Office of the Auditor General of Ontario

Annual Follow-Up on Value-for-Money Audits













December 2020

Chapter 1
Section
1.12

Ministry of Education

School Boards—IT Systems and Technology in the Classroom

Follow-Up on VFM Section 3.12, *2018 Annual Report*

RECOMMENDATION STATUS OVERVIEW						
		Status of Actions Recommended				
	# of Actions Recommended	Fully Implemented	In the Process of Being Implemented	Little or No Progress	Will Not Be Implemented	No Longer Applicable
Recommendation 1	1		1			
Recommendation 2	2		2			
Recommendation 3	1	0.5			0.5	
Recommendation 4	2	2				
Recommendation 5	2	0.75	0.75	0.5		
Recommendation 6	2	0.5	1	0.5		
Recommendation 7	1			1		
Recommendation 8	2	1.25	0.5		0.25	
Recommendation 9	2	1	1			
Recommendation 10	3		2	1		
Recommendation 11	2	0.67	0.67	0.66		
Recommendation 12	2	0.6	1.4			
Recommendation 13	1		1			
Recommendation 14	3	3				
Total	**26**	**10.27**	**11.32**	**3.66**	**0.75**	**0**
%	**100**	**39**	**44**	**14**	**3**	**0**

Overall Conclusion

As of June 30, 2020, the Ministry of Education (Ministry) and school boards had provided us with information on the status of recommendations made in our *2018 Annual Report*. The Ministry and school boards have fully implemented 39% of our Office's recommendations and have made progress in implementing an additional 44% of our recommendations.

The Ministry and the school boards have fully implemented recommendations such as:

- tracking and reviewing the lists of users with access to the Ontario Education Number application so that the access of unauthorized users is revoked; and
- improving student information reporting processes and providing clear information regarding errors and how to resolve them.

However, the Ministry and the school boards have made little progress on 14% of the recommendations, including providing IT security training to teachers; tracking and measuring cyberbullying incidents in Ontario schools; developing a policy that outlines roles and responsibilities in cybersecurity at both the board and school levels; developing and testing effective disaster recovery plans; and developing and implementing effective business continuity plans in order to achieve the boards' strategic objectives. The Toronto Board indicated that it would not be implementing our recommendation to monitor school-provided equipment to mitigate cyberbullying incidents due to the cost associated with the monitoring software from the vendor.

In response to the COVID-19 pandemic, the Ministry provided online course content, digital tools and learning resources for teachers and students to aid in continuous learning. In order to support this initiative, the Ministry launched an online website (**ontario.ca/page/learn-at-home**) to help students continue learning remotely. In addition, the Ministry also outlined minimum expectations with respect to students' work time and the courses assigned for all grades. Work in this area was still under way at the time of our follow-up.

The status of actions taken on each of our recommendations is described in this report.

Background

The Ministry of Education (Ministry) funded 72 district school boards in 2019/20 (72 in 2017/18) that provide elementary and secondary education to about two million Ontario students. School boards and individual schools determine how much funding is allocated to school operations and classroom technology.

School boards reported total information technology (IT) spending of $235.9 million for the 2018/19 fiscal year ($227.8 million in 2017/18), with $165.7 million ($160.6 million in 2017/18) for IT systems and computers (including software and licences), and the remaining $70.2 million ($67.2 million in 2017/18) for the boards' own IT operations and administration.

Schools use IT in the classroom for online learning, sharing lessons and math skills training, as well as computer programming, coding and design and other subject areas. IT also gives students quick access to the Internet for research. Teachers use IT to help design and deliver lessons, and for administrative tasks such as tracking attendance and grades.

Overall, we found that the Ministry had no broad IT strategy for curriculum delivery, use of IT by students or administration of IT. In addition, student access to IT varied across the province because each board made its own decisions about equipment acquisition.

The following were some of our findings:

- The availability of tablets, laptops, computers and applications varied among schools, and school boards generally did not formally assess whether classrooms had adequate, up-to-date and consistently allocated IT resources. At some schools, for example, eight students shared a single computer. At others, each student was assigned their own computer.
- Classroom IT equipment ranged from new and modern, to outdated hardware, which

could be slow and incompatible with the latest software. Older technology could also adversely affect the learning experience, and was more vulnerable to cybersecurity threats because vendors were no longer providing regular security updates.

