



Education Running Wild: Mobile Learning Devices at Kaipara College



Alea iacta est!

Sabbatical Leave Report
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Inquiry

To investigate the introduction, use, management and effectiveness of electronic devices in secondary school student learning.

Summary

The focus question has only one answer. The involvement of mobile learning devices in teaching and learning is inevitable. Introducing mobile devices needs:

1. Widespread consultation.
2. Careful planning.
3. Considerable school resources.
4. Answers to the questions arising from consideration of equity of access.

The Government must orchestrate the policy backbone for the use of WILD in education. In particular, it must resolve the equity issues that arise in this context.

WILD: *Wireless Interactive Learning Device*

Front Cover: *The bridge across the Fiumicino (Rubicone) river. Image courtesy of the Guardian*

Alea iacta est: *"The die (dice) is cast". Ascribed to Julius Caesar as he crossed the Rubicone with the XIII Legion Gemina in 49BC*

The Sabbatical

Introduction

Although the question of ICT and mobile devices in schools appears to be the single most common topic for sabbaticals over the last two years, I decided I needed to create the space and time to work out a course of action for Kaipara. I also needed space and time to come to grips with the implications of the use of mobile devices in a regular, rural secondary school where students come from a wide range of backgrounds, especially as far as socio-economic profiles are concerned.

The focus of my sabbatical was thus:

1. What place do wireless interactive learning devices have in secondary education?
2. Do we introduce mobile learning devices into Kaipara College?
3. If so, what do we introduce and how do we introduce it?

What I did

I read papers, articles and research reports. (See bibliography)

I read many copies of the eSchool News and its linked reports and research summaries.

I visited two South Island High Schools, Cromwell College and Motueka High School, both of which have some similarities to Kaipara College.

I spent a day at Tamaki College.

I spent a few hours talking to technology experts in the IT field.

Context

Ten years ago Kaipara made the decision to become a desk top computer school. Having followed the Kings College research into the student use of laptops and looked into the question on an earlier sabbatical it seemed that the best solution for education was to develop a desk top approach which enabled students to open their desk top wherever in the school they happened to be.

We robustly cabled the school and spent the next few years trying to find sufficient funds to expand the number of computers and installation spaces available to students.

In 2006 we commenced a major rebuild of the school. As part of that we upgraded our cable network. While the cable network has the capacity for wireless, wireless was not installed. At the time we were still happy with our desktop based approach. The rebuild is now complete. Finances, never easy in a school of 600, have been very tight for the last five years. The new facilities, growing popularity and a slowly growing population have caused the first roll increase for five years.

At a time when there does not appear to be any explicit government policy about the use of mobile learning technology in the state schools, schools are filling the gap by introducing their own solutions and policies.

1. Kaipara shares a boundary with Orewa College who have mandated the use of mobile learning devices.
2. Most secondary schools are developing their own solutions to the use of mobile learning services, mainly involving variants of BYOD.
3. Many primary schools around us are opening up opportunities for their students to use mobile devices.

Our parents, in so far as we have ascertained their opinion, albeit in mainly informal situations, are happy that we are taking a conservative approach. There seems to be a strong sense of inevitability about the move but parents want us to take our time.

Electronic Devices in Teaching and Learning

The mlearning Utopia

Mobile devices are the breakthrough in learning. If electronic devices (those tethered version of ICT) opened the knowledge universe to students and teachers in their classrooms and homes then mobile devices will liberate them from the limitations of situated place and time learning.

The future, according to the enthusiastic promoters of mobile devices in learning, has students being guided by co-learning teachers as they pursue their individual questions, interests and needs through the labyrinths of the ever expanding information universe. They learn anywhere, anytime. They learn in authentic situations. They co-construct. They collaborate. They communicate. They “learn just in time, just enough, just for me”. (Park 2011)

The Real World

If eLearning, along with curriculum development, has begun the development of richer content, more tailored, more individualised teaching and learning then mobile devices will significantly accelerate it.

There is an implication, almost an article of faith running through all the writing about mlearning, that it is inherently beneficial. However there is not a great deal of substantive research about mLearning’s impact. It is only in very recent times that classroom-size projects, or bigger, involving the use of mobile devices have begun. They are springing up in many places. In some there are objective and independent evaluations of the experience. I read four detailed trial evaluations:

1. Trinity College, Melbourne
2. “Smart Classrooms” The iPad trial in Queensland Schools
3. iPad Scotland Evaluation
4. “The iPad as a tool for education” A study of the introduction of iPads at Longfield Academy, Kent

In these circumstances most evaluation reports focus on questions relating to student use and to student and parental attitudes. In nearly all cases of school trials and evaluations the devices are supplied to students without cost.

