

BUSINESS INTELLIGENCE IMPLEMENTATION EVALUATION



CENTRE FOR EDUCATION STATISTICS AND EVALUATION

FINAL REPORT

26 NOVEMBER 2015

Acknowledgments

This work was completed with the assistance of Craig Jones, Evalynn Mazurski, Julie Young and Bernadette Degabriele from the Centre for Education Statistics and Evaluation, in the Department of Education.

We would also like to thank the Principals, Directors, Public Schools and other staff within the Department who provided feedback for the evaluation. We thank them for their time and insights and trust that their views are adequately represented in this report.

ARTD Consultancy team

Jade Maloney, Wendy Hodge, Fiona Christian, Francis Matthew-Simmons and Jasper Odgers

Contents

Executive summary	vii
Business Intelligence	vii
Evaluation	vii
Key findings	viii
Conclusion and recommendations	x
1. The Business Intelligence Program	1
1.1 Purpose and principles	1
1.2 Intended users	1
1.3 Logic for the BI Program	2
1.4 Management and governance.....	3
1.5 Status of development and roll-out	3
2. The evaluation	5
2.1 Purpose and scope.....	5
2.2 Methods	6
3. Initial uptake and training	11
3.1 Promotion.....	11
3.2 Registrations	13
3.3 Training.....	19
4. Adoption in practice	22
4.1 Use of the BI Tool	22
4.2 Factors influencing uptake	25
4.3 Management and support for adoption.....	31
5. Early indications of benefits	36
5.1 Perceived benefits.....	36
6. Conclusion and recommendations	39
6.1 Conclusion.....	39
6.2 Recommendations.....	39
Appendix 1. Uptake by Principal Network	43
Appendix 2. Training feedback	46
Appendix 3. Requests for additional information in the BI Tool	50

Tables

Table 1.	User groups.....	1
Table 2.	Overview of methods	7
Table 3.	Participation in training and registered users of Release 1	14
Table 4.	Number and proportion of users logging into BI.....	22
Table 5.	Purposes for which Principals have used BI.....	24
Table 6.	Purposes for which Directors, Public Schools have used BI.....	25
Table 7.	Issues raised with and resolved by User Support.....	32
Table 8.	Time to resolution (for resolved tickets)	33
Table 9.	Benefits of BI.....	36

Figures

Figure 1. Logic model for the BI Program.....	2
Figure 2. Contributions to more informed decision-making in schools and the Department	3
Figure 3. BI promotional activities by month.....	11
Figure 4. Promotional activities and registrations of interest in the BI Tool (2015).....	12
Figure 6. Map of uptake by schools across NSW	16
Figure 7. Map of uptake by Sydney area schools.....	17
Figure 8. Overall rating of training quality, by user type (2015).....	20
Figure 9. Twenty most commonly accessed managed reports.....	23
Figure 10. User Support tickets and registered users	31
Figure 11. Number of report executions and load time (14 July to 4 November)	34
Figure 12. Understanding Business Intelligence.....	46
Figure 13. Training materials.....	47
Figure 14. Trainer	48
Figure 15. Co-facilitator	49
Figure 16. Training facilities.....	49

Abbreviations and acronyms

Acronym	In full
ATAR	Australian Tertiary Admission Rank
BI	Business Intelligence
CESE	Centre for Education Statistics and Evaluation
DoE	Department of Education
ERN	Enrolment and Registration Number
ESSA	Essential Secondary Science Assessment
HR	Human Resources
HSC	Higher School Certificate
ITD	Information Technology Directorate
LMBR	Learning Management and Business Reform Program
NAPLAN	National Assessment Program — Literacy and Numeracy
PSL	Principal, School Leadership
SEF	School Excellence Framework
SMART	School Measurement Assessment Reporting Toolkit
SSNP	Smarter Schools National Partnerships

Executive summary

This report presents the findings from the evaluation of the roll-out of Release 1 of the Business Intelligence (BI) Tool by the Centre for Education Statistics and Evaluation (CESE).

Business Intelligence

The BI Program is part of the Department of Education's broader information management strategy. The BI Tool aims to transform large amounts of data from disparate sources into easy-to-access information that school Principals, Directors, Public Schools and other Departmental staff can use for tactical and strategic planning, analysis, research, reporting and important decision-making. The ultimate aim is to support more informed decision-making in schools and across the Department, but other Schools Division and CESE programs also contribute to this aim.

The initial BI Roadmap identified seven releases (containing different types of information) to respond to stakeholder needs. The roll-out of access to Release 1 (which contained Schools and Early Childhood information) began in November 2014. Uptake was optional, and those Principals, Directors, Public Schools and corporate staff who opted in were required to pass an e-learning module on privacy and data governance and attend training before being given access to the BI Tool. Roll-out of Release 2 (Finance and Assets) began in May 2015 and remaining releases from the BI Roadmap should be complete by the end of 2015.

Evaluation

The Department commissioned ARTD to undertake an independent formative evaluation of the roll-out of Release 1 to identify learnings for subsequent phases and to assess early outcomes. This final report—which follows the interim report delivered in April 2015—covers uptake, experience with the BI Tool and early outcomes. It draws on administrative data, a pre- and post-survey of Principals and Directors, Public Schools who were trained in 2014, and interviews with a range of registered users (of all types) and the BI Team.

The evaluation team is confident that there are sufficient data to assess perceptions of Release 1, the effectiveness of the roll-out (particularly training and support) and early experiences with the BI Tool. However, it is too early in the roll-out to fully assess the realisation of intended benefits. There are limitations to some of the individual data sources, in particular the system data and the post-survey, which we have taken into consideration in presenting the findings.

Key findings

Overall, Education staff are very positive about the potential of the BI Tool. This interest has translated into a relatively high level of registrations among Principals and Directors, Public Schools. However, at this early stage, only a small proportion of registered users are making use of the BI Tool for strategic and tactical decision-making. Corporate staff from the High Performance Unit and CESE have started to explore ways the BI Tool can improve the production of performance information for different users of data within the Education sector.

The level of use to date is not unexpected as it is still relatively early in the diffusion of such a significant innovation, and the literature indicates that getting an innovation widely adopted can be difficult and take many years, even when it has clear advantages.¹ Uptake has also been affected by system performance issues. Considerable effort is being made to address these. Policies that drive use of the BI Tool and connect it to other Education reforms, as well as additional guidance on using the BI Tool to inform planning and decision-making will also be important to influencing use.

Initial uptake and training

As of the end of August 2015, there were 1267 registered users of Release 1: 964 Principals, 64 school executive staff, 61 Directors, Public Schools, 18 other Network staff (Executive Directors and Principals, School Leadership) and 160 corporate staff.² This represents approximately 43% of Principals and 95% of Directors, Public Schools—although this may be a slight over-estimation because of turnover in these positions.³ The high level of uptake reflects the significant interest in the BI Tool, particularly the ability it provides to access disparate data sources through a single platform. It also suggests that the BI Team's integrated promotional strategy has successfully engaged early adopters and most of the early majority of potential users. This is a significant achievement in an environment in which staff can feel overwhelmed by the amount of information that they receive from the Department and by the various reforms in progress. However, additional strategies may be needed to reach late adopters. Directors, Public Schools and Principals, School Leadership would be useful allies in this process.

Overall satisfaction with training has remained high throughout the roll-out of Release 1. Participants valued their trainers, the supportive learning environment and the ability to trial the BI Tool. However, in some sessions across 2014 and 2015 system performance limited participants' ability to familiarise themselves with the BI Tool and troubleshoot issues. Some participants also suggested that it would help if the training more clearly communicated specific ways in which they could use the BI Tool in practice.

¹ Rogers, E.M. 2003, p1. *Diffusion of Innovations*, 5th Edition. New York, Simon & Schuster.

² This may be an under-estimation of corporate staff registered because of gaps in available data.

³ Records suggest a small number of schools have more than one Principal registered (probably because of staff turnover and relieving and acting Principals being trained), so the proportion of uptake by Principals is calculated based on 945 unique schools with at least one registered user out of 2221 schools. Uptake by Directors, Public Schools is calculated out of the 65 Directors, Public Schools positions. It is not possible to calculate uptake for other user groups because there is no data available on the potential number of users.

Adoption in practice

Available data suggest that use of the BI Tool has remained relatively low to date. Most interviewees reported limited engagement with the BI Tool, and system data show that an estimated 21–23% of registered users logged into the BI Tool during the two time periods for which we have data (13 December 2014 to 28 February 2015 and 29 June to 27 August 2015). Among the Principals we spoke to who had logged into the BI Tool to date, most were still exploring. The Power Users and Technical Super Users we interviewed had generally only been experimenting with producing the reports that they normally compile from other Departmental data sources, but the High Performance Unit has started to process some of the data requests that they receive from Principals through the BI Tool and has developed some reports that are nearly ready for release. Additionally, some Directors, Public Schools had used the information in the BI Tool, particularly to inform conversations with Principals.

The evaluation found that while registered users (of all types) appreciate the concept of being able to access a range of data from a central platform, system performance issues have limited use of the BI Tool, as well as the realisation of its relative advantage over existing data sources and the observability of the benefits of adoption. These are two of the five characteristics of innovations known to support successful diffusion.⁴ While the BI Tool is performing quite well on the other three factors—trialability, compatibility with existing values and needs, complexity (ease of use)—the realisation of relative advantage and observability will be necessary to support further uptake by potential users and further use of the BI Tool among registered users. While the BI Team has worked with the Information Technology Directorate (ITD) and Microsoft to make significant improvements to the elements of system performance that are within their control and is continuing to do so, data suggest that the factors beyond their control continue to impact on system speed experienced by registered users (of all types). Going forward, it will be important for the BI Team to understand users' threshold regarding acceptability of load times and endeavour to meet these. Explaining the factors that impact on system speed and those that registered users could ameliorate themselves may be another strategy to improve system performance.

Other factors that have influenced use are competing priorities in the broader context of Education reforms, the timing of the roll-out of Release 1 not aligning with the 2015 school planning and reporting cycle, and the need for additional training and support. Policies that push people towards the BI Tool and clearly link its use with other reforms will be important to encourage further use. Ongoing support for users and capability building for those who are less experienced with analysing and interpreting data, in conjunction with CESE's capability program, will also be important. Principals perceive a need for just-in-time and targeted training on the application of BI reports in planning and decision-making, broader follow-up training, and opportunities to learn from peers who are using the BI Tool. Data also suggest that some Principals and school executive staff will need support in interpreting and using data for planning and decision-making, which could be supported through

⁴ Rogers, E.M. 2003. *Diffusion of Innovations*, 5th Edition. New York, Simon & Schuster.

coordination with CESE's capacity building program. With their connections to Principals, Directors, Public Schools and Principals, School Leadership could also play an important role in supporting further engagement with the BI Tool to improve tactical and strategic decision-making.

Early indications of benefits

The majority of registered users (of all types) consulted for the evaluation see the potential for the BI Tool to save them time accessing and compiling data, and some are already seeing benefits. The five Directors, Public Schools we interviewed who reported using BI reports to inform discussions with Principals and other specific tasks generally reported time savings. Technical Super Users in the High Performance Unit anticipate significant time savings in their role distributing data to Education data users. One report, the *Data Summary Tool* is close to release, the report summarises all the usual attributes of NAPLAN data from 2008.

Registered users (of all types) generally also see the BI Tool as an improvement on existing Departmental data sources because it captures disparate data sources in one place and allows these data to be explored using different filters. At this early stage, it seems that the BI Tool is more often being used to confirm perceptions than to challenge them. However, this may shift as the BI Tool provides more reports that are not readily available through other sources. The evaluation identified a few cases where this is already occurring. For example, one Director, Public Schools reported using summary data from other schools to challenge Principals' assumptions about the potential for improvements to student performance in their schools.

Conclusion and recommendations

The high level of uptake confirms that the BI Tool meets a need for a centralised source of data to inform tactical and strategic planning and decision-making within schools and the Department. Registered users (of all types) appreciate the concept and see the potential for the BI Tool to save them time. As the roll-out did not coincide with the latest school planning and reporting cycle, use of the BI Tool in the next cycle will be a more telling indicator of its perceived relative advantage and provide a chance for those not yet using it to observe its benefits. However, evaluation data suggest that further improvements to system performance, policies that drive use of the BI Tool, and additional support and training will be needed to ensure that users make use of the BI Tool and its benefits are realised. This will require coordination with the Schools Division and CESE's capability program.

Ongoing development of the BI Tool

1. Continue to identify adjustments and options to improve the speed between the BI servers and registered users' computers with ITD.
2. Inform users about planned additions to the BI Tool so they understand the scope of what will be available and when. Send communications as each addition is made so users are aware and can make full use of the content and capabilities in the BI Tool.

3. Ensure that there are accessible feedback loops in place to enable users to suggest refinements to reports, beyond the initial period of user acceptance testing.

Promotion to new and existing users

4. Once system performance is improved, continue promotion to potential and existing users.
5. Involve Directors, Public Schools and Principals, School Leadership in promoting the BI Tool.
6. Use behavioural insights (nudges) in promotional messaging, particularly social norms (e.g. proportion of peers that have registered for the Tool), and stories about how the BI Tool is making it easier to use data for planning and decision-making to encourage take-up among potential users and engagement with the BI Tool among registered users.

Rolling out further releases

7. Align timing of training with the availability of new releases and new content, so registered users (of all types) have access immediately following training.
8. Work with the Schools Division to ensure training clearly communicates how Principals and school executive staff can use the BI Tool in practice, for example, which reports they can use to answer common questions considered in annual school planning and reporting.

Supporting use of BI in practice and improving schools use of evidence

9. Develop further options to support users' ongoing engagement with and use of the Tool in coordination with relevant Departmental Divisions and programs, including:
 - policies that encourage use of the BI Tool, for example, only providing School Excellence Framework (SEF) reports through the BI Tool or providing additional data through the BI Tool
 - just-in-time support or training when schools begin work on annual school planning and reporting
 - additional fact sheets providing specific guidance about how the BI Tool can be used to answer common questions
 - regular emails with top tips for use and examples of how the BI Tool has been used
 - connecting users to share learnings about how the BI Tool can be used in practice
 - capability building in the use of data in the BI Tool for decision-making through CESE's capacity building program.
10. Encourage and support Directors, Public Schools and Principals, School Leadership to support engagement with and use of the BI Tool for informed decision-making. Principals, School Leadership would require access to reports from relevant schools to fulfil this role.

Supporting Power Users and Technical Super Users

11. Develop further options for supporting Power Users and Technical Super Users, for example, connecting Power Users who would like to build reports in PowerView to experienced users or providing follow-up training.

12. Develop a data dictionary and/or more clearly identify the stewards for particular datasets in the BI Tool.

Monitoring and evaluation

13. Develop performance indicators to monitor uptake, use and system performance. Report these through existing governance groups to inform ongoing assessment of, and refinements to, the BI Program.
14. Continue to collect feedback from training participants, but refine the survey to capture whether participants feel that they have gained a sufficient understanding to apply the Tool in planning and decision-making and, if not, what additional support they require. The number of open-ended questions could also be reduced as respondents tend to repeat the same comments across different questions.
15. Continue to the use of short real-time surveys to collect feedback about experience with the BI Tool. These surveys could be implemented quarterly or more frequently depending on how often changes and improvements are made to the Tool.
16. Build baseline information about the time it takes to collect data from existing Departmental sources, for example, by capturing this information when e-learning is completed.

1. The Business Intelligence Program

1.1 Purpose and principles

The Business Intelligence (BI) Program is part of the Department of Education's broader information management strategy. The BI Tool aims to transform large amounts of data from disparate sources into easy-to-access information that Principals, Directors, Public Schools and other Departmental staff can use for tactical and strategic planning, analysis, research, reporting and important decision-making. This is intended to support more informed decision-making.

The Department's BI Strategy (2013) outlined eight principles for business intelligence.

1. Give the users the information they want, quickly and reliably.
2. Provide a scalable and user-friendly reporting environment.
3. Provide capabilities to enhance the trust in the data.
4. Promote the correct usage of the capabilities provided.
5. Ensure an appropriate level of governance is in place.
6. Business Intelligence is not operational reporting.
7. Business Intelligence capabilities require ongoing support and maintenance.
8. Maintain a realistic separation between production support and development.

1.2 Intended users

There are three potential user groups for the BI Tool (see Table 1). The intention is for Power Users and Technical Super Users to create reports that can be shared with all users, thus contributing to the BI Tool's value.