- The Ministry's IT system was used to administer the Ontario Education Number issued to every student in the province, and to collect and store students' personal information and educational records. We found that almost one-fifth of staff user accounts for this system across all school boards in Ontario (971 of 5,229, or 19%) had never been used, meaning that many authorized users do not need their authorization, and that accounts were not always deleted after staff had left their jobs. As these user accounts were accessible by staff and some former staff on the Internet, there was a risk to the security of confidential student information.
- Some school boards provided no formal security-awareness training, and some lacked cybersecurity policies. Fifty-one of the 69 boards that responded to our survey (74% of respondents) indicated that they had not provided formal IT security or privacy training to staff who used technology at boards and schools.
- Although school boards had established policies and guidelines on bullying prevention and intervention according to Ministry requirements, they had not measured the effectiveness and performance of anti-cyberbullying programs. Of the school boards that responded to our survey, 25 (36%) indicated that they did not log cyberbullying incidents and therefore lacked the information to study and address such incidents.
- Two of the four school boards we visited as part of our audit lacked sufficient oversight of their classroom IT assets, such as laptops and tablets. In some cases, board staff were unable to verify whether any equipment was missing.
- We found that most school boards did not have formal business continuity and disaster recovery plans to deal with serious damage to their IT systems from natural or man-made disasters, if such events occurred.
- The Ministry had spent more than $18.6 million on virtual learning environment (VLE) software in the five years before our audit, which it provided for free to school boards. However, most boards had purchased their own software to make up for gaps in the VLE software, and for ease of use. Approximately 26% of the school boards that responded to our survey indicated they rarely used the VLE software. As a result, value for money was not obtained with the VLE, and was not always obtained from boards' IT purchases.
- The Ministry system that school boards used to report student data to the Ministry was inefficient and lacked performance targets for the preparation and submission of student data. Training and support on the system was insufficient to help resolve errors with data validation issues in a timely manner.

We made 14 recommendations, consisting of 26 action items, to address our audit findings.

We received commitments from the Ministry and school boards that they would take action to address our recommendations.

Status of Actions Taken on Recommendations

We conducted our follow-up work between May 2020 and July 2020 for the Ministry of Education and the four school boards—Toronto District School Board (Toronto Board), Waterloo Catholic School Board (Waterloo Catholic Board), Algoma District School Board (Algoma Board) and Peel District School Board (Peel Board). We obtained written representation from the Ministry of Education and the directors of education of the Toronto Board,

the Waterloo Catholic Board, the Algoma Board and the Peel Board that effective October 22, 2020, they have provided us with a complete update of the status of the recommendations we made in the original audit two years ago.

Ontario Does Not Have an IT Strategic Plan for Its Schools

Recommendation 1

In order to better understand how information technology (IT) resources may be used for curriculum delivery and to guide their allocation of resources, we recommend that the Ministry of Education together with the school boards develop a strategic plan specifying minimum expectations for the use of IT in the classroom.

Status: The Ministry: In the process of being implemented by March 2022.

Details

In our 2018 audit, we found that the Ministry of Education (Ministry) had not developed a strategic plan for IT use in classrooms across the province or provided direction to the school boards in using IT resources for curriculum delivery. The Ministry and the school boards were also lacking current data to guide their spending decisions for IT in the classroom. The school boards we visited informed us that they had not systematically assessed to what extent their students were using IT in the classroom.

In our follow-up, we noted that in November 2019, the Ministry had put in place a requirement for Ontario students to complete two online courses as part of their total course requirements to graduate from secondary school. This requirement increased students' access to the virtual learning environment (VLE) and technology-enabled teaching. The Ministry was planning to engage with the public to ensure that the approach to online learning would meet the needs of students and educators, and to discuss issues related to IT in the classroom, by winter 2020. In addition, the Ministry was working in partnership with school boards on the Broadband Modernization Program (BMP). The BMP, in progress at the time of our follow-up and expected to be completed by March 2022, is a multi-year initiative led by the Ministry to support access to reliable, fast, secure and affordable Internet services to all students and educators in schools across Ontario, including those in rural and northern communities. As of September 30, 2020, 54% of school boards had completed the BMP implementation.

Recommendation 2

In order to achieve more equitable access to classroom information technology (IT) resources for Ontario students across schools and school boards, we recommend that the school boards:

- *perform an assessment to evaluate students' needs with regard to classroom technology;*
  Status: Toronto Board: In the process of being implemented by March 2021.

  Peel Board: In the process of being implemented by December 2021.

Details

We found in our 2018 audit that the amount of IT equipment in classrooms varied both among school boards and among schools in the same boards. The Toronto Board, for example, did not have a policy on the ratio of students to computers. At some schools, eight students shared one computer, whereas in other schools, each student was assigned an individual computer. There were different student-to-computer ratios among the nearly 260 schools in the Peel Board as well.

In our follow-up, we found the following:

In response to the COVID-19 pandemic, the Minister of Education announced additional funding of $15 million to assist school boards in purchasing computers and other IT devices for classroom learning. In addition, the government also advised school boards to provide their existing inventory of computers and IT devices to students who do not have access to technology at home.

Toronto Board: The board was working with a vendor to assess the technological needs for their schools and was meeting regularly to review classroom technology requirements. The board planned to complete the assessment by March 2021. The assessment was expected to address computer-to-student ratios, types of technologies to use in the classroom, the optimal age of technology systems and devices, as well as the refresh cycle of classroom technology.

Peel Board: The board was in the process of developing a framework to assess students' needs for classroom technology, as needs varied among schools within the board. As part of the framework, the board was expecting to review requirements for classroom technology devices and vendor support. The board was planning to continue working with schools to perform the assessment by December 2021.

- *develop and implement a classroom IT policy outlining a computer-to-student allocation ratio, the types of technologies to use in the classroom, the optimal age of the technology systems and devices, and the refresh cycle of classroom technology.*

  Status: Toronto Board: In the process of being implemented by March 2021.

  Peel Board: In the process of being implemented by December 2021.