Evaluations report uniformly that there is improved engagement by students with their learning where they have access to mobile devices. Parents also report better engagement by their children. Research appears to consistently report that a mobile device, used well, can have a positive impact on student engagement and motivation.

However these trial evaluations almost all make the point that what data is available about student achievement is not yet sufficient to draw reliable conclusions.

A literature review conducted by researchers at Washburn University (Drain et al 2012) found contradictory conclusions from studies into academic achievement and computer use. They found some studies that showed computer use was correlated with improved achievement. They found some studies that concluded academic achievement was not related to computer use. A few studies suggested that computer use correlated negatively with academic performance. Their own study into SAT and GPA scores over several states (in the US) and over thirty years of data suggested a significant improvement in academic performance with increased computer use.

This was the only unequivocal study that I found.

A number mentioned that the early stages of mobile device use in schools meant that the Hawthorne effect could not be discounted. Most of the large scale trial evaluations mentioned above make this point in various ways.

Nearly all writers report optimism while sounding cautions about reaching reliable conclusions on current data and in the current state of development.

However many writers are agreed that while the devices can have positive motivational impacts the tools themselves are not sufficient for improved achievement. Considerable time has to be invested in learning how best to use it.

Out of this line of thinking is emerging, from many sources, a growing emphasis on the active presence of teachers in classrooms using eLearning and mLearning tools. Skilled pedagogy is still the difference in lifting achievement. The devices themselves are not the key point. What they enable teachers to do is to incorporate the vastly increased affordances of the technology into skilled teaching. Affordance is a term from psychology that has crossed the disciplinary boundary into design and consideration of human interactions with computers and other technology. It means the possible range of actions that can arise from the properties of an object.

Put another way, if pedagogy doesn't change, technology makes no significant difference.

Student competence with technology, in as far as improving positive outcomes is concerned, is down to what teachers do.

In the mobile learning environment teachers are far less the providers of content. In the secondary school teachers are the skilled guides that let students 'see' in the manner of their discipline as they lead students into the beginnings of disciplinary settings for knowledge, skills and thinking. The vastly wider range of affordances means that they must be skilled organisers of experiences and contexts that develop the disciplinary skills of their subjects within their students.

The emphasis shifts to higher order skills, conceptual arcs, critical thinking, reasoning in the discipline, literacy and problem solving. Writers point towards the critical need for students to have better meta cognitive skills. Writers foresee a time characterised by the advantages of more collaboration, more group work, setting students authentic contexts for problem solving, easier publication of student work and communication with a range of people in and out of the school.

There is a shift of what is in the foreground in schools. While disciplinary knowledge is the context in which a student's learning capacity is developed, disciplinary knowledge, per se, recedes and learning capacity comes to the fore. Increasingly students will need the ability to move between disciplines. This requires them to have meta level learning skills. Meta cognitive abilities thus assume greater importance. A secondary school's focus is to build better learning power against a background of disciplinary interests and knowledge.

Devices: Schools and Teachers

The most common approach among schools seems to be variants of the BYOD solution. The schools provide a wireless powered site, establish some use policies, establish some security and allow students to bring their own devices. The extent to which staff are supported to take advantage of the new affordances varies hugely.

In these schools, courses in which academic accomplishment is dependent on students having a mobile device – WILD courses – are presently very rare. But in some cases courses are approaching this rubicon. I refer to this as the rubicon because at the point at which success in a course does become dependent on a device is the point at which education success steps up its dependence on family resources to a new and much higher level. The ability of students and their families to afford the quite significant cost of mobile device ownership and operation varies enormously. This cost is beyond a small but significant number of families.

Schools appear to be addressing this problem but solutions that I am aware of so far are inadequate and rely on the school owning and lending the devices or on poor students giving up free time at school. (See Equity section for a fuller discussion of this question.)

A few schools have mandated device use. At Orewa College iPads are recommended but students can bring their own device.

In Glenn Innes, Point England and Panmure a community trust provides a framework that has allowed a group of schools to mandate device use and to mandate a particular solution.

Manaiakalani

Manaiakalani is the educational trust that operates in the Point England, Glen Innes and Panmure areas providing innovative support to digital learning for students in all its member schools.

