Executive summary

Introduction
The use of information and communication technology (ICT) in public education is steadily increasing, with greater focus in the national curriculum and the introduction of online testing of students. This audit assessed if the Department of Education (DoE) knows what ICT public schools need to support students and if public schools can access these appropriately.

To support our work, we visited 12 schools and conducted a survey of all Western Australian (WA) public schools to understand how they use ICT. We received 454 responses, representing 333 schools.

Background
ICT is a key part of everyday life. Today’s school students are growing up in a technology rich world that is increasingly reflected in their learning environments. Schools use ICT in many different ways in the classroom, from the use of smartboards to deliver lessons, students researching and completing assessments online and delivery of specialised technical subjects.

DoE is responsible for over 290,000 students in around 800 public schools across WA. DoE has invested considerable effort to improve the way students access and engage with ICT in the public school system.

The increasing importance of ICT in education has coincided with a policy shift that has given schools greater independence from DoE. Two system wide changes were critical to this policy shift.

The first in 2009, saw the Independent Public Schools (IPS) initiative provide greater autonomy to schools granted IPS status. An IPS has higher levels of autonomy and accountability than a non-IPS. This includes authority to recruit and appoint staff, to determine curriculum to suit student needs, award contracts and dispose of assets with values up to $150,000. Currently, more than 70% of teachers and students are in an IPS.

The second change in 2014, was the introduction of student-centred funding and one-line budgets. The new model allocates money to schools based on the learning needs of students and the schools characteristics. Schools are now directly responsible for around 75% of DoE’s annual budget, compared to around 10% under the old system.

In 2014, DoE developed an Information and Communication Technology in the Western Australian Public School System: Vision Statement and Priorities 2014 - 2016 (ICT Vision). The ICT Vision is to improve student-learning outcomes, and streamline the management processes, including to:

- deliver an enhanced learning environment for students
- transform access, collaboration and sharing of knowledge amongst teachers and schools
- enable active partnership of parents in their child’s learning and progress.

A fundamental part of DoE’s support for ICT in schools is provision of enabling ICT infrastructure through a standard operating environment (SOE). The SOE provides critical services to schools such as internet, network access, operating systems, security and school
administration software. Schools are responsible for how they leverage off the SOE and implement ICT in the classroom.

Up until 2002, all schools operated their own ICT networks. This structure, known as EDNET, had one section for administration and one for student use. Schools were responsible for all ICT infrastructure. DoE provided support for administrative ICT services but gave no support to schools for non-administration services.

In 2003, DoE started work on an SOE with an aim to:

- simplify design and the amount of infrastructure needed
- improve value for money
- provide schools with more choices for technology
- provide consistent user experiences across schools. This is important given the extensive movement of teachers and students between schools.

An important process that DoE uses to understand school ICT environments is a mandatory annual Computer Census. The census collects data from schools on all devices in use by students and administration staff, including desktop computers, laptops and tablets. The Computer Census does not capture devices owned by students (BYOD). DoE uses the data to establish and manage central ICT infrastructure and service agreements. Census data also shows the number of devices available for teaching and learning in schools.

**Audit conclusion**

DoE has a vision for ICT in the public school system and knows what ICT schools need to run their administration and to provide services to teachers and students.

However, a lack of implementation plans and strategies to communicate how it intends to achieve its vision means schools do not always have a clear understanding of what DoE is doing. It also means that DoE is unable to say if it is achieving its ICT vision.

All schools have autonomy to decide how they will achieve DoE’s vision. DoE provides schools with a base level of ICT but achievement of the vision is largely dependent upon good decision-making by schools and sufficient funding. For many schools, particular small primary and regional schools, funding constraints and limited access to either in-house or contracted ICT expertise means that they will struggle to plan, manage and use ICT in the classroom. DoE provides remote network and administration support to all schools on the SOE, but does not provide additional planning and management support to schools that are struggling.

The effect is that teacher and student access to ICT varies considerably, with some schools well equipped and ICT capable while others are far less fortunate. Other factors associated with this outcome is internet speed and reliability and aging of devices.

**Key findings**

- DoE has a vision for ICT in the public education system and knows what ICT it will deliver to schools. It has four priorities supported by key projects to deliver the vision. However, DoE has not developed implementation plans or strategies for its vision and is unable to show how it is prioritising projects or measuring progress to achieving its vision.
  - DoE has not developed a strategy or plan to guide what individual projects it needs to achieve its ICT Vision 2014-2016 and when these projects need to happen. At the time of our audit, DoE had not developed a draft vision for beyond 2016. Sixty percent of our survey respondents considered that DoE does not clearly communicate to schools about future obligations and requirements for ICT. Without an implementation plan or strategy, DoE is not able to measure progress against its ICT Vision.
DoE plans to provide schools with an SOE. The SOE is a key project under the ‘Deliver and Expand Enabling Infrastructure’ priority of the ICT Vision. Rollout of the SOE began with 100 schools in 2003 but progress has been slow. Rollout of version 4 of the SOE started in 2008. By July 2016, 97% of all schools were on SOE version 4.1 or higher (41% on 4.1 and 56% on 4.5). Two percent were still operating on EDNET and DoE has allowed 8 schools (1%) to continue running their own networks. These 8 schools represent 11% of all secondary students in WA. DoE plans to roll out the SOE to all participating schools by September 2016. All schools need to be operating on the SOE for the full benefits and efficiencies to be realised.