Details

We found in our 2018 audit that the average age and the age range of classroom equipment varied widely across schools. At the Toronto Board, the age of the IT equipment among schools ranged from less than one year to 15 years old. The Peel Board was not able to identify the overall age range of the classroom equipment in its schools. We also found in our survey that 13 school boards (19% of respondents), including both the Toronto and Peel boards, did not have classroom technology replacement plans for their schools, whereas 36 school boards (52%), including the Waterloo Catholic and Algoma boards, replaced their classroom tablets and laptops and/or desktops every three to five years.

In our follow-up, we found the following:

Toronto Board: The board was in the process of developing a classroom IT policy for schools that would address computer-to-student ratios, types of technologies to use in the classroom, the optimal age of technology systems and devices, as well as the refresh cycle of classroom technology. It expected to complete its development of the classroom IT policy by March 2021.

Peel Board: The board had a minimum standard for technology in a classroom. This standard included a supported device (either a desktop computer or a laptop) along with a display device (either an LCD Projector or a TV). Using this standard, the board would perform analyses of classroom device inventories and add more devices to balance the student-to-computer ratio throughout the board. The board planned to have the classroom IT policy in operation by December 2021.

Recommendation 3

In order to reduce the differences in student-to-computer ratios among schools and potentially bring down the cost of acquiring information technology (IT) equipment, we recommend that the school boards assess the benefits of private-sector donations to schools of lightly used IT equipment.

Status: Toronto Board: Fully implemented.

Waterloo Catholic Board: Will not be implemented.

Algoma Board: Will not be implemented.

Peel Board: Fully implemented.

Details

In our 2018 audit, we found that there was no system to encourage and enable private-sector donations to schools of lightly used IT equipment as a way for boards to save costs and to make student access to IT resources more equitable across the province.

In our follow-up, we found the following:

Toronto Board: The board assessed the possibility of allowing donations of laptops from the private sector that would be used in a Bring Your Own Device (BYOD) program by staff and students, and connected to the board's Wi-Fi (wireless Internet) network. The board would accept donations of IT equipment that met its technology requirements for continuous support. In addition, the board had the BYOD program in place at the school level, which helped their students use their personal devices to engage in learning and collaboration in their classrooms. In April 2020, the board also provided devices to approximately 29,000 households that it evaluated as being in need to ensure their students could continue to learn during the COVID-19 school closures.

Waterloo Catholic Board: The board assessed the potential benefits of private-sector donations and concluded that it was not an economically viable option due to its requirements for technology with continuous support. The board indicated that its existing ratio of devices to students was sufficient and reasonable for its classroom technology needs.

Algoma Board: The board would consider new equipment donations that fit its technology requirements. However, IT equipment donated by the private sector may vary in age, make and model, which could introduce a requirement for complex support structures due to different operating systems and security compatibility concerns.

Peel Board: The board has undertaken an assessment of donated IT equipment, including a cost/benefit analysis related to the board's technology requirements for continuous support. The board accepted mobile devices and LCD monitors to replace projectors and TV equipment from private-sector donors through a program that provides refurbished mobile devices (tablets) to students and families who cannot afford them.

Personal Information of Students at Risk of Disclosure

Recommendation 4

In order to ensure that only authorized users have access to the Ontario Education Number application, we recommend that:

- *Ontario's school boards periodically review their lists of users with access to the Ontario Education Number application and notify the Ministry of Education (Ministry) of any changes, so that it can revoke the access of unauthorized users;*
  Status: The Ministry: Fully implemented.

  Toronto Board: Fully implemented.

  Waterloo Catholic Board: Fully implemented.

  Algoma Board: Fully implemented.

  Peel Board: Fully implemented.

Details

We found in our 2018 audit that Ontario Education Number (OEN) accounts existed for users who did not need access. For example, we found 14 user accounts still assigned to former Toronto Board staff who were no longer employed by the board, two similar cases at the Peel Board and two at the Algoma Board. Of the total of 5,229 user accounts with access to the OEN application, we found that 971 accounts (19%) had never been used. This indicated that many authorized users had no need to access the system. We also found that accounts of inactive users of the Ministry's IT system were not always being cancelled after they left their positions at the boards. These accounts were accessible on the Internet, which meant that there was a risk that confidential student information might be exposed to the public.

In our follow-up, we found the following:

The Ministry: The Ministry implemented a semi-annual account review process for all users who had access to the OEN application. The percentage of the user accounts that had not been used decreased

from 19% to 6.76% through the implementation of the new access review process put in place in November 2019.

Toronto Board: The board was reviewing the list of active users who have access to the OEN application and was notifying the Ministry semi-annually to revoke the access of users who did not require access.

Waterloo Catholic Board: The board was receiving a list of active OEN application users from the Ministry and was reviewing it on a quarterly basis. The board was notifying the Ministry if any changes were required.

Algoma Board: The board was reviewing its system users' active or inactive status with its human resources department annually at end of June. If there was a change in employment status, an IT helpdesk ticket was created to remove the access from the OEN application.

Peel Board: The board was reviewing the list of users who had access to the OEN application quarterly to ensure that only authorized users had access. If a user did not log in for an extended period of time, the Ministry would send an email to the board's IT Security Team to confirm if access should be removed.

- *the Ministry track and review unusual activity in the Ontario Education Number application.*
  Status: The Ministry: Fully implemented.

