Deloitte Access Economics

Early Learning Languages Australia: 2016 trial evaluation

Final report

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Contents

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Acronym list

ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
ARIA	Accessibility/Remoteness Index of Australia
BYOD	Bring Your Own Device
ELLA	Early Learning Languages Australia
EOI	Expression of interest
ESA	Education Services Australia
LDC	Long day care
SEIFA	Socio-Economic Indexes for Areas
SES	Socioeconomic status
STEM	Science, technology, engineering and mathematics
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VET	Vocational education and training

Overview of key findings

The Early Learning Languages Australia (ELLA) program is an ongoing Australian Government initiative featuring language-based applications (apps) on tablet devices, which provides opportunities for language exposure for preschool children. This report is the evaluation of the 2016 ELLA trial.

The ELLA trial sites generally found the program easy to implement. There were minimal costs associated with program implementation, and 93% of educators responding to the evaluation survey stated that the ELLA apps were either 'very' or 'somewhat easy' to introduce to the preschool. The majority of educators also found the ELLA supports helpful, most particularly the ELLA educator workshops. However, **holding the workshops earlier in the year may have increased educator engagement** and mitigated some initial misunderstandings around the ELLA program's implementation and delivery.

Preschools being required to provide their own devices, which was a new feature of the 2016 ELLA trial, resulted **an increase in the tablet-to-child ratio within preschools** as compared to the 2015 ELLA trial in which iPads were provided to preschools. Accordingly, while absolute engagement with the ELLA trial was high, **with more than 8,000 active users**, on a per child basis, usage of the ELLA apps was slightly lower than in 2015. In 2016, ELLA participants used the apps for an average of 12.6 minutes per week, with the most active 10% of children accounting for 36% of total app usage.

Engagement with the ELLA trial **has shown positive results in increasing language exposure for preschool children**. Of the educator survey respondents, 17% stated that 'all' children were able to speak words in the target language, while a further 36% reported that 'most' children were able to speak words. Additionally, approximately 70% of educator survey respondents stated that the ELLA apps had facilitated children showing more of an interest in, and understanding of, other cultures.

Educators also reported benefits associated with being involved with the ELLA trial, with 75% stating they had **more confidence incorporating language learning** into their preschools, 68% stating they had **more confidence incorporating digital technology** into their preschool program and 87% noting that they expected children to continue to demonstrate an interest in learning about additional languages.

Family observations of the ELLA program were also positive, with more than 60% of parent/guardian survey responses stating they would recommend the ELLA program be adopted in other preschools. Additionally, more than two-thirds of respondents stated that they had observed their child using at least one word in the target language at home. However, there was relatively low awareness of the ELLA trial among participating families, with 36% of survey respondents stating that they had not heard about the trial until receiving the survey (despite parental consent being required for participation).

As the ELLA program becomes nationally available in 2017, it is likely to be adopted by a growing number of preschools. The **preconditions for a successful expansion**, established through the evaluation, include (1) timely and effective support for educators; (2) engaged educators with the confidence and skills needed to implement, deliver and scaffold the ELLA program appropriately; (3) participant access to the apps to a level that enables meaningful engagement; (4) a continual growing of the evidence base underpinning the ELLA program; and (5) an extensive stakeholder engagement strategy.

Executive Summary

The Early Learning Languages Australia (ELLA) program is an ongoing Australian Government initiative featuring language-based applications (apps) on tablet devices for preschool children. ELLA was initially trialled in 2015[1], and then extended into 2016. This report is the evaluation of the 2016 ELLA trial.

The primary objective of ELLA is to provide language exposure for preschool children, help address barriers to language education in the early years of education, and encourage further language learning in later years of schooling.

The 2016 ELLA trial

At the broadest level, the ELLA trial was developed by the Australian Government in the context of a commitment to expand the teaching of languages in Australia. The Australian Government is committed to supporting language study, commencing from the early years. The ELLA trial was established as one part of the Australian Government's endeavours toward achieving this.

During the 2015 evaluation, the objectives of the ELLA trial were confirmed as being to:

- expose preschool children to languages other than English through a digital platform, improve cognitive development, encourage further language education and develop in children an understanding of other cultures; and
- contribute to transforming language education in Australia in the early years of schooling by addressing barriers to language education and initiating end-to-end language learning opportunities for children.

The 2016 ELLA program was advertised as a suite of materials, including apps for educators and families, resource material and educator support networks, developed through the ELLA trial to support the effective delivery of early language learning in preschools.

A total of 349 preschools applied for the 2016 trial, including 40 preschools that continued their participation from 2015 (out of 41). Trial sites were located in each state and territory, with a mixture of metropolitan, regional and remote locations. They comprised settings including school-based preschools, stand-alone preschools and preschools in a long day care (LDC) setting. For the duration of the trial year, each site used apps in one language that they selected.

Five languages were offered through the trial – Chinese (Mandarin), Japanese, Indonesian, French and Arabic. Seven apps were developed for each language, with the apps being progressively released throughout the year. Each app was comprised of four to six activities.

In light of the expanded nature of the 2016 trial, and drawing on learnings from the 2015 experience, several features of the ELLA trial design were refined in 2016, including:

[1] The 2015 evaluation can be found here: https://www.education.gov.au/evaluation-early-learning-languages-australia-trial-final-report

- Trial sites were given the flexibility to choose their own language – rather than being allocated a language.
- Trial sites were not provided with tablets – sites were expected to supply their own tablet devices.
- ELLA apps were able to be used on Android devices in 2016, whereas in 2015, they were only used on iPads.
- The level of support provided to sites by Education Services Australia (ESA) was relatively less intensive. While support was still available, it was spread across approximately 300 sites, compared with 41 the previous year.
- Two additional apps were introduced, the ELLA educator app and the ELLA family app.
    - The ELLA educator app aims to provide educators with information and support to enable and enhance the implementation of the ELLA program.
    - The ELLA family app features a version of the ELLA apps in demo-mode. It was developed to provide families with information to support their child's participation in language learning at home.

Evaluation approach

The evaluation was designed to encompass both process and outcome evaluation questions. Process evaluation has focussed on the effectiveness of trial implementation. Outcome evaluation has considered if the ELLA trial has led to increased exposure to another language, along with observations from educators and families regarding children learning some of the language they have been exposed to.

The evaluation of the ELLA trial was conducted over the course of the 2016 school year. It drew upon on a range of information sources, enabling a mixed-method qualitative and quantitative evaluation approach. These sources comprised: app usage data; an online survey of educators at trial sites; an online survey of parents and guardians of children participating in the trial; phone consultations with 24 trial sites (including five sites that were in their second year of the ELLA trial); a literature review on the use of digital technology for language learning in preschools; and, consultations with state and territory educational authorities. The evaluation approach, including the evaluation plan, was approved by a Human Research Ethics Committee.

The evaluation cannot yet shed light on the long-term return on investment or cost-effectiveness of the ELLA program as a means of increasing language learning in Australia. This is due to the innovative nature and relatively early stage of the trial, which make it difficult to compare the ELLA program against alternative programs or assess the longitudinal impacts over time. However, a longitudinal study of the program's impact could explore these issues, as discussed further below.

Trial implementation

Following a targeted expression of interest (EOI) process, in which invitations to participate were sent to preschools that had expressed interest in the 2015 ELLA trial, 349 preschools initially expressed an interest to participate in the 2016 trial. Over the course of the year, a number of preschools withdrew from the trial. This may have been because preschools:

- did not fully understand the requirements involved in participating in the expanded 2016 trial, especially in relation to the introduction of the Bring Your Own Device (BYOD) model;
- faced unexpected complexities in implementing the program (such as difficulty obtaining the required tablet hardware or the timing of the implementation);
- may have signed up to the program without fully informing the educators about the program requirements and who would be implementing ELLA; or
- decided to withdraw from the program after starting due to staffing changes or because educators found the ELLA program did not fit with the rest of their learning program.

Preschools that had not started using the first app (released on 28 February 2016) by July 2016 (when app five was released) were asked to withdraw from the 2016 ELLA program as their participation was not consistent with the program intent. In order for the full benefits of ELLA to be realised, the program is designed to be implemented over the school year. As of November 2016, 285 preschools remained registered in the ELLA trial, with 249 of these sites actively using the apps. A timeline of the implementation process is shown in Figure i.

Figure i: Timeline of the implementation process

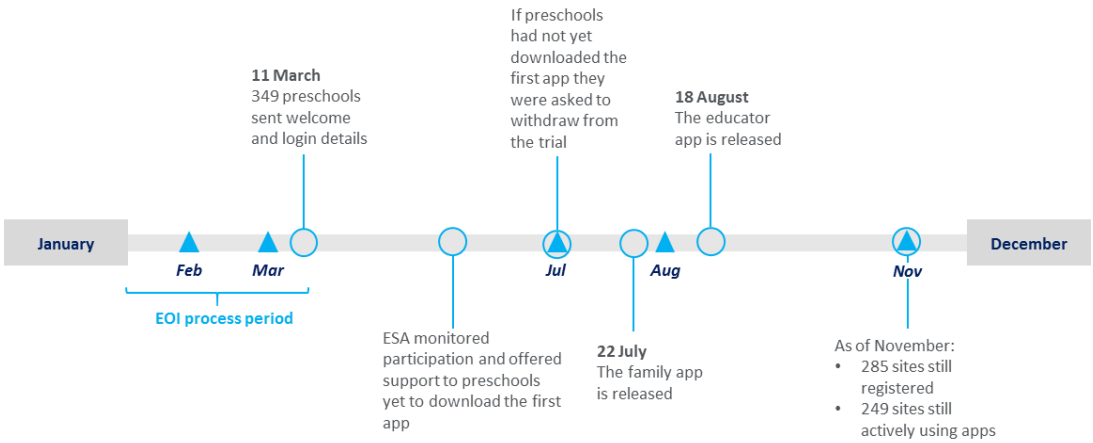
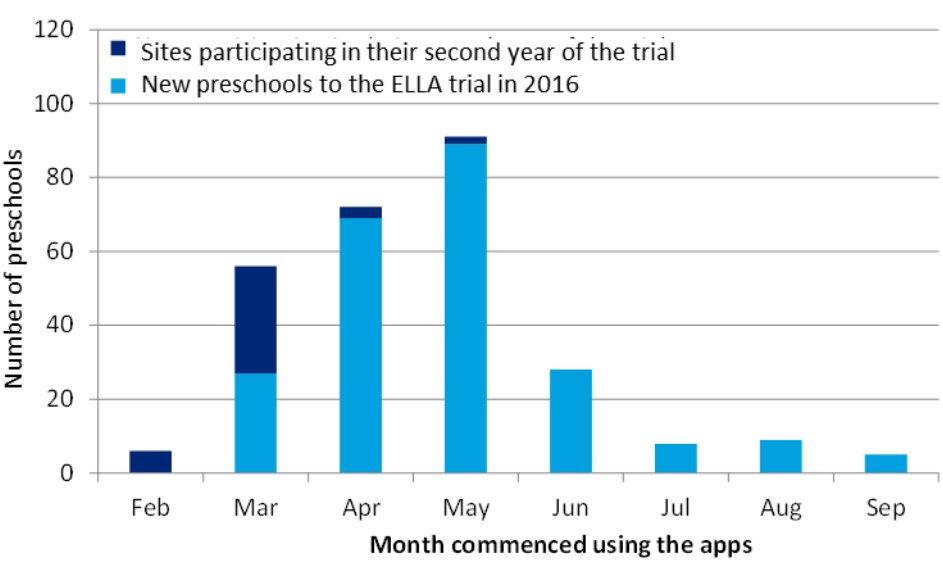


Chart i shows that most sites commenced using ELLA apps in April or May 2016. Sites using ELLA for the first time were more likely to begin using the apps somewhat later than those continuing from 2015.

Chart i: Weeks taken to commence ELLA trial, new and second-year trial sites



Source: Deloitte Access Economics analysis of ELLA app data

Evidence from consultations also supports the finding that some sites commenced using the apps well into the year. Based on consultations, some preschools lacked confidence when familiarising themselves with the apps. In some cases, this was due to a lack of understanding regarding the purpose of the apps and what was expected of preschools.[2] Educators and preschools typically overcame these issues throughout the year. For example, 93% of respondents to the educator survey reported they could 'very easily' or 'somewhat easily' introduce the apps to children.

Trial sites reported minimal costs associated with program implementation, with a few sites (4 out of 24 trial sites consulted) purchasing tablets explicitly for participating in the ELLA trial. However, the tendency to rely on tablets already owned by preschools contributed to most sites having a relatively low number of tablets per child (average of 9.8 children per device). A significant proportion of respondents to the educator survey (41%) indicated they did not have enough tablets. In the 2015 trial, one iPad was provided for every five children, and it is understood that for the 2017 program, a ratio of one device per five children will be recommended.[3]

In comparison with the 2015 trial, more sites involved in the 2016 trial faced challenges in local implementation of the ELLA apps. This appeared to be due to sites being required to supply their own devices, along with a less intensive model of implementation support being available to sites.

[2] To address the issue of delayed implementation, apps for the 2017 program opened on 14 November 2016 (with the aim of bringing implementation activities forward in the year).

[3] In 2017, the Australian Government is providing a $500 support payment for up to 1,000 eligible preschools located in low socioeconomic status (SES) areas, to support their participation in ELLA. The EOI process commenced earlier than previous years, with applications open from 14 November 2016 to support smooth implementation and early communications to assist new preschools in program delivery.

Support for preschools

Preschools participating in the 2016 trial could access support through the same channels available in 2015, including a helpdesk operated by ESA, the ELLA website and ELLA Facebook page. However, the number of participating preschools was considerably increased. During consultations, some preschools indicated an initial lack of understanding of the supports available to them.

The support available to preschools appeared to become more widely utilised following the ELLA workshops that were held throughout Australia in July and August 2016. Many preschools identified these as a turning point for their engagement with the ELLA trial. The workshops built educators' understanding of ELLA, along with their confidence in delivering the program. However, there was a widespread view that the workshops would have preferably occurred earlier in the year. If this had occurred, the delayed commencement in using the ELLA apps that occurred at some sites may have been avoided or minimised. It should be noted here that due to this feedback, the educator workshops will be held earlier in 2017.

By trial conclusion, 56% of educators reported that they found the trial supports 'very helpful', with a further 40% reporting trial supports to be 'somewhat helpful'. 83% of educator survey respondents stated that they understood the supports available, although not every support was used by every trial participant. For example, 73% of survey respondents used the ELLA website, 40% attended the workshop, and 35% reported using the educator app. Among only those that had used the supports, the most helpful support tools were stated to be the workshop (83% of respondents finding it 'very helpful'; 16% finding it 'somewhat helpful'), the educator app (62% finding it 'very helpful'; 37% finding it 'somewhat helpful') and the ELLA website (45% finding it 'very helpful'; 52% finding it 'somewhat helpful').

Because the educator app was released in August 2016, it has not been thoroughly evaluated at this time. However, only 35% of respondents to the educator survey reported using the app, with time constraints and satisfaction with existing supports being cited as reasons for not using the app. It is likely that, due to its development time and feedback from the 2015 trial, the educator app's late release reduced its usage during the time period evaluated in this report.[4] Those that did use the app generally felt it positively supported their implementation and delivery. As such, the educator app is being further promoted in communications materials for 2017.

In comparison with the 2015 trial, a slightly higher proportion of educators were unaware of the trial supports available to them in 2016. However, similar to 2015, the ELLA educator

[4] The educator and family apps were introduced midway through the 2016 trial because they were being developed in the first half of 2016, as a result of a recommendation of the 2015 ELLA evaluation. As the app will be ready for the start of the 2017 program; usage of the educator app is expected to more widespread throughout the year.

workshops and website continue to be seen as the most helpful forms of educator support for the trial.

Trial delivery

A noticeable feature of the 2016 trial was the variability in the ways in which the ELLA program was delivered in preschools. This was evident in the different ways in which the apps were used, and in the diversity of complementary activities introduced to support child engagement and learning.

Educators responding to the survey largely considered they could introduce the ELLA apps to their preschool 'very easily' (57%) or 'somewhat easily' (36%). However, there was diversity between preschools in the methods educators adopted in introducing the apps.

For example, it was observed that:

- Some educators interacted actively with children while they used the apps, while other educators typically left children to use the apps by themselves.
- During consultations, most educators agreed that activities to complement (or scaffold) child learning were critical to reinforce the words and concepts emerging from the ELLA apps. However, there was significant variation in the nature and frequency in how these additional activities were delivered.
- Tablets were often used differently across preschools, with individual use, use in pairs, or use in groups of three or more all reported.
    - A small number of preschools placed a significant emphasis on group learning. At these sites, educators reportedly relied on smartboards to allow the apps to be used as an entire group.
- Some preschools reported using the apps during set times of day; others allowed children to have access to the apps whenever they wanted.
- Most preschools consulted enforced a time limit in order to manage screen time and ensure shared access.

As part of the support for the 2016 trial, educators were encouraged to introduce, and were given advice on, scaffolding activities to complement the ELLA program. However, given the inconsistencies in delivery across sites, it would be desirable for existing advice on best practice, (such as appropriate scaffolding activities, or the optimal number of tablets per children), to be more clearly communicated to participating sites from the commencement of 2017. It is understood that these recommendations are being implemented to inform educators about ELLA in 2017.

Trial engagement

Trial engagement has been assessed across two domains – family engagement and child engagement.

Family engagement and perspectives

Engagement of parents/guardians with the ELLA program delivery in the preschool varied significantly – with some families helping to facilitate complementary activities and some preschools reporting no interaction with families regarding ELLA.

Despite parental consent being required before children could participate in the ELLA trial, awareness of the program among family survey respondents was somewhat low, with 36% of respondents stating they had not heard about the trial until receiving the survey.

Of the families that were aware of the trial, more than 60% were happy with the level of information received, while one in five families would have appreciated additional information – particularly around trial delivery methods, expected outcomes and screen time. Although the family app was introduced to help facilitate family understanding and engagement, 75% of parent/guardian respondents were unware of the app. This may be attributable to the app only becoming available well into 2016. [5]

Expectations of the impacts on children participating in the ELLA trial were high, with more than 70% of families indicating they expected their child to continue to learn another language, and more than 60% of families expecting their child's vocabulary in the target language to continue to increase and their cultural awareness and understanding to increase. 96% of family survey respondents agreed that language and culture programs in preschool were a positive initiative.

The majority (68%) of parents/guardians supported the notion that tablets can be effective educational tools in preschools. Respondents that disagreed with this predominately cited concerns around screen time, the passive nature of tablet use, and the ability of children to convert their learnings from apps into real life.

More than two-thirds of parent/guardian survey responses stated that they had observed their children using at least one word in the target language, learnt through the ELLA trial, at home. However, family perspective on whether the program helped to facilitate their child's interest in the culture associated with the trial language was mixed – with 44% stating they did not observe any change.

A high majority of educator survey responses indicated that parents/guardians had a positive view of the ELLA trial, with only four (from 192) educators disagreeing with this sentiment. More than 60% of parent/guardian survey responses stated that they would recommend the ELLA program be adopted in other preschools.

Child engagement

Child engagement was considered across two domains: the *frequency* with which children accessed the apps; and *how* the apps were used. Child engagement was largely assessed through analysis of the ELLA app usage data, supported by educator survey and consultation responses.

The frequency with which children accessed the apps was seen as a measure of the quantity of language children are exposed to as a direct result of the ELLA apps. The extent that children were exposed to the target language through additional activities to scaffold

[5] The educator and family apps were introduced mid-way through the 2016 trial because they were being developed in the first half of 2016, as a result of a recommendation of the 2015 ELLA evaluation. As the app will be ready for the start of the 2017 program, usage of the family app is expected to more widespread throughout the year.

language learning is not captured through the ELLA app usage data. A snapshot of total trial usage is shown in Table i, along with comparisons to usage across the 2015 trial.