Table 1. User groups

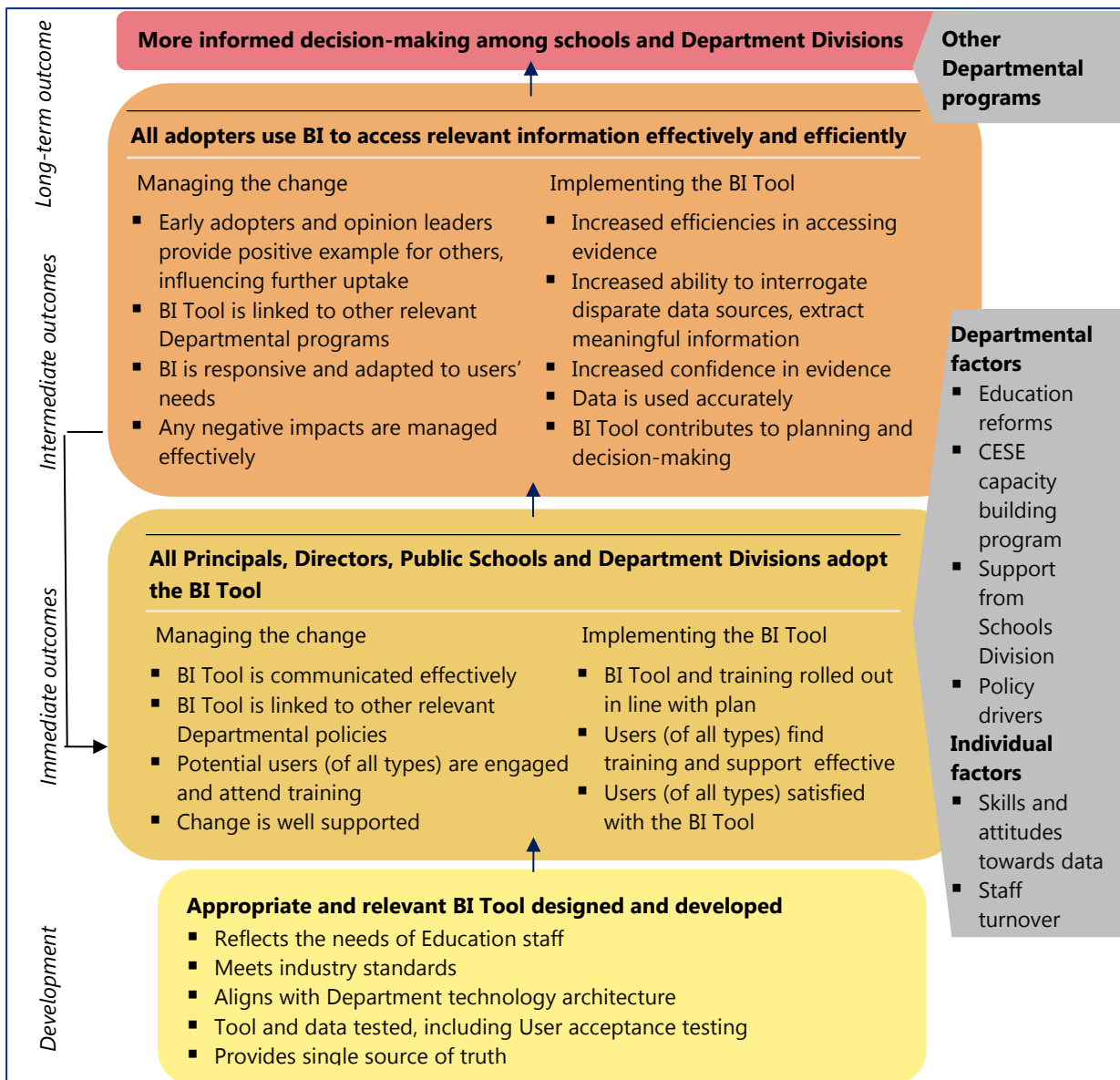
User group	Who are they in the Department	Interaction with data
Technical Super Users	Work in a range of business areas	Experts in using data, regularly write queries in existing systems, design and prepare reports or model data
Power Users	Work in a range of business areas	Access and use data as a core function of their role, familiar with reporting data and data behind reports
Users	Includes Principals, Directors, Public Schools, Executive Directors, Department Executive, Human Resources and Schools Division	Use a range of reporting sources in their day-to-day capacity

Uptake of Release 1 was optional, and those Principals, Directors, Public Schools and corporate staff who opted in were required to pass an e-learning module on privacy and data governance and attend training before being given access to the BI Tool.

1.3 Logic for the BI Program

The logic for the BI Program (Figure 1) highlights the need for the BI Team to effectively develop and implement the BI Tool as well as manage the change process to support initial uptake and ongoing use of the BI Tool if the Program is to contribute to more informed decision-making. There is a feedback loop between the outcome of adopters using the BI Tool efficiently and effectively, and others’ decision to become registered users, reflecting research on the diffusion of innovations.⁵

Figure 1. Logic model for the BI Program

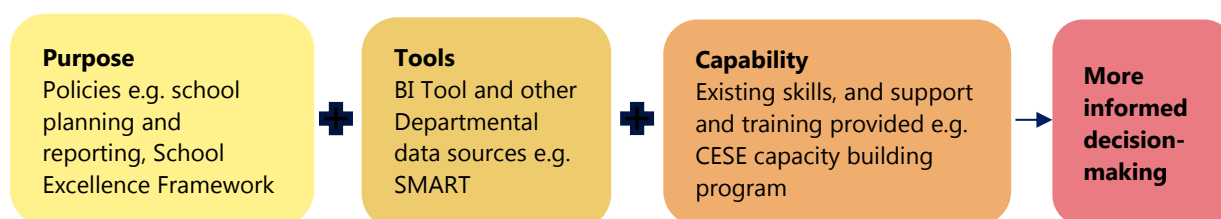


⁵ Rogers, E.M. 2003. *Diffusion of Innovations*, 5th Edition. New York, Simon & Schuster

Additionally, the logic model shows that adoption and use of the BI Tool will be influenced by a range of external factors, including other Departmental policies and programs, individual skills and attitudes towards data, and staff turnover. Other Departmental programs will also contribute to the ultimate aim of more informed decision-making among Principals, Directors, Public Schools and Department Divisions.

Figure 2 shows how the BI Tool, combined with policy drivers and capability building, particularly the Centre for Education Statistics and Evaluation's (CESE's) capacity building program, contributes to more informed decision-making.

Figure 2. Contributions to more informed decision-making in schools and the Department



1.4 Management and governance

Management of the BI Program is with the CESE, which is responsible for providing sound evidence for educators and policy makers to continually improve teaching and learning and meet the current and emerging needs of teachers, students, parents and families, industry, and learning institutions. The development and staged roll-out of the BI Tool is also being overseen by the Department's Information Governance Group and project-level structures.

1.5 Status of development and roll-out

To identify information needs to be met through the BI Tool, the BI Team consulted extensively with 20 stakeholder groups representing all of the Department's portfolios in January and February 2013. These consultations identified twenty focus areas consistent with the Department's strategic goals. These focus areas were organised into seven categories of related data and the Department's Information Governance Group assisted in establishing a prioritisation process for rolling these out. The result was the BI Roadmap, which has subsequently been revised to respond to changes in the Department's needs.

The BI Team has worked with data stewards and conducted user acceptance testing to design appropriate reports to meet the information needs identified in the BI Roadmap. A third party supplier was engaged for initial system development. Challenges with the supplier delayed system development and the roll-out of Release 1 (Schools and Early Childhood). To prevent similar issues affecting subsequent releases, the BI Team developed a hybrid model for delivery—engaging contractors to build the system and buying in consultancy services as required.

The roll-out of access to Release 1 began in November 2014. Release 2 went live in May 2015 and the remaining releases from the BI Roadmap should be complete by the end of 2015. Following this, the technical development of the BI Tool and inclusion of new data will slow down, and the BI Program will focus strongly on engagement and adoption to July 2016. Following this, the BI Program will transition to business as usual—integrating new data sets and focusing on complex analysis for a wider number of users.

In future, priorities for development of the BI Tool will be re-assessed annually with key stakeholders to ensure the strategy is responsive to the Department’s emerging information needs. The BI Team has begun experimenting with predictive modelling—for example, using population and other data to help identify the most appropriate sites for new schools—and analysis to support the identification and development of leaders within the Department.

2. The evaluation

2.1 Purpose and scope

In mid-2014, the Department of Education commissioned ARTD to undertake a formative evaluation of the roll-out of Release 1 of the BI Tool to identify learnings for subsequent phases and assess early outcomes. We delivered an interim evaluation report in April 2015, which focused on promotion and initial uptake, feedback on training, and early experience with the BI Tool. This final evaluation report covers subsequent uptake, experience with the BI Tool, and early outcomes.

2.1.1 Key evaluation questions

Process questions

Communication strategy

- How well has the BI Tool been promoted to the different user groups?
- How do different user groups perceive the BI Tool and its compatibility with their roles in decision-making and the types of decisions they make (strategic or tactical)?

Adoption process

- What is the pattern of uptake of training?
- What are the key characteristics of registered users?
- What is the rate of use of the BI Tool by user groups?

Training and User Support strategy

- What elements of training have been most effective/ least effective for which user groups?
- To what extent are the different user groups satisfied with training and other User Support?
- How could training and User Support be improved?

Patterns of use

- What is the pattern of use over time (frequency of type of data reports, standard management reports versus built reports) by the different user groups?
- What are the most common reasons/ situations in which the BI Tool has been used?

Perceptions of the system

- Is the BI Tool providing the right information (i.e. relevant, useful and meaningful) for decision-making needs of users and for the different kinds of decision-making it is intended to be used for (tactical and strategic)?

- How readily can users access relevant information from the BI Tool in the format they require when needed (i.e. ease of access and timeliness)?
- How confident are registered users (of all types) in their ability to use the BI Tool to access and use information accurately?
- What do registered users (of all types) perceive are the relative advantages/disadvantages of the BI Tool compared to existing ways of accessing evidence for strategic and tactical decisions?
- What do Power Users and Technical Super Users perceive are the relative advantages/disadvantages of the BI Tool compared to previous methods of analysing and reporting data?
- To what extent is the BI Tool being adapted to meet the needs of registered users (of all types)?

Enablers and barriers

- What has facilitated the roll-out of the BI Tool?
- What has hindered the successful roll-out of the BI Tool?

Potential improvements

- How could the BI Tool better meet user groups' needs (i.e. perceptions about issues of functionality and content, varying needs)?
- What aspects of managing future BI releases could be improved?

Outcomes questions

Benefits/ impacts

- What changes have occurred in the business processes and practices used by schools and other user groups to collate and synthesise data to inform decision-making and planning?
- To what extent do the BI Tool and training improve the accuracy of judgements about key data trends?
- To what extent has the BI Tool increased efficiencies for schools in collating information to inform decision-making?
- To what extent has the BI Tool increased schools' and other user groups' ability to interrogate disparate data sources and extract meaningful information?
- To what extent has the BI Tool enabled evidence-based decision-making and, hence, contributed to cultural change around use of evidence to improve schools and the quality of education in NSW?

2.2 Methods

We used a mixed-method approach, drawing on existing administrative data and collecting new data from Principals, Directors, Public Schools, Power Users, Technical Super Users and the BI Team through surveys and interviews (see Table 2).

Table 2. Overview of methods

Source	Method	Sample	Time period	Comments
BI Team promotion data	Analysis of unit record data	All recorded activities	February 2013 to 21 August 2015	<ul style="list-style-type: none"> Includes: SchoolBiz articles, presentations, demonstrations, videoconferences, emails to Principals who had registered an interest in BI and information on CESE's website. Excludes: Emails to existing registered users as these are considered separately as part of support for engagement.
Data kept by the BI Team	Analysis of administrative data (summary and unit record)	All records for Release 1	Up to 27 August 2015	<ul style="list-style-type: none"> Registrations of interest, participation in e-learning and training were only recorded by month in 2015. Monthly records are not available for 2014. Records for Principals and school executive staff cannot be disaggregated. Data may underestimate the number of corporate staff registered because it does not include registrations between March and June 2015.
BI Training sessions	Analysis of unit record data		8 October 2014 to 27 August 2015	<ul style="list-style-type: none"> Calculations for 2015 assume Bridge St sessions were for corporate staff and all others were for Principals/ school executive staff unless specified as PowerView training.
BI training feedback	Analysis of responses to the online survey completed at the end of training	<p>2014: All trainees who provided feedback</p> <p>2015: All trainees who provided feedback</p>	<ul style="list-style-type: none"> 2014: 8 October to 4 December 2014 2015: 23 March to 28 August 2015 	<p>2014</p> <ul style="list-style-type: none"> Response rate: 91% (n=775 [592 Principals; 87 corporate staff; 61 PowerView; 35 Power Users and Co-facilitators]). <p>2015</p> <ul style="list-style-type: none"> Response rate for user training: 77% (n=474/616 participants trained between 23 March and 28 August 2015). Response rate seems to be lower for corporate staff (non PowerView) as there were only respondents from sessions in March and April 2015. Response rate for PowerView training not available, but there was feedback from the three training sessions for Release 1. Questions on understanding of the BI Data Cube and report building were not used in the 2015 survey.
BI User Support	Analysis of unit record data	All tickets	4 November 2014 to 27 August 2015	<ul style="list-style-type: none"> Unit record data including all User Support tickets, whether closed/ resolved or still open. Includes queries from users registered for Release 2 except those about Release 2 stabilisation, which could be isolated from the data.

Source	Method	Sample	Time period	Comments
BI User Support (resolved queries)	Analysis of unit record data (Remedy)	All resolved tickets	5 November to 31 August 2015	<ul style="list-style-type: none"> Unit record data including all User Support tickets with a 'last resolved date'.
BI system	Analysis of system data (summary and unit record)	Point in time data	Two time points: <ul style="list-style-type: none"> Use between 13 December 2014 and 28 February 2015 Use between 29 June and 27 August 2015 	<ul style="list-style-type: none"> Login records are stored for a two-month period, so it is not possible to systematically assess the number of registered users who have logged into the BI Tool or the extent of use over the full period. Summary data on system use was provided for the first period. Unit record data was provided for the second period.
BI users: Principals and Directors, Public Schools	Online survey	Pre-survey <ul style="list-style-type: none"> Principals: random sample of 116 primary and 116 secondary Directors: all Post survey <ul style="list-style-type: none"> All who completed pre-survey Principals=187 Directors=38 	<ul style="list-style-type: none"> Pre-survey: 30 July to 19 August 2014 Post-survey: 12 August to 4 September 2015 	Pre-survey <ul style="list-style-type: none"> Principals: Response from 75% (n=87) of primary Principals and 86% (n=100) of secondary Principals surveyed. Directors, Public Schools: Response from 60% (n=38). Post-survey: <ul style="list-style-type: none"> Principals: Response from 37% (n=60) who responded to the pre-survey. Principals who responded expressed fairly similar views to those interviewed, though they may be more regular users of the system (based on their responses to the question about what planning and decisions they had used the BI Tool for). Directors, Public Schools: Response from 45% (n=17) who responded to the pre-survey. Those that responded to the survey were more likely to be regular users than those interviewed.
Registered users	Quick feedback survey (online)	All users who accessed BI in the week prior: <ul style="list-style-type: none"> Survey 1: 37 Survey 2: 49 Survey 3: 65 	<ul style="list-style-type: none"> Survey 1: 8 December 2014 Survey 2: 8 June Survey 3: 19 October 	<ul style="list-style-type: none"> Survey 1: 49% (18/37). Almost all respondents were Principals. Survey 2: 73% (36/49). All were Principals. Survey 3: 43% (28/65). All were Principals. It is not clear whether the respondents are representative of the broader population of Principals registered to use the system.

