certainly modifying and redefining learning activities so that activities that would not have been possible without devices were part of the learning process.



Visual from:  
<http://www.schrockguide.net/samr.html>

All of these support November and Mull’s statement - “Adding a digital device to the classroom without a fundamental change in the culture of teaching and learning will not lead to significant improvement”, November and Mull, p1. Fundamental changes require teachers to change the way they have traditionally taught - to think about how they can do things that would not have been possible without the device. November and Mull refer to the change moving from 1:1 to 1:world.

Support for all teachers was noticeable within the transformative schools. These were through a variety of models. In one school the Syndicate Leaders were released to model in classrooms and to view how teachers were having students use the devices. This is reflective of Schad’s (2014) ‘Coaching’ model.

In another school there was an ICT director who oversaw the use of devices and worked to support teachers when they were setting up transformative activities. This enabled classroom teachers to take risks within a supportive environment and for teachers to have both pedagogical and additional technical support if needed.

In three other schools classroom teachers who were seen as ‘leaders’ in the use of ICT, were used to provide exemplary models of teaching practice with the devices. In two schools each of these people discussed with me how they saw this as an opportunity to take risks within their programmes and to be able to try things that they perhaps wouldn’t try if they were expecting other teachers to also carry out these. They were also provided with regular release from their classroom within which times they went into other classrooms in the school to model and/or support



learning with devices. This enabled them to provide support, but it also enabled them to identify where needs (equipment and skill/expertise) were school-wide.

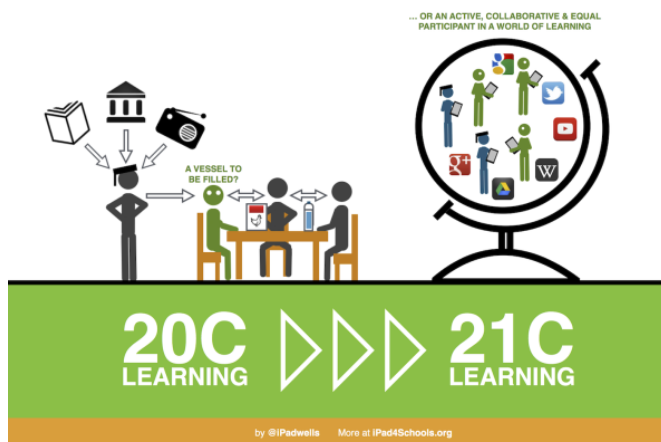
Teachers who weren't the 'leaders' in the school, of whom I spoke with, certainly felt supported - both by personnel and with adequate equipment. These aspects seem critical factors, in enabling teachers to transform their teaching practice.

Teachers I spoke with also talked about their school leaders being responsive to their needs. Decisions for tools to further support learning were often not restricted by prepared plans and budgets. They didn't have to wait 12 months for a tool that might have further enhanced their teaching, if they put a strong case to their management. This also then ensured that they were committed to making these tools work for them in the classroom.

## 2. What do the learning environments look like when students are actively engaged in 1:1/BYOD teaching environments?

A report by the 21st Century Learning Reference Group (2014), outlines the need to create future focused learning environments. It states that within these environments there need to be "multiple learning contexts, including one to one, small groups, collaborative and community learning" (p5). The classrooms that I observed who were integrating the use of devices purposefully had these physical features that enabled the practice to occur.