It is probably fair to say that this is a ground-breaking educational initiative taking place in one of New Zealand's poorest urban areas. It builds on community strengths in self-development and management that have been evident in the district for many years. The geographic position of these communities has given them an identity and a resilience that has been quite a feature of them for a long time. In my time in the community, leaders showed a coherence across cultures that was both respectful and dynamic. There has been an awareness of what would help build community strength for many years. What has been lacking is the financial platform upon which to develop many of these initiatives. Manaiakalani has taken a community idea and given it the resources, support and space to develop into an outstanding programme.

It has nine trustees of which four are business men and five community representatives.

It has the support of

- Ministry of Education
- Te Puni Kokiri
- Housing New Zealand
- Ministry of Pacific Island Affairs
- Woolf Fisher Research centre
- Skycity
- Hapara
- Equico
- ASB Community Trust
- Fusion Networks
- Vector
- The Telecom Foundation
- Tamaki Redevelopment Company Ltd

The supporters provide funding, services and practical support to the trust.

The trust:

1. Provides community wide access to wireless broadband.
2. Provides, supports and underwrites the acquisition of chromebooks for students in the member schools.
3. Supports professional development for staff.
4. Runs a digital teachers training programme.
5. Provides technical support to staff.
6. Liaises with parents about using the technology.
7. Liaises with employers about employment issues for students.

Tamaki College

Tamaki has embraced the Manaiakalani programme.

1. The students all obtain chromebooks at a cost of \$580 by paying a deposit of \$40 and \$15 per month for three years.
2. The school has a full time technician in place.
3. There is PD time allowance equivalent to 1 FTE which is currently distributed to Faculty Heads.
4. Manaiakalani supports digital teacher training and the College has two digital teacher trainees.
5. Lessons are device centred.
6. The staff each have their own website with their lesson materials on it.
7. The system is cloud based and uses Google apps and systems.
8. An app called Dashboard enables staff to monitor student progress, mark work and provide feedback.
9. Watchdog is used for security although it slows the network down markedly.

Soana Pamaka, the principal, reports that while student engagement has improved overall, boys' engagement is much better. She attributes part of the recent significant increase in achievement to this approach to teaching and learning. She describes the students as better learners, able to have conversations about their learning and able to manage their learning better.

So far there have not been serious problems with inappropriate material or with cyber harassment. Only six machines have been lost to theft.

Damage and theft are covered by an insurance policy that the trust operates.

The school has its own digital footprints site with rules and procedures on it as well as support information for students.

In my day at the school I observed some terrific teaching and some very motivated and engaged students. I looked at a few teacher websites. I saw multi-layered, in depth, carefully constructed lesson learning plans on websites. I also saw a website which was basically a set of task sheets on line.

Soana says that the staff are at all levels of growth and commitment. This is what was expected. Professional development resources are being focussed via faculties to support staff skills.

She reports that parents are very happy with what is happening.

They have decommissioned two of the three computer labs and the photocopying expenditure has been slashed.

About 20% of students do not have their devices at any one time. The reasons range from the "left it at home" to damage and maintenance. All maintenance is done on site by a full time technician employed by the Trust. Each room has three to five desk top devices to provide for these students.

These systems and approaches are completely dependent on the ongoing functioning of the Manaiakalani Trust. Without it, this approach to teaching and learning is unsustainable.

Teachers and Devices

Visits to schools and conversations with colleagues reveal that staff in schools are responding to the introduction of devices in a way familiar to all of us. There are enthusiastic early adopters, quiet adopters, ignorers and resisters.

Teachers identify these issues as points of concern

1. Technology in the classroom causes distractions to teaching and learning.
2. Students engage in inappropriate, sometimes dangerous, activities.
3. BYOD deepens the digital divide between students.
4. Teachers worry that they will have to become technical experts.
5. Not all devices are suitable.
6. The problem of knowing how to use all the devices, operating systems and software that students are likely to possess.
7. Students will lose their command of basic skills in numeracy, reading and writing.

There are anecdotal reports from both schools that have mandated the use of mobile devices of teachers feeling under pressure to change teaching approaches that they have found effective and successful for many years.

There are a number of anecdotal reports that teachers are struggling unsuccessfully with the classroom management issues involved in having devices present in their classroom. These teachers often feel that they have lost some of their previously effective classroom management.

Some teachers are feeling that the anywhere, anytime nature of device based learning is blurring the lines between work and personal time by placing, in some cases direct in others indirect, pressure on staff to be available to their students over extended periods of time.

