Acer Windows 8
BYOx tablet trial

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Background

The Department of Education and Training reviews and trials a range of existing and innovative technologies to support schools in meeting the needs of learners and ensuring the latest technology is suitable for all students.

Many schools are considering implementing either a student Bring Your Own Device or a student Bring Your Own Technology model (BYOx) to supplement their existing school technology. Industry trends also show a move towards tablet devices for personal computing.

Previous Department of Education and Training (DET) trials have examined the effect of laptops, netbooks, iPads and iPods on student engagement and outcomes. The trials have also informed Information Technology Branch (ITB) about the strengths, weaknesses and security implications of the various operating systems – Windows, Mac OSX and iOS - as well as device usability in various sizes and shapes.

The aim of this project was to evaluate the suitability of a small Windows 8 tablet device in a BYOx setting. The aim of the trial was to:

- investigate student use of small hand-held Windows 8 devices
- assess the suitability of the tablet as an eReader
- assess device compatibility with the department’s network
- inform future device categories on the department’s Purchase IT catalogue
- determine possible support strategies and materials for BYOx schools
- identify solutions for Windows 8 App deployment and device management in BYOx settings

The trial took place at three primary schools during Term 4, 2014. Participants were selected after consultation with Regional Technology Managers.

Data was collected via school visit observations and survey feedback from teachers and students.
**Participant classes**

The trial was conducted in a Year 4/5 composite class at Granville State School, a Year 5/6 composite class at Quinalow Prep-10 State School and a Year 4/5 composite class at Vienna Woods State School.

School details:

<table>
<thead>
<tr>
<th></th>
<th>Granville SS</th>
<th>Quinalow Prep-10 SS</th>
<th>Vienna Woods SS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Region</strong></td>
<td>North Coast</td>
<td>Darling Downs South West</td>
<td>South East</td>
</tr>
<tr>
<td><strong>Year level</strong></td>
<td>Year 4/5</td>
<td>Year 5/6</td>
<td>Year 4/5</td>
</tr>
<tr>
<td><strong>Class enrolment</strong></td>
<td>27</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td><strong>Device scenario</strong></td>
<td>1:1</td>
<td>1:1</td>
<td>1:1</td>
</tr>
<tr>
<td><strong>Classroom connectivity</strong></td>
<td>Wi-Fi</td>
<td>Wi-Fi</td>
<td>Wi-Fi</td>
</tr>
</tbody>
</table>
Devices

Each trial school was provided with Acer Iconia W4-820 tablets (Figure 1) and protective cases which also doubled as a tablet stand (Figure 2). These were loaned by Acer Computer Australia. The mobile touch screen tablets were running the full Windows 8.1 operating system. DET also provided each teacher with an Acer branded HDMI to VGA converter, an Acer branded capacitive stylus and a $25 Windows Store card.

Acer Iconia W4-820 tablet technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel Atom Z3740 (1.33GHz)</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel HD Graphics</td>
</tr>
<tr>
<td>Screen</td>
<td>8” Active Matrix TFT Colour LCD (1280 x 800 resolution)</td>
</tr>
<tr>
<td>RAM</td>
<td>2Gb of LPDDR3 RAM</td>
</tr>
<tr>
<td>Flash Memory Storage</td>
<td>32Gb</td>
</tr>
<tr>
<td>Wireless</td>
<td>AzureWave AW-AH691 (802.11a/b/g/n) Wi-Fi and Bluetooth</td>
</tr>
<tr>
<td>Ports</td>
<td>Micro HDMI, Micro SD card, Micro USB, Headphone</td>
</tr>
<tr>
<td>Battery</td>
<td>2-cell Lithium Polymer (4960 mAh) … up to 8 hours use</td>
</tr>
<tr>
<td>Dimensions</td>
<td>10.8mm H x 135 mm W x 219 mm D</td>
</tr>
<tr>
<td>Weight</td>
<td>Approximately 415g without case</td>
</tr>
</tbody>
</table>
A standard Windows 8.1 image was installed on the tablets as this was a BYOx trial and the devices were not capable of handling the DET Managed Operating Environment (MOE) image. The tablets came with a student version of Microsoft Office 2013. Administration accounts and generic student accounts were set up on each device. The student account had a number of the default apps removed – particularly those that encouraged online purchasing (Amazon, eBay) or the use of social media (Cha Cha, Didlr).

A number of free educational apps were installed on the devices (including: GeoGebra, 100 Chart, Fresh Paint, Overdrive, Physamajig, M8!) and a few paid apps (including: Explain Everything, CreateBook, Carly’s App).

Each school received enough tablets to allow one per student, one for the teacher and an extra for a support person (school technician, teacher aide or teaching partner).

Schools were encouraged to run the trial as a BYOx program with students allowed to take the tablets home. Initially all schools decided to keep the tablets in the classroom until the students were comfortable using them. By the end of term most students were taking the tablets home.