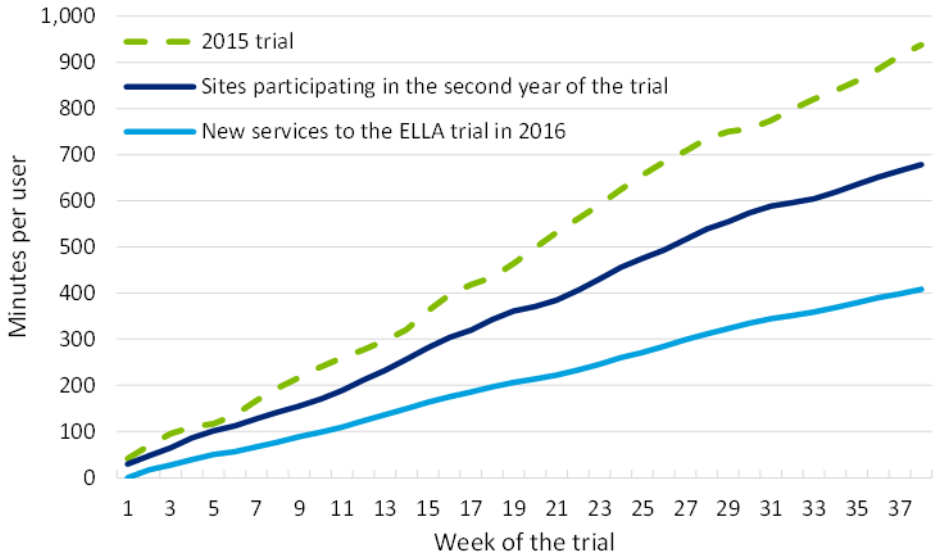
Table i: Overall usage statistics, by child

	As at week beginning 20 November 2016	2015 trial
Total active users	8,502	1,771
Number of sessions	434,097	234,956
Average sessions per child per week	1.8	4
Median sessions per child per week	1.1	3.9
Total hours	50,376	27,661
Average minutes per child per week	12.6	28.5
Average minutes per session	7.0	7.1
Median minutes per session	6.9	7.0
Number of users above average	26%	24%
Users with average sessions at least 5 minutes	84%	92%
Users with average sessions at least 10 minutes	14%	7%

Source: DAE analysis of ELLA app data

Overall, usage has decreased on a per child basis compared to 2015 levels, as illustrated in Chart ii below.

Chart ii: Minutes per user by week of trial, 2015 and 2016 trials

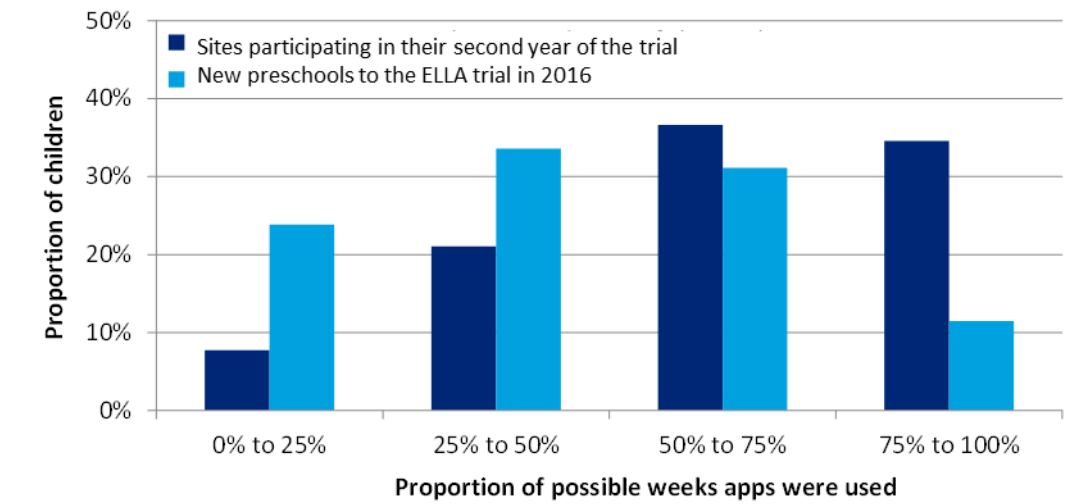


Source: DAE analysis of ELLA app data

Throughout the 2016 trial, children were less likely to engage with the apps every week, and there were many more instances of no ELLA app usage in a preschool over a given week.[6] The data analysis shows that 45% of children participating in the trial logged in less than once per week (compared with 25% in the 2015 trial).

This is particularly true of children attending preschools new to the ELLA trial in 2016. Chart iii illustrates that at preschools new to the ELLA trial, 57% of children logged in less than half the weeks it was possible for them to do so.

Chart iii: Proportion of weeks apps used in 2016, new and second-year trial sites



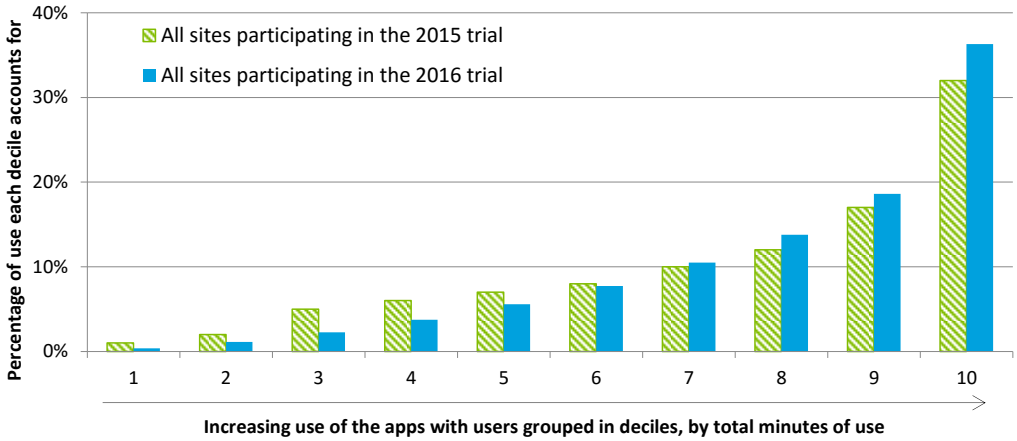
Source: DAE analysis of ELLA app data

However, once the apps were being used, patterns of use were similar between the 2015 and 2016 trials. Both trials exhibited the same length of use per session (an average of about seven minutes per session), distribution of use (largely concentrated in the highest 10-20% of children) and usage patterns (an initial burst of activity whenever an app was released, followed by a moderation of use). Further, the popular activities (in particular, Cake), and the extent of language exposure, remained consistent across both trials.

Chart iii groups children into deciles based on their frequency of app use, and shows the share of total app usage that each decile accounts for. The chart demonstrates that the heaviest users comprise a significant proportion of total app usage. In 2016, the most active 10% of children accounted for 36% of total app use (see the column on the far-right of Chart iv). A similar distribution pattern was observed in 2015. However in 2016, those in the highest-use decile accounted for an even greater proportion of total use than was the case in 2015. This indicates equally significant variability in language exposure. This issue is considered further in discussion of future considerations below.

[6] While some weeks without app usage data being recorded are to be expected due to school holidays, the number of weeks without data being recorded at many sites exceeded the number of weeks of school holidays.

Chart iv: Distribution of child app usage by decile, 2015 and 2016 trials



Source: DAE analysis of ELLA app data

Despite the variability with which children were found to have engaged with the ELLA apps, how the apps were used by children was largely consistent between users. Identified trends include:

- There was an initial burst of high usage associated with the release of every new app, after which usage moderated to a stable level.
- A majority of children (more than 70%) spent between 5 and 10 minutes per session with apps.
- App 3 (Polyglots at the Birthday Party) was found to be the most popular app.
- Cake (within App 3) was the most popular activity by a significant margin.
- The degree of language exposure (the share of time spent listening to the target language, as opposed to performing other tasks), within each app was similar across all users.

Survey responses indicated that 78% of educators felt children were 'very engaged,' with a further 20% reporting children were 'somewhat engaged'. However, educators that responded to the survey were likely to be those most engaged with the trial, which could result in the perceived level of engagement being overstated when based on survey responses alone.

Trial impact

The ELLA trial has shown positive results in ***increasing language exposure for preschool children***.

- The app usage data suggested that engagement with the ELLA apps was consistent throughout the year across many users, and grew in absolute terms as more sites were able to implement the trial. This is likely to have resulted in continued language exposure for children involved in the trial, particularly for children who used the apps frequently.
- As a consequence of exposure to language, some educators observed that children were able to demonstrate a degree of language learning. Seventeen percent of educator survey respondents stated that 'all' children were able to speak words in the

target language, while a further 36% reported that 'most' children were able to speak words in the target language.

  - Educators typically associated positive language learning outcomes with the introduction of additional activities that reinforced language heard while using the apps.

- Approximately 70% of educator survey respondents stated that the ELLA apps had facilitated children showing more of an interest in and understanding of other cultures.
- In addition to the benefits associated with language exposure, educators reported that participation in the trial was associated with improved social interactions and enhanced digital competency.

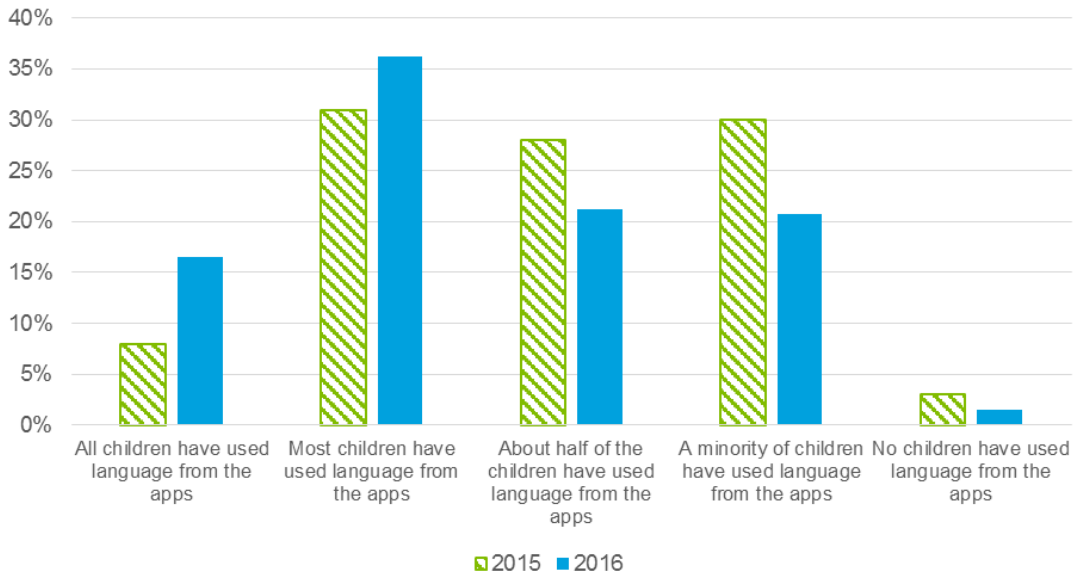
With regard to ***addressing barriers to language education***, the ELLA trial also appears to have been effective in enabling language exposure and learning where the educator is typically not proficient in that language. Responses to the educator survey included:

- Most educators (75%) stated that they got more confidence after the ELLA trial in incorporating language learning into their preschools.
- 68% of educators stated that as a result of the ELLA trial, they have become more confident incorporating digital technology into their preschool program beyond the ELLA trial.
- 87% of educators either agreed or strongly agreed that they expect children to continue to demonstrate an interest in learning about additional languages.

According to the 2016 and 2015 educator surveys, educator perspectives on child outcomes were slightly stronger in the 2016 trial, with a larger proportion of educators in 2016 observing high levels of language use and believing children will continue to be interested in language and culture. For example, 17% of 2016 survey respondents observed all the children using language from the apps, compared to 8% in 2015. Likewise, 21% observed only a minority of children using the language in 2016, compared to 30% in 2015.[7]

[7] In 2015 the survey response rate was higher, with almost 100% of the 41 sites submitting a response, compared with 49% in 2016. The 2016 response may include positive response bias.

Chart v: Children's use of language from the apps, 2015 and 2016 trials



Source: DAE ELLA educator survey (n=193), average of DAE 2015 educator surveys - baseline 2015 survey (n=39), August 2015 survey (n=109), December 2015 survey (n=69)

Future considerations

From 2017 onwards, as ELLA becomes nationally available, the ELLA program is likely to be adopted by a growing number of preschools. Reflecting the fact that the ELLA program required significant development costs, but has a relatively low ongoing marginal cost, the cost per child associated with the ELLA program is expected to continue to decrease over time as the number of participants increase.

However, the benefit of the program being made nationally available and subsequently being adopted by more sites is dependent on the quality of the ELLA program being maintained. Drawing on the findings of the evaluation, there are a number of preconditions considered necessary to support a successful continued expansion of the program. These include:

- ***Timely and effective support for educators***, including face-to-face workshop opportunities close to program commencement for the foreseeable future (or for new educators in existing participating preschools), noting that over time transition to a more self-directed, online-based support model is likely to be appropriate.
    - It was found that the extent of effective integration of the ELLA program within each participating preschool varied and often depended on the approach of individual educator(s) within each site.
    - While providing sites and educators with a high degree of flexibility during the trial phase has been appropriate, there is an opportunity now to emphasise to preschools that the adoption of demonstrated good practices – such as use of scaffolding activities to complement the ELLA apps – is more likely to produce a better experience of the ELLA program for sites, children and families.
    - As the take up of the ELLA program grows, regional networks and technology-based supports will become an increasingly important part of the support model. This will enable a larger number of preschools to be supported cost

effectively. However, face-to-face workshops should continue to be a feature of the support model for the foreseeable future.

- Timely contact and personalised assistance for sites that experience delays implementing the program will assist in maintaining sites' engagement with the program. A similar approach to that adopted during the 2016 trial (in which ESA identified preschools that were yet to commence using the apps, and called these sites directly to offer support) would be appropriate.

- ***Engaged educators that have the confidence and skills*** needed to implement, deliver and scaffold the ELLA program within participating preschools.
  - The ability for the ELLA program to be implemented and delivered effectively is highly dependent on the level of educator engagement and confidence – reiterating the need for effective and timely educator support to be available. The educator app is a positive development to achieve this.
  - If digital-based learning – whether in languages or other areas, such as science, technology, engineering and mathematics (STEM), is to become more widespread, then use of technology in early learning should possibly also be incorporated in early childhood education through the higher education and vocational education and training (VET) systems.
- ***Participant access to the apps to a level that enables meaningful engagement*** with the ELLA program.
  - The BYOD model relies on preschools being able to access tablet technology to support the ELLA program. This raises concerns over whether the ELLA program will be accessible to all preschools who wish to participate, and if tablet-to-child ratios support children within each participating preschool to have adequate access to the apps to ensure full program participation.[8]
  - Additionally, increased prevalence of education apps may result in reduced utilisation of ELLA apps if preschools limit overall screen time, acknowledging there are national guidelines relating to the appropriate amount of screen time for preschool children.
- ***A continuous growing of the evidence base underpinning the ELLA program***, which informs both the ongoing refinement of good practice guidance and further investigation of the long-term impact of the ELLA program.
  - A longitudinal study, tracking language learning and other outcomes among children exposed to the ELLA program compared with a matched control group, would be the most robust method to determine outcomes and cost effectiveness of ELLA over time.
  - The long-term impact of the ELLA program should also consider the extent to which continuity in language learning, and the creation of language pathways between preschools and early years of schooling, would influence the potential benefits of the ELLA program. However, there are a number of practical issues requiring resolution if this is to occur.
  - Exposure to language through the ELLA apps varies widely, consistent with the distribution of usage by all participating children. This is not a significant concern in the context of a preschool based program focussed on language exposure in

[8] ESA is providing advice to 2017 ELLA program participants that the optimal ratio is one tablet to five children.

a play-based environment. However, it would present a more significant issue if ELLA, or similar, were to be aligned with primary school language learning.

- ***An extensive stakeholder engagement strategy*** will support a smooth expansion of the ELLA program.
  - There is likely to be increased exposure of the ELLA program in the context of a nationally available program, and key stakeholders, such as educational authorities, peak bodies and large providers, can play a critical support and engagement role. Additionally, the risks associated with a lack of support from any key stakeholder are significantly increased under a national program than within the context of a contained trial.
  - In the future, strong relationships with educational authorities to facilitate language pathways and linkages between the preschool sector and schooling would assist in enabling children to access a continual language learning journey from preschool through to the later years of schooling.

The evaluation has provided evidence on the conditions that are expected to support the ongoing effectiveness and development of the ELLA program. Reflecting that ELLA has been trialled for two years, the scope of the evaluation did not extend to an in-depth return on investment analysis. However, the ELLA trial has shown positive results in increasing language exposure for preschool children and in contributing to associated short-term outcomes. Over time, further longitudinal analysis could strengthen the evidence base linking participation in the ELLA program and longer-term language and education benefits.

Deloitte Access Economics

1 Introduction

The ELLA program is an ongoing Australian Government initiative featuring language-based apps on tablet devices for preschool children. ELLA was initially trialled in 2015, and then extended into 2016. The trial was evaluated in 2015.[9] This report is the evaluation of the 2016 ELLA trial.

The primary objective of ELLA is to provide language exposure for preschool children, to help address barriers to language education in the early years of education, and encourage further language learning in later years of schooling.

At the broadest level, the ELLA trial was developed by the Australian Government in the context of a commitment to expand the teaching of languages in Australia. Through a play-based platform, the Australian Government intends the ELLA program to foster an interest in language learning for children from a young age.

The 2016 ELLA program was advertised as a suite of materials, including resources and educator support networks, developed through the ELLA trial to support the effective delivery of early language learning in preschools.

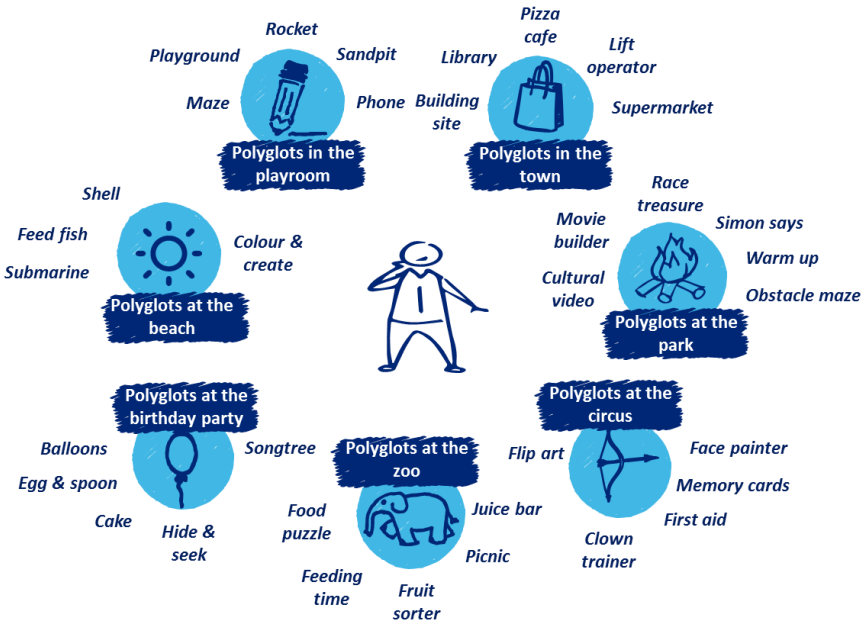
1.1 The 2016 ELLA trial

1.1.1 The ELLA apps

Five languages were selected for the trial – Chinese (Mandarin), Japanese, Indonesian, French and Arabic. Seven apps were developed for each language, with the apps being progressively released to preschool trial sites throughout 2016. Each app was made up of four to six activities (see figure below).

[9] The 2015 evaluation can be found here: https://www.education.gov.au/evaluation-early-learning-languages-australia-trial-final-report

Figure 1.1: Summary of ELLA apps



The apps were developed by a software developer, DT Millipede. The ELLA reference group, comprised of representatives from state and territory educational authorities, as well as language learning experts, provided input into both the app design and the broader program design.

Two additional apps were introduced to the ELLA program in 2016, the ELLA educator app and the ELLA family app. The objectives of both apps are outlined below.

The ELLA educator app

The ELLA educator app aims to provide educators with information and support to enable and enhance the implementation of the ELLA program. The educator app is tailored to cater to the qualification levels of qualified early childhood teachers in a range of early childhood settings. It provides for varying levels of engagement and consideration of the time educators have available for extracurricular professional learning.

For each of the five languages, an educator app was developed and made available on app stores, such as Google Play, providing educators with background information on the ELLA apps, as well as information on the language and culture, and a sound library of the language used in their trial. It also provides practical advice on how to implement and integrate the trial into the learning environment.

At a high level, it is believed that the app will benefit educators from guidance on how to:

- integrate the ELLA apps effectively into their preschool program;
- communicate with families and communities about the purpose of the apps;
- access and benefit from the educational reporting functionality within the apps; and
- provide information about each individual app, the relevant cultures and language of the app, associated resources and links and targeted professional learning.