Source	Method	Sample	Time period	Comments
Registered users (of all types)	Interviews and discussion group	<p>Round 1</p> <ul style="list-style-type: none"> ▪ <i>Principals</i>: stratified random sample of 30 ▪ <i>Directors, Public Schools</i>: random sample of 10 ▪ <i>Corporate</i>: 3 identified by BI Team <p>Round 2</p> <ul style="list-style-type: none"> ▪ <i>Principals</i>: 19 follow-up from Round 1; 16 trained in 2015 who had logged in frequently ▪ <i>Directors</i>: 3 follow-up from Round 1; random sample of 14 extra ▪ <i>Corporate</i>: 7, mix of frequent and infrequent users from different units ▪ <i>Non-users (Principals)</i>: random sample of 5 	<ul style="list-style-type: none"> ▪ Round 1: 23 February to 11 March 2015 ▪ Round 2: 17 August to 18 September 2015 	<p>Round 1</p> <ul style="list-style-type: none"> ▪ <i>Principals</i>: We completed 19 interviews. Of the 34 Principals we contacted, 21 agreed to an interview, 6 declined and 7 did not respond. Of the 6 who declined, 3 did not wish to participate as they had not used BI and believed they could not contribute constructively to the evaluation, and 3 said they preferred not to participate. Of those who agreed to be interviewed, 2 were not subsequently available. ▪ <i>Directors, Public Schools</i>: We completed 4 interviews. Of the 16 Directors, Public Schools we contacted, 4 agreed to an interview, 6 declined (because they had returned to a school role, were too busy or preferred not to be interviewed) and 6 did not respond. ▪ <i>Corporate staff</i>: We interviewed all 3 identified. <p>Round 2</p> <ul style="list-style-type: none"> ▪ <i>Principals</i>: We interviewed 33 Principals. Of the 19 trained in 2014 we followed up, 14 participated, 2 declined, 2 agreed but were then not contactable, and 1 could not be contacted. Of the 21 Principals trained in 2015 that we contacted, 19 participated, 1 could not be contacted and 1 was on leave. Primary Principals are over-represented because more primary Principals logged into the BI Tool more frequently. ▪ <i>Directors, Public Schools</i>: We interviewed 16 Directors. Of the 3 we followed up (the other was on leave), 2 agreed, 1 declined. Of the 23 others we contacted, 14 participated, 2 agreed to an interview but were not then contactable, 3 had moved to other roles, 1 was on leave, 1 had retired, 1 did not have enough experience to comment, and 1 declined. ▪ <i>Corporate staff</i>: Of the 13 corporate staff we contacted, 7 participated, 3 could not be contacted, 2 had moved to other positions, and 1 was on leave. The interviewees we spoke to were from CESE, High Performance and People and Services. Some were registered users of Release 2. ▪ <i>Non-users (Principals)</i>: Of the 13 we contacted, 4 agreed to an interview, 5 could not be contacted, 2 were on leave, 1 had since been trained, 1 had moved to another position.

Source	Method	Sample	Time period	Comments
BI Team	Semi-structured interviews	Round 1 <ul style="list-style-type: none"> Key Team members 	3 March 2015	Round 1 <ul style="list-style-type: none"> We were able to speak with all identified BI Team members (n=5).
		Round 2 <ul style="list-style-type: none"> Key Team members 	18 September 2015	Round 2 <ul style="list-style-type: none"> We were able to speak with all identified BI Team members (n=3)

2.2.1 Confidence in the findings

The evaluation team is confident that there are sufficient data to assess perceptions of Release 1, the effectiveness of the roll-out (particularly training and support) and early experiences with the BI Tool. However, it is too early in the roll-out to fully assess the realisation of intended benefits.

There are limitations to some of the individual data sources, but we have generally been able to triangulate the findings across the different sources. Where there are differences and gaps, we have noted these.

As data on system use is only available for two time periods, it is not possible to say exactly how many registered users have logged into the BI Tool or how often they have done so. However, the system data aligns with the findings from other data sources.

The low response rate to the post-survey (38%) means that we cannot assume that the findings are representative of the broader group of registered Principals and Directors, Public Schools. We have considered this data indicative only and noted where it aligns or diverges from other sources.

The fact that system performance was degraded at the time of the interviews and post-survey in August 2015 likely heightened critical comments about system performance, but we asked registered users (of all types) about their experience over time, and can align this with the two real-time surveys, which were administered at different time points.

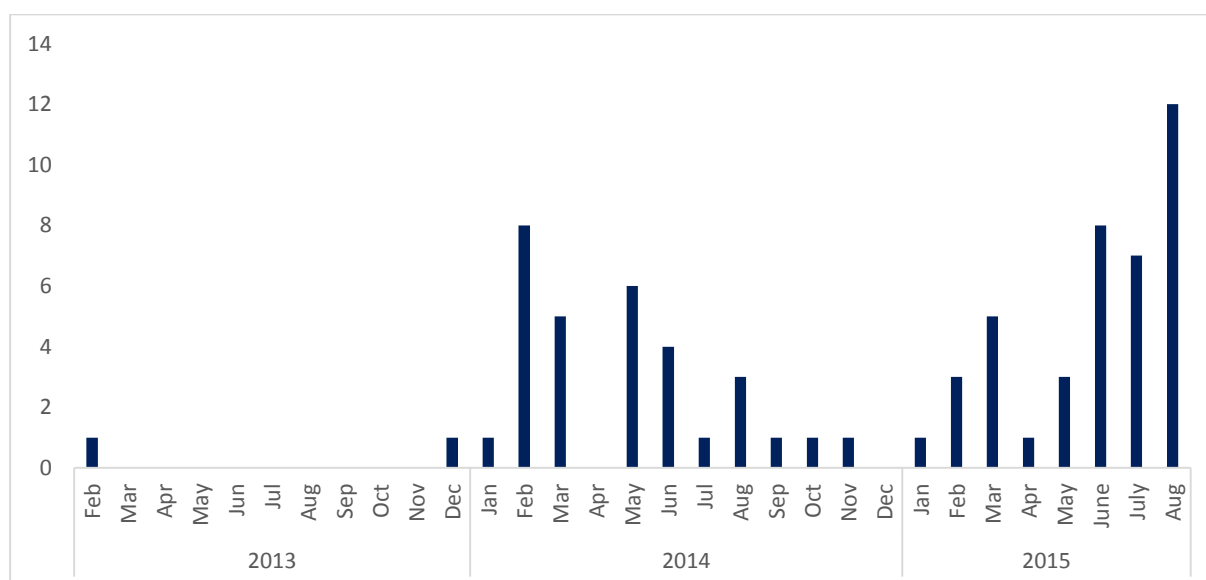
3. Initial uptake and training

3.1 Promotion

3.1.1 Delivery

The BI Team arranged 74 activities to promote the BI Tool between February 2013 and August 2015 (see Figure 3). There were 47 meetings/ presentations, 12 group emails, 10 articles in SchoolBiz, 3 videoconferences, a conversation in Yammer, and materials provided on CESE's website.⁶

Figure 3. BI promotional activities by month



Source: Promotional activities recorded by the BI Team between February 2013 and 21 August 2015. Includes face-to-face presentations, demonstrations, articles in SchoolBiz, videoconferences, and emails, but not the website as this makes information available on an ongoing basis

Promotion commenced with an article in SchoolBiz in February 2013, which coincided with stakeholder consultations being undertaken to inform the development of the BI Strategy. A second article in SchoolBiz in December 2013 informed Principals that the BI Tool would be available the following year. Targeted promotion began in January 2014 with a presentation at the Directors, Public Schools conference. This was followed by videoconferences, presentations and demonstrations to various Principal Networks, the Primary Principals Association, the Secondary Principals Council, and School Executive Directors. More targeted promotion to these groups, as well as to the Public Schools Executive Group, and some corporate staff was undertaken in 2015. Departmental leaders (the Executive Director, CESE)

⁶ This summary excludes emails promoting developments and other communication to existing registered users, which are considered separately as part of supporting and encouraging use.

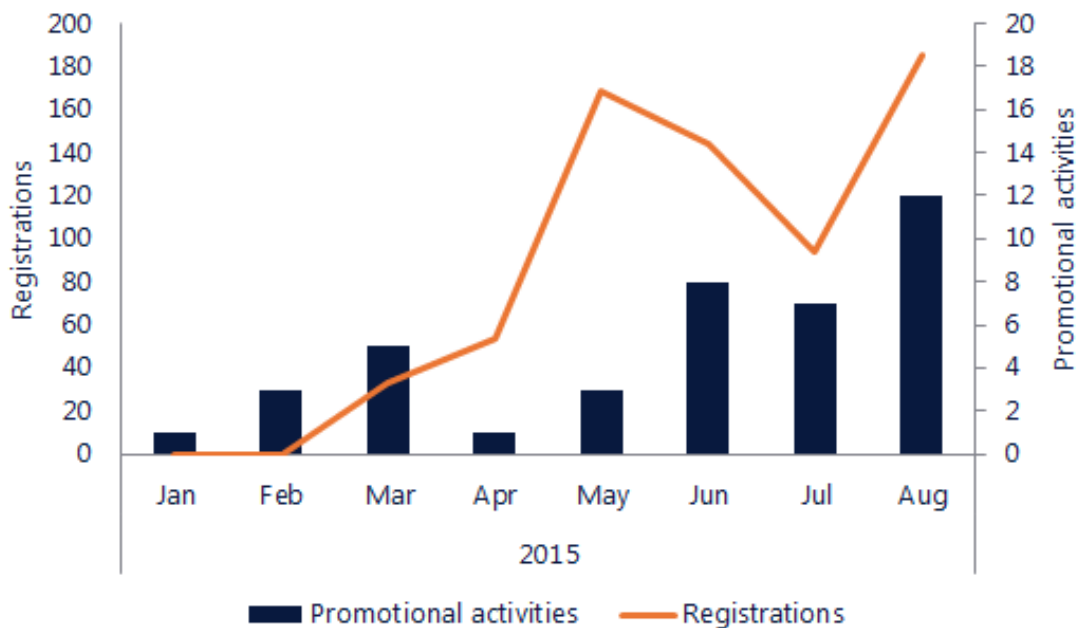
and respected peers (Principals seconded to the BI Team for the initial phase of development and roll-out) delivered many of these targeted activities.

3.1.2 How it has worked

Having an integrated promotional strategy that uses multiple channels and general targeted communication from leaders and respected peers reflects good marketing practice. It has supported the BI Team to reach the different potential user groups across the Department and encouraged a significant proportion to register their interest. This is a significant achievement in an environment in which staff can feel overwhelmed by the amount of information and communications they receive from the Department.

Available data show peaks in registrations of interest in May and August 2015 (see Figure 4). The spike in May 2015 coincided with an article in SchoolBiz in late April, which was followed by an email in May providing directions to register for training sent to those who had registered an interest in the BI Tool. The spike in August was likely caused by the extension of access to Assistant Principals, Deputy Principals and Head Teachers, which was promoted through various channels.

Figure 4. Promotional activities and registrations of interest in the BI Tool (2015*)



Source: Promotional activities and registrations of interest (from all user types) recorded by the BI Team in 2015.
 *Data on registrations of interest by month was not available for 2014.

While the Principals we interviewed did not generally have good recollection of exactly how they had heard about the BI Tool, SchoolBiz was the source most commonly mentioned, particularly among those who registered in 2014. Others had heard about the BI Tool through an email, presentation, their Director, Public Schools or another Principal. The two latter sources increased in importance in 2015 as the number of registered users grew, and some Directors, Public Schools took on a promotional role.

There will be a need for ongoing promotion to encourage remaining potential users and new Principals, Directors, Public Schools and relevant corporate staff (with staff turnover). Different communication channels will likely be needed to reach late adopters. Directors, Public Schools and Principals, School Leadership would be useful allies in this process as they can use interpersonal channels to encourage uptake, which the literature suggests are more effective in persuading individuals to adopt new ideas.⁷

3.2 Registrations

As of the end of August 2015, there were 1,267 registered users of Release 1—just under half of all Principals and nearly all Directors, Public Schools.

3.2.1 Uptake by user type

As of the end of August 2015, 964 Principals, 64 school executive staff, 61 Directors, Public Schools, 18 other Network staff (Executive Directors and Principals, School Leadership) and 160 corporate staff were registered users of Release 1 (see Table 3).

⁷Source: Rogers, E.M. 2003. *Diffusion of Innovations*, 5th Edition. New York, Simon & Schuster.

Table 3. Participation in training and registered users of Release 1

	Population	Participated in training	Given access to BI	% population given access to BI
Principals	2,211	2014: 605 2015: not available Total: not available	2014: 581 2015: 383 Total: 964#	43%#
School executive staff (Assistant Principals, Deputy Principals, Head Teachers)*		2014: 0 2015: not available Total: not available	2014: 1 2015: 63 Total: 64	-
Directors, Public Schools	64	2014: 56 2015: 7 Total: 63	2014: 54 2015: 7 Total: 61	95%
Other Network Positions (Executive Directors, Principals, School Leadership)	Not available	2014: 32 2015: not available Total: 32	2014: 18 2015: not available Total: 18	-
Corporate staff	Not available	2014: 152 2015: 50 Total: 202	2014: 136 2015: 24^ Total: 160	-

Sources: Compiled from sources provided by the BI Team: record of monthly registrations of interest, training and e-learning kept by the BI Team from the beginning of 2015 to August 27 2015; record of registered Principals and school executive staff for 2014–15; record of registered Directors, Public Schools for 2014 and 2015; record of corporate staff registered in 2014 and between 29 July and 21 August 2015.

*School executive staff were given access in August 2015.

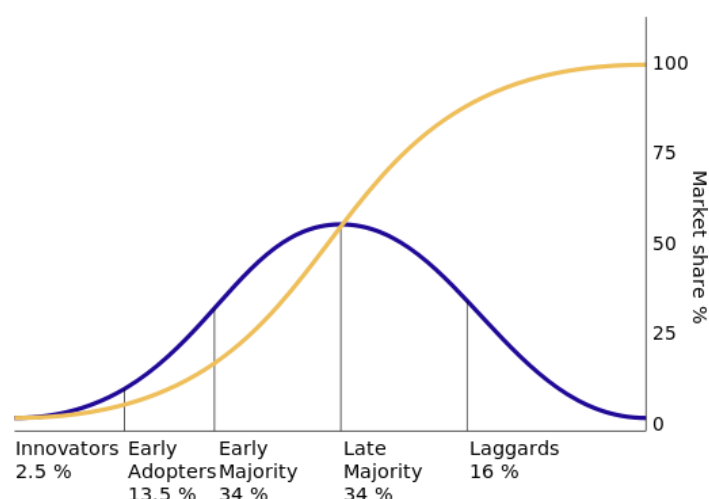
#With turnover and leave, the numbers of Principals is not static and therefore not equal to the number of schools. Records suggest a small number of schools have more than one Principal registered (probably because of Principal turnover and relieving and acting Principals being trained), so proportion of uptake is calculated based on the 945 unique schools with at least one registered user.

^Assumes the staff in the Strategy and Evaluation Branch (former Office of Education) who had done training but not received access in 2014, received access in 2015. This figure is likely an underestimation as 2015 data on corporate staff only included those registered by the time of the interim evaluation and those registered between 29 July and 21 August 2015.

Approximately 43% of Principals in NSW and 95% of Directors, Public Schools are registered users of the BI Tool.⁸ This suggests that early adopters and most of the early majority within these groups have been reached (see Figure 5). However, with turnover of Principals and Directors, Public Schools, it is difficult to get an accurate figure and these percentages may be a slight over-estimation.

Our interviews indicate that the recent extension of access to school executive staff (Assistant Principals, Deputy Principals and Head Teachers) is appreciated because it reflects the shared nature of responsibilities for data analysis and interpretation in schools and enables peers to support each other in using the BI Tool. However, not all of those we spoke to were aware of this change. Additionally, one Principal we spoke to was very concerned that their School Administration Manager cannot also access certain sections of the BI Tool because they have an important role in data analysis. It is not clear whether other Principals share this view.

Figure 5. Rogers' innovation adoption curve



Source: Rogers, E.M. 2003. Diffusion of Innovations, 5th Edition. New York, Simon & Schuster.