Details

We found in our 2018 audit that the Ministry did not have access to the current employment status of school board staff, and therefore was not able to revoke access to the OEN application in a timely manner when staff left their positions at the boards. Instead, the Ministry relied on the school boards to inform it when their staff no longer required access to the application. It was evident by the large number of inactive accounts we found that some school boards had not been notifying the Ministry of personnel changes consistently and in a timely way.

In our follow-up, we found the following:

The Ministry: The Ministry implemented tracking and reviewing of unusual activity in August 2019, such as OEN user accounts that had not been used for over six months. We noted that the Ministry validated a list of users whose accounts were suspended, revoked or had no activity on the system, to ensure that there was no unauthorized activity. The Ministry also created a standard process for consistent tracking and review of OEN application users.

Recommendation 5

To safeguard students' personal information, we recommend that the school boards in collaboration with their schools:

- *deliver ongoing privacy training to staff who have access to personal data;*
  Status: Toronto Board: In the process of being implemented by December 2020.

  Waterloo Catholic Board: Fully implemented.

  Algoma Board: Little or no progress.

  Peel Board: Little or no progress.

Details

We found in our 2018 audit that all four school boards we visited indicated that they did not generally provide formal IT security or privacy training to teachers who had access to technology and third-party websites. Without guidance from the Ministry or training by the boards on the appropriate use of approved online teaching resources, such as e-textbooks, many teachers made individual decisions to use online tools, applications and third-party websites that were not approved by the boards. Registration on these unapproved sites could record personal data. Their use, without proper training, increases the risk of privacy breaches.

In our follow-up, we found the following:

Toronto Board: All staff were required to complete and obtain a passing grade in online training on the

Municipal Freedom of Information and Protection of Privacy Act to demonstrate their understanding of personal data privacy risk. The board was also conducting periodic privacy and cybersecurity awareness campaigns and internal phishing exercises to reinforce privacy awareness both at the school and board levels. The board was planning to complete a formal assessment of ongoing privacy needs by December 2020.

Waterloo Catholic Board: The board provided privacy training to staff through a training website in November 2019. The privacy training required staff to watch a video and complete a test. Training status reports were generated from the website and managers of individuals who had not completed the training were following up with their staff to ensure prompt completion.

Algoma Board: The board was planning for the introduction of privacy training videos on their internal website so that staff could access and complete the required training. The board had engaged a third-party vendor to help deliver this training plan but this had been deferred until March 2021 due to COVID-19.

Peel Board: The board had communicated the importance of student information privacy to all staff and teachers, and had emphasized that staff have a duty and responsibility to ensure that personal data held by the board is kept confidential. Staff and teachers were required to meet expectations outlined in the Digital Citizenship policy and the Safe Schools policy. The board was also working with a vendor to develop a privacy training program for staff, and had planned to implement it by December 2021.

- *perform risk assessments and take necessary actions associated with using non-approved websites or software.*
  Status: Toronto Board: Fully implemented.

  Waterloo Catholic Board: In the process of being implemented.

  Algoma Board: In the process of being implemented by February 2021.

  Peel Board: Fully implemented.

Details

Toronto Board: The board performed a cyber-risk assessment on its IT systems in 2019. Based on the results of the risk assessment, the board filtered or blocked websites that were deemed high risk.

Waterloo Catholic Board: The board was in the process of enhancing procedures for reviewing educational web applications in order to use them safely in schools. The board had also planned to have a Privacy Officer perform a privacy impact assessment to verify that applications were safe to use.

Algoma Board: The board had deployed a policy to block unapproved websites at the board and schools. In addition, the Educational Computing Network of Ontario and the Ontario Association of School Business Officials were collaborating on a province-wide web application security initiative to address approved and unapproved software applications and websites. The board planned to implement the result of this project by February 2021.

Peel Board: The board had implemented a process to conduct privacy risk assessments when using third-party software applications or web-based IT systems in schools. This process also ensured that the vendors were complying with the board's privacy standards.

School Boards on Alert for Cybersecurity Risks

Recommendation 6

In order to mitigate the risks of cyberattacks, we recommend that school boards:

- *develop a policy that outlines roles and responsibilities in cybersecurity at both the board and school levels;*
  Status: Toronto Board: Fully implemented.

Waterloo Catholic Board: Little or no progress.

Algoma Board: Little or no progress.

Peel Board: In the process of being implemented by December 2020.

Details

In our 2018 audit, we found inconsistencies among school boards regarding their cybersecurity policies. Of the 69 school boards that responded to our survey, 41 boards (59%) indicated that they did not have a formal cybersecurity policy to safeguard sensitive data and assets at the boards and their schools. We also noted that 19 school boards had not updated their cybersecurity and/or information security policies in more than one year.

In our follow-up, we found the following:

Toronto Board: The board had developed policies and procedures to outline roles and responsibilities for cybersecurity, code of online conduct, password management, network security and acceptable use of information technology resources.

Waterloo Catholic Board: The board planned to implement a new administrative procedure and/or policy to include cybersecurity functions by November 2020.

Algoma Board: The board was planning to develop a formal cybersecurity policy with the assistance of a vendor and expected to be issuing the policy in December 2020.