The ELLA family app

The ELLA family app, which features a version of the ELLA apps in demo-mode, was developed with the objective of:

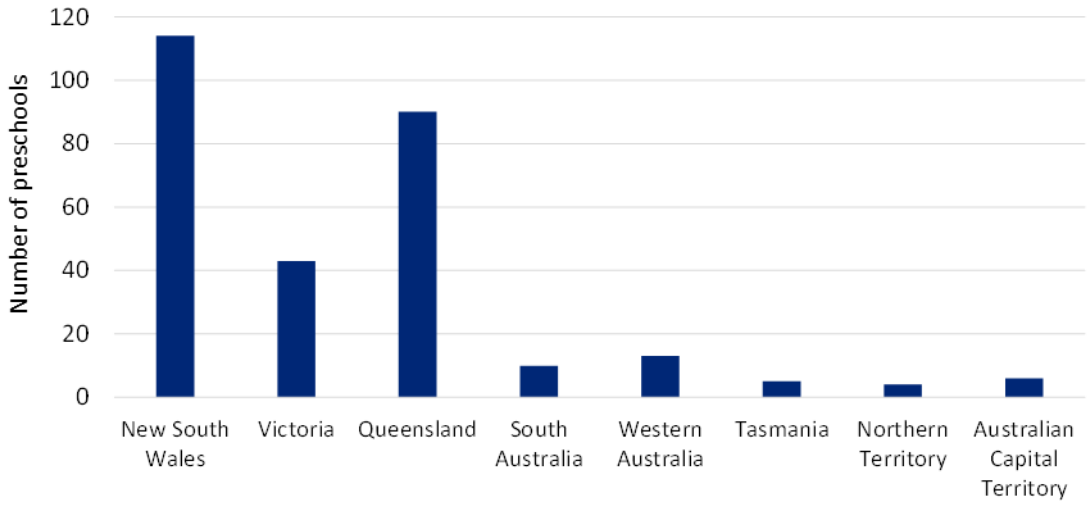
- providing families participating in the ELLA program with information to effectively support their child's participation;
- providing opportunities for families to extend their child's language learning; and
- providing some exposure to the ELLA program to other families who may be interested in participating in the program.

1.1.2 The trial sites

For the 2016 trial, expressions of interest were invited from all preschools that had applied to participate in the 2015 trial (a total of 1,117 preschools); 349 preschools applied to participate in the 2016 trial – including 40 preschools who continued their participation from 2015 (out of 41).

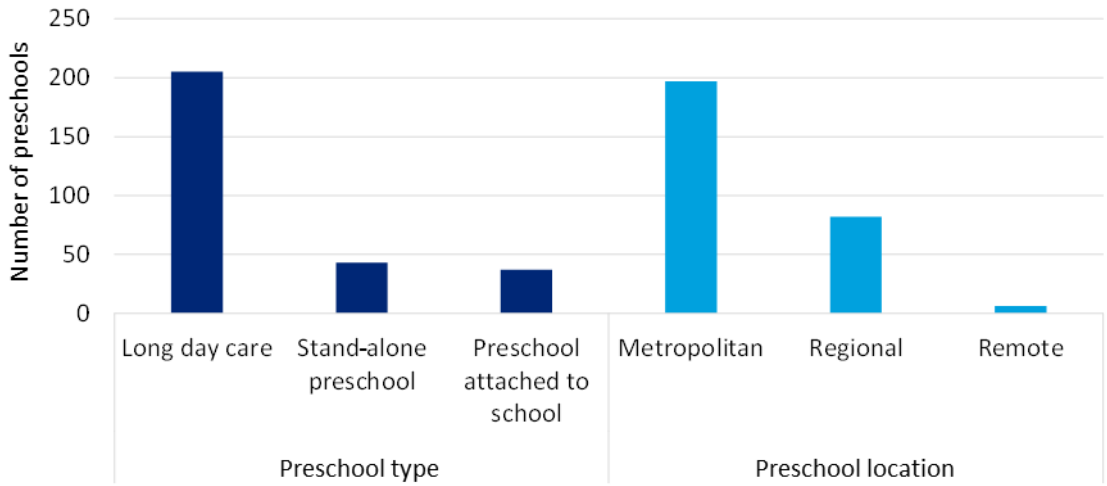
Trial sites were located in each state and territory, with a mixture of metropolitan, regional and remote locations, and a range of settings, such as school-based preschools, stand-alone preschools and LDC preschools (shown in Chart 1.1 and Chart 1.2). For the duration of the trial, each site used apps in one language.

Chart 1.1: Preschools participating in ELLA trial, by state and territory



Source: DAE analysis of ESA service data

Chart 1.2: Preschools participating in ELLA trial, by preschool type and location

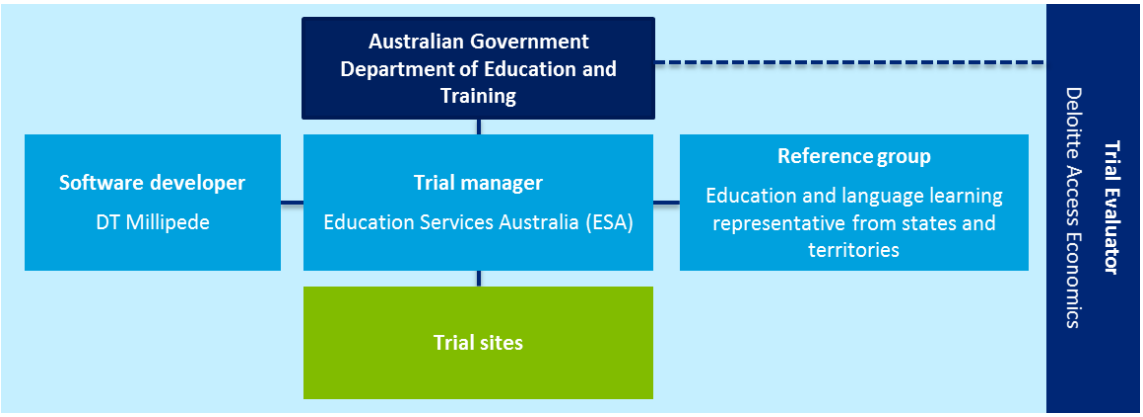


Source: DAE analysis of ESA service data

1.1.3 Project management

In 2014, the Australian Government Department of Education and Training appointed ESA to manage (1) the design and development of language apps for preschool children and (2) implementation of an ELLA trial at 41 preschool sites across the country. ESA continued in the project management role over the course of 2016.

Figure 1.2: Structure of 2016 ELLA trial



1.1.4 2016 ELLA trial implementation

Given the expanded nature of the 2016 trial, and drawing on learnings from the 2015 experience, several features of the ELLA trial design were amended, including:

- Trial sites were given the flexibility to choose their own language – rather than being allocated a language.
- Trial sites were not provided with tablets – and were expected to supply their own tablet devices. It is noted that the ELLA apps were also available for use on Android devices in 2016, to increase flexibility for trial sites.

- Given the trial site sign-up process was open until 11 March 2016, the implementation period for the sites was protracted – with more than half the trial sites only beginning to use the apps at the beginning of May.
- Workshops with participating educators were still held, and funded by the Department, but were held over July/August (as opposed to February in 2015).

1.1.5 National availability from 2017

The Australian Government has announced that $5.9 million will be provided to make the ELLA program nationally available to all preschools from 2017. In addition, Spanish and Italian will be added to the suite of ELLA apps available. In 2018, Modern Greek and Hindi will be added to the list of languages available.

From 2017, the program will be delivered on an opt-in BYOD basis, similar to the model trialled in 2016. The program will include funding support to assist 1,000 preschools from disadvantaged areas throughout Australia to purchase devices so they can participate in the program.

Responding to evaluation findings, it is noted that ESA will be implementing a range of strategies for the 2017 ELLA program, to improve guidance to educators and information for parents. This includes:

- holding educator workshops earlier in 2017;
- early engagement with key stakeholders, including early childhood peak bodies and education jurisdictions;
- commencing the EOI process earlier (from 14 November 2016 to 26 February 2017);
- apps being released earlier in 2017 to support early engagement with preschools;
- developing posters and brochures for parents to better share information about the ELLA program through preschools;
- preschools communicating to families that they have the option to opt-out, rather than opt-in to the program;
- all primary communications highlighting the educator app, family app and additional resources;
- grants of $500 being available to eligible preschools from disadvantaged areas to support the purchase of tablet devices and equipment;
- apps being compatible with cheaper tablet devices, noting that an arrangement has been made with ESA and a technology provider to enable eligible preschools to purchase tablet devices and equipment at cheaper rates; and
- increasing the number of Champions to provide additional guidance on the ELLA program to educators, including scaffolding and integration activities.

1.2 Evaluation approach

To establish the evaluation approach, Deloitte Access Economics developed a comprehensive evaluation plan. This document outlined the evaluation objectives and purpose, set out a program logic model, put forward a series of evaluation questions, and discussed the evidence sources and analytical approach. The same evaluation questions have been used for both the 2015 and 2016 trial evaluations, and are detailed in section 1.3.

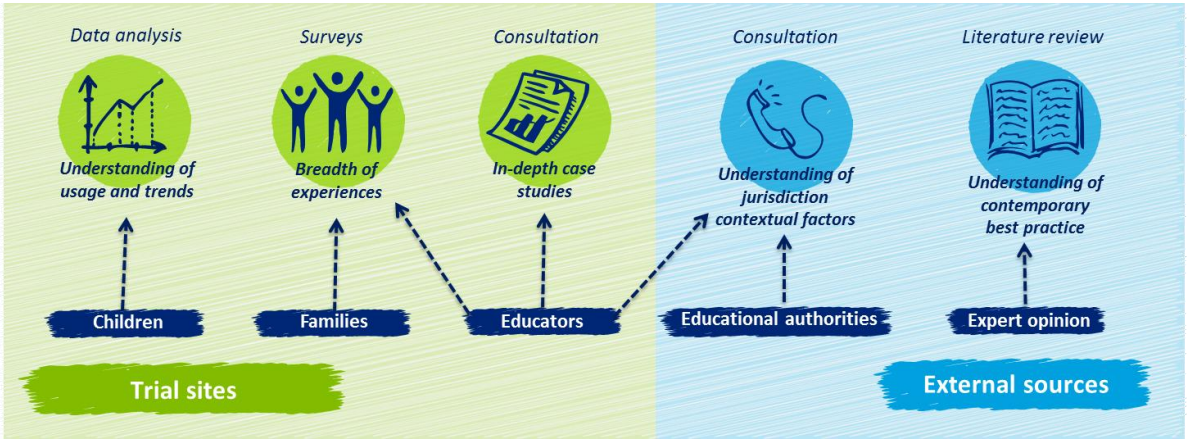
The evaluation questions were designed to consider encompassed elements of both process and outcome evaluation. Process evaluation has focussed on the effectiveness of trial implementation while outcome evaluation has considered the extent to which the ELLA trial has led to increased exposure to another language, along with any observations from educators and families regarding children learning some of the language they have been exposed to.

It is worth noting that, at this early stage, the evaluation cannot yet shed light on the long-term return on investment or cost-effectiveness of the ELLA program as a means of increasing language learning in Australia. Although the evaluation has been able to evaluate language exposure for participating children – to the extent that engagement with the ELLA apps provides language exposure, and that educator and family observations of child behaviour indicate some measure of program impact – the longer-term benefits of the ELLA trial cannot be readily measured. This is due to the new nature and early stage of the trial, which make it difficult to compare the ELLA program against alternative programs or assess the longitudinal impacts over time.

Following the development of the evaluation plan, Deloitte Access Economics obtained ethics approval from a Human Research Ethics Committee (Bellberry Limited) and research approval from state and territory educational authorities.

This evaluation drew upon on a range of information sources, which each contributed a distinct evidence base. These sources, described below, enabled a multifaceted qualitative and quantitative evaluation approach and are summarised in Figure 1.3.

Figure 1.3: Evidence sources for ELLA trial evaluation



Source: DAE

1.2.1 Usage data

Over the course of the evaluation, Deloitte Access Economics has been provided access to non-identifiable app usage data. This report includes an analysis of app usage data associated with the ELLA trial (i.e., from the end of February to mid-November).

ELLA app usage data was analysed to inform:

- the level of child engagement (such as total time spent using apps, number of apps used) and the variation of engagement over time, preschools and apps; and
- the degree to which the apps expose children to the target language.

A profile of the app usage data, which informed this report, is provided in appendix A.

1.2.2 Online surveys

Two surveys were undertaken to inform the evaluation, an educator survey and a family survey. Specifically:

- The educator survey sought educator observations on certain elements of the ELLA trial, including trial design, implementation, support provided, trial delivery and trial impact.
- The parent/guardian survey sought parent and guardian observations on certain elements of the ELLA trial, including trial design, family understanding and engagement with the ELLA trial and expected impact.

There are generally biases inherent in surveys of this type. In particular, survey responses to both responses may be subject to:

- *Non-response bias* – that is, those preschools that responded to surveys were likely to have done so because they had been more engaged with the trial, and not representative of all preschools involved in the trial.
- *Response bias* – as the survey was completed at the end of the year, survey responses are likely to focus on the attitudes of educators at the conclusion of the trial. This is likely to be different to the attitudes and experience of educators at the beginning of the trial.

The analysis of survey responses should be considered in light of these two caveats.

Both surveys were open for response from 10 October 2016 to 9 November 2016 and a profile of survey responses (i.e., the number and representativeness of responses received) is included in appendix A.

1.2.3 Site visits

Over the course of October and November, 24 consultations, including 19 interviews with sites participating in ELLA for the first time in 2016, as well as 5 interviews with sites in their second year of the ELLA trial, were conducted.

The purpose of these interviews was to obtain a more detailed understanding of the appropriateness and effectiveness of the 2016 ELLA trial, extending upon the questions asked in the educator survey. Interviews with sites in their second year of the ELLA trial explored educator observations regarding the use of the apps by a new group of children, and the impact of any changes to the way preschools have implemented the ELLA trial.

A profile of the trial sites, which were engaged through consultation, is included in appendix A.

1.2.4 Literature

A review of literature on the use of digital technology for language learning in preschools was undertaken in 2015. The purpose of this literature review was to develop an understanding of whether the ELLA trial aligns with the available evidence on best practice approaches to:

- language exposure in preschools; and
- digital technology use in educational settings, focussed on preschools.

The literature review was updated in 2016, to incorporate any emerging studies. The findings of the literature review are provided in section 2.

1.2.5 Educational authorities

Representatives from the majority of state and territory educational authorities were consulted, to understand how the delivery of the ELLA trial may be influenced by factors unique to each jurisdiction. This included a discussion of the alignment between the ELLA trial and any existing language education or technology policies within each state or territory, as well as relevant considerations for any future development of the program.

1.2.6 2015 Evaluation findings

The evaluation of the 2015 ELLA trial has been used as a reference point for the purpose of evaluating the appropriateness and effectiveness of the 2016 ELLA trial design, to the extent that trial design, implementation and outcomes differed from 2015.

1.3 Report structure

The evaluation findings have been organised under several key headings, as outlined below.

- **Section 2: Literature review.** This section provides a series of brief key findings from the literature review on language learning for preschool children and the background literature to the ELLA program more generally.
- **Section 3: Trial implementation**. This section considers the available evidence supporting the effectiveness of the ELLA trial's implementation, including the implementation process and any implementation issues.
- **Section 4: Support for preschools**. This section considers the available evidence pertaining to the adequacy and appropriateness of support provided to ELLA trial sites, including the introduction of the educator and family apps.
- **Section 5: Trial delivery.** This section examines the available evidence supporting the appropriateness and effectiveness of the delivery of the ELLA trial across sites, including how the trial was introduced within sites, methods of trial delivery and the use of complementary activities.
- **Section 6: Family perspectives and engagement.** This section examines the experience of families with the ELLA program, including views on trial design, engagement with the trial and observations on trial impact.
- **Section 7: Child engagement.** This section analyses the available evidence on the appropriateness and effectiveness of children's engagement with the ELLA trial, including an overview of children's usage of the apps and an analysis of the factors potentially driving differences in use.
- **Section 8: Trial impact.** This section provides an overview of the evidence supporting the impact of the ELLA trial on child, educator and preschool outcomes across trial sites.
- **Section 9: Future considerations.** This section provides an overview of identified trial limitations and potential refinements. The section also discusses how to maximise the impact of the ELLA program going forward – including an analysis of trial cost-efficiency, in light of the outcomes achieved. Implications for the immediate future of ELLA, including the 2017 expansion of the program, are also discussed.

The report will seek to answer a number of key evaluation questions and their related sub-evaluation questions. The questions and where they are addressed in the report can be found below in Table 1.1.

Table 1.1: Evaluation framework and report structure

Evaluation question		Sub-evaluation questions		Report section
1	**Was the overall design of the ELLA program appropriate and based on evidence?**	1.1	What is the evidence regarding the link between early exposure to other languages and educational and developmental outcomes?	Section 2
		1.2	Is there evidence that the ELLA trial was designed in accordance with available evidence from research literature and demonstrated good practice approaches in comparable programs?	Section 2
2	**Was the design of the software appropriate? Is it fit for purpose?**	2.1	Did the apps incorporate a level of functionality that was appropriate for their purpose?	Section 5.1.1
		2.2	How user friendly were the apps for preschool aged children?	Section 8.1.3
		2.3	How user friendly were the apps for educators?	Section 5.1.1
		2.4	Could educators easily engage with children about and during use of the apps?	Section 5.1.1
3	**Was the program able to be implemented effectively? Did children use the program?**	3.1	Was the initial availability of apps and subsequent app updates timely and accessible for the trial sites?	Section 3.1.3
		3.2	To what extent were children engaged with the apps?	
		3.3	Was the involvement of parents/guardians throughout the trial appropriate?	Section 6.1
		3.4	Why did children use the apps more or less?	
		3.5	Were tablets an appropriate platform for children's use of the apps?	Section 5.1.2
		3.6	Were preschools adequately supported in use of the apps within the sites?	Section 4.1.2
		3.7	Did preschools and their staff receive adequate and appropriate training in use of the apps throughout the trial?	Section 4.1.2
		3.8	How often were the apps used?	Section 7.2

Evaluation question		Sub-evaluation questions		Report section
		3.9	What were the patterns of usage?	Section 7.2
		3.10	Did usage vary across languages?	Section 7.3
		3.11	Why did usage vary across certain apps or app series?	Section 7.2
		3.12	Why did usage vary across sites?	Section 7
4	**Did the ELLA program make a difference to children's outcomes?**	4.1	What did children learn as a result of the ELLA trial?	Section 8.1
		4.2	In what ways did exposure to another language through the ELLA trial contribute to the development of children?	Section 8.1
5	**What would be the cost of expanding the program to more children?**	5.1	What was the cost of the ELLA trial and its components (fixed and variable; operating and capital)?	Section 3.1.3
		5.2	What did it cost to implement?	Section 3.1.3
		5.3	What did it cost to operate?	Section 9.2.1
		5.4	Are there economies of scale that will reduce the per child cost if the program is expanded?	Section 9.2.2
6	**Are there other options or pathways for the ELLA model?**	6.1	What are the key lessons from the ELLA trial that should be applied to any future program or service model?	Section 9.3
		6.2	What are the options for models of ongoing delivery of early childhood language education utilising digital technology?	Section 9.3
		6.3	What model is recommended?	Section 9.3
		6.4	What role should the Australian Government play in this area?	Section 9.3
		6.5	What role should state and territory governments play in this area?	Section 9.3

2 Literature review

The use of apps utilising tablet technology as an education tool is an emerging field, and as such there is not as yet a robust and deep literature base through which to assess ELLA program design. However, to the extent that research literature is available, there is broad alignment between this evidence base and the ELLA program's rationale and design. This section provides a high-level overview of the literature relating to the ELLA program. The literature review is presented in its entirety in appendix B.

From a policy perspective – the introduction of a program to increase language exposure in the early years is consistent with bipartisan policies directed to increasing language uptake in Australia, while the focus on Asian languages is consistent with the policy objective of increasing interaction with Asia (Lo Bianco & Slaughter, 2009; Australian Government, 2013).

The ELLA program design, while a new concept, appears to be consistent with features of best practice program design. There are three key reasons this is considered to be the case:

- ***Introducing a language in preschool, as opposed to in the later years of schooling, brings a range of identified benefits,*** including an increased ease in understanding a second language, more accurate pronunciation and increased learning outcomes in other areas.
  - Earlier exposure to a language other than English is associated with increased probability of successfully acquiring the second language (Griva & Sivropoulou, 2009) with young children being more receptive to language learning and more likely to develop pronunciation similar to native speakers (Stewart, 2005).
  - Learning a second language at an early age improves children's cognitive development and problem solving skills (Bialystock & Craik, 2010; Gold et al., 2013).
- Emerging literature findings indicate that ***digital technologies have been found to effectively support learning outcomes in preschools***, particularly given children's increasing digital literacy and the ability for children to work at their own pace.
  - Tablets provide an easy-to-use and intuitive interface for a child (Neumann & Neumann, 2014) and preschool-aged children are increasingly able to actively engage with digital technology (Rushby & Surry, 2016).
  - Digital technologies encourage a high level of self-motivated learning (greater ownership of learning processes) (Forbes, 2013; Oakley et al., 2012).
  - Children have the capacity to transfer what they learnt using digital technology to the real world (Huber et al., 2016).
- In the absence of a qualified language teacher, ***digital technology offers an alternative method through which to increase language exposure*** in early years.
  - A study looking at the ability for digital activities to support language learning found that the use of dialogue through computer games was a supportive environment for language learning as verbal information is provided in appropriate context (Peterson 2010). The use of personal avatars also creates an immersive experience and increases motivation for learning.
  - In the context of difficulty in recruiting and retaining well-qualified language educators in the preschool sector – technology offers an alternative method for language exposure (Nemeth & Simon, 2013).