3.2.2 Uptake at the school level

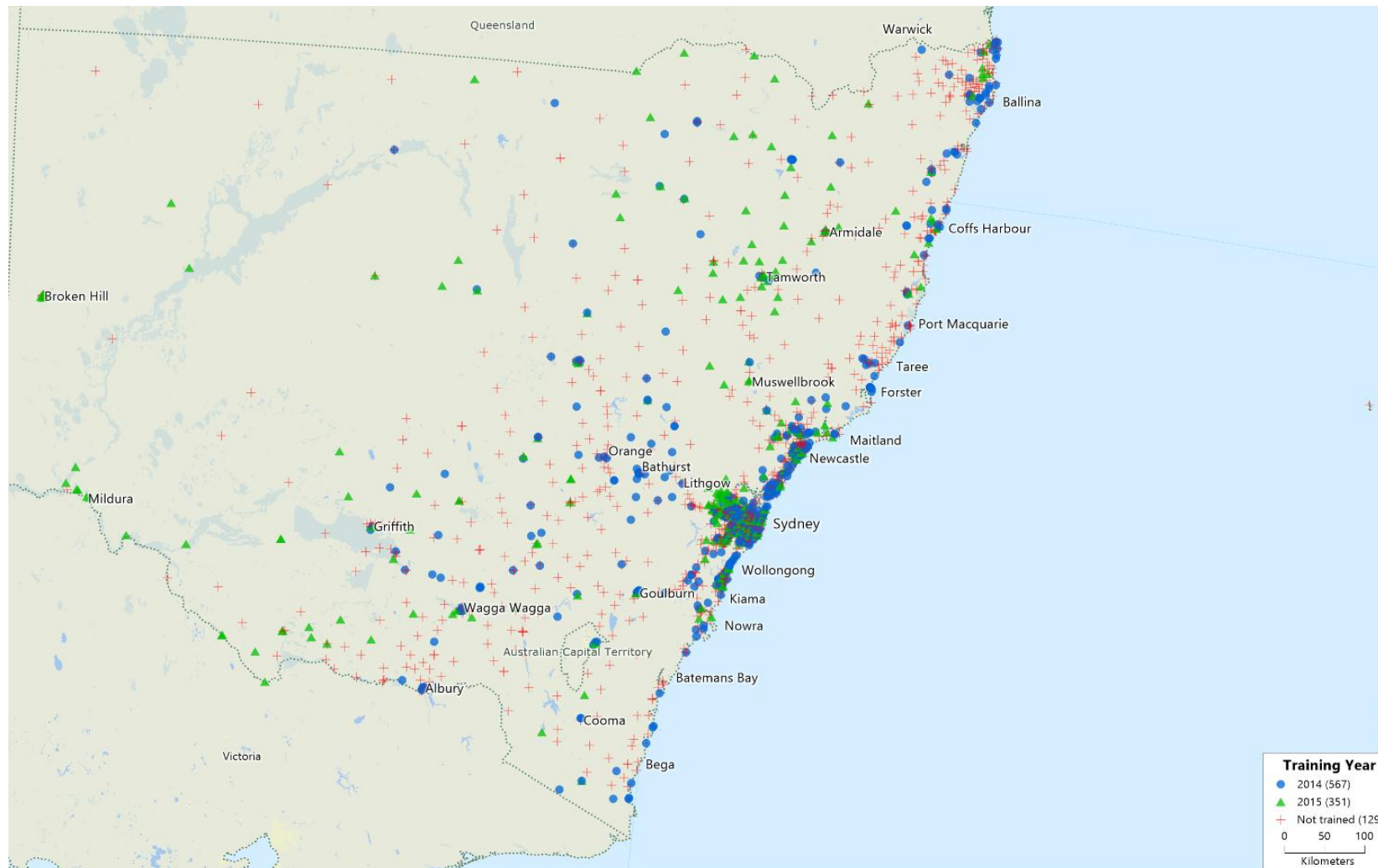
The rate of uptake by schools differs significantly by Principal Network. The Networks with the highest levels of uptake within the timeframe of the evaluation were Parramatta (90%), Hawkesbury (76%), the Hills (71%) and Far West (70%). Those with the lowest uptake were Hastings (6%), North Sydney (14%), Albury (17%), Orange (18%), Clarence Valley (18%), and Holroyd (19%) (see Appendix 1). In all but a couple of Networks the proportion of schools with at least one registered user has increased since 2014, but the extent of the increase varies. The most substantial increase occurred in the Far West where 70% of schools now have a registered user, compared to none in 2014, when no local training sessions were held.

Interviews and consideration of the relationship between level of uptake in a Network and access to local training (see Appendix 1) suggest that the BI Team's responsiveness to requests for local training in 2015 has had a positive impact on uptake. The Team's plans to release online training will further support reach. Interviews also suggest that Directors, Public Schools can have a positive influence on uptake.

Figures 6 and 7 show the rate of uptake across NSW schools.

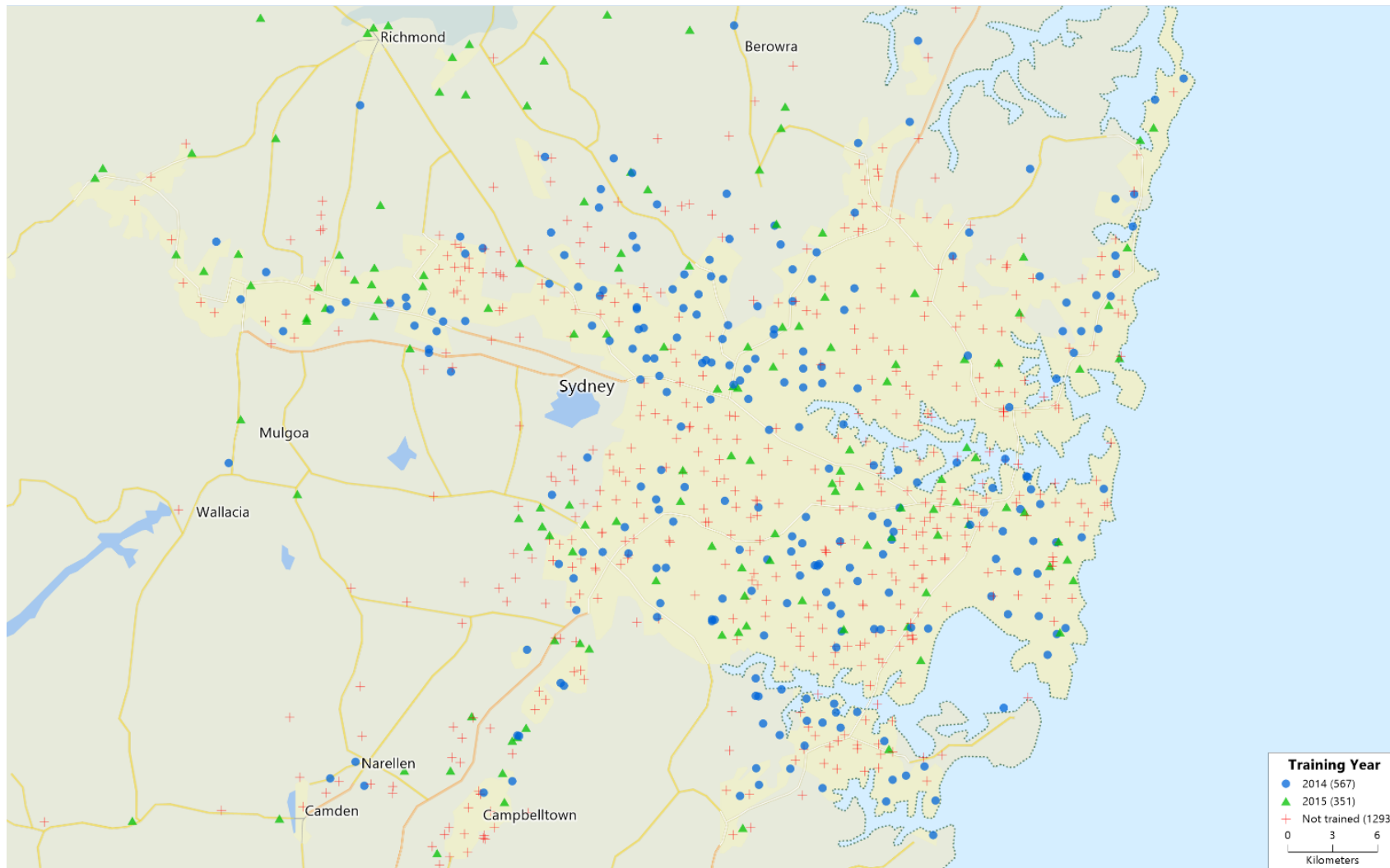
⁸ It is not possible to calculate proportions for other user groups because there is no data available on the potential number of users.

Figure 6. Map of uptake by schools across NSW



Note: Across NSW, 27 schools with a registered user could not be matched to the list of schools open in 2015, so could not be mapped as having registered.

Figure 7. Map of uptake by Sydney area schools



3.2.3 Reasons for opting into BI

There is clearly a need for more efficient access to disparate data sources among Education staff. This was the main motivation for becoming a registered user of the BI Tool.

Principals and Directors, Public Schools

Among Principals who opted into the BI Tool in 2014 and 2015, the main motivation (expressed in interviews) was to get the data they need in one place/ access data more efficiently. The overall similarity between the cohorts suggests that some of those who registered in 2015 may have been early adopters had training been available in their local area in 2014 or scheduled for a different time. However, at least one of those who registered in 2015 waited because he thought it would be better to access training once the BI Tool was more developed.

Some of the Principals we spoke to noted personal beliefs about the importance of quality evidence in school planning as a factor in their decision to register. Others mentioned contextual factors that motivated them to register, including being one of the 229 schools currently implementing the *Local Schools, Local Decisions* reform, being a new Principal or new to their school, and seeing the potential for the BI Tool to support a broader push their school was making for more sophisticated use of data. A couple of Principals said that their Director, Public Schools had specifically suggested that they register.

While we did not specifically ask Directors, Public Schools about their motivations for registering for the BI Tool, interviewees indicated they also hoped to get the data they need more efficiently.

Power Users and Technical Super Users

The Department's High Performance Unit has required relevant staff be trained as Power Users and Technical Super Users because they clearly identified the potential for the BI Tool to save them time producing the reports that they need to create. A couple of those from other units that we interviewed also said that they were required to register as they would need to use the BI Tool in their role.

3.2.4 Reasons for not opting into BI

Of the four Principals we spoke to who are not currently registered users, all had heard of the BI Tool, although one had to be prompted with a description and another had the impression that it was only for the 229 schools currently implementing the *Local Schools, Local Decisions* reform.

The two others had recently registered for BI training. Both of these had not registered in 2014 because there was not a training session in their local area and they were busy in the

context of broader Education reforms. The fact that the training was not mandatory was an additional disincentive for one of these, who said that more of a push from their Director, Public Schools was what had eventually encouraged them to register. A perception that the BI Tool was not yet at a mature stage of development and not yet a one-stop shop for data was the additional deterrent for the other Principal; issues with the Department's Learning Management and Business Reform (LMBR) program had heightened his reluctance to become an early adopter. The tipping point for this Principal was a local training session being arranged, not only because this made it convenient to attend but because it meant that a local learning community could be established to support ongoing use of the BI Tool.

One of the Principals who has not registered similarly indicated that they were unwilling to subject their staff to 'trials' because of issues with LMBR and they were concerned that support would not be available locally. The second Principal who has not registered was only acting in the position and perceived he did not have enough time for it.

From these interviews, our attempts to contact other Principals who have not yet registered and interviews with registered users, it seems that competing priorities and Principal turnover may be affecting uptake.

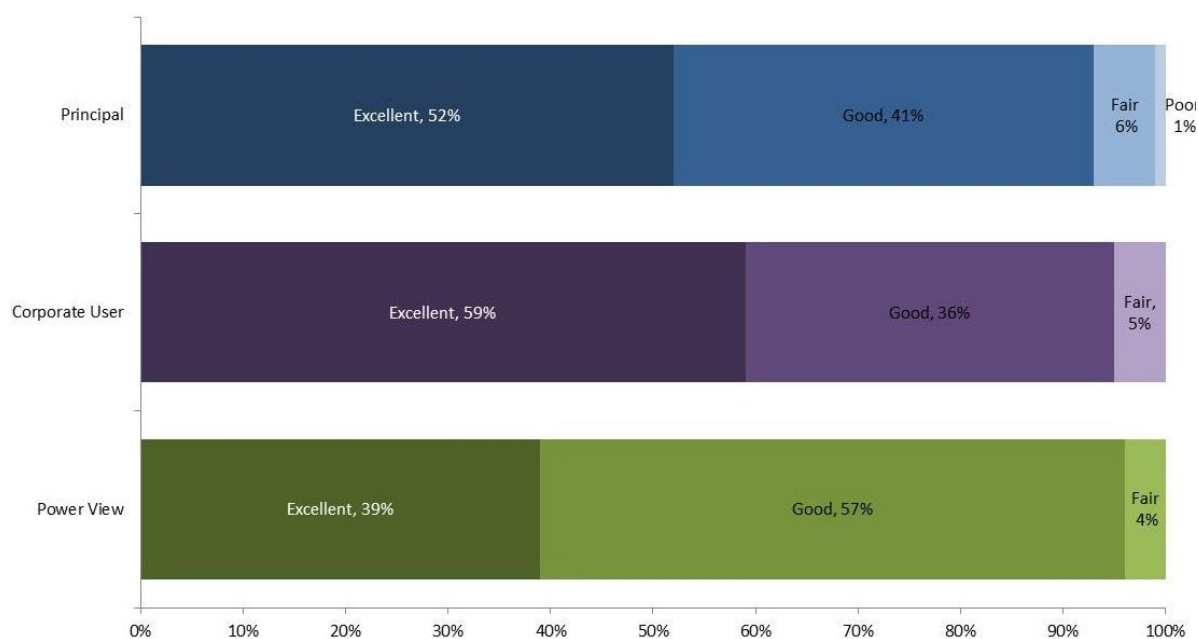
3.3 Training

3.3.1 Delivery

A total of 33 training sessions were delivered in late 2014: 17 for Principals, 7 for corporate staff, 2 for Power Users and co-facilitators, and 7 for Technical Super Users. A further 84 training sessions were provided for Release 1 between 23 March and 27 August 2015: 72 for Principals and school executive staff, 9 for corporate staff and 3 for Technical Super Users. Training sessions for Release 2 were also being delivered from May 2015.

3.3.2 How it has worked

Overall satisfaction with the quality of training delivered in 2015 was high across user groups, with the majority rating the training as excellent or good quality (See Figure 8). Satisfaction with the particular elements of training canvassed in the survey—the training materials, trainer, co-facilitator, training facilities and understanding of the training provided—was also high (see Appendix 2). Corporate staff, Principals and school executive staff were more positive than Power Users and Technical Super Users (PowerView training). On the whole, ratings were fairly consistent with those for training sessions delivered in 2014.

Figure 8. Overall rating of training quality, by user type (2015)

Source: BI training feedback survey 23 March 2015 to August 27 2015.

*Principals include school executive staff and a small number of Directors, Public Schools trained in 2015. Data from corporate staff was only available for sessions presented in March and April 2015

Principals and Directors, Public Schools

Overall, Principals who provided feedback on the training (through the training feedback survey and interviews) were positive about their trainers and co-facilitators, the training materials, the practical component of the training and the learning environment, which gave them the opportunity to learn with colleagues and ask questions. However, their comments suggest that system performance issues affected multiple sessions. While many training feedback survey respondents said that their trainer managed these issues well, they did limit opportunities to trial the Tool and troubleshoot in the training environment.

Additionally, smaller proportions of comments in the training feedback survey raised issues with the use of dummy data, the training facilities, the training location and scheduling, the instructions for finding venues, and finding training rooms within schools. The need to use dummy data to ensure good data governance and maintain the focus of training on the Tool not the data is explained in training sessions. The other issues are beyond the Team's control as it will not be possible to satisfy all participants with scheduling and training locations or address difficulties finding venues or rooms within schools, and the Team is limited to using school computer labs and Department training facilities.

While Principals who responded to the training feedback survey were positive about their understanding of the system, interviews and the post-survey suggest that some Principals need further support to use the Tool in practice, particularly those who were unable to or did not have the time to access the Tool soon after training (see Section 4.2.1). A couple of the Principals interviewed also suggested that the training would have been more useful if it had

focused on how they could use the BI Tool in their role specifically, for example, what reports they could look at to inform annual school plans and annual reports. One of these Principals suggested that having examples of how other Principals had used the BI Tool would have been useful.

There was no separate training feedback survey data from Directors, Public Schools in 2015, but all of those who responded to the post-survey (administered by ARTD) agreed or tended to agree that the training had prepared them well for using the BI Tool. Feedback on training was not a significant focus of interviews, but several Directors, Public Schools said that system performance issues had affected their training session and one suggested that the training should focus more on demonstrating the value of the BI Tool to Directors, Public Schools and showing them how they can use it in their role.

Corporate staff

The corporate staff who responded to the training feedback survey were generally positive about the trainer and co-facilitator, training materials, the structure and interactive nature of the training and the learning environment. However, as with sessions for Principals, system performance affected opportunities to use the BI Tool in some sessions.

A few comments suggested tailoring training content more to participants' technical capacity and exploring opportunities to hold the training where staff work when a number of those from the same unit are attending. One respondent felt that the assessment questions were a little vague and another that the training materials explained more what BI is than how to use the Tool.

PowerView participants

Overall, Technical Super Users and Power Users gave positive ratings of the PowerView training for Release 1 (although more agreed than strongly agreed). Comments suggest that what they liked best was the practical and interactive nature of the training.

While there were no specific closed-option questions to capture Technical Super Users' and Power Users' understanding of the BI Data Cube and how to edit and create reports in the training feedback survey in 2015, some respondents' comments suggest potential improvements in this area. Suggestions included cutting overlaps with content covered in e-learning and previous training, providing more time to play with the BI Tool along with more scenarios, as well as providing a data dictionary or additional explanations of the data.