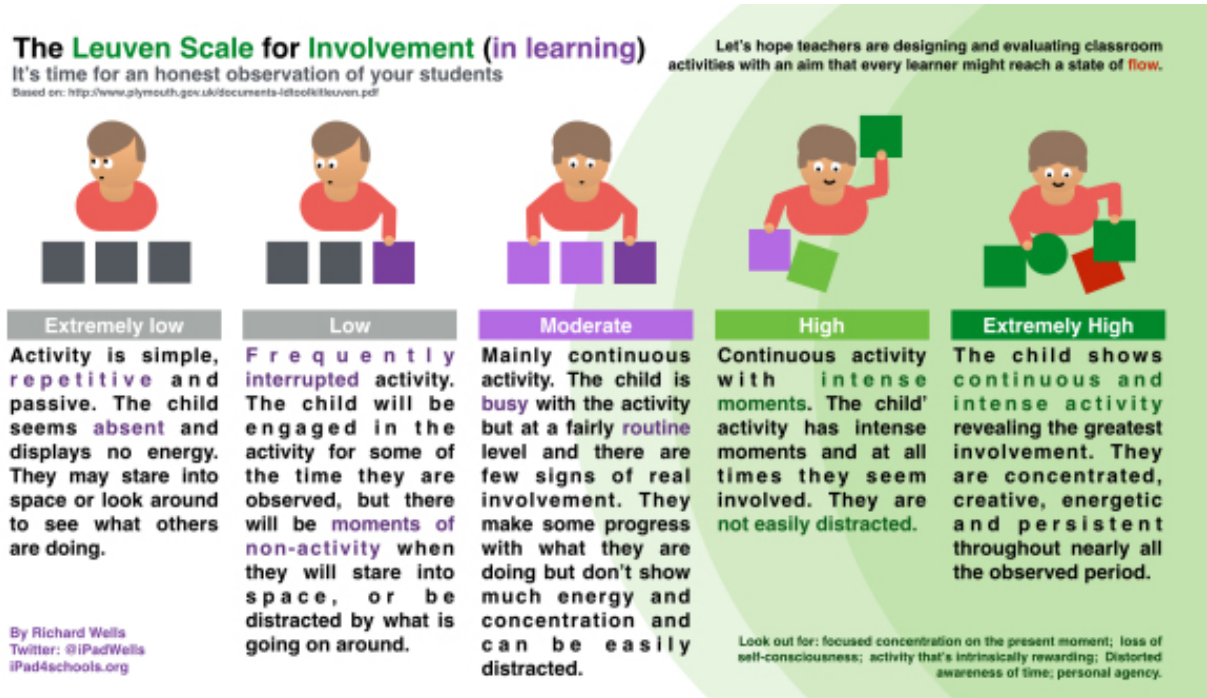
The image below is a clear visual for what these changes look like within a transformative classroom. Students were using a variety of sites, apps and tools when carrying out learning activities. In Yrs 5-8 the selection of what to use was often given to the student, in order to best meet the needs of the individual. In lower classes these were often teacher directed, after there can be some explicit teaching of the use of the specific tool.



Infographic from Richard Wells - [www.ipads4schools.org](http://www.ipads4schools.org)

Digital Citizenship was prevalent in all schools - both visually and in the teaching programme. Teachers alerted students to aspects of digital citizenship throughout lessons and one school even had a visual 'Digital Citizenship Kit' that acted as a metaphor for their online behaviour.

Classrooms and learning spaces with devices in use by the majority (or all) of the students were very busy places. Students were involved in hands on learning opportunities, in a range of spaces and with a variety of people (students of similar, lower or higher ability, teachers or other adults in the learning environment). The Leuven Scale for involvement would represent these classes in the 'High' and 'Extremely High' ratings of the scale. The diagram (below) is a good example of how teachers could measure the involvement of their learners.



Infographic from Richard Wells - [www.ipads4schools.org](http://www.ipads4schools.org)

Fahlvick (2013) states that there are three strategies to use in a Student Centred Learning environment with devices. The third strategy is to 'Empower Students to be Creators Not Consumers'. Within this he believes that this creates learners who are fully engaged and who internalise their learning.

While there isn't clear research to back that ICT improves academic outcomes, the engagement of students I viewed in their personalised learning environments must surely enable greater learning to occur.

### **3. What equipment is enabling the learning (both student owned and school owned devices)?**

This was varied. Of the schools I visited there were various models (according to Dixon and Tierney, 2013):

1. School mandated device (3 schools mandated Chromebooks, 1 school mandated iPads)
2. Student choice of laptop or tablet (4 schools).

Interestingly there was no correlation between school decile and the uptake of a BYOD programme. I visited a decile 1 school where all students were equipped with their own device (purchased by home), and I also visited high decile schools that were having difficulty getting more than 50% of their students to bring a device.

In schools where devices were being used for the majority of the time, classrooms were well equipped with additional devices. Schools whose students had Chromebooks were also provided with a pod (usually 5 or 6) iPads per class. The school who had students bring iPads had a number of pods of Chromebooks available to students. A school where Surface Tablets were the preferred device (but not the only device that students could bring) had a number of pods of laptops available to students.

I believe that my observations reinforce the notion that there is no one 'best fit' for a device in a classroom or school. Teachers and schools need to select the model that best fits their vision for teaching and learning.