However, while literature indicates that in principle, the concept of the ELLA program is sound – the realisation of the ***positive benefits noted above are dependent on the program implementation and delivery aligning with best practices*** relating to language learning and digital technology in the preschool setting.

Indeed, misuse of tablet technology or the program has the potential to result in adverse outcomes for participating children, including:

- ***Excess screen time*** for participating children, which has the potential to result in suboptimal sedentary behaviour.
  - The Australian Government Department of Health and Aging (2009), recommends that screen time exposure for three to five years olds should be limited to no more than one hour per day.
  - Hinkley et al. (2012) discovered in a study of Melbourne preschool children that 78% exceeded an hour of screen time and these children were not participating in a sufficient amount of physical activity (as outlined by Australian and United States professional organisation recommendations for physical activity and screen time).
- Screen time ***interactions that are not of a high quality***, and do not encourage the learning and development of participating children.
  - If apps are not sufficiently targeted at the appropriate developmental level, or of a high quality – children can experience frustration and boredom. Similarly, if screen time interactions are not supported by appropriate implementation from a teacher, learning and engagement may be compromised (Neumann & Neumann, 2014).
- ***Screen time used as a behavioural management tool*** may compromise the educational objectives of the program, and be detrimental to participating children.
  - The use of interactive technologies to distract children and act as a behavioural self-regulation tool may be detrimental to later social-emotional outcomes if used as the primary method through which children are taught to regulate their behaviour (Radesky et al., 2015).

The risks outlined above highlight the imperative for the ELLA program to be implemented and delivered in line with best practice for the desired outcomes to be realised, and to minimise the potential for adverse outcomes. Supporting this, the below tables highlight the alignment between the best practice elements identified in the literature review (detailed further in appendix B – including references) and the design of the 2016 ELLA trial.

Table 2.1: ELLA design relative to best practice in integrating digital technology in preschools

Best practice principles	ELLA trial	Alignment
Tablets should not replace good teaching	The ELLA trial was designed in such a way that educators did not have to be familiar with the target language. However, several educators have acknowledged the importance of educator involvement while children engage with the apps, including scaffolding the use of the program with complementary activities and interacting with children while using the apps. As such, the alignment of the ELLA trial with this principle depends upon the extent to which resources encourage and support educator engagement. This has been achieved in part through ESA providing guidance on scaffolding activities and the educator app providing information for educators involved in the trial.	 *Partially aligned*
Provide a range of pedagogical support for teachers	ESA offered a range of materials to support educators' use of the apps. While most educators found the support helpful, there were some educators who felt there could have been more support materials made available. The additional support material could have included tips for integration with the learning program, research summaries and a list of resources to support child learning. There was also evidence of at least several educators using the tablets as pacifying tools within the preschool. Support and training for teachers should be very clear on the role of the tablet as a supporting educational tool and appropriate use guidelines – including screen time.	 *Partially aligned*
Provide technical support to schools	ESA was contracted to operate the ELLA helpdesk as part of its contract management role, which was designed to support sites encountering technical difficulties. This was widely considered to offer timely and appropriate support.	 *Aligned*
Tablets are most effective when used in a supportive school and home environment	There was some evidence from trial sites that children who used the family app displayed greater engagement with the trial. However, as the family app was not released until mid-2016 due to app development occurring, the evaluation has not been able to fully assess its impact.	 *Partially aligned*
The ratio of tablets to children matters	A ratio of one device for several children is generally considered to be optimal for preschool children. According to survey data, the trial had 9.8 children per device on average, which is potentially higher than the optimal ratio. From 2017, sites will be provided with guidance that a 1:5 ratio of tablet to child is recommended. To support this, $500 will be available (capped) to eligible preschools from disadvantaged areas to support the purchase of tablet devices and equipment.	 *Partially aligned*
The choice of app is important	ESA, in conjunction with the Department and Millipede, designed apps specific for their purpose, rather than relying on publicly available apps.	 *Aligned*

Source: DAE literature review, ELLA trial app data, August educator survey, consultations

Table 2.2: ELLA design relative to best practice in app design for early learners

Best practice principles	ELLA trial	Alignment
Allow content creation	There are some activities within the ELLA trial that allow the children to create their own content (such as Sandpit or Colour & Create).	Aligned
Mixed learning methods	The ELLA apps are consistent in providing children opportunities to learn through a variety of means. The apps allows children to learn via visual means (through the imagery on the screen), via aural means (by listening to the target language), and via oral means (by speaking into the microphone).	Aligned
Personalised pathways	The ELLA trial offers four to six activities within each app. The variety of tasks offered to children across these activities allows them considerable scope to personalise their learning experience.	Aligned
Engaging content	Given the frequency and length with which the apps have been in use, it appears the content is engaging for children. This is supported by positive reviews from educators and parents/guardians.	Aligned
Encourage skills development	The apps offer children opportunities to develop a variety of foundation skills, such as colours, counting and greetings. They are encouraged to develop their skills by speaking the words when prompted by the apps.	Aligned

Source: literature review, ELLA trial app data, August educator survey, consultations

Table 2.3: ELLA design relative to best practice principles for teaching additional languages in preschools

Best practice principles	ELLA trial	Alignment
Play-based learning is important in early language learning	The ELLA apps allow for children to engage in play-based activities while being exposed to additional languages.	Aligned
Repetition	Language learning through apps allows for more repetition than through learning from an educator, as the apps allow children to re-listen to the words and phrases as they choose.	Aligned
Develop listening skills	Language is learnt best through oral and aural means, rather than through reading and writing, especially considering most preschool children are preliterate. Most language exposure through the ELLA trial is done orally and aurally, allowing children to develop their listening skills.	Aligned
Use contextualised language	Contextualised learning plays a large role in the ELLA apps. The characters often use hands and facial expressions, in addition to the target language, to convey meaning.	Aligned

Best practice principles	ELLA trial	Alignment
Social and cultural context	The apps are designed to display the culture associated with each language.	 Aligned
Use of decontextualised language (language removed from context)	The app does not offer children the opportunity to use decontextualised language. Such learning (such as children developing stories or recalling past events in the target language) must be educator led, and personalised for each child. As such, this is dependent on the level of engagement of the educator and the resources provided to support decontextualised language use outside the apps – which is difficult if the educator does not speak the target language.	 Not aligned
Language production	Several activities employ the use of a microphone, which rewards children for attempting to speak the target language. Such activities encourage language production, consistent with best practice.	 Aligned

Source: DAE literature review, ELLA trial app data, August educator survey, consultations

In summary, across all three facets of best practice, the ELLA trial appears to have been designed and implemented largely in accordance with best practice principles. However, in recognition of the risks associated with tablet misuse – the benefits of the ELLA program are dependent on the manner in which educators implement and deliver the program within preschools. Similarly, the links between the early exposure to language provided through the ELLA program, and potential benefits realised in language learning in later years, are as yet uncertain.

3 Trial implementation

This section provides an overview of the experience that sites had with the initial implementation of the ELLA trial, by:

- examining the choices that sites made with regards to the trial, as well as any previous experience in language learning;
- analysing aspects of implementation, such as when preschools signed up and started using the apps, the BYOD model and consent from families; and
- providing a series of implementation considerations in light of these findings.

The **key evaluation questions** this section seeks to answer are:

- Was the program able to be implemented effectively? Did children use the program?
  - *Was the initial availability of apps and subsequent app updates timely and accessible for the trial sites?*
- What would be the cost of expanding the program to more children?
  - *What was the cost of the ELLA trial and its components (fixed and variable; operating and capital)?*
  - *What did it cost to implement?*

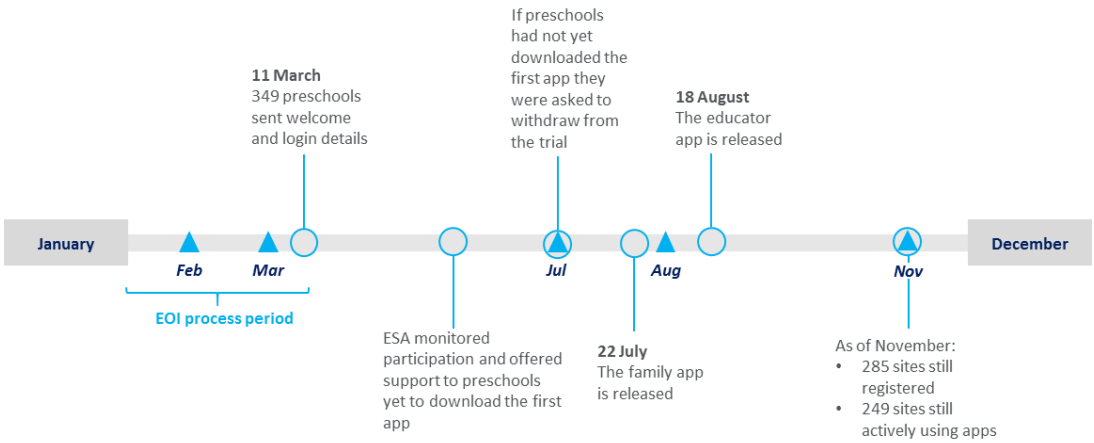
General findings on the implementation of the ELLA program in 2016

- ***Timing of trial implementation:*** A large proportion of preschools (particularly those new to the ELLA trial in 2016) began using the ELLA apps well into the year. According to the survey results, nearly 70% of preschools signed up in February in the 2015 trial whereas 2016 trial sign ups were spread out throughout the year, with a significant number of preschools signing up in March through to May. Consultation with preschools also indicated that some did not fully understand the purpose of the ELLA trial, or lacked confidence to use the apps appropriately.
- ***Rationale for joining the trial:*** Many sites saw the trial as an opportunity for them to provide a language learning program. Preschools were also keen on further enhancing the use of digital technology.
- ***Previous language learning experience:*** From the survey results, more than two-thirds of respondents stated they had not engaged in any language learning previously (67%). Any language teaching that did occur prior to the trial was often ad-hoc and based on educator background and experience.
- ***Cost of the trial:*** Most trial sites reported few costs involved with the program, having owned tablets already. Only a few sites that were consulted (4 trial sites) purchased additional tablets deliberately for the ELLA trial.
- ***Number of tablets:*** Generally speaking, most preschools had between 1-5 tablets available for children to use in each preschool group.
- ***Whether the number of tablets was adequate:*** According to the survey data, there was an average ratio of 9.8 children per tablet. Just more than half of all survey respondents felt they had the correct number of tablets available for the children in their preschool (55%) while 41% felt there were too few tablets available to adequately implement the trial.
- ***Parent/guardian consent:*** From the consultation interviews, preschools indicated that they generally had little difficulty obtaining consent from families. There were some instances where not all families agreed to participate, causing difficulties in trial delivery.
- ***Release of ELLA apps:*** More than 80% of survey respondents either agreed or strongly agreed that the availability of ELLA apps have been timely.

3.1 The implementation process

Figure 3.1 depicts the timeline of the implementation process for the 2016 trial.

Figure 3.1 : Timeline of implementation process



Preschools were chosen for the trial following an EOI process period that closed on 11 March. ESA then contacted the preschools to check whether they had begun downloading the first app. By July, those that had not yet downloaded the first app were asked to withdraw from the trial as they no longer fulfilled their agreed participation requirements.

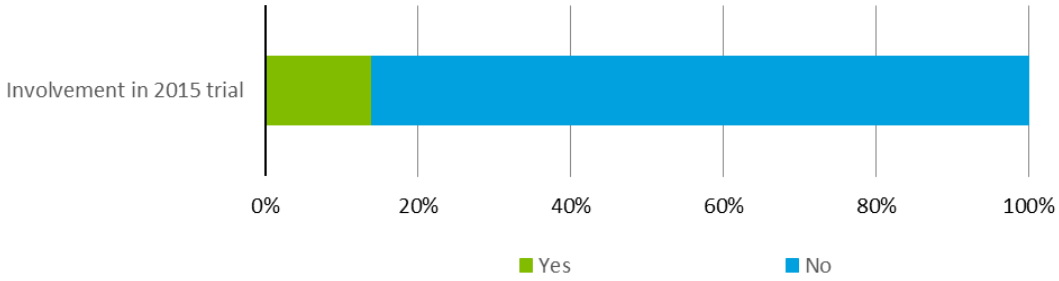
3.1.2 Joining the ELLA trial

Sites that were recruited for the trial had a range of reasons for entering the trial, related to exposure to languages other than English and digital technology usage. Preschools also had different reasons for choosing a particular language and most had not engaged in teaching a language other than English prior to the trial.

How sites were recruited

The ELLA trial was significantly expanded in 2016, from 41 preschools in 2015 to 349 in 2016, resulting in the majority of them (approximately 86%) being new to the ELLA trial.

Chart 3.1: Involvement in 2015 ELLA trial among 2016 trial sites



Source: 2016 ELLA service list (n=286)

To recruit the new trial sites, 1,187 preschools that had lodged an EOI for the 2015 trial were invited to participate in the 2016 trial. Preschools were invited to participate through a BYOD model, where they were required to supply their own tablets in order to use the ELLA apps.

This invitation resulted in 349 preschools being offered the opportunity to take part in the 2016 ELLA trial. However, a small number withdrew from the program throughout the year for a variety of reasons, including staffing changes – resulting in 285 registered trial sites in November 2016.

Rationale for entering trial

The evidence from consultations revealed a number of reasons for entering the trial. According to the interviews, many sites saw the trial as an opportunity to introduce a language program. These preschools were generally of the opinion that exposure to languages other than English was beneficial for preschool children and felt that this was not part of their existing offering. Some preschools, particularly those in regional and rural areas, had stated that they lacked other language learning options in their local area, making the ELLA trial an appealing choice.

Only a small number of preschools spoken to had any form of language learning program in place. These preschools saw the ELLA trial as a useful teaching tool to complement or enhance their existing programs. Many educators in these preschools believed the trial's interactive digital technology component provided a new approach to the language learning experience.

Other factors that influenced sites to join the ELLA trial included having children from a diverse range of non-English speaking backgrounds. These preschools felt that, given their multicultural cohort, it was natural for them to introduce a program built around exposure to languages other than English.

Conversely, there were also preschools which had very few, if any, children from non-English speaking backgrounds. Educators at these preschools stated that they thought the ELLA trial was a good opportunity for these children to be exposed to a language other than English. This was particularly so, given such opportunities may not arise through interactions with other children at the preschool, or through their families and local community.

Preschools that were consulted also cited a range of views on the benefits of language learning for preschool age children. Some educators viewed it as cognitively beneficial for children (with some noting that they had done some background research on the topic). Others thought it was generally important for children to be aware of other languages and cultures. Other educators simply stated that they thought it would be enjoyable and stimulating for the children.

Another rationale for taking up the trial was that preschools were keen on further enhancing the use of digital technology in their preschool. For some educators, the ELLA trial was seen as an appropriate extension of the digital technology they already used in their everyday activities.

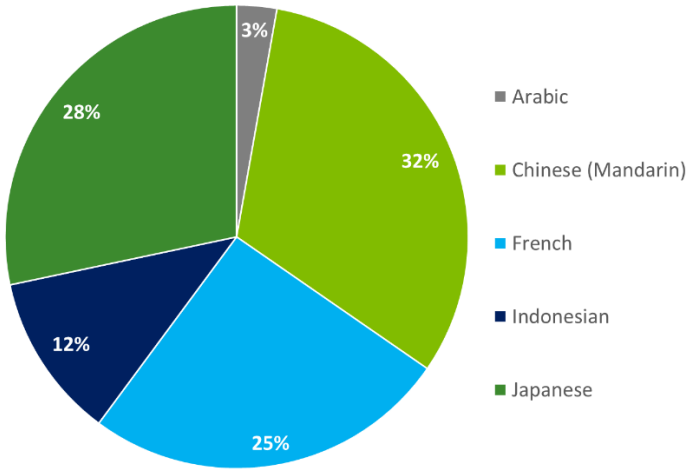
Other preschools saw it as an opportunity to address the lack of digital technology used for learning purposes. While they owned devices, such as tablets, they did not frequently use them as a learning tool for children and saw the ELLA trial as a useful first step. Further, almost all the preschools that participated in the consultations considered using digital technologies and improving digital literacy as an important skill for children to have.

Language choice

The most popular language was Chinese, with nearly a third of preschools choosing it (91 preschools), followed by Japanese (81 preschools) and French (73 preschools).

In contrast, only 33 sites chose Indonesian and even fewer – 8 in total – opted for Arabic. The breakdown of language choice across all the trial sites is shown below in Chart 3.2.

Chart 3.2: Language trialled by preschools



Source: 2016 ELLA service list (n=286)

Common rationales for choosing a specific language, as explored in consultations, included:

- linking in with languages being taught at local primary schools, with educators seeing a potential opportunity for language continuity for children when they commence school;
- educators leveraging previous resources, such as existing materials in Japanese that they could utilise as a complement to the ELLA program;
- educators being already familiar with a particular foreign language (such as Chinese or French), either because they were from that language background or had learned it previously, and as a result, wanting to proactively introduce children to the language; and
- leveraging off the language backgrounds of children attending the preschool, such as Arabic or Chinese.

International linkages

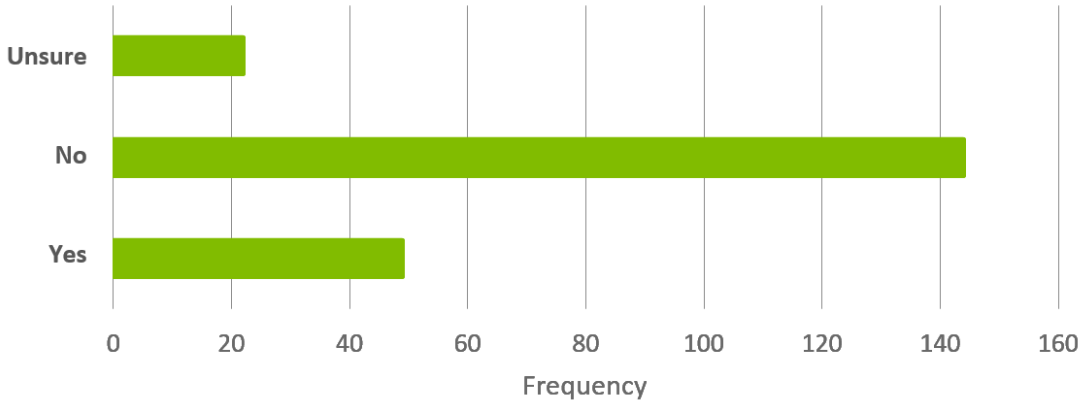
One trial site reported having a sister school in China. This preschool suggested that exposure to the Chinese language in the ELLA trial could help children at their preschool communicate with the children at the Chinese preschool, hoping that it could lead to an exchange of content, such as letters or other forms of messages. While this was still early in development, it was seen as an exciting opportunity for cultural and language exchange, helped by the ELLA trial.

Some preschools stated that the choice in language was made by a previous director/educators and they were not privy to the decision making process. Other preschools selected their language simply based on interest and curiosity.

Previous learning of languages other than English

More than two-thirds of survey respondents stated that their preschool had not engaged in any language learning previously (67%). Less than a quarter stated that they had (23%), while the remainder were unsure (10%). The frequency of responses is shown below in Chart 3.3.

Chart 3.3: Educators engaged in language learning prior to ELLA trial



Source: DAE ELLA educator survey (n=215)

From the consultations it was revealed that for many sites that engaged in previous language learning, the approach was relatively ad-hoc, such as teaching the occasional word. This was often based on educators' personal language background, study or travel experiences. Another informal method was for parents of children with a non-English speaking background to occasionally come to the preschool and read or sing songs in their home language.

Only a few sites that engaged in previous language learning said in interviews they had a more structured program, such as having special language teachers deliver sessions to the children.