Teachers and school technicians were supported through school visits, email and phone contact. A SharePoint site was set up to share resources and to log issues but due to the tight timelines and the busy time of the year for teachers this was used sparingly.

**Connectivity**

One of the requirements of the trial was for the classrooms involved to have access to the newer H3C wireless access points as the Iconia W4-820 tablet could not connect to the older 3-Com access points. Two of the schools already had these in place in the designated classrooms and the third had an access point installed.

Students were able to use the tablets to access the internet and the staff were able to download apps. One of the schools used the Flick app to allow students to send files wirelessly between tablets.
Findings

Trial findings are categorised in four major areas:

- Device management
- Contemporary practice
- Teacher perceptions
- Student learning

Device management

Schools were provided with devices already imaged by the Learning Partnerships team to fit a BYOx model. The master image created two users on each device – Admin and Student. The student user account had a number of the pre-installed apps removed including: 7 Digital Music Store, Amazon, eBay, Cha Cha, Didlr and Skype.

A number of free apps were preloaded including CreateBook Reader, M8!, 100 Chart, Unit Converter+, OverDrive, Physamajig, Photo Editor by Aviary, Fresh Paint, GeoGebra, and Kids Story Builder.

A $25 Windows Store card was purchased for each school and a Windows Store account created using an MIS mailing group. Microsoft Store rules allow a purchased app to be installed on up to 81 devices. Normally, corporate users purchase one app per device but for the purposes of this trial Microsoft agreed each school could purchase the app once and install on all of the tablets. The Learning Partnerships team logged onto each separately and installed a number of paid apps using the Windows Store account for that school. These included: Explain Everything ($2.99), CreateBook ($3.49) and Carly’s App ($2.99).

Windows was activated and the individual Microsoft Office 2013 activation codes were entered onto each tablet. Finally the BYOx joiner was copied onto each of them.

All of the above meant that there was little setup required at the school except for joining the school network using the BYOx joiner.

Students found the BYOx joiner’s screen too small and it was difficult for many to type their username and password. Future versions need to cater for “touch” and small screens.
School staff were shown how to add apps to the tablets. As this had to be done on each tablet it was a long and tedious process especially if bandwidth was limited.

Initially the tablets were kept in the classrooms with power boards used overnight to charge them. When students started taking them home they were expected to bring them back fully charged. This had mixed success – most comments from teachers, parents and principals were about how responsible students had been. One parent of a Year 4 student commented “My son can’t remember to brush his teeth but always remembers to charge the tablet”. A few students frustrated teachers by always forgetting to charge their tablets.

Each Acer tablet came with a power adapter, a USB power cable and a micro USB to standard USB extension cable. One principal was concerned that classroom management techniques needed to be better outlined. Students were swapping these components which might lead to missing items when it was time to return the devices at the end of the trial.

Acer provided cases for the tablets and these seemed to protect them from scratches and other superficial damage. One tablet had its screen smashed when a mother stepped on it accidently but this was the only damage to the devices.

Some of the students at two of the schools organised a personalised protective sleeve to use when transporting the tablets to and from home (Image 1 below) while others purchased cheap carry cases which meant the power charger and cables could be kept with the device (Image 2 below).
Contemporary Practice

All three teachers were at different ICT skill levels. This had an impact on their approach to the integration of the tablets in their classrooms. This was exacerbated by the rushed start to the trial. In past trials teachers spent a day learning about the device and brainstorming ideas for use in the classroom. They then had two weeks to familiarise themselves before students received their devices.

Unfortunately for this trial by the time the tablets arrived and were set up it was not until the second week of term 4 that they were delivered to the schools. This meant students and teachers received them at the same time. While the Learning Partnerships team delivered the devices and helped with initial setup and connection to the school network, it wasn't until week 6 that teacher professional development was possible. This left only three or four weeks until the end of the school year for teachers to explore new ways of working in the classroom.

However, even with these limitations, teachers all felt the tablets enriched their classrooms.

One class, whose teacher was still an ICT novice, initially used the tablets simply as a computer replacement and classroom tasks mainly involved the use of the Office suite – Word, PowerPoint and Excel. This caused issues as those programs are not optimised for touch and, this is particularly noticeable on a small screen device such as the Iconia W4-820.

To solve the problem students borrowed USB keyboards and mice from some faulty desktop computers. However, because the Acer tablets had only one USB port, students had to keep swapping the keyboard and mouse. One student brought a Bluetooth keyboard from home so he could have the mouse and keyboard working at the same time.

The other two schools did explore the tablet apps initially. After the second round of school visits, all schools were using them and starting to explore different ways of working.

Some of the tablet apps used included: CreateBook, Fresh Paint, Physamajig, Explain Everything, Photo Editor by Aviary, Geoboard, iMath, Carly’s App, Calculator, Asparion Unit Converter+, Sound Recorder (to record their reading), Kids Story Builder, Google Maps, Class Board, QR Reader (for literacy activities), 2048 and Math Mage (used as five minute warm up activity at the start of a lesson), and Science for Kids (used for reading for interest and conducting experiments).
As well as using the apps individually, teachers started to use them in combination as a workflow or “app smash” to create richer products such as multi-modal texts, presentations and movies.