4. Adoption in practice

4.1 Use of the BI Tool

4.1.1 Access

Available data suggest that use of the BI Tool has remained relatively low to date. This is not unexpected as it is still relatively early in the diffusion of such a significant innovation and the literature indicates that getting an innovation widely adopted can be difficult and take many years, even when it has clear advantages.⁹

Most Principals interviewed reported having limited engagement with the BI Tool and the majority of those who responded to the post-survey said that they used it less than once a month. Over half of the Directors, Public Schools who responded to the post-survey reported engaging with the Tool more than once a month, but interviewees tended to be less frequent users. System data on logins—which is more representative than the interviews and the survey, but does not represent engagement with and use of the content—show that an estimated 21–23% of registered users logged into the BI Tool during the two time periods for which data is available (13 December 2014 to 28 February 2015 and 29 June to 27 August 2015) (see Table 4). School holidays would have limited use in the first period. Other factors influencing use are described in Section 4.2.1.

Table 4. Number and proportion of users logging into BI

Number of times accessing BI*	Use between 13 December and 28 February 2015		Use between 29 June–27 August 2015	
	n	%	n	%
No times	625	79%	981 ²	77%
1 time	36	5%	167	13%
2 times	22	3%	66	5%
3 times	16	2%	28	2%
>3 times	91	12%	25	2%
Total	790[^]	100%	1267[#]	100%

Source: Summary data provided by the BI Team for the interim report; BI system extract provided for final report.

* If a user accessed multiple reports on the same date, this was counted as one login.

[^]Based on all registered users in 2014.

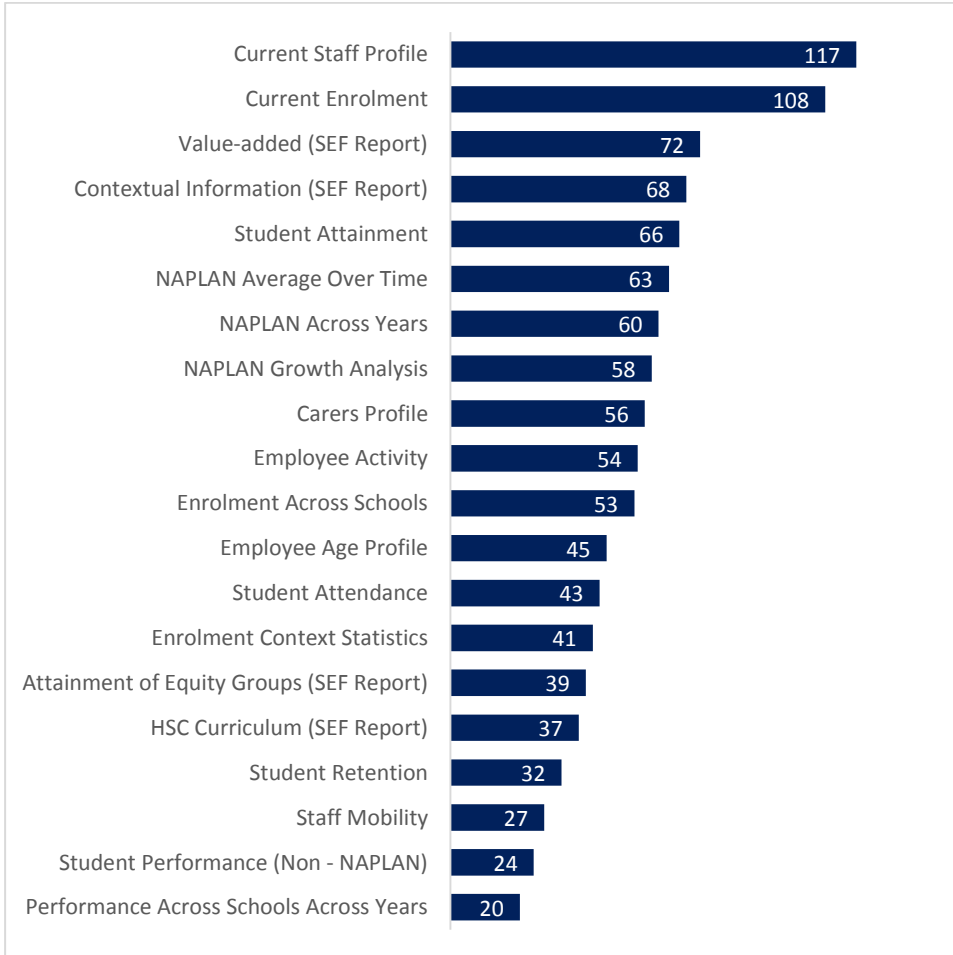
[#]Based on all registered users of Release 1 as at 27 August 2015 (data likely to underestimate corporate staff).

⁹ Rogers, E.M. 2003, p1. Diffusion of Innovations, 5th Edition. New York, Simon & Schuster.

4.1.2 Reports accessed

The most commonly accessed report categories between June and August 2015 were staff profile and enrolment data (see Figure 9).

Figure 9. Twenty most commonly accessed managed reports



Source: BI system data from 29 June to 27 August 2015.

4.1.3 Ways of using the BI Tool

Principals and Directors, Public Schools

Among the post-survey respondents who had logged into the BI Tool, the most common reported use was for school planning and annual reporting (see Table 5). A small number of the Principals we interviewed who had logged into the BI Tool had used it for school planning and communication with staff, while others were still exploring and had not yet used it for specific purposes.

Table 5. Purposes for which Principals have used BI

Purpose*	n	Yes
Annual school reporting	43	49%
3-year plan	45	49%
Annual school planning	43	42%
Staffing organisation	44	27%
Planning professional development for staff	44	23%
Planning learning support for students	43	12%
Planning student welfare	42	7%
Planning curriculum offerings	42	5%
Planning student activities	43	2%

Source: Post-survey (August–September 2015).

*Question only asked of those who had logged into the BI Tool since training.

The majority of the Directors, Public Schools who responded to the post-survey reported using the BI Tool to compare the performance of schools in their Network and structure conversations with Principals (see Table 6). However, only a minority of Directors we spoke to reported using the BI Tool in this way or to support Principals with school planning and improvement. This makes it difficult to gauge the overall proportion of Directors, Public Schools who are actively engaged with the BI Tool.

Table 6. Purposes for which Directors, Public Schools have used BI

Purpose*	n	Yes
Structuring conversations with Principals in my Network	15	80%
Comparing performance across schools in my Network	14	64%

Source: Post-survey (August–September 2015)

*Question only asked of those who had logged into the BI Tool since training.

Power Users and Technical Super Users

The Power Users and Technical Super Users we interviewed had generally only been experimenting with producing reports that they normally compile from other Departmental data sources. However, the High Performance Unit has started to process some of the requests for data that they receive from Principals through the BI Tool and has developed some reports that are nearly ready for release.

4.2 Factors influencing uptake

The literature indicates that the characteristics of the innovation, time, communications channels, and the social system are the four key factors of innovation diffusion.¹⁰

The evaluation found that while registered users (of all types) appreciate the concept of the BI Tool (that is, being able to access data through a central platform), system performance issues have limited use of the BI Tool, as well as the realisation of its relative advantage over existing data sources and the observability of the benefits of adoption. These are two of the five characteristics of innovations known to support successful diffusion.¹¹ While the BI Tool is performing quite well on the other three factors—trialability, compatibility with existing values and needs, complexity (ease of use)—the realisation of relative advantage and observability will be necessary to support further uptake by potential users and further use of the BI Tool among registered users.

Other factors that have influenced use are competing priorities in the broader context of Education reforms, the timing of the roll-out of Release 1 not aligning with the 2015 school planning and reporting cycle, and the need for additional training and support. Policies that push people towards the BI Tool and clearly link its use with other reforms will also be important for encouraging further use. Ongoing support for users and capability building for those who are less experienced with analysing and interpreting data, in conjunction with CESE's capacity building program, will also be important.

¹⁰ Rogers, E.M. 2003. *Diffusion of Innovations*, 5th Edition. New York, Simon & Schuster.

¹¹ Rogers, E.M. 2003. *Diffusion of Innovations*, 5th Edition. New York, Simon & Schuster.

4.2.1 Principals and Directors, Public Schools

The structure and content of the BI Tool

The majority of the Principals who were interviewed and who responded to the first real-time survey said that they found the BI Tool easy to use, although some said that they needed more time to become familiar with it or to use it more often for it to become intuitive. Directors, Public Schools who were interviewed and responded to the post-survey generally also found the BI Tool easy to use. However, about half of the Principals who responded to the post-survey, a minority of real-time survey respondents and a small number of the Principals we spoke to said that they did not find the Tool that easy to use. Survey data suggest that those who use the BI Tool more frequently are more likely to know how to find what they are looking for and interviews suggest that those who are more confident with data and/or technology will also find it easier.

Difficulties interpreting the data were more common among Principals than Directors, Public Schools and more common than difficulties navigating the BI Tool. The Principals who noted some issues interpreting at least some of the graphs in the BI Tool did not generally describe themselves as having difficulties with data or technology. The issues they raised included using the filters and slicers, interpreting the data for small schools, understanding the NAPLAN growth over time report and understanding some of the ratings in the School Excellence Framework (SEF) reports. Some of these relate to a broader need for capability building in the use of data that falls within the remit of CESE's capacity building program rather than the BI Team.

Nearly two-thirds of Principals and most Directors, Public Schools who responded to the post-survey said that it is easier to find data in the BI Tool than in existing Departmental data sources. However, our interviews suggest that, at this stage, many Principals and some Directors, Public Schools are still favouring existing data sources because they are familiar with them, and because the BI Tool does not yet have all of the data that they need and is not yet performing optimally. While a small number of the Principals had identified that the BI Tool provided some reports that would have been difficult to generate from existing systems (thus giving it a relative advantage), most only perceived the BI Tool as providing information they can access through other data sources.

Post-survey data suggest that Principals and Directors, Public Schools have found the school enrolment, SEF and staff employment reports most useful to date. However, the evaluation also identified some issues with the measures used in the SEF reports (not their functionality).

Fifty-nine per cent of Principals and all Directors, Public Schools who responded to the post-survey said that the BI Tool provides high-quality evidence for decision-making. It is not clear why the other Principals disagreed. Through the real-time surveys and interviews some Principals and Directors, Public Schools reported looking for additional information, data cut

in different ways and additional capabilities than they had found in the BI Tool. Most had not contacted User Support to ask whether they could access what they were looking for.

Some of the information and capabilities requested were already available in the BI Tool, but users were unaware of them. Given this, a small number suggested additional communication about new and planned content would be useful.

Some of the information requested (such *Tell Them From Me* survey and teacher accreditation data) has since been added to the BI Tool or will be released by the end of 2015. Access to some of the other information requested is tied to the roll-out of other reforms (for example, financial data to the roll-out of LMBR) or to permissions by other authorities that own the data (for example, ATAR from the Universities Admissions Centre and school pathways data from universities). There were also some requests for schools to be able to add their own data. See Appendix 3 for full list of suggestions.

Only a small number of interviewees questioned the relevance of the information in the BI Tool or the way that the data had been cut. The specific issues they raised included needing to be able to see information at the individual student or teacher level and needing to identify individual staff leave patterns (not proportion of staff on leave). A couple of interviewees also raised broader questions about the measures used to assess performance and value in Education, which are beyond the control of the BI Team, as the BI Tool draws on existing data within the broader framework set by the Department.

System performance issues

System performance issues were the main concern and most common barrier to use raised by Principals and Directors, Public Schools across the various evaluation data sources and over time. The majority of respondents to the post-survey indicated that they do not find report load times acceptable, although proportions varied by report type and Directors, Public Schools were more positive than Principals. The results of the last two real-time surveys suggest the threshold of tolerance for reports to load is about 30 seconds.¹²

A smaller number of Principals and Directors, Public Schools who participated in the evaluation identified issues with logging in as key concerns, particularly issues with updating their credential manager and downloading and running Microsoft Silverlight. A few have encountered ongoing issues, which seem to relate to not having administrator rights to their computers and to confusion about the browsers through which the BI Tool can be accessed. Some said they would like to be able to access the BI Tool through their preferred browsers, such as Firefox or Chrome, and for the Tool to function on Mac computers or iPads.

User Support data and interviews suggest that some Principals and Directors, Public Schools have also encountered issues with the default settings in the BI Tool. There were reports that a school was initially unavailable, that the system displayed a school's data under a different

¹² This is based on load time reported by users rather than actual load time.

school's name and that the system seemed to be set to all schools (though the data was not accessible).

Context for use

Another important barrier to further use of the BI Tool were principals' and Directors, Public Schools' own busy schedules and competing priorities, particularly in the broader context of Education reforms. Some Principals said that they could see how the BI Tool supports Education reforms and fits with the growing emphasis on evidence-based decision-making, but still found it hard to find the time to use it. While some of the Directors, Public Schools interviewed had found the BI Tool really useful to help prepare for their discussions with Principals and have encouraged use of the BI Tool among Principals, others did not think it would be worthwhile for them to use the Tool until Principals in their Network were using it more.

The extension of access to school executive staff should help to increase use of the BI Tool by schools. Use of the Tool in the next cycle of annual school planning and reporting will also be a more telling indicator as schools had generally substantially commenced their latest school plans and reports before gaining access to the BI Tool or did not have time to familiarise themselves with the BI Tool before these were due. Some of those we spoke with are planning to use the BI Tool for upcoming school planning and reporting. Tying the BI Tool to other Education reforms and developing policies that drive Principals and Directors, Public Schools towards the BI Tool would also support further use.

However, our interviews suggest that it may remain difficult for teaching Principals and those with fewer executive staff to make the time to use the BI Tool. Additionally, the small number of Principals from small schools may see the BI Tool as less relevant to them because their school's student performance data can be affected by changes in one student's performance and it is easy for them to keep track of information about staff without the BI Tool. On the other hand, interviews suggest that Principals and Directors, Public Schools who are new to the role or to their school/ Network may find the Tool particularly useful because they are not already familiar with the data available through other sources.

Individual characteristics

Users' confidence in using data and technology also influences their use of the BI Tool. The majority of Directors, Public Schools who responded to the post-survey said they were confident using the BI Tool, but only about half of the Principals who responded said they were. While limited use to date and lack of familiarity with the BI Tool is likely one factor affecting this, interviews with Principals and Directors, Public Schools, as well as the High Performance Unit, suggest that some Principals will also need additional support in interpreting data to make effective use of the BI Tool. The post-survey data suggest a relationship between formal learning in use of data and confidence in using the BI Tool.

Support for use

The majority of Principals and all Directors, Public Schools who responded to the post-survey were clear about the intended use of the BI Tool, but interview and survey data suggest the need for more support to translate this into practice. The majority of Directors, Public Schools who responded to the post-survey agreed or tended to agree that the support available to them to use the BI Tool is sufficient, but fewer than half of the Principals who responded agreed or tended to agree. Most Principals and some of the Directors, Public Schools interviewed identified a need for additional support to help Principals use the BI Tool. Many of the suggestions were for further face-to-face or online training, but for different purposes: as a refresher, to learn to use the BI Tool in a more advanced way, to answer specific questions or to coincide with the roll-out of new releases or annual school planning and reporting. Other suggestions included 'how to' sheets for specific questions, support to connect with peers to share learnings and communications about how the Tool is being used, support to interpret their school's data, and onsite training for school executive staff. Some Directors, Public Schools said that they would also value opportunities to connect with peers, obtain fact sheets or receive follow-up training.

A few Principals suggested that support similar to what they receive for other 'products' could be available for the BI Tool, for example, sharing desktops through Bridget sessions to resolve issues with LMBR, support from the Learning Bar to understand *Tell Them From Me* survey data, and Adobe Connect sessions to answer questions about the *Tell Them From Me* survey. As Adobe Connect sessions have been used for the BI Tool, this suggests some users may not be aware of the supports available to them.

The variation in suggestions for ongoing support reflects the different capabilities, needs and learning styles of individual users, indicating a need for a multi-pronged strategy. Coordination with CESE's capacity building program could help to build capability in the use of data in the BI Tool. Directors, Public Schools and Principals, School Leadership could also play key roles in assisting Principals to use the BI Tool.

4.2.2 Power Users and Technical Super Users

The structure and content of the BI Tool

The Power Users and Technical Super Users we interviewed appreciated the way that the BI Tool brings together different data sources and supports the development of reports for other corporate staff and schools. They generally found it easy to use, although those new to the Department said that a data dictionary or clarity about who the data steward is would help them to use the BI Tool, particularly because there are many fields with similar names.

Few made specific comments about the data available in the BI Tool, although one said that the data they required was not available when they first completed training and another suggested that having additional ESSA fields and *Tell Them From Me Survey* data would be

useful. A couple of others noted some issues with the accuracy of the data. One of these had not been able to get the same results using BW/SAP and the BI Tool. The other said that the BI Team had resolved the discrepancy in calculations once they identified it.

System performance issues

As with other users, system performance issues are the main factor limiting Power Users' and Technical Super Users' use of the BI Tool. One of those we interviewed said that they would like to experiment more with different datasets but they cannot because it would take too long. Others had temporarily stopped building reports when system performance was degraded between the end of July and early September 2015.