- Schools operating on the SOE and using SOE compliant devices can draw on DoE’s Customer Service Centre (CSC) for network and administration support. The CSC acts as a Service Desk for schools and Departmental staff and is based at the DoE East Perth offices. CSC staff do not provide onsite support for schools or deal with hardware issues and faults. Our survey showed that schools are generally (76%) satisfied with the quality of service desk support provided by the CSC.

- Schools are responsible for planning and managing their own ICT. However, small schools, particularly primary and regional schools, are at a relative disadvantage. This is because DoE’s devolved management model, which saw the introduction of one-line budgets and student centred funding, does not fully recognise that schools have varying levels of access to ICT expertise. Schools that lack internal expertise or are unable to fund ICT support are more likely to make poor ICT planning and investment decisions and be less able to ensure their ICT is operating reliably and used well.

- Slow and unreliable internet is an ongoing issue for the majority of schools with 74% of respondents to our survey saying that it affected their use of ICT. Teachers advised that it was a factor in students becoming distracted and disruptive.

  - Schools and DoE staff advised that increasing the numbers of devices, the use of wireless internet and online student testing impacted bandwidth capacity and affected internet speed.

  - DoE is progressing a number of projects, worth around $20.2 million, to address these issues. DoE plans to complete these projects by April 2017. These include increasing bandwidth capacity at 192 schools across the state and providing additional wireless capability to 551 schools to allow more students to connect at the same time. However, some issues are out of DoE’s control. For example, the availability of telecommunications infrastructure for remote and regional schools limits what DoE can provide.

- In 2014, DoE returned to its previous device to student ratio, set in 2000. This resulted in a ratio change from 1:1 to 1:5 for secondary students and 1:10 for primary students:

  - This is a significant decline from the actual 2008 ratio of 1:2.9 for secondary students and 1:4.5 for primary students and is inconsistent with DoE’s vision of technology rich classrooms.

  - The 2015 Computer Census data shows that most primary and secondary schools meet the target ratios based on the total number of devices in use. However, if devices over 4 years old were excluded, then 7 secondary schools and 26 primary schools would not meet DoE’s target ratios. DoE advised that there has been ‘continued growth in the number of devices being purchased by schools’.

- The average ICT device in schools is getting older. The 2015 Computer Census showed that 28% of all student devices were over 4 years old, compared to 18% in 2012. DoE requires schools to work to a 4 year replacement cycle, but responsibility rests with individual schools to have long-term planning and to prioritise funds for replacement. Computers, laptops and tablets are more likely to be slow and less reliable as they age.
and are generally considered obsolete after 4 years. This means students may not have reliable devices for use in their studies.

- The aging of devices is affecting secondary schools the most:
  - In 2012, secondary schools owned 7,366 devices that were older than 4 years but by 2015, the number had grown to 26,589. Funding through the National Secondary Schools Computer Fund (NSSCF), which started in 2008 and ended in 2012, led numerous secondary schools to purchase many devices in a single year. Those devices are now approaching or exceeding 4 years old and will need replacement if schools are to maintain their device to student ratios. We found secondary schools did not have plans in place to allow them to maintain their current ratios in line with the increasing level of obsolescence.
  - Primary schools are increasing the number of new student devices while the number of older devices has remained relatively consistent from 15,530 in 2012 to 17,640 in 2015. Primary schools received additional State funding through the Primary Schools Device Rebate, announced in December 2015 which provided dollar for dollar investment to eligible primary schools totalling $20 million. Supporting and eventually replacing these devices is a planning and resourcing issue for schools now and into the future.

- DoE collects annual Computer Census data from each school. However, this data is not publicly available to enable schools, parents and teachers to make comparisons against other schools and informed decisions about device replacement.

**Recommendations**

1. By February 2017 the Department of Education (DoE) should:
   - create an implementation strategy for the ICT Vision, including timeframes and measures of success
   - consider ways to improve communication with schools to ensure they have a clear understanding of major projects and how they fit within DoE’s strategic direction
   - consider ways to identify schools that require more support from DoE and how to provide it
   - make school Computer Census responses publicly available.

2. By August 2017 DoE should:
   - complete projects currently underway to improve internet speed and bandwidth
   - update its ICT information and guidance to be more user friendly and easier to find
   - have a plan in place for schools that have chosen not to move to the SOE.

**Response from the Department of Education**

With the exception of a few minor issues on a small number of the findings, which have been discussed with your staff, the Department of Education accepts the finding of the audit and the recommendations of the Auditor General and has initiated appropriate action to address the recommendations.