Examples of ideas and activities implemented with trial classes:

- Using QR Codes for literacy
- Learning anywhere, anytime
- Creating a multi-modal text
- An internet safety presentation
**Teacher perceptions**

Teachers were all very positive about the trial and the benefits that the tablets brought to their classes. They all commented on the increase in student engagement and the improved ability to embed ICTs into the curriculum when every child has a tablet.

One teacher highlighted that “it was great for reticent readers as they were able to be engaged with reading on the device”.

Another commented that the “students had fun, especially in reading groups and were now excited about doing tasks they normally disliked”.

All of the teachers were looking forward to working with the devices again with a different group of students in Term 1, 2015. They feel they now have a better handle on the apps and the best way to use the tablets in the classroom. It is unfortunate that the trial did not commence earlier so that the teachers could have had two terms with the one class.

Some issues teachers brought forward included:

- Network issues – the tablets did not always connect and even though they saw the network they needed to be joined again
- Random updates – the devices would restart without warning potentially losing student work or causing inconvenience during a class activity
- Loading the apps took a long time (particularly as they had to be downloaded individually on each tablet) and sometimes the Microsoft Store was slow and difficult to connect to
- Some of the devices overheated and locked up. This happened at all three schools but at one school this happened so frequently on two devices that they were replaced
- Some web based programs the schools used (such as Mathletics) were almost impossible to use on the small device because the onscreen keyboard got in the way
- DET’s “joiner” logon was too small
- Touch was difficult on a small screen for some students – having to tap multiple times to close a window or accidently selecting the wrong item in a drop-down menu
Student feedback

Students were also mostly positive in their feedback about the tablet. They felt it was “small, easy to carry around, fun and easy to work with and modern”.

The students adapted quickly to the new operating system and liked the freedom in setting up the tiles on the home screen and the personalisation of the tablet. One student commented “it is easier to use than Windows 7 and easy to touch with your finger and have multiple things open”.

As mentioned above a few had difficulty with using touch, particularly in desktop mode. The technician at one school observed that some of the younger students were confused about where files eventually were stored.

![Student overall satisfaction with the device](image)

Student overall satisfaction with the device

(VD = very dissatisfied, D = dissatisfied, N = neither satisfied nor dissatisfied, S = satisfied, VS = very satisfied)
Students were asked to nominate the types of uses to which they put the tablet. The uses are summarised below:

Use as a consumption device

Use as a creation device
Students were also asked to rate the devices from poor to excellent on a range of other criteria:

The first group of questions looked at the general use of the device:

- **Speed of the Apps**
- **Startup time of the device**
- **Touch controls**
- **Onscreen keyboard**

The second group of questions looked at specific use of the device…

- **Accessing the internet**
- **Listening to music**
Playing movies and to a lesser extent reading eBooks were the only categories where there was a large number of responses in the “poor” category. The underpowered Atom chip had difficulty with CPU intensive tasks such as playing movies – and could also be affected by how many apps were open at the same time.

The tablet’s battery was advertised as lasting up to 8 hours and student responses confirmed this by the number responding **Yes** to the question “did the battery last the whole school day” …
**Recommendations**

**For schools:**

- Allow teachers sufficient time to become familiar and confident with any new devices before introducing to the classroom.

- Schools must budget for additional costs to ensure devices are effectively implemented in the classroom. Infrastructure costs such as adequate Wi-Fi and good bandwidth as well as teacher professional learning are all essential components.

- Classroom management practices, care of the devices, advice for parents around options for online security when the devices are being used at home and agreements outlining student responsibilities for the appropriate use of the devices while at school all need to be considered.

**For the department:**

- Continue research into BYOx devices and their utilisation in school settings.

- Develop documentation that outlines the benefits and limitations of the various BYOx device options for parents and schools so that students are encouraged to bring the most appropriate device for their future needs.

- Develop a network joiner that is optimised for use on smaller touch enabled devices.

- Ensure that future trials are run with adequate lead time to ensure teachers are comfortable with the device and have had a chance to develop units of work that incorporate the device before the trial begins and students get their devices.
Conclusion

This Acer tablet trial was focused on evaluating the effectiveness of small form factor Windows 8 tablet devices in primary school classrooms. Like the iPad trials and the Windows 7 tablet trials held previously, it sought to provide teachers and school administrators with evidence-based information about the use of tablet devices, their impact on teaching and learning, and logistical considerations which need to be addressed in schools.

All the trials so far have resulted in the same successful benefits for students. Engagement and enthusiasm have increased in classes and teachers have reported positive outcomes in curriculum alignment and student management. This trial was no different.

The schools chosen were in low socio-economic areas – areas where BYOx with expensive devices may not be possible. The positive responses of both the teachers, the students and the wider school community prove that it is possible to use cheaper devices and still achieve good outcomes.