There are also many staff flourishing in a device rich world of teaching and learning. They are finding more entry points for the students into lesson material, customising programmes, involved in more authentic learning situations, developing games and virtual experiences and encouraging their students to reach out through their devices to new situations, experts and fellow students.

Many of the enthusiastic writers dismiss the negative issues raised above as myths or as being unimportant.

Research writers did not find that any of them were significant enough to have negative impacts on students in the researched situations. However none of the trial regimes involved whole schools.

While teachers persistently raise the first three points and have fairly strong views on the remaining four, most educational leaders, especially those in schools and areas which have systematically introduced mobile devices into schools repeatedly stress the need to manage these questions clearly, firmly and proactively.

The New Zealand Curriculum

eLearning and mLearning in the New Zealand Curriculum

The New Zealand Curriculum has a very small section making quite a general comment on eLearning. In the section titled “E-Learning and Pedagogy” there are 153 words which are mainly aspirational, very general and expressed conditionally. It concludes with a 26 word paragraph;

“Schools should explore not only how ICT can supplement traditional ways of teaching but also how it can open up new and different ways of learning.”

This reference is at once reassuring and disconcerting.

Its reassurance lies in being consistent with the broad sweep of the curriculum document as a whole and thus leaving the precise form of its implementation to each school. This is usually held to be one of the great strengths of the national curriculum.

If mobile learning device writers are correct about its power and the direction of development in teaching and learning then there will be significant progress in the development of student meta-learning and meta cognitive skills. This is consistent with the best aspirations of the curriculum document’s vision, values, principles and key competencies.

The disconcerting aspect arises from this very feature. What is clear from the studies and the writing is that the use of mobile learning devices will engender significant change in learning and teaching that will have major consequences for teacher work, student learning, school resources, school organisation and school design.

The learning impact of mobile devices is not yet adequately assessed.

Their involvement in schools, teaching and learning seems to be inevitable.

The resource impact is not small for schools, teachers or for families.

The NZ Curriculum document offers no guidance and mandates nothing beyond the requirement to explore the use of ICT in supplementing traditional ways of teaching.

That the government believes ICT should be centrally involved in teaching and learning is attested to by:

1. Government funding of high speed broadband to schools.
2. An Associate Minister with this as a main brief.
3. A ministerial working group with this as a focus.
4. Several Ministry advisory and guidelines documents.
5. A Ministry supported eLearning website.
6. The N4L initiative.

The Ministry’s Modern Learning Environments also implies the use of ICT in education while dealing with any of the matters relating to school design that might arise only in a very general way.

Nonetheless schools are individually addressing the eLearning and mLearning challenge. Policy and developments are proceeding on an ad hoc basis. This raises two significant issues:

1. Research seems to stress the need for careful planning, for significant support for teachers and significant technical background support. This will seriously strain the resources of most New Zealand schools.
2. The equity issue.

Equity

Equitable access by students to the opportunities afforded by mlearning emerges as an important issue when any step towards using devices in schools is considered:

1. The devices are quite expensive to purchase. Bulk purchased chromebooks cost about \$450 cash and about \$580 on a very reasonable time payment scheme. iPads range in cost from about \$450 to \$1250. The cheapest tablets are about \$200 and they are heavily dependent on the cloud.
2. Insurance and maintenance costs are incurred. Damage rates appear to be between 10 and 20%.
3. While much software can be acquired free, there are some software costs associated with security and some applications.
4. Data costs are significant. Many plans assume access to some form of broadband. Some areas of the College zone do not yet have broadband. Basic family data plans seem to cost between \$60 and \$85 for 80GB per month which appears to be the smallest package. Prepay data is very expensive with costs, depending on how much data is purchased, ranging from \$20 for 500MB to \$80 for 5GB.

Underlying the practical problems is a major philosophical issue. New Zealand is a state education system. One of the fundamental reasons for state provision is the objective of providing equitable access to educational opportunities for students regardless of their family and personal circumstances.

The cost of owning a device for each child in a family, and of servicing, insuring, equipping and running it, is significant. It is much more than the cost of a school uniform and is probably more akin to the cost of an overseas school trip. It is a significant potential barrier to equitable access of opportunity for many students.