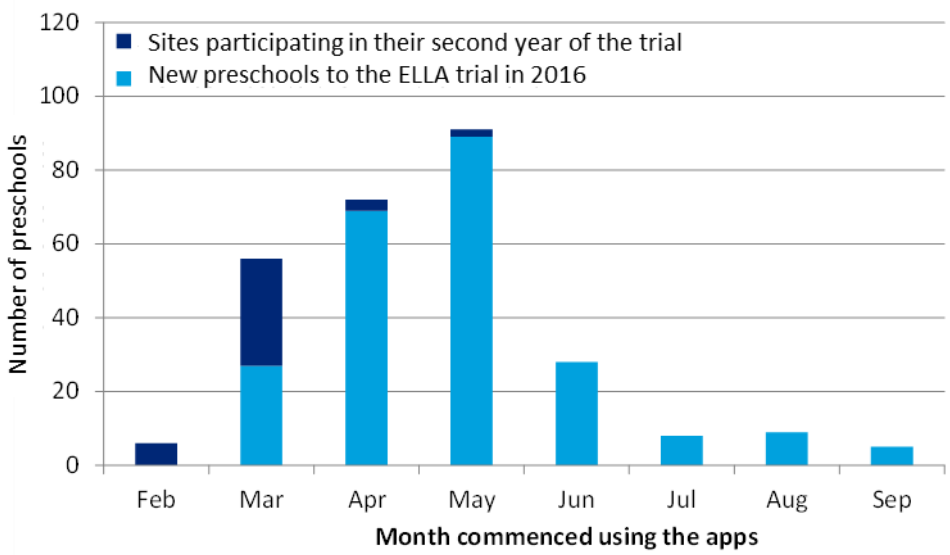
3.1.3 Implementing the ELLA program

Preschools joined the trial and started using the apps over the first half of 2016 (compared to the 2015 trial, when most joined the trial in February). Most reported few costs but a number of preschools felt they had too few tablets to adequately deliver the trial. Obtaining consent from families was generally not a problem and the release of apps was seen as timely.

When preschools started the trial

While the EOI process was open from February until 11 March 2016, the ELLA app usage data indicated that a significant proportion of preschools did not begin to use the apps until well into the first half of the year (Chart 3.4).

Chart 3.4: Weeks taken to commence ELLA trial, new and second-year trial sites



Source: DAE analysis of ELLA app data

The commencement of app use shown above reflects that the EOI process was open until 11 March 2016. Additionally, evidence from consultations provided further explanation of why sites were somewhat slow in commencing use of the ELLA apps.[10] Preschools mostly cited an initial lack of understanding of the purpose of the trial, or initially lacking confidence regarding appropriate use of the apps, when reflecting in consultation why they did not begin using the program early in the year.[11]

Many educators overcame these issues throughout the year, and were able to successfully deliver the apps to children (for example, 57% of survey respondents reported finding they could introduce the apps 'very easily' to children and a further 36% reporting they could introduce it 'somewhat easily' – see section 5 for more details).

Sites that were involved in the second year of the trial (i.e., that participated in the 2015 trial) generally found that implementing the ELLA trial was easier in 2016. Survey commentary supported this noting that '*the experience gained and ongoing learning from 2015 has made easier* (sic)*, educators has gained more confidence'*.

Aside from educator confidence and experience, which was the most frequently cited reason for the ease of implementation, other survey respondents noted that:

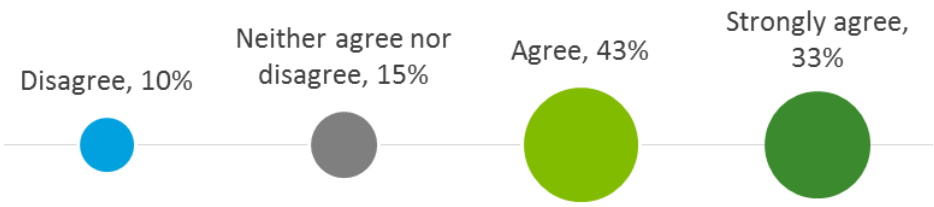
- in the second year of the trial the preschool switched to a language which they found easier to support (i.e., as they had greater access to parents who spoke this language);
- older children, who were experienced with the tablets and apps, could assist younger children; and
- having notes for each app at the beginning of the trial was helpful.

[10] It should also be noted that ESA contacted preschools that were registered but had not downloaded and used the first app, offering support until July. In July, preschools that were still not using the apps were asked by ESA to withdraw from the trial as they no longer fulfilled their participation requirements.

[11] To address the issue of delayed implementation, applications for the 2017 program opened on 14 November 2016 (with the aim of bringing implementation activities forward in the year).

Educators who disagreed primarily cited that staff changes within the preschool made implementation difficult, due to a lack of training for new staff.

Chart 3.5: Educator agreement with statement 'Introducing the ELLA apps into the classroom in 2016 was easier than in 2015'



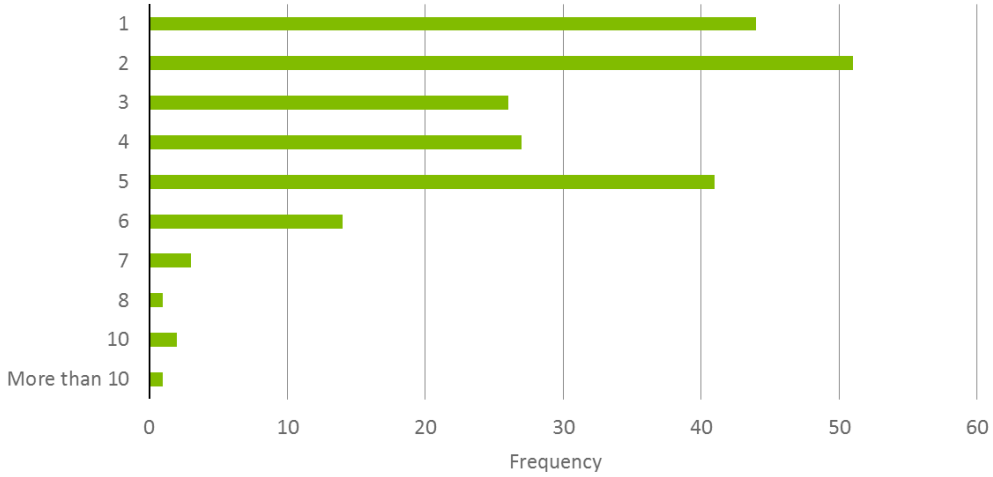
Source: DAE ELLA educator survey (n=40)

The BYOD model

The 2016 ELLA trial used a BYOD model, with preschools required to supply their own tablets in order to use the ELLA apps. Through consultations, most trial sites reported few costs involved with the trial, as they already owned tablets. Only 4 of the 24 trial sites consulted purchased additional tablets specifically for the ELLA trial. In rare instances, preschools stated that families donated or lent tablets to them for the trial.

Generally speaking, most educators in the survey stated they had between one to five tablets available for children to use.

Chart 3.6: Number of tablets with ELLA apps for each group of children to use



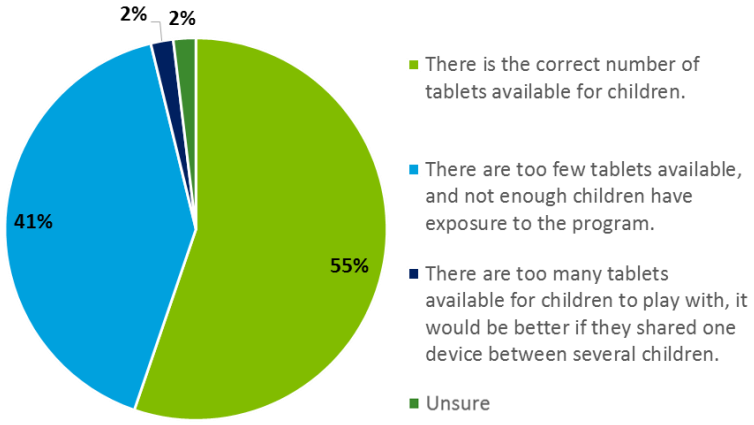
Source: DAE ELLA educator survey (n=210)

One of the preschools consulted purchased special headphones that allowed two children to listen in on the app at the same time, while a single child played on the tablet. Some preschools stated they would have liked to have purchased other items, such as safety cases and headphones, but did not have an available budget for this purpose.

Using the survey data, which reported the number of tablets used for the trial at each preschool, and trial site registration data from ESA, which reported the number of participants, it was found that on average, there were 9.8 children per tablet device (or 0.1 tablets per child participating in the trial).

Just more than half of survey respondents felt they had the correct number of tablets available for the children in their preschool (55%), with 41% stating there were too few tablets available to adequately implement the ELLA trial. A considerably smaller number stated they had either too many tablets or they were unsure whether their quantity of tablets was appropriate (Chart 3.7).

Chart 3.7: Educator attitude towards quantity of tablets available for use by children



Source: DAE ELLA educator survey (n=210)

This survey finding that a significant number of educators would have liked to have had more tablets is also confirmed through the consultations. Further, the consultations revealed that the number of tablets available to a preschool influenced the manner in which educators chose to deliver the ELLA program (see section 5 for more details).

Consent from families

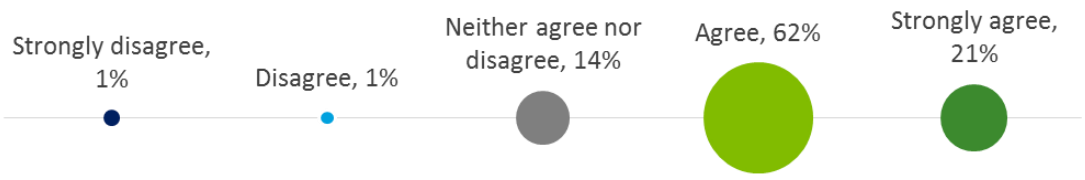
From the consultation interviews, preschools indicated that they had generally little difficulty obtaining consent from families. Most preschools stated that they had strong levels of communication with parents and guardians about the preschool's activities, and the consent forms and material that were prepared by ESA were effective in communicating the intent of the trial to families.

However, there were instances where some families did not give consent to participate. The reasons given for this vary, from differing opinions on the importance of language learning, to concerns about screen exposure, to concerns about a particular language that was being taught through the ELLA trial. When not all children were permitted to use the ELLA apps, this occasionally caused difficulties in delivery of the program (discussed further in 5.1.2). The perspectives of families on the ELLA trial are explored in detail in section 6.

Timing of app availability

The significant majority of educators – more than 80% of survey respondents – either agreed or strongly agreed that the availability of ELLA apps have been timely (Chart 3.8), indicating support for the staged release of the apps.

Chart 3.8: Educator agreement with statement 'Availability of the ELLA apps has been timely'



Source: DAE ELLA educator survey (n=210)

3.2 Implementation considerations

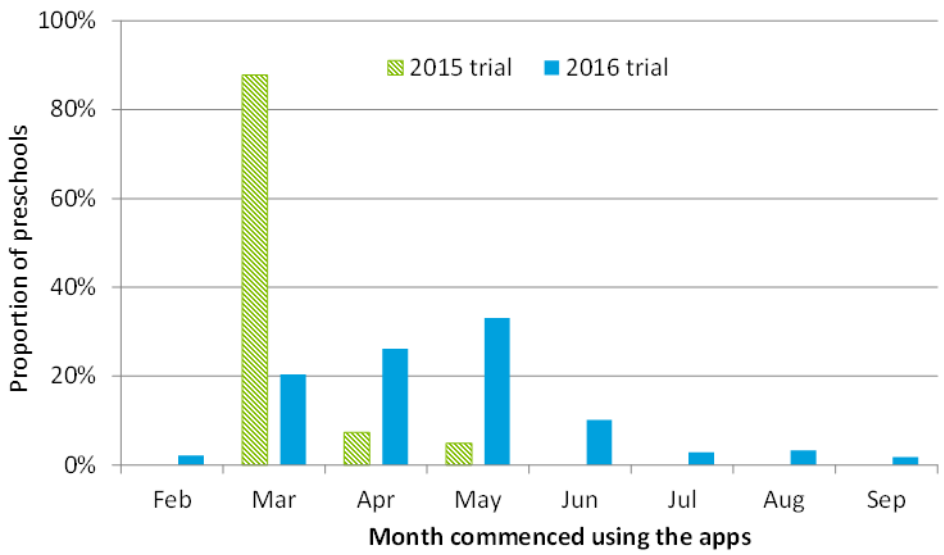
This section considers the implementation considerations for the ELLA program arising from the findings above, and through a brief comparison with the 2015 ELLA trial evaluation findings.

3.2.1 Comparisons with the 2015 ELLA trial findings

In comparing child engagement with the results from the 2015 trial, the most notable difference was the delay in project implementation at a significant number of sites. While the internet firewall issues that delayed the implementation at some government sites in 2015 were resolved, many preschools experienced significant delays in commencing the 2016 trial. Compounding this, a number of trial sites appeared to disengage with the trial, having not used the apps in the month preceding the data analysis. Consultations with trial sites suggested that a lack of guidance as to the best way to introduce the program caused these delays, much of which were addressed after educators were able to attend the workshops held in July and August.

In 2015, a significant majority of trial sites were signed up and actively participating in the ELLA trial by the end of March. In 2016, as the EOI process was open until 11 March, and given the larger number of trial sites resulted in a longer time period for individual preschool follow-ups, the sign-up and participation of sites in the ELLA trial was more protracted over the year.

Chart 3.9: When preschools started using ELLA apps in 2015 and 2016 trials



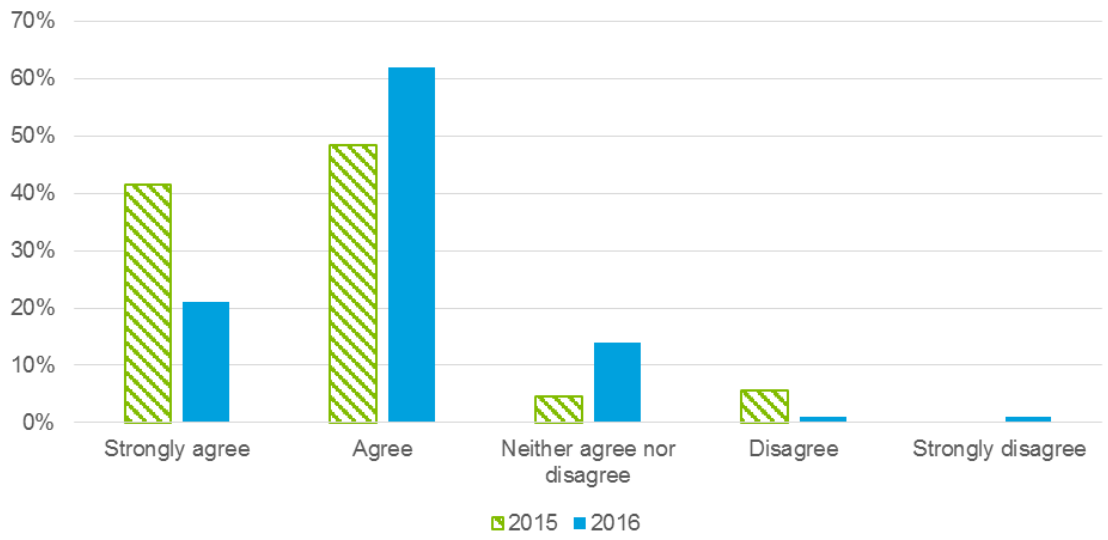
Source: DAE analysis of ELLA app usage data

The other key difference to the trial design in 2015 as compared in 2016 was the introduction of the BYOD model. As seen, the introduction of the BYOD model was not associated with major cost increases for preschools due to the fact that the majority of preschools owned tablets already. However, it is also possible that a number of the preschools who were offered the opportunity to participate in the trial, but chose not to, made this choice because they were not in a position to purchase tablets.

Additionally, the lower tablet-to-child ratio exhibited this year indicates that under the BYOD model, children were likely to have less access to tablets on average than under the 2015 trial in which tablets were provided. On completion of the ELLA trial in 2015, 70% of educators stated that the preschool had enough tablets to sufficiently cater for the ELLA program. In comparison, this reduced to 55% in 2016, indicating that the BYOD model may have implications for optimal delivery conditions for the ELLA program.

Further, a lower proportion of preschools in the 2016 trial strongly agreed that the ELLA app availability was timely, compared to the 2015 trial (Chart 3.10). However, overall, the majority of preschools in both the 2016 and 2015 trials found the ELLA apps released in a timely way.

Chart 3.10: Educator agreement with timeliness of app availability, 2015 and 2016 trials



Source: DAE ELLA educator survey (n=210), average of DAE 2015 educator surveys – baseline 2015 survey (n=39), August 2015 survey (n=98), December 2015 survey (n=68)

3.2.2 Implementation considerations

In consideration of the findings above, it is noted that:

- The ELLA program appears to be meeting a need within the preschool sector. However, the number of preschools that indicated interest in the ELLA program and then either chose not to participate, or commenced participation but did not actively remain engaged suggests that:
  - Additional communication around the capabilities and resources required to participate in the ELLA program (particularly under the BYOD model) may help to ensure that preschools that sign up to participate in the trial are aware of participation requirements, along with the program benefits.
  - Additional guidance on implementation of the program under a BYOD model, such as the optimal tablet-to-child ratio, to support effective delivery of the ELLA program, would be advisable, and it is understood this advice has been provided for 2017.
- To maximise the exposure of preschools to the program throughout the year, and to streamline the implementation process, it would be optimal for preschools to be signed-up and actively participating from as early as possible in the year. It is noted that this has already been addressed for the 2017 ELLA program, with applications to participate being accepted from November 2016 (earlier than the 2016 trial).
- It is expected that implementation will become smoother for participating preschools in their second and third years of ELLA program participation – though it is worth considering how staff changes should be managed to ensure knowledge is maintained at each preschool throughout the year. Ideally, preschools should be sufficiently engaged to actively manage any personnel changes that occur and ensure continuity of knowledge.

4 Support for preschools

This section provides an overview of the support that ELLA trial sites received throughout the trial, by:

- reporting on the awareness and frequency of usage of available supports;
- discussing whether preschools found the trial supports to be helpful;
- examining observations on the technical support available to trial sites; and
- outlining several implications, in light of trial support observations.

The **key evaluation question** this section seeks to answer is:

- Was the program able to be implemented effectively? Did children use the program?
  - *Were preschools adequately supported in use of the apps within the sites?*
  - *Did preschools and their staff receive adequate and appropriate training in use of the apps throughout the trial?*

General findings on ELLA trial supports in 2016

- ***The educator workshop***: The educator workshop was noted by many sites in consultations as being a turning point for engagement – making educators aware of supports available, increasing their confidence in using the apps and motivating them to deliver the ELLA program effectively. Prior to the workshop, many preschools were either unaware of the extent of trial supports, expressed some confusion towards the purpose of the trial or were unaware of the best methods to implement the ELLA program. After the workshop, preschools stated they were able to make better use of the support available, and provide a more positive experience for children.
- ***Overall awareness of supports:*** Most survey respondents either agreed or strongly agreed that they understood the supports available to them throughout the trial. This should be considered in the context of preschools completing the survey after the workshop.
- ***Most helpful supports:*** From both the consultations and survey, the ELLA helpdesk and educator workshops were seen as the most helpful by preschools aware of the trial supports, while the Facebook page and online discussion forum were seen as less helpful.
    - ***Educator workshop:*** According to the consultations, the workshop was considered highly useful by almost all educators that attended it. It enabled a more meaningful involvement with the ELLA trial and provided them with useful suggestions on implementation. However, it was consistently noted that it would have been beneficial for the workshops to have been held earlier in the trial.
    - ***Educator app:*** In the survey, most educators stated that they were aware of the educator app (72%). However, of those that were aware of the educator app, only around half of had used it, citing reasons, such as time constraints and satisfaction with other supports available. Those who used it felt it supported their implementation and delivery. The educator app will be available for all of the 2017 program.
- ***Adequacy of technical support:*** Most trial sites did not face any major technical difficulties, as evidenced in both the consultations and survey. In the survey, preschools that were aware of the supports available felt they received adequate technical support.
- ***Whether more support was needed:*** The survey also found that most preschools neither agreed nor disagreed about whether the ELLA trial could have benefited from more technical support. However, most preschools that had participated in the 2015 trial noted a greater level of support in that year, as compared to the 2016 trial.

4.1 Experience with trial supports

The supports available to preschools in the 2016 trial were:

- An **educator workshop**, which provided training and demonstrations of the ELLA apps to educators from participating preschools, allowing them to learn about how to effectively deliver the trial to children.
    - All ELLA trial sites were offered the opportunity to take part in an educator workshop, with five workshops being held across Australia between late July and early August. Travel costs were covered to ensure cost was not a prohibitive barrier to participation.
- The **ELLA website**, with an educator area that provides background information about the language and culture, as well as advice and support material on how to implement the ELLA apps.

- All preschools were provided access login to the ELLA website and provided an electronic version of the program guidelines on commencement of the ELLA program (i.e., between February and March depending on when they signed-up).

- A **helpdesk** staffed by ESA, available on weekdays to help preschools troubleshoot issues and provide advice and assistance on trial implementation, delivery and general technical support. The helpdesk, paired with the program guidelines and Quick-start guide provided to preschools on trial commencement, formed the primary technical support for the trial.
- A **Facebook group** to enable educators to share tips and experiences with other preschools involved in the ELLA trial.
- An **online forum** which, like the Facebook group, was designed for educators to discuss their experiences with the trial and share ideas.