Most schools also had some form of hardware that enabled students own devices to projected onto classroom projectors or flat screen TVs. These were usually ChromeCast or Apple TVs. This created more opportunities for collaboration and community within the classroom (and beyond).

### **4. What school-wide systems enabled transformative learning to occur?**

Each school that I visited, in which transformative teaching practices were evident, had a very clear school direction. School visions were clearly articulated, usually represented in some sort of pictorial form, and had quite a presence around the school. Both teachers and students who I spoke with were able to clearly articulate what the direction of the school was and how their teaching practice (or learning) fitted in with this.

Each school's vision of teaching and learning, and inclusiveness of devices was usually based on research or a particular model. The staff and school had then made

this research or model their own, usually accompanied with personalised school driven visuals.

In the schools where the students were most articulate about their learning, there were also a large number of visual scaffolds around classrooms and schools. These were of various focus areas - on Key Competencies, Higher Level Thinking, School directed goals/focus areas/dispositions.

In most of these schools there had also been decisions made about the use of a specific device such as a BYOD or 1:1 tool. These decisions were usually for schools to use Chromebooks (from Yr3/4 up) or iPads. The decision as to which device should be brought by students was made around the direction for teaching and learning, and the vision of the school. From my observations I believe that if schools are making this type of decision then the teachers as a whole need to decide what device best fits with the school vision for learners.

These decisions were sometimes influenced by the wider educational network that the school was a part of ie schools or students were able to select devices that they knew would be used in the Intermediate or High school environments that the students would be moving to. One particular school was a contributing school to three schools, and so the device choice was often made by students and their families, based on the next school that they were attending.

### **Conclusion:**

In concluding it can be seen that many of the schools who are implementing transformative practices with the use of devices in BYOD or 1:1 settings have made explicit links to research or models of teaching when making the change and introducing the devices. Teachers have been transformative in the changes that have been made, and in many cases had experimented in their teaching approaches before they had felt comfortable and further developed the practices that they were adopting.

Having a school-wide philosophy is key. Leaders and teachers need to be clear on their beliefs about teaching and learning and how the use of devices can enhance these. Visual representations around the school allow this to be clear to both teachers and learners and assist everyone in being able to articulate the importance of the learning process being changed and embedded.

Allowing learners the responsibility and ownership of their learning is important in enabling them to be engaged and to connect with the learning that they are taking part in. This was represented in 'busy' classrooms where students were engaged,

working either independently or collaboratively, regardless of what was happening around them.

The ability for teachers to feel that the school leaders were responsive to their needs was important. In some schools this was in regards to hardware (regardless of what had been planned into this year's budget in the planning the previous year), however in most schools this involved the support and upskilling of teachers, based on each of their own needs. This was usually provided by having an 'expert' teacher or coach work with teachers. This teacher was usually a classroom teacher who had developed their own practice over time and was able to provide examples of practice (both successful and not).

The greatest benefits to learners, that I observed, were when students were creators of information, rather than consumers, when using devices. In order to move to this type of approach teachers have to be prepared to experiment, to make mistakes, in order to refine their practice. The use of devices (in a 1:1 or BYOD setting) is unprecedented in the majority of schools, therefore there can be no 'best way' for things to happen. School leaders need to have confidence in their teachers and teachers need to know that it is OK to experiment and learn from both the successes and the mistakes.

Only when the above aspects were enabled within the school, could the transformative practices of teaching using devices in a 1:1 or BYOD environment begin to take place.

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Wells, R. (2015, February 28). Can iPads help achieve a state of Flow? Retrieved March 4, 2015, from <http://ipad4schools.org/2015/02/28/can-ipads-help-achieve-a-state-of-flow/>

## **APPENDIX ONE - Suggested Readings and Resources**

### **Websites:**

I have collected a significant number of videos and other resources that support my research in this area. These can be viewed on the BYOD page of my wiki -

[www.deidre.wikispaces.com/BYOD](http://www.deidre.wikispaces.com/BYOD)

Please keep in mind that this is a continuing 'working document'.

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<http://www.future-focused.tki.org.nz/Schools/Leamington-School/The-Leamington-Learner>

SAMR Model:

Using the SAMR model. (n.d.). Retrieved March 27, 2015, from

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**Other readings include:** (These are the readings provided to the staff at OIS as a result of my sabbatical)

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