What schools can charge parents for is influenced by the principle of free education. State schools cannot charge fees, cannot charge for tuition, cannot limit access to educational services on the basis of student payment of 'donations'. Families are expected to pay for stationery, uniforms and school trips. If a mobile learning device is basic to learning can it be mandated at parental cost? If it is a substitute for teaching resources, ie a text book or work sheet substitute, can it be mandated at parental cost? If it is just stationery can it be mandated?

Even if a school adopts a BYOD approach students without access are at somewhat of a disadvantage. When a teacher, or a school, develops a programme in which having a device is really essential to get merit and excellence grades, perhaps even to pass, then the rubicon has been crossed. At that point there must be a solution to equitable access in place or a fundamental principle of a state education system has been set aside. Access to educational success will depend on a family's ability to fund the acquisition and operation costs of mobile electronic devices for all the children in the family.

Schools are taking a range of solutions to this problem. Manaiakalani students are being financed into ownership over three years. Other solutions involve the school owning devices to lend to students. Most availability is at school although a few schools permit students to borrow devices for longer periods of time. This solution, while well intentioned, amounts to a requirement that students unable to afford a device or unable to operate a device at home must surrender lunch times and after school time just to attempt to keep up. This amounts to reduced lunchtimes and reduced extra-curricular activities for students from poorer circumstances.

The point is that we have a state education system and, notwithstanding the relative independence of schools within the system, the solution to equitable access must come from the state in some way.

The state should certainly not be permitting schools to cross the rubicon as individual entities.

Devices in Schools: Blended Learning

So what place are devices likely to have in the next few years?

When the visions of the utopians are married to the real world of schools and classrooms the notion of a new style of teaching and learning within the current physical and organisational environment of schools emerges. This is referred to as blended learning.

In the blended learning classroom the key question is how electronic learning devices are used.

A device is not a passport to easy learning. It doesn't change the ability to learn or improve student achievement by itself.

For all the blue sky talk of anywhere, anytime, just in time, just for me, highly personalised, situated, contextualised learning, education will still be overwhelmingly school based, in class groups and teacher organised for the foreseeable future.

A device, however sophisticated, is a tool for learning. A very clever pen. The central issue is the pedagogy. The affordances offered by mobile devices are enormous. This does change the way teachers can teach.

Teaching has always had three central features:

1. Motivating students and engaging their interest.
2. Presenting information, concepts and skills to students.
3. Giving students an opportunity to demonstrate what they have learned.

The affordances offered by devices enable each of these aspects to become richer, more layered and more tailored. Devices can:

1. Provide a number ways to engage student interest by providing multiple entry points to a subject and by situating them in the real or virtual world.
2. Present information in many ways and in multiple formats.
3. Offer students many ways to express and or demonstrate what they have learned.

The teacher will not be the main source of all information any longer but they will be the organiser, facilitator and conductor of learning. Meta-learning skills become a basic skill set alongside literacy and numeracy. (Thinking skills in the National Curriculum) Learning may extend beyond the classroom in new, real and virtual, ways but the classroom will be the centre of the organisation of the learning. Interactions with teachers may not be confined to just the classroom and school, they may be able to take place at any time. While schools will still be the organisational centre of adolescent learning they may need to adapt their structures to new rhythms.

Introducing Devices into a School

Introducing wireless interactive learning devices into a school - current practice

In New Zealand each school is considering the challenges of introducing mobile devices in their own way. In many cases the introduction consists of basic policy and school rules, the provision of wifi and permission for students to bring their own devices.

This is allowing the enthusiast to experiment with the affordances of mobile devices and begin to explore the richer learning environment available to students. But it is also providing other staff with a range of frustrations and classroom management challenges.

In many senses there is a rush to embrace the new technology for reasons which are not always clearly articulated. This is resulting in some very serious questions about the technology itself, about school resourcing and about equitable access being dealt with much more slowly than the introduction of technology itself.

Manaiakalani is an exception. Here there is systematic planning and attempts to provide practical answers to the serious 'big' questions. Interestingly the work of the Trust is showing how intensive and expensive the introduction of effective mobile learning technology to schools actually is.

Introducing wireless interactive learning devices into a school - best practice

In considering successful introduction of devices into teaching and learning writers advocate a systematic approach across a school district or a school system.

Synthesising approaches to the introduction of devices from several sources suggests that these questions are key:

1. A vision of the place technology has in learning.
2. Parental support
3. Teacher support
4. Availability of Resources
5. Internet access
6. Effective connectivity
7. Quality software
8. Technical support
9. Professional development
10. Administration support
11. Strong policy and procedures framework for staff and students.
12. Planning time
13. Time for students to use technology
14. School organisation
15. An evaluation of effectiveness.