Two supports were newly introduced for the 2016 trial – an educator app and family app. The **educator app** provides background information and practical advice to educators on implementing and delivering the ELLA apps. The **family app** can be downloaded by families onto their personal devices, to try out a demo version of one of the apps and learn more about the ELLA trial (discussed further in section 6).

4.1.1 Awareness and usage of supports

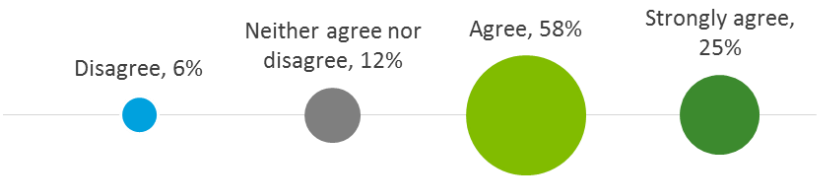
Findings from consultations indicate that prior to the workshop, some preschools were unaware of the extent of trial supports, or found them insufficient to fully support them in implementing and delivering the ELLA program.

However, following the workshop, preschools generally reported a strong awareness and understanding of the trial supports, and how these supports could aid in trial delivery. The most commonly used supports were the website, followed by the educator app. It should be noted that the survey took place *after* the workshop, and survey responses therefore reflect attitudes to trial supports after educators had received a detailed demonstration of the ELLA trial.

Understanding of supports

More than 80% of survey respondents agreed with the statement "I understand the educator support available to our service for the ELLA trial". While no preschools strongly disagreed with this statement, 6% did state that they disagreed, while 12% stated they neither agreed nor disagreed with the statement (Chart 4.1).

Chart 4.1: Educator agreement with statement 'I understand the educator support available to our service for the ELLA trial'



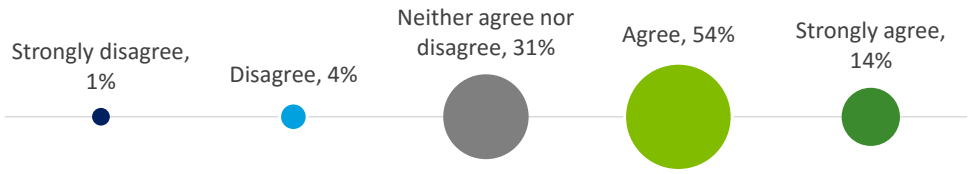
Source: DAE ELLA educator survey (n=205)

Respondents that disagreed with the statement provided the following reasons:

- Lack of awareness of trial supports:
  - *"I did not know it was available".*
  - *"Unaware they existed".*
- Unfamiliarity due to educators entering into the preschool after the trial had begun:
  - *"Started working after program was introduced so haven't had a chance to look at them".*

When asked if they would have preferred more support in relation to how the ELLA apps are best implemented, 54% of respondents agreed, and a further 14% strongly agreed (Chart 4.2). This is despite the fact that as part of the 2016 trial, educators were provided with a range of materials and guidance in relation to how to best introduce the apps into the preschool, including suggestions for scaffolding activities to complement the ELLA apps. It should also be noted that despite the request for additional support, most educators reported they found it easy to introduce the apps (see section 5), and generally reported observing positive outcomes from the trial (see section 8).

Chart 4.2: Educator agreement with statement 'I would have liked more support in relation to how the ELLA apps are best implemented in the classroom'



Source: DAE ELLA educator survey (n=197)

Possible reasons for the desire for an increased level of support, despite support materials being readily available, are discussed below.

Discussion with ESA revealed that a number of educators had not received the welcome email, including the link to the ELLA website. This was assumed to be due to the fact that the email was sent to the individual that registered for the ELLA trial, which may not have been the educator tasked with trial implementation (i.e., it may have been sent to a school principal rather than the preschool educator). As such, there was a risk that the email was not forwarded on. Alternatively, given time constraints educators may not have worked through the materials provided. Another possibility was that the relatively high turnover of staff in many preschools, meant some educators entered into the 2016 ELLA trial without having a full understanding of the ELLA trial.

Out of 24 trial site consultations, two preschools stated they were unaware of any of the supports available and one preschool stated they were only aware of the helpdesk. Other preschools were unaware of the extent of the support, or how to use the support available, until they were provided with a demonstration at an ELLA workshop.

The lack of awareness of materials resulted in some educators not being confident in supporting delivery of the ELLA trial. A few educators consulted expressed a sense of frustration that they did not completely understand the context of the activities and were not able to understand or pronounce the words that were being spoken through the apps. Likewise, two of the preschools consulted said that they only felt comfortable delivering the ELLA trial without support because

they had some background experience in the language being used in the apps (noting that the ELLA apps were designed to be used by educators without language teaching experience). A small number of the survey responses also reaffirmed this attitude:

- *"I really believe that the ELLA apps are useless without the support of an educator who speaks the language".*
- *"*[Because] *the educator speaks the same language this year, the benefits are huge".*

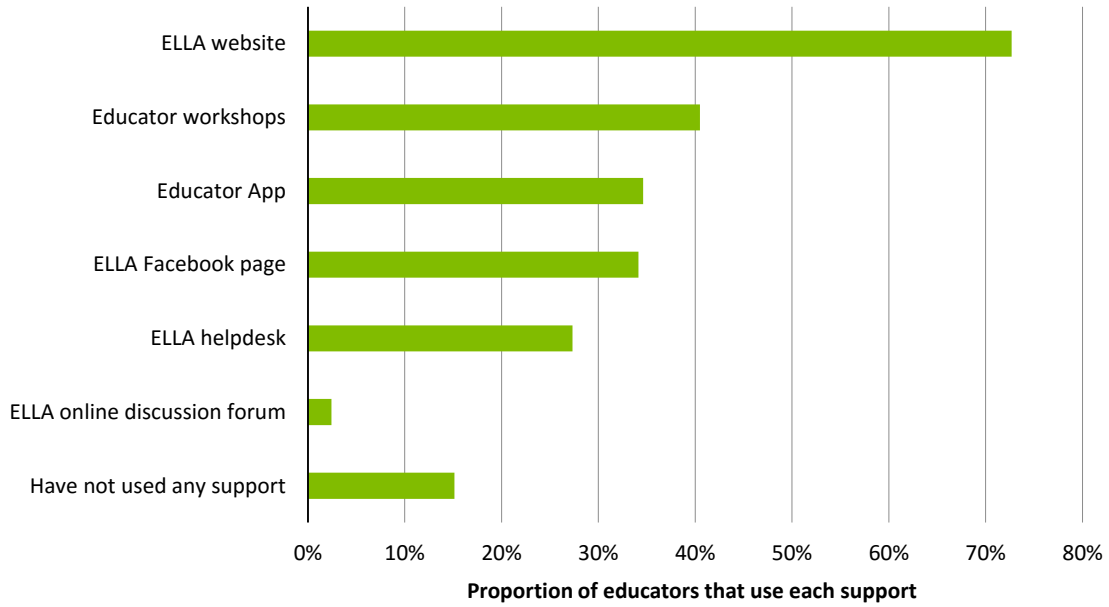
A further implication is that the lack of awareness of supports may have contributed to the high levels of variability in program delivery that was observed in the 2016 trial. This is discussed further in section 5.

Frequency with which the supports were used

In terms of the supports that the sites actually used, the most commonly used support was the ELLA website, followed by the Educator workshop and the educator app, ELLA Facebook page and ELLA helpdesk. In contrast, the ELLA online discussion forum was the least used form of support (although this was only introduced on 1 August 2016). A number of educators also stated that they did not use any support at all.

A breakdown of the frequency of support use among survey respondents is shown in Chart 4.3.

Chart 4.3: Proportion of educators that used ELLA trial supports



Source: DAE ELLA educator survey (n=205)

Respondents that stated they did not use the supports gave the following reasons as to why this was the case:

- Time constraints that prevented them from using trial supports:
  - *"Lack of available time".*
  - "*No time*".

- Felt comfortable implementing and delivering the trial without external support:
  - *"Didn't feel the need".*
  - *"Didn't need any support".*

4.1.2 Helpfulness of support

This section examines which supports were considered the most useful among educators. It is important to note that in this section, survey responses pertaining to the helpfulness of each support are only included if an educator has reported using that support. The educator workshop was considered highly useful; however it was generally thought to have occurred too late into the trial. Educators also noted that of the other supports, the website was widely used, and contained a number of helpful guides and tips.

Educator workshop

The educator workshop was clearly reported as the most valuable support for educators, and should be considered as a necessary precondition for the successful delivery of the ELLA apps. 83% of survey respondents that attended the workshop stated they found it 'very helpful' – the highest proportion out of all the trial supports. A further 16% of educators stated they found it 'somewhat helpful'.

Consultations supported this theme with almost universal positive responses. Educators noted that the workshop gave them a fuller involvement with the trial and useful suggestions on how to implement the trial and include complementary activities. For educators that were initially unsure about the merits of the ELLA trial, they noted the workshop increased their confidence and motivation, leading to greater engagement. During consultations, the educator workshop was consistently referred to as a turning point in the year for ELLA trial sites.

In the educator survey, a number of comments were made relating to the benefits of the educator workshop:

- *"The Educator workshops provided me an opportunity to meet up with other educators to share experience* (sic) *and discuss the difficulty I encountered. It gave me a broad picture* (sic) *how the ELLA program integrates with the preschool program".*
- *"I found the ELLA workshop the most useful as networking with others* [face-to-face] *allowed me to brainstorm solutions to minor problems (e.g., using accessibility settings to prevent children leaving the ELLA apps to use other apps). It also allowed me to hear ideas on how others were extending the program".*
- *"I found the workshop the most helpful. The speakers were amazing and very inspiring. Being able to meet other educators and share success stories and ideas was fantastic".*

However, a consistent piece of feedback from the consultations was that the workshop was held too late in the year, with educators stating they would have preferred it to be held at the beginning of the trial. Many trial sites indicated that they felt they were 'making things up' or 'playing it by ear' until the workshop was able to provide them with practical guidance.

This was reiterated by respondents to the educator survey:

- *"Maybe a workshop at the beginning of the year would have been useful as that is when I needed the extra support rather than at the end of the year".*

- *"*[T]*he educator workshop was the best but needed to be earlier in the year to give us time to implement the awesome ideas I learnt".*
- *"The workshop would have been more beneficial if it was earlier in the year given that we were new to the program this year".*

Overall helpfulness of supports

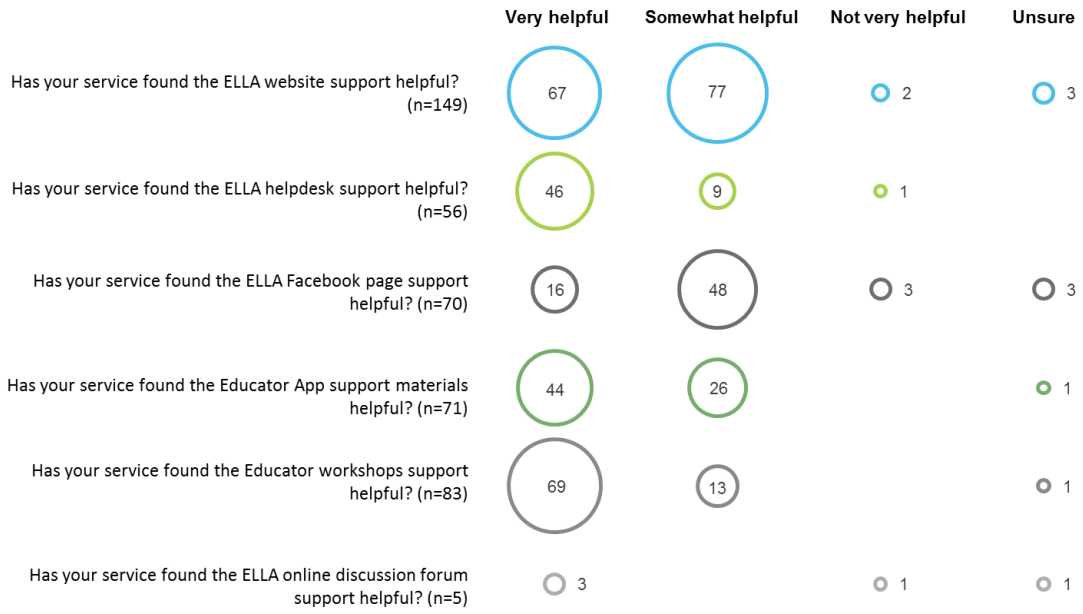
Chart 4.4 shows how helpful the respondents found the various supports they used.

The ELLA website was stated to be the most regularly used support, and was widely accepted as being either 'very helpful' or 'somewhat helpful' by nearly all survey respondents.

Among those that used each support, the workshop was viewed by the highest proportion of educators as 'very helpful', followed closely by the helpdesk. In contrast, a significantly lower proportion of educators found the website or Facebook page 'very helpful'.

Similarly, for almost all the supports, the vast majority of educators that used them found that either 'very helpful' or at least 'somewhat helpful', indicating that the support system as a whole was well targeted. The only exception to this was the online discussion forum, where a smaller proportion found it helpful.

Chart 4.4: Educator views on helpfulness of ELLA trial supports



Source: DAE ELLA educator survey

Website

According to the survey, while only 45% of educators that used the website stated that they thought it was 'very helpful', 97% of educators thought it was either 'very helpful' or at least 'somewhat helpful'.

This was supported in consultations in which educators frequently noted that the website was a useful support, providing suggestions, such as implementation advice and examples of complementary activities, which aided their delivery of the trial in their preschool. Likewise, survey comments confirmed that the website was viewed as a useful support:

- *"*[B]*ecause it has detailed information* [and] *knowledge about each app, which supports educators to gain knowledge for themselves, share information to the families, and also* (sic) *simply print out to use as additional resources or playing tools* (sic) *for children".*
- *"The information on the website is excellent quality* (sic)*. We printed off the Overview for each app and made booklets for parents to peruse. They gave us fabulous insight and reference for each app which I refer to regularly".*

Helpdesk

Of the survey respondents that used the helpdesk, 82% reported that it was 'very helpful' – the second highest proportion, next to the educator workshop. Similarly, 98% of respondents that used it reported that it was either 'very helpful' or 'somewhat helpful'.

A couple of educators in the consultations highlighted the responsive and concise manner with which the helpdesk resolved their queries. This was also confirmed in the survey responses:

- *"The helpdesk suited us the most as it was available to answer my question directly, and I found it the least time consuming".*
- *"Answers were quick and easy to follow".*

Facebook page

Only 23% of survey respondents that used the Facebook page found it to be 'very helpful', the lowest proportion out of all the trial supports. However, the Facebook page was not seen as entirely unhelpful, with 91% of educators that used it reporting it was 'very helpful' or 'somewhat helpful'.

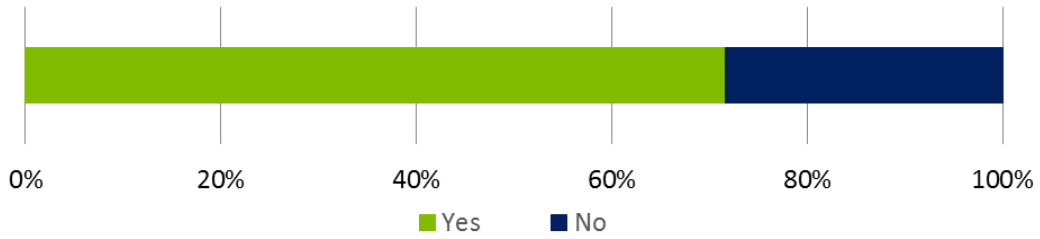
The Facebook page provided an opportunity for preschools to share their experiences with other preschools involved in the trial. While a couple of preschools that were consulted stated they only browsed the Facebook page once or twice for ideas, the survey responses indicated that some educators did find the Facebook page helpful for the trial:

- *"It has many ideas from others and inspires us".*
- *"The Facebook page as you could see what other educators have used and how they have resolved issues".*

Educator app

Of respondents that used the educator app, 62% found it 'very helpful', while 99% of those that used it found it either 'very helpful' or 'somewhat helpful'. Most respondents to the survey stated they were aware of the educator app, although almost one-third (28%) stated they were unaware of it. This level of unawareness potentially indicates barriers in communicating the availability of this particular support, especially as it was released mid-way through the trial.

Chart 4.5: Educator awareness of the educator app

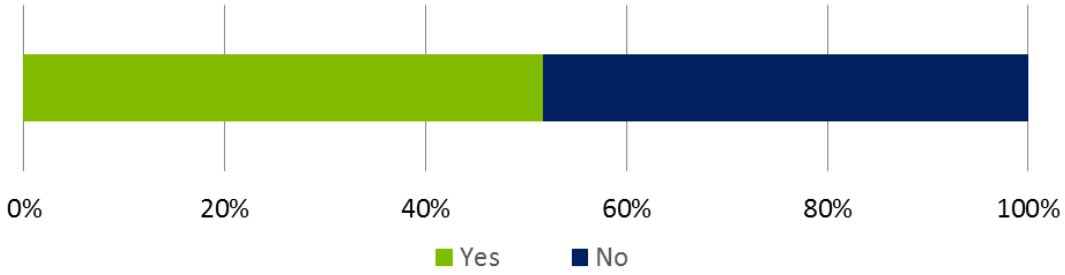


Source: DAE ELLA educator survey (n=197)

Of those educators who *were* aware of the educator app, around half stated that they actually used it (Chart 4.6). During consultations, several reasons were given for the low-usage rates:

- time constraints, in terms of limited ability to engage with the educator app outside of face-to-face teaching hours;
- educators feeling that the content covered in the app was already available through other support channels, such as the workshop or website; and
- educators believing that they already had sufficient confidence in implementing the trial in their preschool without requiring further support.

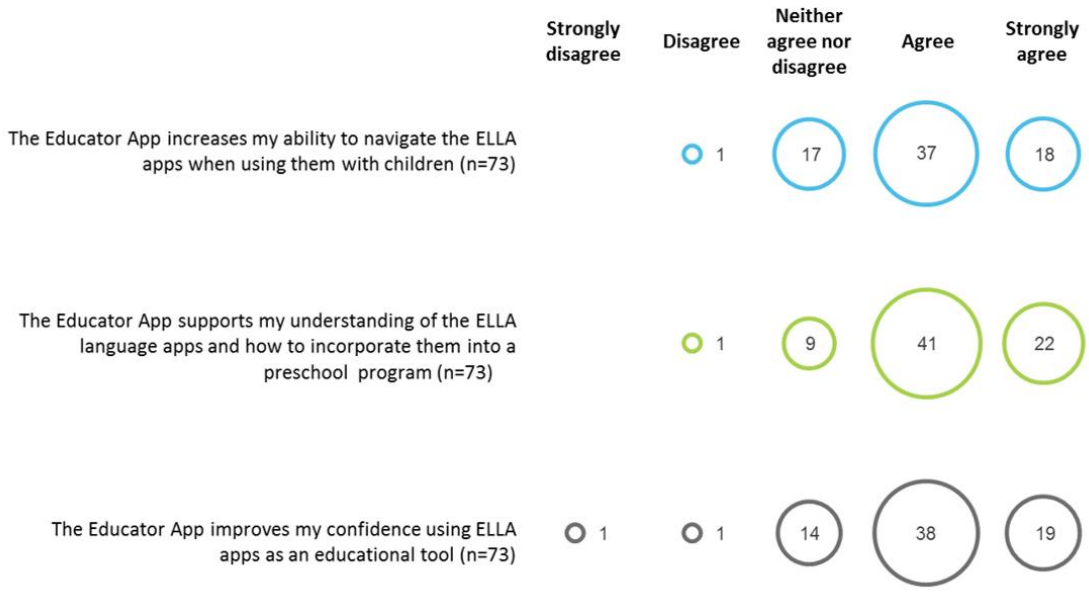
Chart 4.6: Educator use of educator app (if they were aware of it)



Source: DAE ELLA educator survey (n=141)

In terms of attitude towards the usefulness of the educator app among those that used it, most educators agreed that it increased their ability to navigate the apps, supported their understanding of how to incorporate the apps and improved their confidence in using the apps as an educational tool (Chart 4.7).