On a positive note, those that had been using the BI Tool longer had noticed improvements to system performance. One of these said that they had also learned that they needed to build reports smarter—working out what data they required rather than putting everything in and working it through because larger datasets take longer to process.

Context for use

The BI Tool is expected to replace other processes Power Users and Technical Super Users use to create reports over time. Those in the High Performance Unit see the BI Tool as part of their core business, but noted that fitting it in with other day-to-day tasks can be difficult.

Individual characteristics

Most of those we interviewed have a background in data analysis, so were comfortable with using the BI Tool. However, one who did not have a background in data analysis said that they would like the opportunity to access one-on-one support to learn to build reports using PowerView.

Support for use

Those in the High Performance Unit valued the community of practice they had established to support their use of the BI Tool. The community is informal and meetings are used as an opportunity for staff to share how they have been using the BI Tool and the steps they have taken to build the reports they have been working on (either in PowerView or Report Builder).

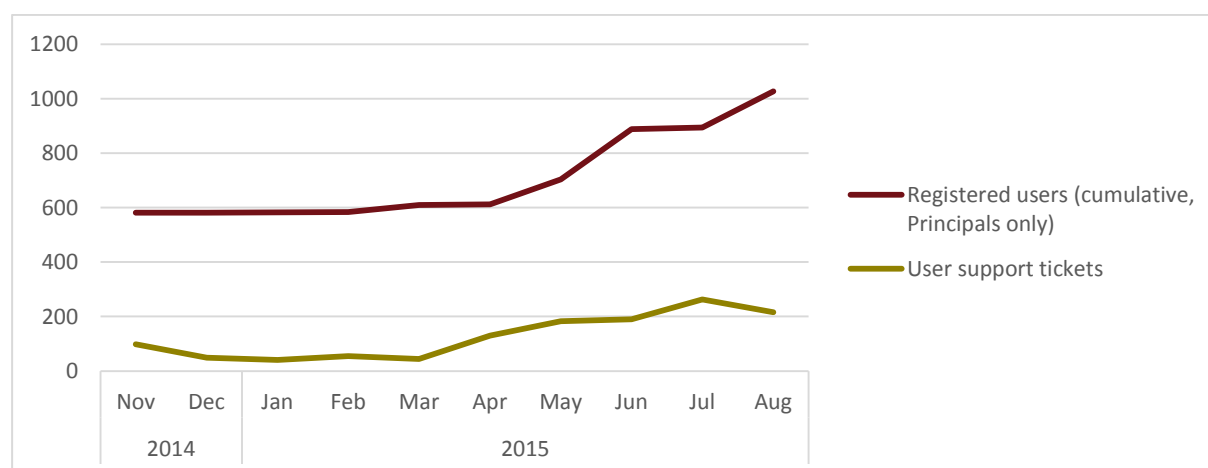
Some of those from other units we spoke to suggested follow-up support would be useful. One suggested that a sandpit environment to experiment with report building without being concerned about mistakes would also help.

4.3 Management and support for adoption

4.3.1 User Support

Between November 2014 and August 2015, BI User Support has received 1259 requests (excluding requests about Release 2 and Release 3) by phone or email. The number of requests received per month has increased as the number of registered users has increased (see Figure 10). However, our interviews with Directors, Public Schools and Principals suggest that not all are making contact when they encounter issues, as is the case with other User Support systems. These users are more likely to disengage with BI either completely or temporarily. Reasons interviewees gave for not contacting User Support include being too busy, getting interrupted by other tasks, being able to consult alternative data sources for information, and not remembering the information about User Support.

Figure 10. User Support tickets and registered users*



Source: BI User Support data 4 November 2014 to 27 August 2015.

* Data on the number of new registered users by month is only available for Principals, not other user types. User Support tickets related to Release 2 and Release 3 have been excluded, but general queries include queries from Release 2 users.

The most common issues that have been raised with User Support are login and access issues (see Table 7). Non-production requests (which include requests for local training) and access requests (which include requests for access to the preproduction environment and access to the BI Tool), also made up a significant proportion of queries.

All or almost all issues related to login problems, non-production requests, access requests, enquiries, e-learning and 'how to' questions have been resolved (see Table 7). Rates of resolution are lower for queries related to data looking incorrect because these need to be sent to a subject matter expert or data steward outside of the BI Team.

Table 7. Issues raised with and resolved by User Support

Issue	n	% of total	% closed or resolved
Login Problems / Access problems	362	28%	99%
Non Production Requests	241	19%	100%
Access Requests	142	11%	98%
Data looks incorrect	79	6%	62%
System issues	79	6%	84%
General queries (enquiries)	64	5%	100%
eLearning	58	5%	100%
Change Requests	57	5%	91%
Problems with cubes	52	4%	94%
Functionality issues (How To)	45	4%	100%
Other	80	6%	86%
Total	1259	100%	95%

Source: BI User Support data. User Support data 4 November 2014 to 27 August 2015. Includes queries from registered users of Release 2 except those about Release 2 that could be isolated from the data. Excludes queries about Release 3.

*'Non-production requests' category, which includes requests for local training and access to the preproduction environment, began to be used in June 2015.

#'Access requests' category, which includes requests to access the BI Tool, began to be used in April 2015

^'Other' includes: 'Assistance with data interpretation', 'BI Support Enquiry', 'CESE requests', 'Change of schools', 'Info on access to smart data and BI data', enquires and issues with SEF reports and 'Others'.

While most queries are rated as low priority based on business urgency and business impact, many are still resolved quickly. Non-production requests, access requests and how to queries are resolved most quickly—with a median time to resolution of less than half an hour. Login and access problems and general queries are also resolved quickly. More complicated queries and those that must be processed by a subject matter expert or data steward take longer to resolve (see Table 8).

Table 8. Time to resolution (for resolved tickets)

Time period	n	Time to resolution (median)
Non Production Requests	181	17 minutes
Access Requests	133	29 minutes
Functionality issues (How To)	34	30 minutes
Login Problems / Access problems	263	45 minutes
General queries (enquiries)	49	1 hour 9 minutes
Problems with cubes	41	3 hours 1 minute
eLearning	38	5 hours
System issues	46	3 days
Change Requests	36	6 days
Data looks incorrect	36	8 days
Other	67	19 hours
Total	924	2 hours 1 minute

Source: Remedy data 5 November to 31 August 2015, excluding queries about Release 2 and Release 3.

*'Other' includes: 'Assistance with data interpretation', 'BI Support Enquiry', 'Change of schools', 'Info on access to smart data and BI data', 'Others', Requests, SEF issues.

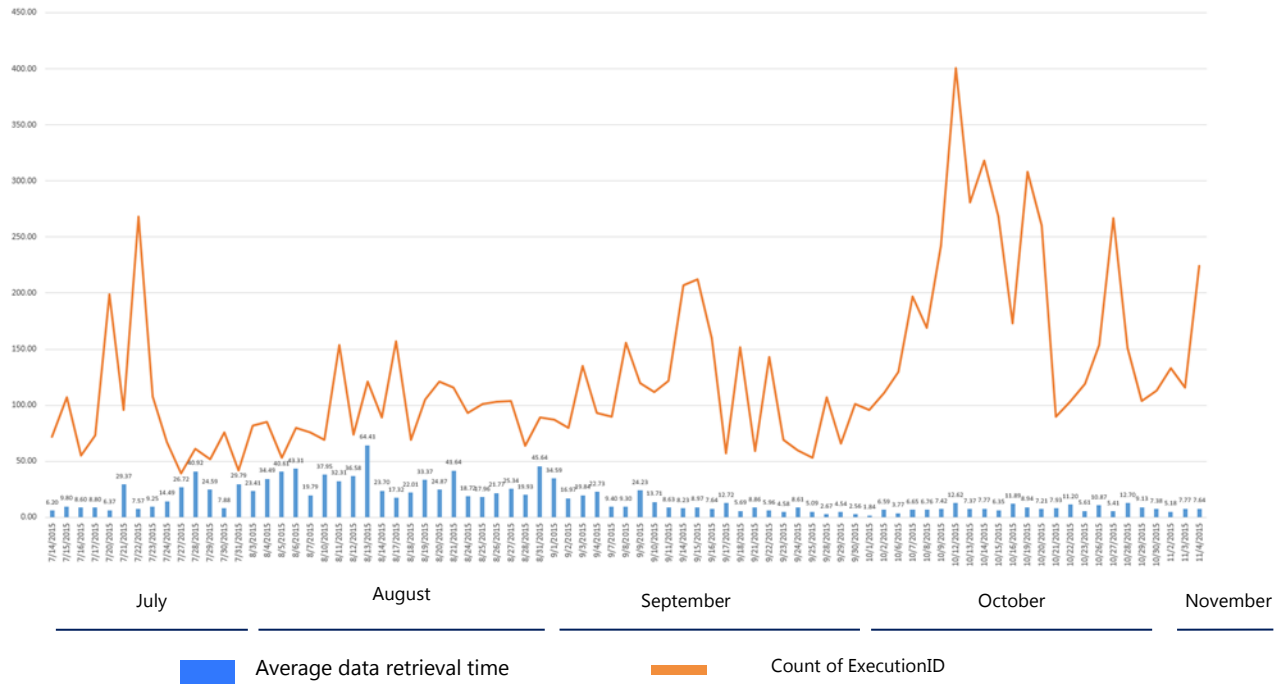
Numbers of tickets in Table 8 will not match Table 7 because the data for resolved tickets is obtained from a separate system with last resolved date (see section 2.2).

There is not systematic or representative data on satisfaction with User Support. The data we do have from interviews and the real-time surveys shows that some have been satisfied with support received, but a few reported ongoing issues accessing the BI Tool—related to updating the credential manager on their computer, installing and running Microsoft Silverlight or access permissions—or with system performance.

4.3.2 Improvements to system performance

System performance has been a priority for the BI Team and they have worked with the Information Technology Directorate (ITD) and Microsoft to make improvements to the aspects of system performance within their control throughout 2015. Figure 11 shows the number of reports executed and the average data retrieval time on the BI servers per day between 14 July and 4 November 2015. System performance was degraded between the end of July and early September 2015 after 2015 NAPLAN data was loaded into the BI Tool. Data retrieval time peaked at an average of 64 seconds on 13 August. With the changes made by the BI Team, this has reduced to an average of less than 10 seconds since 10 September (see Figure 11).

Figure 11. Number of report executions and load time (14 July to 4 November)



Source: System data, 14 July 2015 to 4 November 2015.

Report load times that users actually experience can be longer than this because they are impacted by a complex chain of activities that are beyond the control of the BI Team. The factors affecting load time between the BI servers and the end user include the internet link being slow or under load and the users' computer speed.

Critical comments about system performance in the interviews and post-survey were likely heightened by the fact that system performance was degraded during the data collection period, but comments indicated it had been an ongoing issue. The results of the real-time surveys conducted in June 2015 and October 2015 support this, suggesting that the factors beyond the control of the BI Team are impacting system speed experienced by registered users (of all types).

Respondents to the two real-time surveys that assessed load time reported load times from 5 seconds to over 5 minutes and, in some cases, that reports did not load while they waited. There was not a clear difference in reported system performance between regional and metropolitan areas in any of the evaluation data sources, and it was not possible from the available data to identify locations consistently experiencing problems. Further real-time surveys may assist the BI Team to better understand and track this issue.

Users we spoke with did not generally associate slow load times with their own computers or internet connection, as they thought that other online applications were generally faster than the BI Tool. Thus, it is likely that system speed will have implications for the reputation of the BI Tool if left unresolved.

4.3.3 New reports

The BI Tool has begun to deliver added value through the production of new and customised content. Some new reports, such as the SEF reports, have been distributed, while others on staff accreditation, recent NAPLAN data and ESSA performance over time were ready for distribution at the time of the evaluation. However, interviews with Power Users and Technical Super Users suggest that system performance issues have impeded the speed of development and roll-out of new content.

A small number of interviews (with different user groups) suggested that while new reports all undergo user acceptance testing, additional feedback loops following the release of reports would help to ensure they meet users' needs.

User Support data and interviews suggest that few users are taking up the opportunity to request customised reports to meet their needs. Some comments from Principals suggest that this is unlikely to change and that it will be important to build the suite of managed reports based on the requests that are received from Principals and feedback through other channels.

5. Early indications of benefits

5.1 Perceived benefits

Interview and survey data indicate that Principals and Directors, Public Schools generally see the BI Tool as providing additional capabilities and anticipate potential efficiency gains in accessing and compiling data. The majority of those who responded to the post-survey also saw the BI Tool as better than existing Departmental data sources (see Table 9). However, survey respondents had very high expectations of the BI Tool, so not all reported these having been met at this stage.

Table 9. Benefits of BI

Statement	Principals agree		Directors agree		Total agree	
	n	%	n	%	n	%
BI makes trend data more readily available	36	86%	14	93%	50	88%
Overall, BI is better than what we had before	30	71%	13	93%	43	77%
BI makes it easier to cross-reference and match data from different sources	20	63%	12	80%	32	68%
The data in BI has provided new insights about my school/schools in my Network*	16	62%	10	83%	26	68%
I am relying more on evidence to inform school planning and decision-making/structure my conversations with Principals than 'gut feeling' now that I have access to BI*	17	63%	9	69%	26	65%
BI makes it easier to customise data to meet my information needs	22	55%	13	87%	35	64%
I am spending more time interrogating my school's/schools in my Networks data now that I have BI*	13	48%	8	62%	21	53%
The data available in BI has challenged some perceptions that I or other staff held about our school/schools in my Network*	12	48%	6	46%	18	47%
BI has reduced the time I and other school staff spend collating data for school planning and decision-making*	11	42%	-	-	11	42%

Source: Post-survey (August–September 2015).

*Questions only asked of those who had used BI for a specific purpose (as recorded in the survey). Other questions asked of those that had logged into the BI Tool since training.

5.1.1 Actual and anticipated efficiency gains

Principals and Directors, Public Schools

All but one of the five Directors, Public Schools interviewed, who reported using the BI Tool for particular purposes, indicated that it had saved them time because it provides data in one place and provides useful trend data.¹³ While most only spoke generally, one estimated that it had cut the time he spends preparing to visit Principals by about one-fifth, which he considered substantial.

Other Directors, Public Schools and the majority of the Principals interviewed identified the potential for the BI Tool to save them time accessing and compiling trend data as system performance improves.

Only a minority of Principals interviewed were not convinced about the potential for efficiency gains. A couple of these were Principals of small schools who questioned the relevance of the data available in the BI Tool to their context; one was not prepared to invest the time required to familiarise themselves with the BI Tool at the moment; one did not expect the BI Tool to change their practice; and another thought they would spend as much time using data, but that BI would provide them with more insights to inform decision-making.

Power Users and Technical Super Users

The Power Users and Technical Super Users interviewed generally anticipate the BI Tool will save them time as system performance improves. While it may take as long to create a report in the BI Tool, the value will come from being able to reuse the same report for different schools or different time periods, and to share it more broadly.

5.1.2 Impact on use of evidence for planning and decision-making

Principals and Directors, Public Schools

About one-third of the Principals we interviewed noted the potential for the BI Tool to increase the extent to which data is used in school planning and decision-making, at least among some Principals. Others suggested the BI Tool will save them time rather than increasing their use of evidence because they were already using evidence regularly. This also seemed to be the case for Directors, Public Schools who regularly used evidence prior to the introduction of the BI Tool.

Given that much of the data in Release 1 is available through existing sources and that it is still relatively early in the implementation process, it is unsurprising that very few of the

¹³ The one who did not identify efficiency gains said slow load times had prevented this.

Principals and Directors, Public Schools we interviewed said the BI Tool had provided them with new insights or challenged their perceptions. Those who had used the BI Tool tended to say that it had confirmed rather than challenged their perceptions to date. Of the three Principals who said the BI Tool had given them new insights, one was a new Principal who said they would not have known about staff capacity to teach certain subjects; one had thought their school's staffing was fairly stable, while the data showed some regular changes; and one gained insights into trends in performance and considered how this might relate to staffing data. New insights noted by a few Directors, Public Schools related to staffing and finances. Additionally, one of the Directors, Public Schools reported having used the BI Tool to challenge Principals' assumptions about their school, for example, by providing performance data for like schools. As more data that is not readily available through other sources is added to the BI Tool, it may challenge perceptions more often.

Power Users and Technical Super Users

The High Performance Unit identified the potential to share more reporting information with schools through the BI Tool because it enables them to build a report once and reproduce it for different schools and share large reports that would be harder to distribute through other means. The BI Tool also gives them more flexibility than SMART because it is easier and faster to add different reports; they can build reports themselves rather than having to contract the build, which requires Departmental sign-off. The BI Tool can also save them time in responding to data queries from Principals.