Peel Board: The board was in the process of developing an acceptable-use procedure for information technology resources and exploring cybersecurity training options for staff during onboarding, and on an ongoing basis. This would help define and reinforce roles and responsibilities in cybersecurity. The board was planning to implement the policy by December 2020.

- *provide formal information security including cybersecurity awareness training to teachers and staff who have access to information technology.*

Status: Toronto Board: In the process of being implemented by January 2021.

Waterloo Catholic Board: Fully implemented.

Algoma Board: In the process of being implemented by March 2021.

Peel Board: In the process of being implemented by December 2020.

Details

We found in our 2018 audit that 74% of the boards that replied to our survey indicated that they did not provide formal information security awareness training to teachers and staff with access to technology. As the methods and techniques used by attackers to manipulate school board staff into divulging sensitive information had become increasingly sophisticated, the importance of providing updated cybersecurity awareness training continued to grow. In our follow-up, we found the following:

Toronto Board: In addition to the cybersecurity awareness campaigns and phishing exercises provided to teachers and staff, the board was planning to launch a Cyber-Monday program where cybersecurity and online risks would be taught to students on the first Monday of every month during the school year, starting January 2021.

Waterloo Catholic Board: The board had provided cybersecurity training to staff through a training website. The cybersecurity training required staff to watch a video and complete a short test. The board generated the training status reports from the training website, and followed up with the individuals who had not completed their training for prompt completion.

Algoma Board: The board sent reminder emails about malicious or phishing emails for staff awareness on a periodic basis. For formal information security training for teachers and staff, the board had contracted a vendor to deliver the training by March 2021.

Peel Board: The board was working with a vendor to provide phishing campaigns and information security training to teachers and staff by December 2020.

Recommendation 7

To improve the effectiveness of existing cyberbullying programs in Ontario schools, we recommend that the Ministry of Education track and measure the incidence of cyberbullying in Ontario schools.

Status: Ministry of Education: Little or no progress.

Details

In our 2018 audit, we found that school boards and the Ministry did not track metrics to measure the effectiveness and performance of anti-cyberbullying programs. Without appropriate logging and tracking, school boards were not able to address the root causes of such incidents and reduce the occurrence of cyberbullying at schools.

In our follow-up, we found the following:

The Ministry: The Ministry had initiated a project to enhance its existing strategies and processes for cyberbullying. On November 27, 2019, the Minister of Education announced five new measures to prevent and address bullying, including cyberbullying, in Ontario schools. Three of the five measures were aimed at gathering information and perspectives from students, their parents or guardians and educators on bullying prevention, intervention and reporting. The Ministry had also launched its online bullying survey for students, parents and staff on February 26, 2020. The Ministry planned to use the results to inform changes to its policies on bullying and cyberbullying.

Recommendation 8

To improve the effectiveness of existing cyberbullying programs in Ontario schools, we recommend that school boards:

- *monitor school-provided equipment to mitigate cyberbullying incidents;*

Status: Toronto Board: Will not be implemented. The Office of the Auditor General of Ontario continues to believe that the Toronto Board should, at the very least, monitor school-provided equipment to mitigate cyberbullying incidents.

Waterloo Catholic Board: Fully implemented.

Algoma Board: In the process of being implemented by March 2021.

Peel Board: Fully implemented.

Details

We found in our 2018 audit that school boards and the Ministry did not evaluate whether their prevention strategies were effective. School boards conducted cyberbullying awareness campaigns specifically during an annual prevention week, and many publish materials and surveys for staff, students and parents. Nevertheless, school-provided equipment, such as laptops, tablets and Internet connections, was reported as misused for cyberbullying at 32 boards that responded to our survey.

In our follow-up, we found the following:

Toronto Board: With respect to monitoring school-provided equipment, the board engaged in discussions with the vendors that provided monitoring services for the various communication tools used at schools. After reviewing the initial and ongoing costs for the monitoring service from the vendor quotes, the board stated it would not be implementing this recommendation unless dedicated funding was identified or the initiative was led by the Ministry. The board advised it would work collaboratively with the Ministry on a provincial solution.

Waterloo Catholic Board: The board had implemented an application called Imagine Everything – Student Aware. This application monitored for cyberbullying on all board-provided student accounts. Alerts were sent automatically to IT administrators when alarming subject matter was found, entered or searched, for monitoring and investigation when necessary.

Algoma Board: The board was in the process of investigating a software solution to deal with online safety and cybersecurity. The board had implemented the Safe Schools and Workplace Violence incident tool, where any related incidents or suspicions were reported by students or employees, then reviewed and remediated by the board. The board had also heightened teacher and administrator risk awareness within its schools through email communications. In addition, the board had deployed web filtering on its networks, directing users away from unapproved websites.

Peel Board: The board had implemented an Internet content filter to block unapproved social networking and cyberbullying content when accessed through school-provided equipment by students.

- *formally track, report and review cyberbullying incidents at schools.*
  Status: Toronto Board: Fully implemented.

  Waterloo Catholic Board: In the process of being implemented by October 2020.

  Algoma Board: Fully implemented.

  Peel Board: Fully implemented.

Details

Toronto Board: The board had developed an e-solution application to track cyberbullying incidents that could result in suspension or expulsion. The e-solution, allowing the board to track, report and review cyberbullying incidents, was deployed in early 2020.