Chart 4.7: Educator views on usefulness of educator app (if they used it)



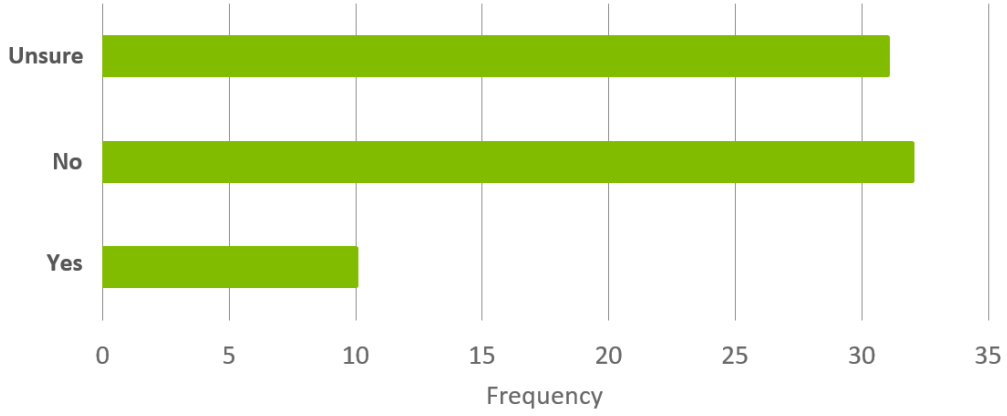
Source: DAE ELLA educator survey (n=73)

The survey comments also indicated that, for those educators who used the educator app, it was seen as user friendly and provided clear supporting content:

- *"*[I]*t is very clear and concise when explaining how each app works".*
- *"The educator app is the most useful as it helps staff know the correct pronunciation of the words* [and] *it provides an overview of all the apps in the one place".*
- *"I found the educator app particularly useful for me because it related best to my needs and requirements and was very user friendly".*

Moreover, most educators that used the educator app either felt the features available on the app were sufficient for their needs, or were unsure whether they wanted to see additional features (Chart 4.8).

Chart 4.8: Whether educators wanted to see additional educator app features



Source: DAE ELLA educator survey (n=73)

Some of the additional features that survey respondents felt the educator app could have included were:

- more content assisting them with word pronunciation;
- more video footage on practical implementation of the program; and
- more resources which they could print out, such as posters or labels.

Online discussion forum

Of the five survey respondents that stated they used the online forum, three (60%) of them found it 'very helpful'. None of the five respondents stated they thought it was 'somewhat helpful'.

The consultations also confirmed the survey findings that supports, such as the online discussion forum, were viewed as not particularly helpful. Some felt that there was a missed opportunity for preschools to network via the forum or Facebook page.

A likely reason why the forum was seen as not helpful was low levels of participation among preschools. Without a significant active user base, the forum is unlikely to generate timely and informative discussion on the trial. As shown in Chart 4.7 , only five survey respondents stated they used the forum. This reasoning is confirmed by the survey responses:

- *"Further participation in online discussion forums by all preschools would be beneficial so that educators can gain ideas from one another about how* [their] *preschool is implementing the ELLA program".*

4.1.3 Observations on technical support

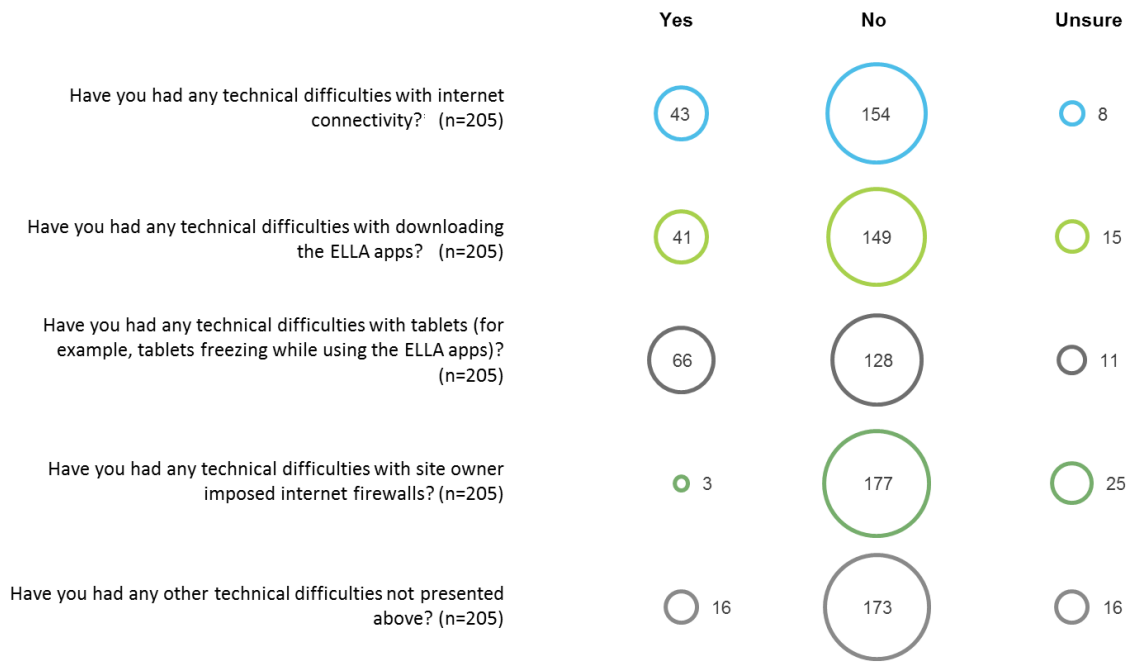
This section discusses any technical difficulties faced by the trial sites. Generally speaking, few technical difficulties were noted by preschools, aside from internet difficulties. Likewise, most preschools felt the technical support they received was adequate.

However, it should also be noted that a few preschools indicated in both the survey and consultations that they had a lack of awareness of all the trial supports, including any technical assistance.

Technical difficulties faced by preschools

Survey respondents indicated that they faced technical difficulties. As seen in Chart 4.9, the most common technical difficulties were either related to the tablets (e.g., freezing while the apps were being used) or internet related (difficulties with internet connectivity or downloading the apps).

Chart 4.9: Technical difficulties experienced by educators in trial sites



Source: DAE ELLA educator survey

These findings were confirmed through consultations where some sites mentioned difficulties with Wi-Fi connection to the tablets and download speeds for the apps, especially for preschools with poor internet connection. However, these tended to be eventually resolved over time. Some survey respondents also experienced similar issues:

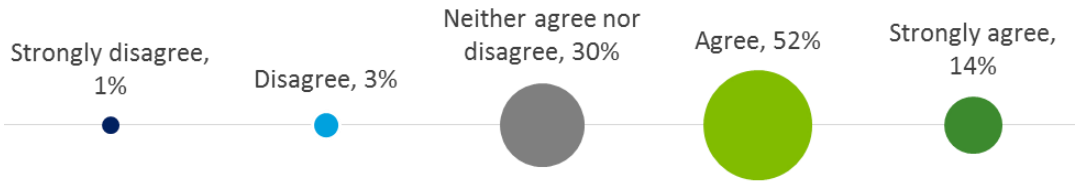
- *"Due to* [the National Broadband Network] *roll out in our area the internet connection has been consistently interrupted which has led to* [i]*ncreased waiting times while we try to connect or download* [the] *new* [a]*pps".*
- *"Limited internet connectivity at my centre so* [I] *have to use my personal internet from my mobile phone".*
- *"The internet at our service is horrible. It hasn't really affected the children using the app* (sic) *however downloading the apps has been a problem".*

No glitches, such as the apps not working properly and/or malfunctions of the apps, were reported by any of the trial sites in the consultations.

Adequacy of technical support

Most respondents to the educator survey felt they received adequate access to technical support or did not have an opinion about the support provided. Around two-thirds of preschools agreed or strongly agreed with the statement "Our service was able to get the technical support we need" (Chart 4.10).

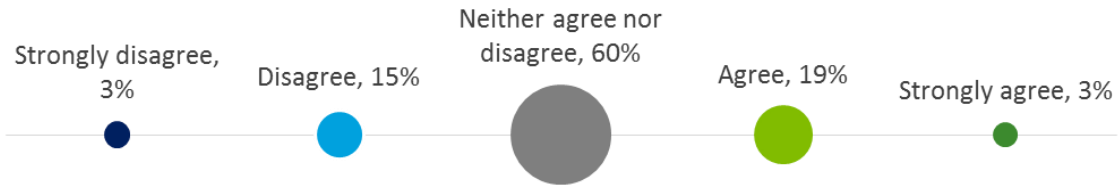
Chart 4.10: Educator agreement with statement 'Our service is able to get the technical support we need'



Source: DAE ELLA educator survey (n=205)

Further, the survey also found that most educators did not have an opinion about whether the ELLA trial would have benefited from more technical support.

Chart 4.11: Educator agreement with statement 'The ELLA trial would have benefited from more technical support'



Source: DAE ELLA educator survey (n=205)

In the consultations, a couple of trial sites noted that they did not receive as much technical support as they would have liked from ESA. Preschools that had participated in the trial in 2015 noted a much greater level of support last year. Unsurprisingly, however, these preschools also stated they were much more comfortable with implementing the trial this year, due to their prior experience.

4.2 Considerations for preschool support

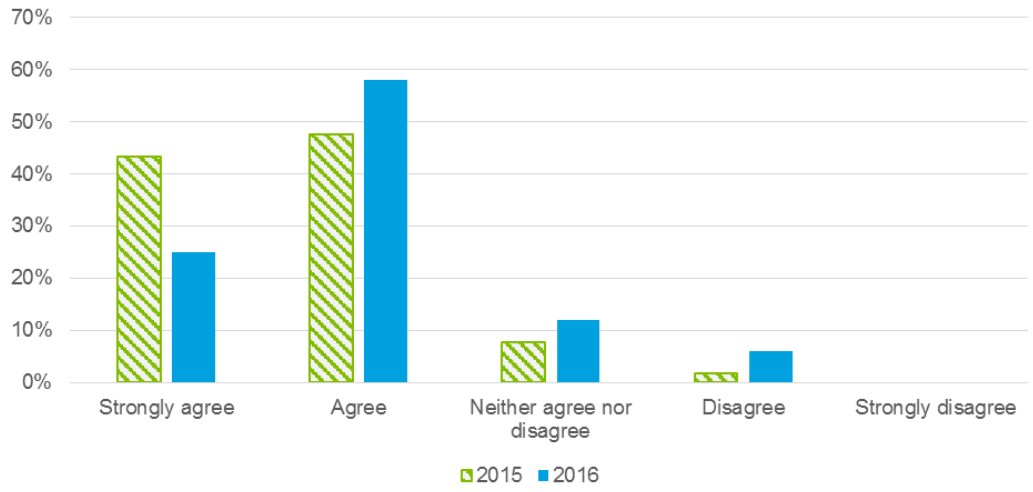
This section considers the implementation considerations for the ELLA program going forward arising from the findings above, and through a brief comparison with the 2015 ELLA trial evaluation findings.

4.2.1 Comparisons with the 2015 ELLA trial findings

There were a higher proportion of educators that were unaware of the trial supports under the 2016 trial than in 2015, in which no educators stated that they were unware of the trial supports. This is potentially a function of a higher number of participating preschools, and a reduced ability to individually follow up each preschool to ensure educators are sufficiently informed.

Also, a lower proportion of educators in the 2016 trial strongly agreed that they understood the educator supports available, compared to the 2015 trial (Chart 4.12).

Chart 4.12: Educator agreement with statement that they understood educator supports available, 2015 and 2016 trials



Source: DAE ELLA educator survey (n=205), average of DAE 2015 educator surveys – baseline 2015 survey (n=39), August 2015 survey (n=98), December 2015 survey (n=68)

In relation to technical issues, there were a lower number of internet connection issues due to site firewalls in 2016, which in 2015 caused significant delays in accessing the apps for some preschools. There were also less reports of difficulties downloading the apps – both findings indicating that some of the issues encountered in 2015 had been actively resolved for the 2016 trial.

However, the proportion of educators stating that they would have appreciated a greater level of technical support throughout the trial (22% strongly agreeing or agreeing with this statement) also potentially reflects the reduced level of awareness and uptake of available supports.

Similar to 2015, the workshops and website continue to be seen as the most helpful forms of support.

4.2.2 Considerations for preschool support

In consideration of the findings above, it is noted that:

- The workshops are a critical component of the ELLA program support scheme. They help build educator confidence and offer guidance for the best methods to introduce the apps into a preschool setting. They also underpin the correct application of the rest of the supporting material made available to sites.
- A range of support and guidance is made available to educators at the beginning of the program. Efforts should be made to ensure that the educators tasked with implementing and delivering ELLA are aware of all available supports. It is noted that, for the 2017 ELLA program, participating preschools are asked to provide emails for all participating staff, rather than a nominated contact, which may assist with this process.
- While the support system appears to be well targeted and well used, the online forums and Facebook page require a critical mass of participants to be highly useful. Participant educators should be more actively encouraged to utilise this resource.

- The educator app was not widely used in the 2016 trial; however, it is expected that this is primarily due to its late release date – in which the support provided by the app was less imperative as educators were already well progressed though trial implementation and delivery. As the educator app will be ready for use from the beginning of the 2017 program, it is anticipated that its use will be more widespread than it was during the 2016 trial.
- It is also noted that the intensity of support available to sites throughout the 2016 trial was less than what was made available to sites during the 2015 trial. This reflected an increased focus on the financial viability of supports as the ELLA program becomes more widely used.

Several other recommendations made by educators regarding the ELLA trial supports in survey responses included:

- sending out physical support materials and teaching aids, such as children's books, cultural items, music or flash cards, to support educators and consolidate children's learning;
- having additional workshops or professional development opportunities/conferences throughout the year;
- similarly, having an online workshop or self-paced professional development program for educators that are unable to attend the educator workshop to also receive training and implementation/delivery advice; and
- providing more information for parents on the benefits of the ELLA program and access to resources/information that parents can use at home with their children (noting that the family app addresses some components of this).

5 Trial delivery

This section examines evidence about the appropriateness and effectiveness of the delivery of the ELLA trial across sites, by:

- considering the initial use of the ELLA apps by preschools;
- examining variation in the delivery of the trial across sites;
- discussing the complementary activities used by educators as part of the trial; and
- outlining considerations for future trial delivery in light of these observations.

The **key evaluation questions** this section seeks to answer are:

- Was the design of the software appropriate? Is it fit for purpose?
  - *Did the apps incorporate a level of functionality that was appropriate for their purpose?*
  - *How user friendly were the apps for preschool-aged children?*
  - *How user friendly were the apps for educators?*
  - *Could educators easily engage with children about and during use of the apps?*
- Was the program able to be implemented effectively? Did children use the program?
  - *Were tablets an appropriate platform for children's use of the apps?*
  - *How often were the apps used?*
  - *What were the patterns of usage?*

General findings on the delivery of the ELLA trial in 2016

- ***Ease of delivery:*** The introduction and delivery of the ELLA apps was considered relatively easy.
  - In the survey, 57% of educator respondents found the ELLA apps to be very easy to introduce into the preschool and 36% found it somewhat easy.
  - 60% of survey respondents found they could very easily navigate the apps and 36% found they could somewhat easily navigate it.
  - Half of the educators surveyed found it very easy to engage children while children used the apps, while 37% found it somewhat easy to engage children.
- ***Variation in delivery:*** Both the surveys and consultations indicated **significant variation in trial delivery methods**.
  - There was variability in the level of educator engagement with children while they used the apps.
  - The ELLA apps were most commonly used during a fixed time, such as free-play activity time or quiet time. However, a few preschools allowed children to access the apps whenever they wished to.
  - Some preschools also used a checklist, where children were ticked off by the educators and allowed to play on the tablets for a set amount of time.
  - Some preschools only allowed one child per tablet, while other preschools allowed two or more children per tablet.
  - In two of the consultation interviews, educators stated that they delivered the ELLA apps almost exclusively in a large group setting.
  - From the consultations, a small number of educators also stated they experienced difficulties in separating the children that were registered to participate in the trial from those that were not.
- ***Complementary activities:*** Most educators also incorporated or extended the ELLA apps into their broader preschool program, such as through singing songs or telling stories in the ELLA app language.

5.1 Trial delivery experience

This section discusses the trial delivery experience of educators, in terms of the ease of the initial introduction of the apps and the levels of variation in the way the ELLA program was delivered across the trial sites.

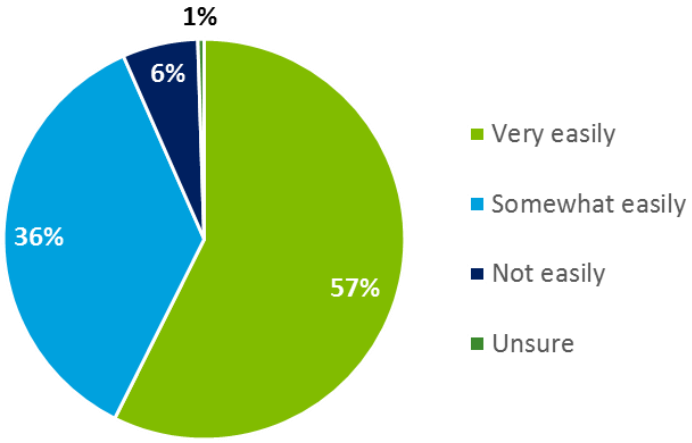
5.1.1 Initial introduction of ELLA apps

Educators generally thought it was easy to introduce the ELLA apps to children, navigate the apps and engage children with the apps.

Ease of introduction to children

Fifty-seven percent of survey respondents said they were able to 'very easily' introduce the ELLA apps into the preschool and 36% said they were able to 'somewhat easily' introduce it (Chart 5.1). Further, 6% of educators said they found the introduction not easy.

Chart 5.1: Educator views on ease of introducing ELLA apps to children



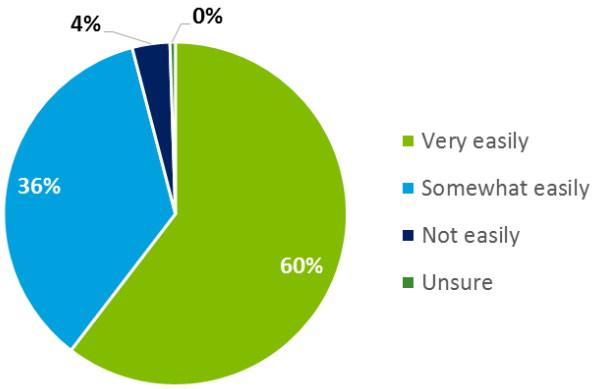
Source: DAE ELLA educator survey (n=197)

While the consultations generally confirmed it was easy to introduce the apps to children, a few trial sites did note some issues. Some preschools noted there was a significant time factor involved with developing the profiles for the children, particularly within the context of a busy early learning environment. In one instance, the preschool asked parents to oversee the children while they created and uploaded the profiles for each child. One trial site noted that they found implementation so difficult that they decided to only have a single profile and use that one profile with a larger group of children in educator-driven sessions. These consultation findings, however, should be balanced against the survey results shown above, which found that only a small number of educators did not find it easy introducing the ELLA apps to children.

Ease of navigation

The ELLA apps were viewed by most survey respondents as well designed and easy to navigate. Of survey respondents, 60% of educators found they could 'very easily' navigate the apps and 36% found they could 'somewhat easily' navigate them (Chart 5.2), while 4% reported app navigation not to be easy.

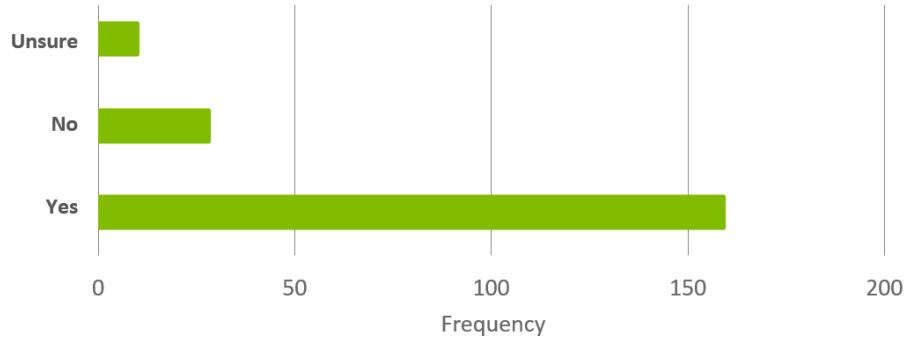
Chart 5.2: Educator views on how easily they could navigate the ELLA apps



Source: DAE ELLA educator survey (n=197)

Further, most educators stated that their ability to navigate the ELLA apps improved over the course of the trial (Chart 5.3).

Chart 5.3: Improvement in ability to navigate the ELLA app since start of trial



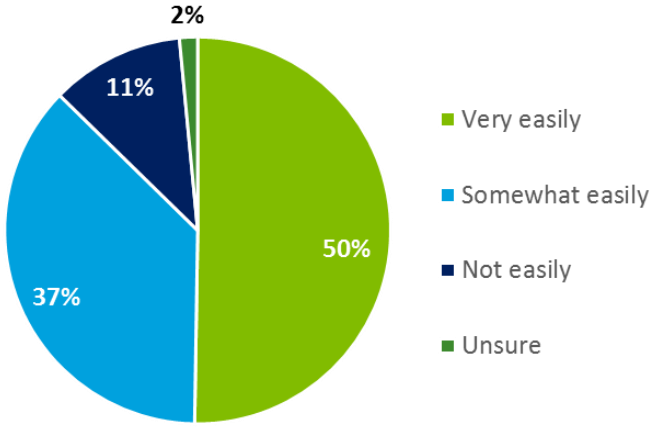
Source: DAE ELLA educator survey (n=197)

Educators consulted stated that they could easily navigate the apps. In the interviews, preschools generally stated that they found the apps well designed in terms of ease of movement within and across activities.