6. Conclusion and recommendations

6.1 Conclusion

The high level of uptake confirms that the BI Tool meets a need for a centralised source of data to inform tactical and strategic planning and decision-making within schools and the Department. Registered users (of all types) appreciate the concept and see the potential for the BI Tool to save them time. As the roll-out did not coincide with the latest school planning and reporting cycle, use of the BI Tool in the next cycle will be a more telling indicator of its perceived relative advantage and provide a chance for those not yet using it to observe its benefits. However, evaluation data suggest that further improvements to system performance, policies that drive use of the BI Tool, and additional support and training will be needed to ensure that registered users make use of the BI Tool and its benefits are realised. This will require coordination with the Schools Division and CESE's capacity building program.

6.2 Recommendations

6.2.1 Ongoing development of the BI Tool

The way the BI Tool brings together disparate data sources gives it a relative advantage over existing Departmental data sources. Each new Release will add to the BI Tool's value and should help to convince potential and existing registered users of its relative advantage. The BI Tool has already begun to deliver added value through some new content and will be able to deliver more through Power Users and Technical Super Users, if system performance can be improved. Our interviews suggest that users may not all be aware of the full breadth of content available in the BI Tool, particularly the new content that has been added, suggesting that ongoing communications about new and planned content could be useful. A small number of interviewees also suggested that while user acceptance testing is done in the development phase, further feedback loops for reports released would also be useful in ensuring reports meet users' needs. This may be particularly important as only a few of those interviewed who wanted access to data cut in different ways or additional information had thought to contact User Support about this.

More significantly, the evaluation data suggest that the aspects of system performance that are outside the control of the BI Team continue to impact on system speed experienced by registered users (of all types) and, unless this can be improved, it will inhibit ongoing engagement with the BI Tool.

Recommendations

1. Continue to identify adjustments and options to improve the speed between the BI servers and registered users' computers with ITD.
2. Inform users about planned additions to the BI Tool so they understand the scope of what will be available and when. Send communications as each addition is made so users are aware and can make full use of the content and capabilities in the BI Tool.
3. Ensure that there are accessible feedback loops in place to enable users to suggest refinements to reports, beyond the initial period of user acceptance testing.

6.2.2 Promoting the BI Tool to potential and existing users

Existing promotional strategies have successfully engaged early adopters and the early majority. Ongoing promotion will be needed to encourage new potential users (through staff turnover), and additional strategies will be needed to encourage late adopters. Further communications will also be needed to encourage ongoing engagement with the BI Tool among registered users. Directors, Public Schools and Principals, School Leadership could play an important role in promotion, using their interpersonal communication and networks.

Recommendations

4. Once system performance is improved, continue promotion to potential and existing users.
5. Involve Directors, Public Schools and Principals, School Leadership in promoting the BI Tool.
6. Use behavioural insights (nudges) in promotional messaging, particularly social norms (e.g. proportion of peers that have registered for the Tool), and stories about how the BI Tool is making it easier to use data for planning and decision-making to encourage take-up among potential users and engagement with the BI Tool among registered users.

6.2.3 Rolling out further releases

The changes that the BI Team have made to their delivery model—engaging contractors to build the system and buying in consultancy services as required— should help to prevent delays occurring for future releases. Early feedback (described in the interim report) suggests it will be important not to promote new releases too early and to make sure the release is available concurrently with training.

While satisfaction with the training provided for Release 1 has been high, data suggest that initial training sessions could have more of a focus on how the Tool can be used in specific practice situations. This will require coordination with the Schools Division.

Recommendations

7. Align timing of training with the availability of new releases and new content, so registered users (of all types) have access immediately following training.
8. Work with the Schools Division to ensure training clearly communicates how Principals and school executive staff can use the BI Tool in practice, for example, which reports they can use to answer common questions considered in annual school planning and reporting.

6.2.4 Supporting use of BI in practice and improving schools' use of evidence

The evaluation findings suggest that while the initial training was a useful introduction to the BI Tool, further support and training opportunities will be needed to encourage ongoing engagement with the BI Tool. While building capacity for the interpretation and use of data in planning and decision-making is not the responsibility of the BI Team, some Principals and school executive staff will need this support to make effective use of the BI Tool. CESE's capacity building program could support this, and Directors, Public Schools and Principals, School Leadership could further support engagement.

Recommendations

9. Develop further options to support users' ongoing engagement with and use of the Tool in coordination with relevant Departmental Divisions and programs, including:
 - policies that encourage use of the BI Tool, for example, only providing SEF reports through the BI Tool or providing additional data through the BI Tool
 - just-in-time support or training when schools begin work on annual school planning and reporting
 - additional fact sheets providing specific guidance about how the BI Tool can be used to answer common questions
 - regular emails with top tips for use and examples of how the BI Tool has been used
 - connecting users to share learnings about how the BI Tool can be used in practice
 - capability building in the use of data in the BI Tool for decision-making through CESE's capacity building program.
10. Encourage and support Directors, Public Schools and Principals, School Leadership to support engagement with and use of the BI Tool for informed decision-making. Principals, School Leadership would require access to reports from relevant schools to fulfil this role.

6.2.5 Supporting Power Users and Technical Super Users

The experienced analysts who have become Power Users and Technical Super Users generally understand how to use the BI Tool. Power Users who are less experienced, but would like to use PowerView, could benefit from one-on-one support. Additionally, a data dictionary or connections to data stewards would help those that are new to the Department.

Recommendations

11. Develop further options for supporting Power Users and Technical Super Users, for example, connecting Power Users who would like to build reports in PowerView to experienced users or providing follow-up training.
12. Develop a data dictionary and/or more clearly identify the stewards for particular datasets in the BI Tool.

6.2.6 Monitoring and evaluation

The evaluation experience has provided some learnings for future monitoring and evaluation of the BI Tool. To better assess the breadth and depth of ongoing engagement with the BI Tool it will be important to download and retain system data for longer than the two months it is automatically stored in the system. Keeping records of training sessions in which system performance issues are encountered, and continuing use of the training survey and short real-time surveys could also help the BI Team to monitor user experience and make adaptations as needed. While it will remain difficult to capture baseline data about the time it takes to compile data from existing Departmental data sources (to then assess the efficiency gains that the BI Tool enables), the point of registration may represent the best opportunity for capturing this information.

Recommendations

13. Develop performance indicators to monitor uptake, use and system performance. Report these through existing governance groups to inform ongoing assessment of, and refinements to, the BI Program.
14. Continue to collect feedback from training participants, but refine the survey to capture whether participants feel that they have gained a sufficient understanding to apply the Tool in planning and decision-making and, if not, what additional support they require. The number of open-ended questions could also be reduced as respondents tend to repeat the same comments across different questions.
15. Continue to the use of short real-time surveys to collect feedback about experience with the BI Tool. These surveys could be implemented quarterly or more frequently depending on how often changes and improvements are made to the Tool.
16. Build baseline information about the time it takes to collect data from existing Departmental sources, for example, by capturing this information when e-learning is completed.

Appendix 1. Uptake by Principal Network

Principal Network*	Training or presentation in Network		Schools in Network^	% of schools in Network trained	
	2014	2015		by 2014	by 2015
Parramatta	Presentation and training	Presentation	29	62%	90%
Hawkesbury	None	Training (2)	34	12%	76%
The Hills	None	None	34	53%	71%
Far West	None	Training (3)	20	0%	70%
Canterbury	Presentation	None	35	60%	66%
Barwon	Training	None	34	26%	65%
Penrith	Training	Training (2)	34	32%	65%
Tamworth	Presentation and training	Training (3)	34	9%	65%
Lake Macquarie East	Presentation	Training (1)	35	40%	63%
Bathurst	Presentation and training	Training (1)	39	55%	59%
Warringah	Training	None	34	-	59%
Botany Bay	Presentation and training	None	31	41%	58%
Macquarie	Training	Training (4)	31	36%	58%
Dural	Presentation	Training (4)	35	37%	57%
Glenfield	None	None	31	39%	55%
Gosford	Presentation and training	Training (3)	38	51%	55%
Wollongong North	Training	None	40	35%	53%
Queanbeyan	Training	Training (2)	31	26%	52%
Woronora River	Training	Training (2)	33	48%	52%
Deniliquin	None	None	32	3%	50%
Liverpool	Training	None	35	23%	49%

Principal Network*	Training or presentation in Network		Schools in Network^	% of schools in Network trained	
	2014	2015		by 2014	by 2015
Wagga Wagga	Training	Training (2)	35	22%	49%
Wollongong	None	Training (2)	37	30%	49%
Wyong	None	None	39	31%	49%
Lake Macquarie West	Presentation	Training (4)	33	32%	48%
Maitland	None	Training (2)	38	32%	47%
Griffith	Training	None	35	17%	46%
Southern Tablelands	Presentation	None	37	26%	46%
Blue Mountains	None	None	32	13%	44%
Fairfield	None	Training (2)	34	24%	44%
Newcastle	Training	None	27	36%	44%
Callaghan/ Port Stephens	None	None	37	26%	43%
South Coast	None	Training (2)	37	30%	43%
Coffs Harbour	None	Training (2)	33	27%	42%
Great Lakes	None	None	33	38%	42%
Nirimba	Training	None	33	36%	42%
Strathfield	None	None	33	19%	42%
Tweed	None	None	32	31%	41%
Northern Tablelands	None	Training (3)	35	11%	40%
Bankstown	None	Presentation and training (4)	36	19%	39%
Port Jackson	Presentation	None	37	24%	38%
Richmond Valley	None	None	37	37%	38%
Hunter	Training	Presentation and Training (1)	30	16%	37%
Connected Communities	-	Training (2)	17	-	35%

Principal Network*	Training or presentation in Network		Schools in Network^	% of schools in Network trained	
	2014	2015		by 2014	by 2015
Wollondilly	None	None	34	29%	35%
Wollemi	None	None	29	6%	34%
Campbelltown	None	Training (2)	34	12%	32%
Port Hacking	None	None	34	29%	32%
Eastern Creek	None	Training (2)	35	23%	31%
Lachlan	None	Training (1)	30	19%	30%
Ku-Ring-Gai	None	None	34	18%	29%
Marrickville	None	None	34	15%	29%
Far South Coast	None	None	32	28%	28%
Lismore	Training	Training (3)	37	14%	27%
Mid North Coast	None	None	33	18%	27%
Western Plains	None	None	30	3%	27%
Hornsby	Training	None	31	23%	26%
Macarthur	None	None	34	11%	26%
Cootamundra	None	None	35	20%	23%
Georges River	None	None	36	17%	22%
Holroyd	None	None	32	16%	19%
Clarence Valley	Training	None	34	15%	18%
Orange	None	None	34	11%	18%
Albury	Training	None	36	17%	17%
North Sydney	Training	None	35	6%	14%
Hastings	Training	None	31	6%	6%
Total	-	-	2210	-	-

Source: Data on registered users at the school level. Proportions are calculated based on the first user registered for the school (where a school has more than one user).

*Sessions at ATP Eveleigh (n=10) and Macquarie Park (n=1) could not be matched with a Principal Network.

^Number of schools in Network uses 2015 data. In some cases, numbers have changed slightly since 2014. Calculations exclude 1 school with Network unassigned.