Waterloo Catholic Board: In addition to its tool that monitors cyberbullying activities when students are connected to the school network, the board provided a link on its webpage allowing individuals to report instances of bullying. The board was working with the vendor of its application Imagine Everything – Student Aware to include additional information on reported cyberbullying incidents to help administrators with their investigations, and was planning to implement this by October 2020.

Algoma Board: Cyberbullying incidents at the board were being reported in the Safe Schools/Workplace Violence incident tool. The principal of the school resolved these issues in most cases. The board's senior management was involved in resolution processes when necessary.

Peel Board: The board had the Safe Schools incident reporting tool for cyberbullying incidents reported by board staff and teachers according to the board's Bullying Prevention policy. Principals in schools were responsible to investigate and resolve cyberbullying incidents, and their progress was tracked in the incident tool.

Not All School Boards Tracking Inventory of IT Assets

Recommendation 9

In order to maintain the security of information technology (IT) assets, and to reduce financial losses due to lost or stolen IT assets at school boards and schools, we recommend that the school boards:

- *develop and implement an IT asset management system defining clear roles and responsibilities of the school boards and schools for efficient IT asset life-cycle management;*
  Status: Toronto Board: Fully implemented.

  Peel Board: In the process of being implemented by December 2022.

Details

Our 2018 audit found inconsistencies between school boards in Ontario generally in tracking processes for IT assets. At the four school boards we visited, the Algoma and Waterloo Catholic boards had inventory tracking processes and up-to-date computer inventory listings. However, both the Peel and Toronto boards did not track their IT assets and maintain a current and complete inventory listing.

In our follow-up, we found the following:

Toronto Board: The board had implemented an IT asset management tool (ServiceNow) in April 2019

to efficiently manage IT assets at the board and schools by tracking IT equipment from purchase to disposal, along with service warranty information.

Peel Board: The board was in the process of implementing a dedicated IT asset management function to improve inventory management of the many different devices found at the board and schools. This would allow the board to efficiently manage IT assets from purchase to disposal. The board planned to implement this function by December 2022.

- *design and implement formal IT asset tracking and reporting procedures.*
  Status: Toronto Board: In the process of being implemented by December 2020.

  Peel Board: Fully implemented.

Details

Toronto Board: The board was in the process of finalizing reporting templates from IT asset information compiled in the IT asset management tool by December 2020.

Peel Board: The board had implemented a process for tracking and reporting various types of IT assets used at the board and in schools. Microsoft devices were tracked through Microsoft tools, and iPads and cell phones were managed through a mobile device management system. In addition, Chromebooks were tracked through the Google device management system, and projectors were managed through an online projector database.

School Boards Have Not Formally Identified Key IT Risks

Recommendation 10

To manage risks to key information technology (IT) processes and infrastructure at the school boards and in the schools, we recommend that the boards develop and test effective disaster recovery plans that:

- *define processes for identifying, assessing and managing risks and uncertainties resulting from internal and external events that could impede the boards' ability to achieve their strategic objectives;*
- *train staff in their roles and responsibilities in disaster recovery; and*
- *put in place effective mitigation measures.*
  Status: Toronto Board: Little or no progress.

  Algoma Board: In the process of being implemented by April 2021.

  Peel Board: In the process of being implemented by December 2023.

Details

In our 2018 audit, we found that many school boards did not have processes in place to identify events or circumstances that could negatively affect their operations and potentially damage their IT systems. For example, among the four boards we visited:

- The Toronto Board did not have a physical location to serve as a disaster recovery site for its IT systems.
- The Toronto and Algoma boards did not have a formal IT disaster recovery plan in place.
- The Waterloo Catholic Board had a disaster recovery plan that it had not yet fully tested.
- The Peel Board did not have a disaster recovery or business continuity plan in place.

We also found that the school boards were not clear on what mitigation measures they should use in which scenarios. Mitigation measures were put in place to foresee the kinds of damage that could potentially occur if disaster struck and to plan for limitation of the damage and recovery. In IT, this could involve plans and exercises for recovering data if servers were physically destroyed, for example.

At the time of our follow-up, we found:

Toronto Board: The board was in the process of developing a business continuity and disaster recovery plan at the board and school levels including the necessary assignment of roles and responsibilities, as well as training and testing exercises. However, the board had encountered financial challenges with budget cuts in the 2019/20 school year

and prioritized COVID-19 emergency measures. As a result, the plan to implement a formal business continuity and disaster recovery plan was delayed. The board expected to start working on specific tasks such as assessing risks, determining prevention and mitigation measures, and performing business impact analyses in the second half of 2020.

Algoma Board: The board had contracted a vendor to develop disaster recovery plans but work has been on hold due to COVID-19. The board's disaster recovery plans, including testing the plan and training staff, were expected to be implemented by April 2021.

Peel Board: The board had started a disaster recovery project and had opened a secondary data centre equipped with IT devices such as Uninterrupted Power Supply (UPS) and computer hardware in 2018. The board was in the process of developing a disaster recovery plan, and had planned to build disaster recovery test cases for testing and training staff by December 2022. In addition, the board was in the process of assessing risks and implementing effective mitigation measures for implementation by December 2023.