Digital Citizenship

The digital world is vast and immediate. The virtual world also has a degree of permanence in which communications remain frozen in time as they were when the send button was hit. Because it often lacks the regular face to face contact that influences and constrains social interactions in the real world, it lends itself to impulsive contributions which are not always thoughtfully prepared.

Schools have become well aware of this in the last ten years as the internet and mobile technology have become central instruments of teenage communication. Schools have rules, policies and procedures that help them manage these challenges.

All the guideline documents of overseas schools and school systems that I have seen stress the need to further develop this framework as mobile learning devices are introduced to schools. They stress the need for ethical systems and for clear etiquette in students using devices for learning.

The concept is one of digital citizenship and covers not only distractions and inappropriate materials but questions of appropriate ways to communicate and legal issues. Schools are urged to have clear, strong systems and to actively teach students the ethics and etiquette of digital citizenship.

Among the areas digital citizenship can cover are:

1. The care and management of the device.
2. Communication rules and etiquette.
3. When the device can be used.
4. Protocols for using school networks.
5. Security of passwords.
6. Data protection.
7. Privacy.
8. Copy write and intellectual property matters.
9. Legal rights and responsibilities.
10. Harassment and bullying.

Next Steps for Kaipara

Can we maintain the status quo?

For a year or two only probably.

Then the College will have to have a mobile device learning plan.

We may be able to exercise the option to remain desk top focussed but this will result in all the expense of electronic learning falling on the school. It is doubtful if we could manage this in the current school finances climate. It also ignores the fact that mobile devices look to be supplanting tethered devices particularly for personal use.

Given that the move is probably inevitable, what should we do?

In short:

1. Consult widely and develop a plan.
2. Set up the provision – SNUP the school.
3. Develop the digital citizenship framework with parents, staff and students.

The plan should probably involve a basic provision for students to have devices at school in 2015 without constructing an environment that makes possession of the device a question of equity.

This will provide time for us, preferably the country, to solve the policy issues that arise from devices becoming implicitly or explicitly compulsory.

It will also allow us to look into the budget questions that will inevitably arise for the school.

There is a checklist for administrators and a checklist for teachers in Appendix 1. These are not mine but have been synthesised from various sources. They focus on questions relating to the pedagogy rather than the technology.

The issues that arise for us in taking any steps are summarised on the flow chart in Appendix 2.

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Appendix 1:

Action Plan recommendations for school leaders:

1. Review national curriculum and NCEA standards with technology in mind.
2. Collaboratively determine key aspects of curriculum(s) to focus on.
3. Use cross disciplinary teams of teachers to find new ways that technology can help students achieve these learning goals.
4. Collaboratively create a technology plan for the school.
5. Set 1, 2 & 5 year goals for achievement improvements
6. Identify specific skills, practices, and attitudes that can be improved by the use of technology.
7. Identify good exemplars in and out of the school
8. Be aware of national plans
9. Utilize research findings that identify factors that improve the effective use of technology for teaching and learning.
10. Develop an understanding of the value of technology for all students, particularly those at risk of not achieving
11. Ensure that all students have equitable access to effective uses of technology.
12. Provide on-going research based PD opportunities that link technology to the curriculum.
13. Provide time-lines, structures and incentives for teachers to participate
14. Find ways of changing the school day to support engagement with learning technology
15. Consult parents.
16. Educate parents
17. Evaluate the effectiveness of the technology in improving student achievement.

Action plan recommendations for teachers

1. Determine the specific purposes for using technology.
2. Link technology implementation initiatives with specific learning goals.
3. Collaborate with colleagues to develop coordinated meaningful learning activities for students
4. Promote the use of learning circles, especially on-line.
5. Encourage students to broaden their horizons with technology by making connections outside the school, taking electronic field trips and researching and publishing on-line.
6. Ensure that students have equitable access to technologies.
7. Encourage collaboration and peer assessment among students.
8. Use authentic tasks in assessment
9. Ensure that technology rich programmes are evaluated against the education goals not against competence with technology.
10. Create opportunities for students to share their work publicly.
11. Link learning technologies to technologies in the work place.
12. Participate in PD activities
13. Use technology to connect with teachers outside the school.

Appendix 2: Summary of mLearning issues for Kaipara

W.I.L.D. Education: Mobile Learning Devices at Kaipara College