Appendix 2. Training feedback

Figure 12. Understanding Business Intelligence

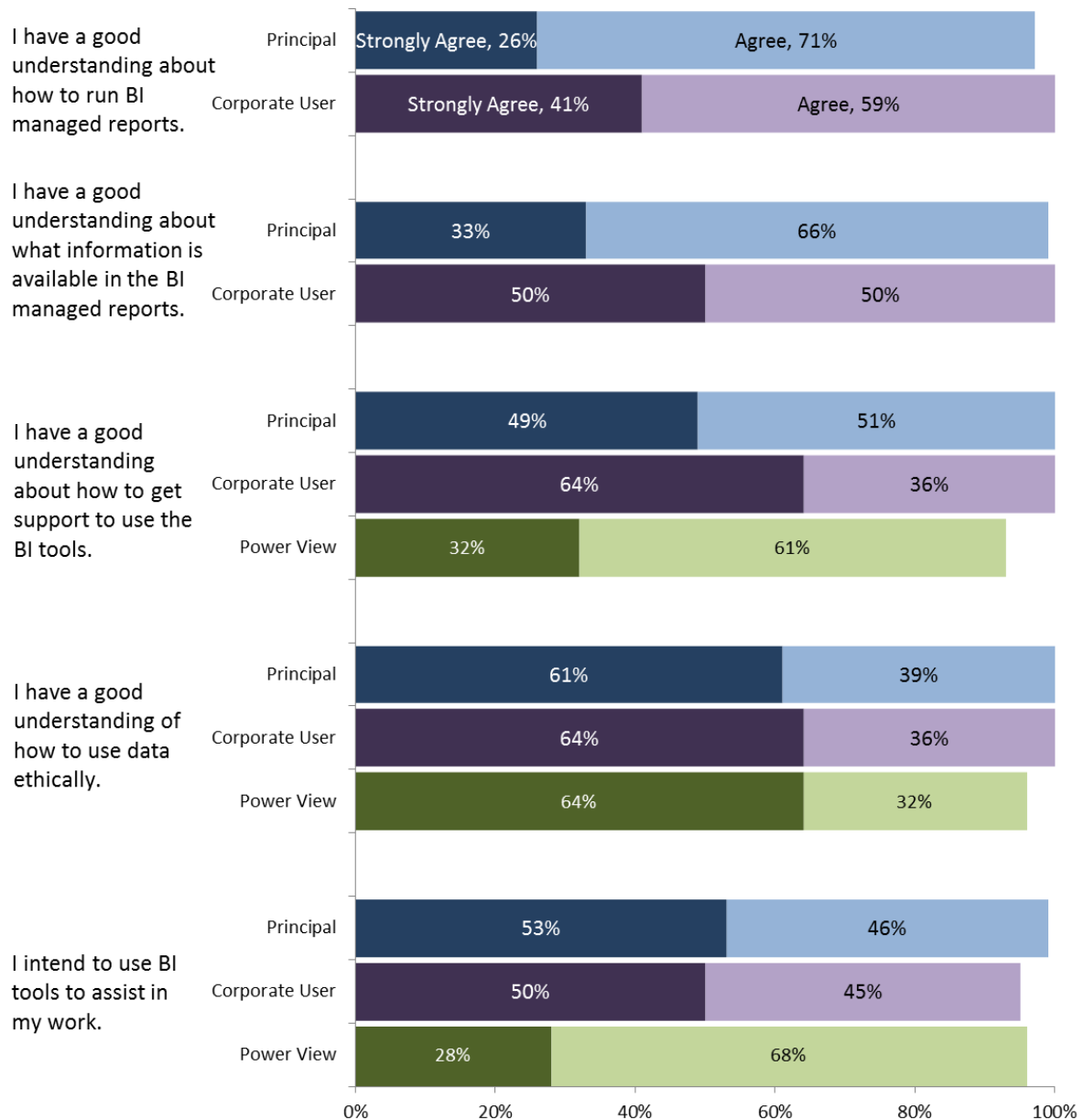


Figure 13. Training materials

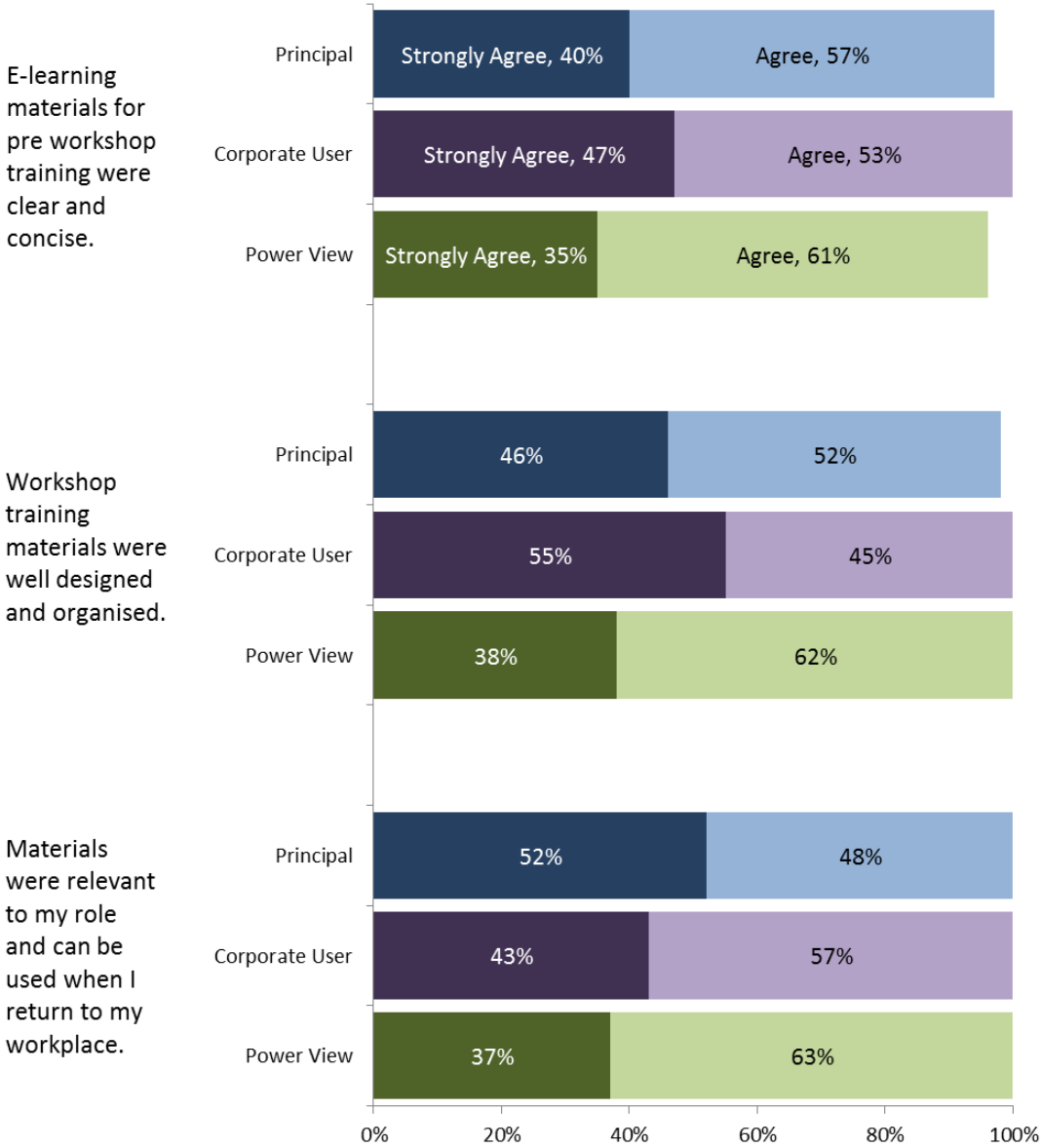


Figure 14. Trainer

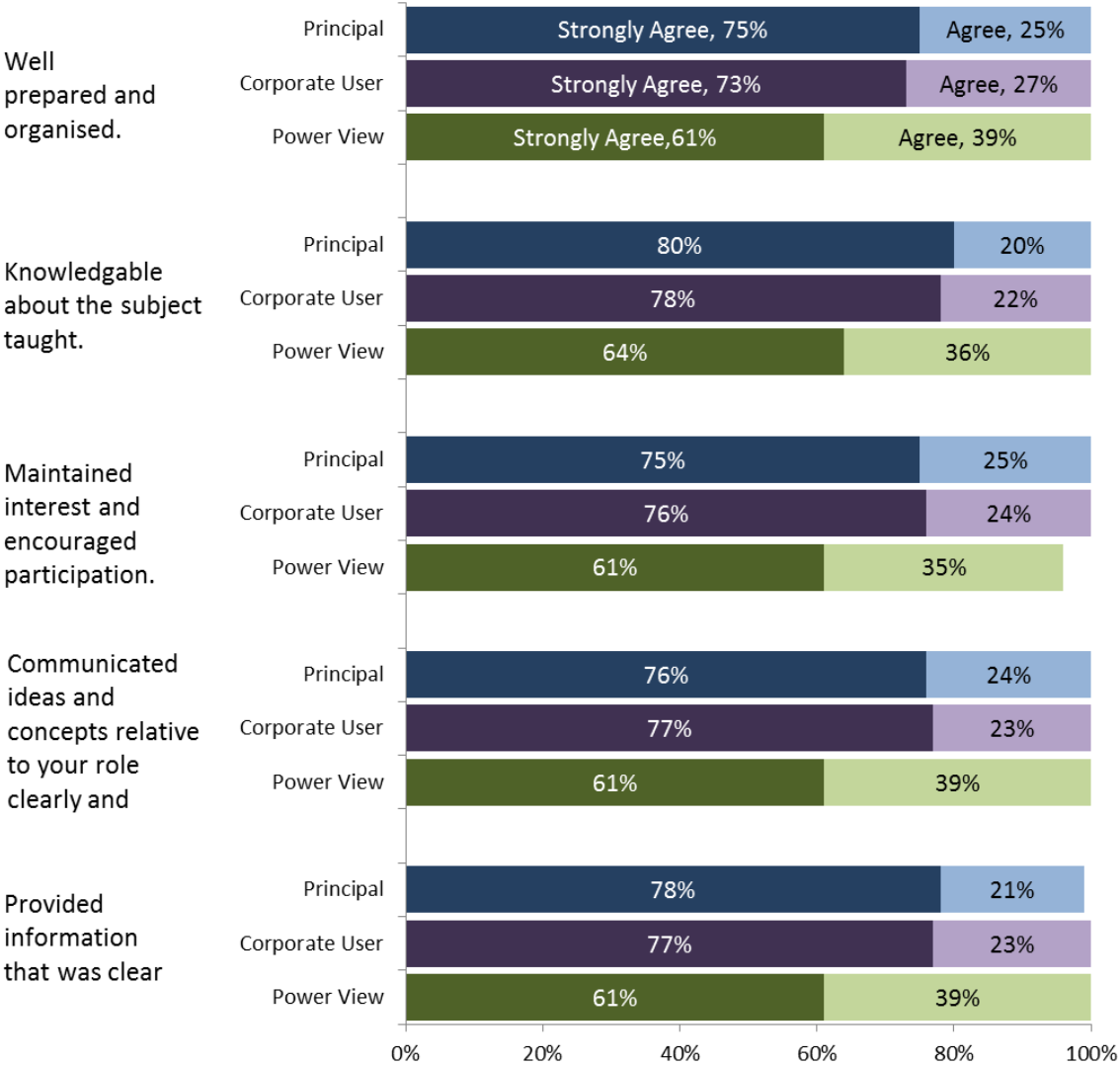


Figure 15. Co-facilitator

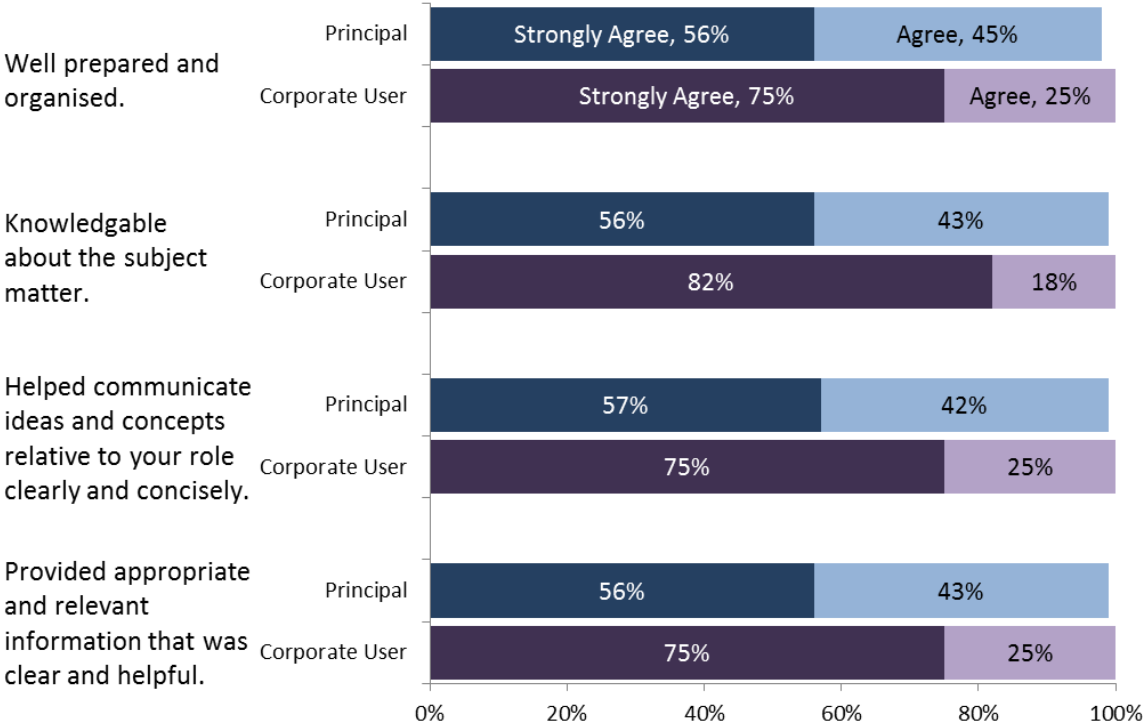
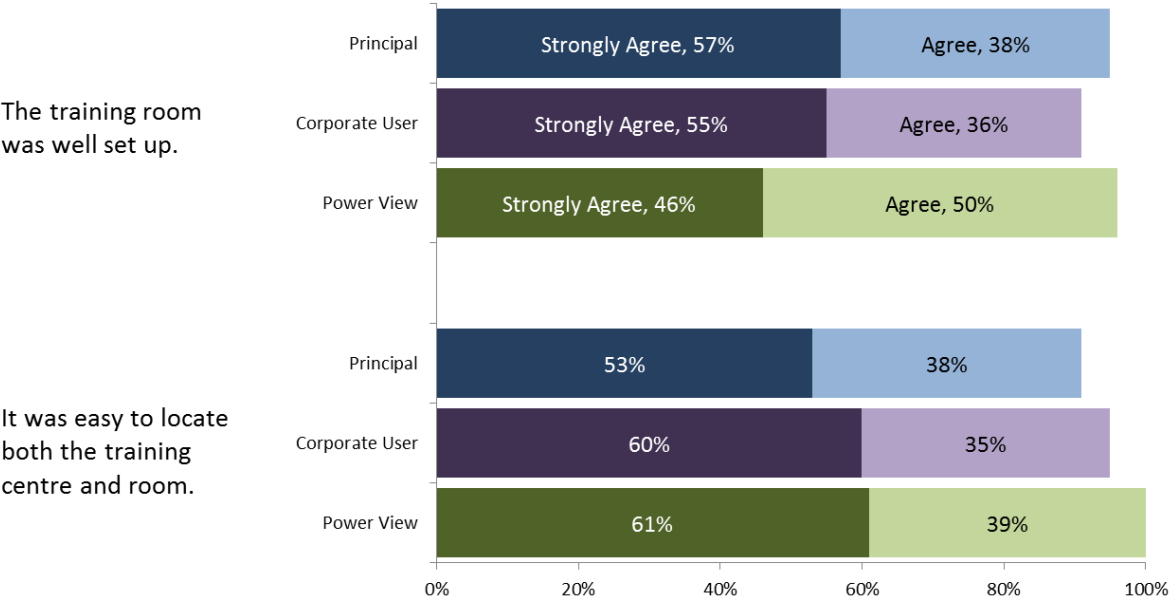


Figure 16. Training facilities



Appendix 3. Requests for additional information in the BI Tool

All requests from three or more people are marked with an asterisk.

Request	Available/ possible
Additional data	
Financial data* <ul style="list-style-type: none"> At school level High-level information across schools RAM (Resource Allocation Model) funding — amalgamated 	<ul style="list-style-type: none"> Not in the BI Tool. Financial data at school level is available to 229 schools with LMBR and broader access is tied to LMBR roll-out. Schools have access to RAM outcomes
Asset Management Data	<ul style="list-style-type: none"> Not available in the BI Tool and no current plans to add it
Tell Them From Me data*	<ul style="list-style-type: none"> Has been added to the BI Tool and will be released before end of 2015
Broader enrolment data <ul style="list-style-type: none"> Live and go data - number of children in the catchment area and what schools they go to, children in outer zone, high school that Year 6 students go to In-zone vs out of zone enrolments 	<ul style="list-style-type: none"> Live and go data is available in the BI Tool In-zone vs out-of-zone enrolments available in school finder, but not yet released
Attendance data*	<ul style="list-style-type: none"> Available in the BI Tool
Suspension data*	<ul style="list-style-type: none"> Not requested for the BI Tool, so no current plans to add it. It is available in ERN.
Plan data and continuum mapping	<ul style="list-style-type: none"> Not available in the BI Tool and no plans to make this available as the test is being replaced to address issues of reliability
More HSC data* <ul style="list-style-type: none"> Results Analysis Package – HSC More HSC data e.g. HSC Band results 	<ul style="list-style-type: none"> Results Analysis Package not available and no current plans to add it HSC Band results available in the BI Tool
ATAR data* <ul style="list-style-type: none"> Longitudinal (10 years) 	<ul style="list-style-type: none"> Requires access to data from the Universities Admission Centre; work being progressed to access this for BI
Post School Pathways <ul style="list-style-type: none"> e.g. success of students supported towards a particular apprenticeship Transition to university post-HSC data 	<ul style="list-style-type: none"> Data owned by universities; to be included in Release 5

Request	Available/ possible
VET data	<ul style="list-style-type: none"> Currently not available to the Department
Positive Behaviour for Learning data	<ul style="list-style-type: none"> Not available
School student mobility as an annual percentage of total population	<ul style="list-style-type: none"> Not available
Data that schools collect* <ul style="list-style-type: none"> e.g. Reading Recovery data local assessment data (not specified—assume means data the school collects) 	<ul style="list-style-type: none"> Not available
Information about the evidence base for particular programs (e.g. Focus on Reading, MultiLit for reading comprehension), assessment tools for schools to use to assess these programs, and the data from assessments	<ul style="list-style-type: none"> Source data is not available and generating it through data collection from schools would require additional licenses
Teacher accreditation* <ul style="list-style-type: none"> Teachers and approved subjects 	<ul style="list-style-type: none"> Available in the BI Tool now, but not at the time of the evaluation
Staff professional development* <ul style="list-style-type: none"> Teacher and SAS staff compliance training Information visible across schools that staff members have worked in 	<ul style="list-style-type: none"> Teacher and SAS staff compliance training not available, and no current plans to add Having information visible across schools depends on the development of a new data source called PLAS
Staff leave—sick leave, other	<ul style="list-style-type: none"> Available
Population data <ul style="list-style-type: none"> Number of 5 year olds in the region to inform expected enrolments Community demographics 	<ul style="list-style-type: none"> Will be available in the BI Tool by end 2015
Information drawn from other government departments <ul style="list-style-type: none"> Information about parents e.g. a Defence family (can apply for funding for support for student)? Refused a Working with Children Check? 	<ul style="list-style-type: none"> Some information, including health and crime data, will be available by end 2015
Updated data	
Updated NAPLAN data	<ul style="list-style-type: none"> Added annually
Information cut in additional ways	
Ability to compare 'like' schools	<ul style="list-style-type: none"> Available in the BI Tool
Trend data by Network, ability to compare school to other schools in the Network (requested by Directors, Public Schools)	<ul style="list-style-type: none"> Not available, no current plans to make available, as 'like' schools measure is used for comparisons
Ability to track NAPLAN results for the same cohort over time (i.e. through Year 3, 5, 7, 9)	<ul style="list-style-type: none"> Available in the BI Tool

Request	Available/ possible
Student performance data by attendance	<ul style="list-style-type: none"> ▪ Available in the BI Tool
Student performance by teacher	<ul style="list-style-type: none"> ▪ Available for primary schools, but technically complex
Student performance by welfare/ Tell Them From Me*	<ul style="list-style-type: none"> ▪ Not currently possible in the BI Tool
Student performance or attendance by SES	<ul style="list-style-type: none"> ▪ Available, using Socio-Economic Indexes for Areas (SEIFA) or Family Occupation and Education Index (FOEI)
Compare ATAR and HSC back to NAPLAN	<ul style="list-style-type: none"> ▪ Possible (pending permission to release ATAR)
Capability	
Ability to export the data to excel	<ul style="list-style-type: none"> ▪ Not possible in Release 1 but will be with other Releases
Ability to drill down to individual staff level e.g. for absent days	<ul style="list-style-type: none"> ▪ Is possible
Ability to drill down to individual student*	<ul style="list-style-type: none"> ▪ Is possible
All features of SMART	<ul style="list-style-type: none"> ▪ Not currently available in the BI Tool
Making BI more accessible	
Locating BI in Department portal/ Principal dashboard	<ul style="list-style-type: none"> ▪ The BI Tool is in the Department portal but there was an initial issue with it not appearing for some users



VISIT LEVEL 4, 352 KENT ST SYDNEY NSW 2000
MAIL PO BOX 1167 QUEEN VICTORIA BUILDING NSW 1230
TEL 02 9373 9900
WEB ARTD.COM.AU

ARTDCONSULTANTS
strategy & evaluation