Recommendation 11

To manage risks to key information technology (IT) processes and infrastructure at the school boards and in the schools, and to help ensure that in case of disaster, essential information technology (IT) assets continue to function so that the boards are able to achieve their strategic objectives, we recommend that the school boards:

- *develop and put in place effective business continuity plans;*
  Status: Toronto Board: Little or no progress.

  Algoma Board: In the process of being implemented by April 2021.

  Peel Board: In the process of being implemented by December 2023.

Details

We found in our 2018 audit that 64 school boards of the 69 that responded to our survey (93%) indicated that they did not have an approved business continuity plan in place. In addition, 44 school boards (64%) indicated they did not have approved service-level agreements for delivery of support and service to their schools in the event of a disaster. Without recognition of threats and key IT risks, and without having proactive measures in place in the event of a disaster, school boards were unable to ensure that personnel and assets would be protected and able to function. In addition, 38 of the school boards (55%) indicated that they did not have an approved backup policy that defines roles and responsibilities, backup schedules, retention policies, and disposal and security policies and practices.

In our follow-up, we found the following:

Toronto Board: The board planned to perform business impact analyses in the second half of 2020.

Algoma Board: The board was in the process of developing business continuity plans, but this work was put on hold due to COVID-19. The board was planning to implement business continuity plans by April 2021.

Peel Board: With the COVID-19 situation, the board had increased its resources to support remote working with software licensing and required hardware. The board was in the process of analyzing assets critical to the continuous functioning of the board to help define an effective business continuity plan. The board expected to implement this by December 2023.

- *establish backup policies, including backup schedules, retention policies, and disposal and security policies and practices.*
  Status: Toronto Board: Little or no progress.

  Algoma Board: Fully implemented.

  Peel Board: Fully implemented.

Details

Toronto Board: The board expected to start working on specific tasks such as assessing risks, determining prevention and mitigation measures, and performing business impact analyses in the second half of 2020.

Algoma Board: The board had established a backup schedule based on the criticality of their databases and applications.

Peel Board: The board had documented backup procedures including backup schedules for board IT systems, and data and records retention policy. In addition, the board had a disposal policy for various types of media such as mobile devices, computers, servers and storage devices, and a certified vendor who provided a certificate of recycling for secure disposal.

Ministry and School Boards Not Always Obtaining Value for Money on IT Purchases

Recommendation 12

In order to ensure a good return on investment in all classroom equipment and student learning software, we recommend:

- *school boards ensure that teachers and staff receive necessary training in the use of the technology already purchased and on all future purchases of technology on a timely basis;*
  Status: Toronto Board: In the process of being implemented by end of the 2020/21 school year.

  Waterloo Catholic Board: In the process of being implemented by end of the 2020/21 school year.

  Algoma Board: In the process of being implemented by end of the 2020/21 school year.

  Peel Board: In the process of being implemented by end of the 2020/21 school year.

Details

In our 2018 audit, we found that the four school boards were not always obtaining value for money with purchases of hardware and software because the technology was not necessarily being used as intended, or to its full potential. The Ministry had spent more than $18.6 million on virtual learning environment (VLE) software over the past five years, which it provided to the school boards for free. VLE provided a variety of online tools that helped with, for example, communication, assessment, student tracking and course management. However, staff at the school boards we visited and at the boards we surveyed noted that they received limited training from the Ministry on VLE.

In our follow-up, we found the following:

Toronto Board: The board provided online and in-person technology-related training to teachers and staff through the training website during the 2019/20 school year. The training website was available to all teachers and staff and provided training courses for the use of technology in classrooms and at the board. In addition, the training website tracked formal learning sessions for monitoring training completion status, and the course contents were regularly reviewed for appropriateness. In response to the COVID-19 pandemic, the board continues to provide ongoing remote learning training to teachers and staff.

Waterloo Catholic Board: The board provided ongoing training to teachers and staff on current technology, as well as on new technology being introduced, through an online training website and in-person sessions during the 2019/20 school year. In response to the COVID-19 pandemic, the board continues to provide ongoing remote learning training to teachers and staff.

Algoma Board: The board provided training in the use of technology to teachers and staff on an ongoing basis so that its technology would be used effectively. All new applications and classroom devices included formal training as well as video

training. Such training sessions were included as part of the professional development program for teachers and monitored in the learning management system for the 2019/20 school year. In response to the COVID-19 pandemic, the board continues to provide ongoing remote learning training to teachers and staff.

Peel Board: The board was providing ongoing training and support to teachers and staff in the use of technology during the 2019/20 school year. This training took various forms, such as online and in person (both one-on-one and group, where possible), as well as after-hours sessions and instructional resources such as FAQs, instructions and links to instructional videos. In response to the COVID-19 pandemic, the board continues to provide ongoing remote learning training to teachers and staff.

- *the Ministry of Education and school boards perform a cost-benefit analysis of the need for and use of equipment and software that can take the form of a business case before purchase.*
  Status: The Ministry: In the process of being implemented by fall 2021.

  Toronto Board: Fully implemented.

  Waterloo Catholic Board: In the process of being implemented.

  Algoma Board: Fully implemented.

  Peel Board: Fully implemented.

Details

We found in our 2018 audit that due to the challenges with virtual learning environment (VLE) software, school boards were purchasing other learning tools in their classrooms. For example, the Algoma Board spent an additional $57,500 over two years to purchase Edsby to use as its classroom management software instead of VLE, which the Ministry had provided for free. Edsby provided additional features for analyses of student attendance and report cards. We also found that the Toronto Board purchased 2,710 smartboards between 2013 and 2018 at a cost of about $9.7 million. We noted that it purchased these smartboards without a formal business case or plan for their use.

In our follow-up, we found the following:

The Ministry: The Ministry completed a review of its educational software procurement approach and approved a transition plan in January 2020. As part of the transition plan, the Ministry would work with the Ontario Education Collaborative Marketplace, a not-for-profit education-sector partner that leads outreach and sourcing work for new educational software Vendor of Record (VOR) arrangements based on evidence and cost-benefit analyses. This would allow school boards to choose digital learning resources that meet their local needs. The Ministry had planned to implement this initiative by fall 2021.

Toronto Board: The board had performed assessments of the benefits of high-cost and complex technology such as smartboards (as well as business cases for them), and purchased such equipment and software only once the assessments or business cases were completed and approved. For instance, the board provided a business case for the procurement of a cybersecurity and threat protection software tool in February 2020 that included detailed information on benefits and costs.

Waterloo Catholic Board: The board had implemented an IT governance framework to ensure that IT resources were aligned with the board's academic and administrative objectives. The board surveyed staff, students and the school community about technology and software requirements. The feedback and purchase requirements for IT hardware and software were presented to the IT governance council for review and approval in the 2019/20 school year.

Algoma Board: We noted that the board performed a needs assessment for senior management approval prior to the purchase of equipment and software. The board also compared its product research with other school boards and vendors, and

compared pricing with other similar Ontario Public Service VOR arrangements in March 2020.

Peel Board: In March 2020, the board implemented a process to submit business cases for new projects, including IT initiatives, that were critical to the board's operations and goals. All business cases with cost-benefit analyses required approval by the Superintendent/Controller of the area and the Director or Associate Director before purchase.

Ministry and School Boards May Not Be Obtaining Full Value for Money for Student Information Systems

Recommendation 13

To eliminate duplication, save on costs and realize potential efficiencies in collecting and submitting student data, we recommend that the Ministry of Education, in collaboration with the school boards, investigate implementing a shared centrally managed student information system and determine whether such a system will achieve these aims.

Status: The Ministry: In the process of being implemented by June 2021.

Details

In our 2018 audit, we found that there was no single common centralized student information system at the provincial level. Such a centralized system could potentially bring cost savings to the boards through economies of scale if all school boards used one system managed by the Ministry. However, we noted that the Ministry and boards had not formally assessed whether there were potential overlaps, cost-saving opportunities and inefficiencies in the submission of student information.

In our follow-up, we found the following:

The Ministry: The Ministry was continuing to work with the school boards, through Ontario Association of School Business Officials – Information & Communication Technology and Education Computing Network of Ontario on the common Student Information System Reference Architecture. The reference architecture would provide guidance on the implementation of standardized processes and applications, as well as define the student information data required. The Ministry, in collaboration with the school boards, was continuing to look for ways to streamline the new and existing data collection process, and to support school boards with research and analyses to assist them to make evidence-based decisions. The Ministry planned to complete the project by June 2021.

Recommendation 14

To improve the data reporting process for student information, we recommend that the Ministry of Education, in collaboration with the school boards:

- *improve the student information workflow with a focus on streamlining processes and providing clear information regarding errors and how to resolve them;*

  Status: The Ministry: Fully implemented.

Details

We found in our 2018 audit that the effort required to submit data for one reporting period to the Ministry's Ontario School Information System (OnSIS) could be onerous for school boards. We noted that the lack of data validation and lack of clarity in business controls to ensure accuracy of data contributed to inefficiencies in the reporting process. School board staff who were involved in submitting data to the Ministry indicated to us that error messages from the Ministry's OnSIS system were not clear and often did not provide enough information to identify and resolve problems.

At the time of our follow-up, we found:

The Ministry: To streamline data submissions and reduce errors, the Ministry had improved data reporting requirements and communications to school boards regarding upcoming changes to the OnSIS through regular meetings with school boards. The Ministry was also working with the boards to

identify and fix specific error messages encountered by the boards during the submission process.

- *establish key performance indicators and monitor the time required for boards to sign off on OnSIS submissions and the quality of signed-off data;*
  Status: The Ministry: Fully implemented.

Details

The Ministry: The Ministry had implemented a new quality assurance process for student information collected in OnSIS. To ensure accurate and timely data from boards at each submission, the Ministry performed quality assurance exercises and was sending boards checklists to review any anomalies for correction if required.

- *improve the training provided on OnSIS submission and reporting.*
  Status: The Ministry: Fully implemented.

Details

We found in our 2018 audit that 55 of the 69 school boards that responded to our survey (80%) mentioned that the training provided by the Ministry on OnSIS data submission and reporting was not sufficient. Our follow-up found:

The Ministry: The Ministry had issued a new user guide in December 2019 and updated its OnSIS training materials. The Ministry had also provided documents that explained changes made to the OnSIS application to school boards.