Ease of child engagement

According to the educator survey, half of the educators found they could 'very easily' engage children using the ELLA apps, while 37% reported they found they could 'somewhat easily' engage children (Chart 5.4), while 11% of educators found it not easy.

Chart 5.4: Educator views on how easily they could engage children using ELLA apps



Source: DAE ELLA educator survey (n=197)

Survey responses that indicated educators could easily engage the children with the ELLA apps included:

- *"Children have been totally engaged in the app since day 1. Lots of excitement when a new app comes out".*
- *"They are very engage*[d] *and love to explore each* [app]*".*

- *"The children now have their favourite apps and games. They like to play side by side using the same games".*

The survey responses did indicate instances where educators found it difficult to engage with children using the apps:

- "*It wasn't always possible to engage with the children who were working with* [the ELLA] *program as we are responsible for supervising 20 children".*
- *"Given we are a 4-5* [year old] *room with 20 children a day, there are only two staff within the room. It is difficult to engage and interact with the children regularly while using the ELLA apps".*
- *"Children are engaged at the start of each new app and enjoy the privilege; however,* (sic) *soon become bored. By the second or so week, children have to be coerced to play".*

5.1.2 Variation in delivery

A key observation from the consultation interviews for the 2016 ELLA trial was the high level of variability in delivery methods.

The features of delivery methods where variation was observed include:

- the way in which educators interacted with children using the apps;
- when the ELLA apps were used during the day;
- how long each session lasted, and how it was rotated among children;
- the tablet-to-child ratio within preschools;
- whether large-group use was employed; and
- how educators catered for non-ELLA participants.

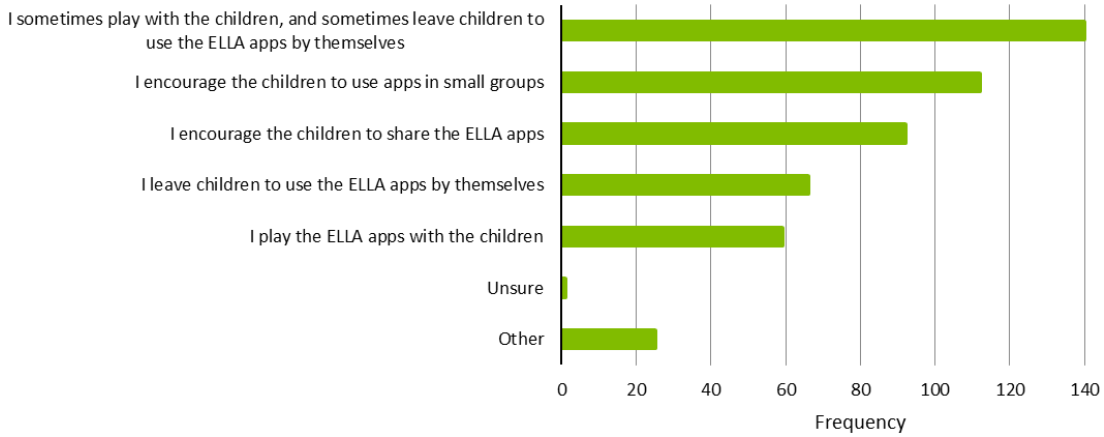
This variability reflects the flexibility afforded by the program, which enables preschools to tailor the program to the unique needs of their children. However, good practice in the use of the ELLA program is becoming increasingly apparent based on the two years of program trialling. For example, the use of complementary activities to support the ELLA apps, along with educators interacting with children while they use the apps.[12]

Educator interactions with children

The survey findings indicated a wide spread in regard to the way educators interacted with children as they were using the apps. Chart 5.5 shows the most common ways that survey respondents interacted with children using the ELLA apps.

[12] These findings are based upon observations of the 2015 trial sites and an extensive review of the literature relating to digital technology in a preschool setting. For more details, see the 2015 evaluation.

Chart 5.5: Ways educators interacted with children while ELLA apps were in use



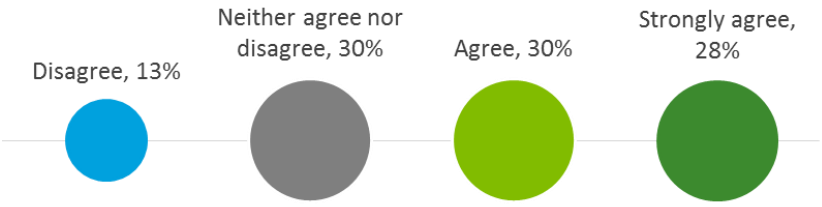
Source: DAE ELLA educator survey (n=197)
Note: Respondents were able to select multiple responses.

The survey responses supported the finding that educators interacted with children during the ELLA trial in multiple ways:

- *"I have an adult nearby either a parent or myself to oversee the use of the apps and to re-enforce the learning by discussing the words/terms being used".*
- *"I sit with children as they play the apps and chat with them about what is happening; encourage them to follow the instructions such as repeat the words, etc".*
- *"We speak at group times occasionally about what the apps are teaching us".*

Sites that had **participated in the ELLA trial in 2015** showed a mix of responses as to whether they felt they could build on their experiences from the previous year in order to enhance the learning experience. Roughly equal numbers said they either 'agreed', 'strongly agreed' or felt neutral on the issue (Chart 5.6).

Chart 5.6: Educator agreement with statement 'We have been able to build on our experiences from last year to further enhance the learning experience for children'



Source: DAE ELLA educator survey (n=40)

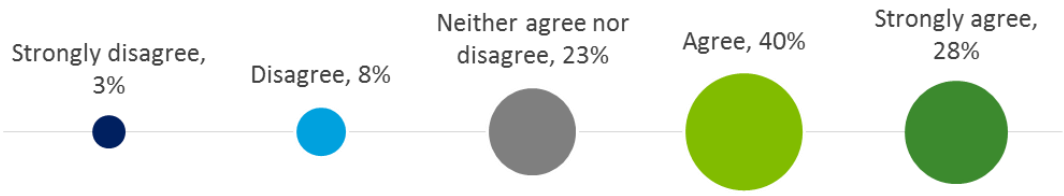
Survey responses from 2015 trial participants illustrated how they built on their previous experiences in delivering the 2016 trial:

- *"Previous experience, having notes for the app was very helpful".*
- *"My own familiarity with the apps and the language has helped a lot. My understanding of the iPads has made it easier for me to problem solve the issues that we have come across along the way".*

- *"It was easier because we were already familiar with the apps, even though last year we had a different target language".*

A similar mix can be observed in educator beliefs on whether they were able to better support children in learning the language in the ELLA apps in this trial, compared to in the 2015 trial (Chart 5.7).

Chart 5.7: Educator agreement on providing better support for children learning language in ELLA apps, compared to 2015 trial



Source: DAE ELLA educator survey (n=40)

Detailed survey responses included:

- *"*[B]*y understanding what went well and what didn't, knowing the apps content, and thereby supporting linking to the program".*
- *"We know what we are doing, so we can plan better experiences and children have learnt from our confidence as well".*
- *"Deeper understanding of the concepts - more time to research and provide extensions of children's interests".*

Usage during the day

According to the consultations, a common way the app was used in the preschool environment was during a fixed time, such as free-play activity time or quiet time, which made it easier to manage app usage among the children. This would normally occur on set days during the week.

It was also common for preschools to allow children to have access to the apps whenever they wished to. However, educators took care to ensure that children did not spend an excessive amount of time using the ELLA apps.

Length of session and child rotation

In the consultations, most educators said they typically allowed children to spend around 10-15 minutes with the ELLA apps per session, with some children finishing earlier and moving onto other activities. Generally speaking, educators thought this was sufficient time for children to be engaged with the activities in the apps, without detracting from other activities. Indeed, the majority of educators were cautious about controlling screen time and stated that they clearly communicated this to families.

Many preschools that were consulted also used a checklist, where children were ticked off by the educators and allowed to use the tablets for a set amount of time. Some preschools

structured ELLA app usage around groups of children being given access to the apps on particular days of the week. This was stated to allow the tablets to be rotated through all children, giving everyone an equal opportunity to use the apps.

These consultation findings were supported by a number of detailed survey responses:

- *"We use* [a] *timer for 10 minutes and have a list for who is having next turn".*
- *"*[I] *set up the tablets with a waiting list chart and timer, each child gets 15 mins for each turn".*
- *"Writing their names on a list on a whiteboard, teachers monitoring times of turns, giving timely warnings of "one more game" and the children signing out to tell the next person on the list it is their turn".*

However, other preschools were less structured in managing access to the ELLA apps. In the consultations, a small number of trial sites permitted children to manage the usage rotation themselves, allowing them to tick themselves off the checklist and pass the tablet on to others. Two trial sites that were consulted also allowed the children to self-regulate their usage time. These preschools reported that they felt the system worked well and there were no instances of excessive screen time or children missing out.

A few of the survey responses supported this finding:

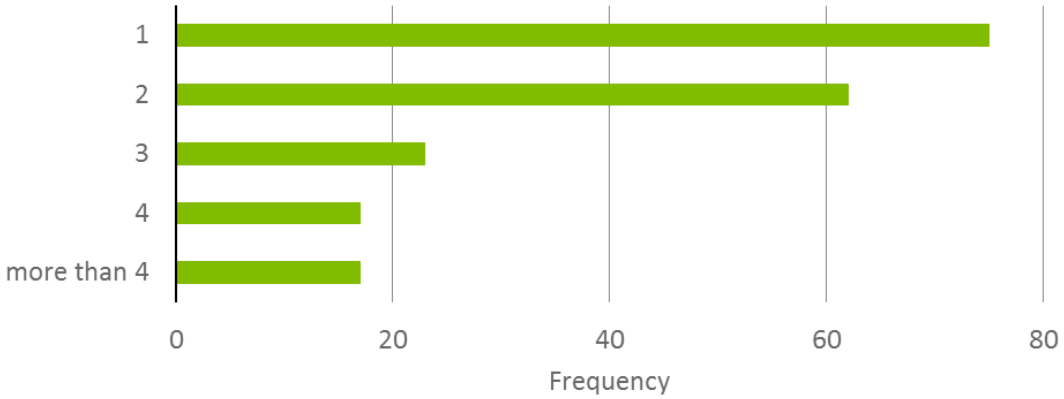
- *"We have a system whereby children take a turn and check their name off our designated Indonesian board".*
- *"*[T]*he children tend to self regulate it themselves".*
- *"Chart system. One is "I have had a turn" and the other is "I have not had a turn." They transfer their photo from one to the other".*

A few educators said in the interviews that while they initially implemented the ELLA trial with very strict timing and checklists, as they became more comfortable with delivering the program, they transitioned towards a more self-directed approach. In the consultations, three preschools stated that because they managed large groups of children, many of whom attended irregularly, it was often difficult to fully supervise the timing and rotation of children.

Number of children using each tablet

There was also a degree of variability in how many children used the tablets at the same time. Survey results show that a similar number of educators observed children using the apps individually, in pairs, or in groups of three or more (Chart 5.8).

Chart 5.8: Number of children that played with each tablet using the ELLA apps



Source: DAE ELLA educator survey (n=194)

According to the consultations, the most typical scenario was simply that of one child per tablet, who would – for example – sit in a designated activity area of the preschool or with other children using the apps. However, the interviews also noted deviations from this practice. One trial site stated that they paired children off, so that there were two children per tablet, with one watching and helping while the other did the activities. After a period of time, they would swap roles. A few preschools reported that an insufficient number of tablets resulted in larger numbers of children per tablet in some instances.

A small number of educators that were consulted also noted that children would naturally gather around others using the ELLA apps and sometimes groups of three or even more children would form around one tablet, with one child in control of the tablet while others watched or assisted. In these instances, educators experienced few issues with this model. It was noted that there was sharing and socialising amongst the children, and they would help each other to use the apps.

Emphasis on large group use

In the consultations, one educator stated that they delivered the ELLA apps exclusively in a large group setting, such as sitting around in a circle with the tablet and having an educator undertake the activities with the children in a group.

Some other preschools stated in both the consultations and the surveys that they would go over each app with every child when it was released on a smartboard, while others would go over it as a group after the children had a chance to use it on their own, as a way of reinforcing the learning.

The emphasis on large group use was noted in some of the survey responses:

- *"I introduce each app using our interactive whiteboard so we* [can] *navigate and problem solve as a whole group first. This allows the children to ask questions, be confident and understand expectations for using each app and learning experience".*
- *"Each time a new app is launched we will have a group time with the whole class and have a little look around at the app".*
- *"Twice a week we put the* [a]*pp up on the white board and go through the apps as a whole class".*

Catering for non-ELLA participants

In the consultations, educators stated that, for various reasons, not all children were permitted to participate in the ELLA trial. As a result, preschools often had a mix of children that were participating in the trial and those that were not. However, information provided to educators at the commencement of the trial advised that it was the responsibility of educators to identify and offer alternative arrangements to children that did not have parental consent to participate. The educator app contains ideas on alternative learning pathways to ensure that children who are not able to participate in ELLA can still enjoy and participate in other language learning experiences, such as cooking, singing, videos, inquiries, discussions and creative experiences.

A small number of consultation participants noted that there were sometimes difficulties separating non-ELLA participants, particularly in small preschool environments. Children would naturally gather around others using the apps, even if they were not allowed to play with it themselves. A number of educators stated that some degree of exposure to the trial was hard to avoid, particularly with non-participating children being able to hear the sound from the apps and interacting with children that had learnt words from the ELLA trial.

These educators often stated that children would be upset when they were told they were not allowed to participate (for example, because their parents/guardians did not want them to have screen time at preschool). Educators said that these issues were normally resolved over time, as there were other children and activities at the preschool that could absorb the attention of non-participants. Separating trial participants in some way, such as having a special table or corner for them to use the tablets, also helped.

A small number of survey responses reaffirmed that the presence of non-participants caused issues at their preschool:

- "*Unfortunately when the children use the app other children who are unable to use the app(ether* (sic) *not old enough or do not have parent consent) are glued to screen watching and get upset when they are not allowed a turn*[.] [T]*hey are missing out learning other important skills as the screen time is very distracting and* [a]*bsorbs all their attention".*
- *"We find it hard to turn children away if they don't have permission or they aren't old enough".*

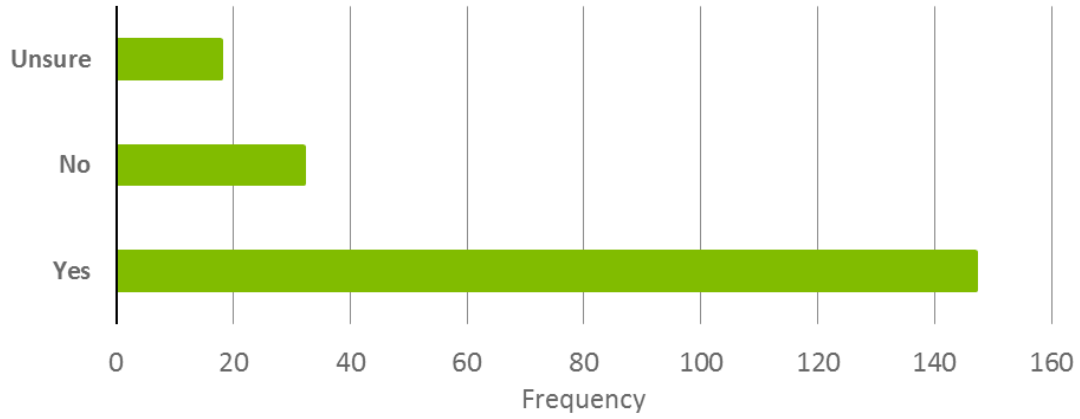
A few educators that were interviewed said they considered separating the children that were allowed to participate into another room for them to use the apps. However, this was often impractical because of educator-child ratios that needed to be maintained in the preschool.

A related issue was exposure to a language when consent had not been granted because some parents had concerns regarding that language. For example, one site that was consulted had chosen Arabic as their language for the trial because their preschool was located in an area with a strong Middle Eastern community. However, while many families were enthusiastic and supportive of the trial, there were some families that were negative about the choice and, as a result, did not allow their children to participate in the trial. This resulted in issues where non-participants were still unintentionally exposed to the Arabic language in the preschool.

5.1.3 Use of complementary activities

Most survey respondents incorporated or extended the ELLA apps into their broader preschool program, consistent with best practice in delivering the ELLA program. Nearly all educators responding to the survey noted that additional activities (such as through singing songs or telling stories in the language from the ELLA apps) were vital to reinforcing the language exposure experienced through the apps (Chart 5.9).

Chart 5.9: Whether educators incorporated or extended ELLA apps into broader preschool program



Source: DAE ELLA educator survey (n=197)

According to consultation participants, complementary activities incorporated by preschools included:

- A language corner, such as a French or Chinese corner, which contained books related to the language and culture, with a learning book that children could write in, and reflect on, the learning they had done.
- Unique activities, such as having a Teppanyaki cooking session at lunchtime to complement the Japanese apps.
- Cultural arts and crafts, such as creating a 'lucky dragon' in the preschool as part of the Chinese ELLA apps, and to celebrate Chinese New Year. Another example was papier-mâché balloons with foreign words on them.
- Reinforcement of the trial content, such as counting numbers or naming colours in the foreign language taught in the app, in a more general preschool setting. This included singing songs and even informal occasions where educators quizzed children about words they had learnt from the app.
- Reinforcement of learning by doing the apps together as an entire group, with the use of an interactive whiteboard, to even further reinforce specific elements and content from the apps themselves.

Educators stated that these complementary activities were well received by the children and were beneficial to the outcomes of the ELLA trial (see section 8.1 for further details).

Survey respondents who did not incorporate complementary activities provided several explanatory reasons, including:

- Not knowing where to find additional material to complement the ELLA apps. This was particularly the case in rural and regional areas.
- Time constraints that prevented educators from preparing and developing complementary activities.
- Not feeling confident in their skills and experience in bringing new learning content on top of the ELLA apps into their preschools.
- A few educators also stated that they were unaware that the ELLA trial could have a complementary activities component.

5.2 Considerations for trial delivery

This section considers the trial delivery considerations for the ELLA program going forward arising from the findings above, and through a brief comparison with the 2015 ELLA trial evaluation findings.

5.2.1 Comparisons with the 2015 ELLA trial findings

In a similar manner to the 2016 trial, the 2015 evaluation also found that preschools delivered the ELLA trial with significant variation. This, in part, reflects the ELLA program design, in the ability to be flexible to the unique circumstances of each participating preschool. However, there were two key observations to be made:

- The 2015 trial encouraged flexibility and innovation in delivery by design, as the trial was in its first year and the optimal methods of delivery were still to be explored and determined. While the ELLA program was still in trial phase in 2016, it would be expected that the variation in service flexibility would have reduced somewhat as preschools move towards a best-practice model, drawing on evaluation findings and continual learnings from other sites.
- During 2015, each trial site received a site visit from ESA to support ELLA trial delivery. In the absence of this – 2016 trial sites were found to be more likely to be delivering the apps using methods that were not originally intended – such as solely through large-group sessions that no longer incorporate the individual learning objectives of the app design. If the trial is delivered in a manner that is considerably different from the original design – there is a risk that the benefits of the trial may not be realised.

In a similar manner to the 2015 trial, the significant majority of educators stated that they interacted with the children while using the apps and delivered complementary activities. However, also similar to the 2015 trial, it appears that the ability of educators to effectively support the ELLA trial can be compromised by time constraints, lack of educator knowledge or capability to do so and lack of access to resources.

5.2.2 Considerations for trial delivery

In consideration of the findings above, it is noted that:

- It would be beneficial to provide stronger guidance, drawing on the continual learnings of the ELLA program, to preschools on the optimal ways to deliver the program. While some flexibility is inherent, to cater for the individual needs of a preschool, a growing body of best practice techniques should be developed and communicated.

- Given the importance of embedding the ELLA apps in the broader preschool program for child engagement and outcomes, heightened support for educators on how to interact with children while using the apps or scaffold using complementary activities would be beneficial.[13] This may include encouraging educators to use the Facebook group or online, as this was noted by some educators as useful tools to share their learning and experiences with the apps.

[13] Noting that ESA already provides some guidance around appropriate scaffolding activities for the ELLA apps.

6 Family perspectives and engagement

This section examines evidence on family engagement with, and perspectives on, the ELLA trial, by:

- discussing the nature and extent of family participation in the trial; and
- outlining family observations of the trial, including parent/guardian observations of trial outcomes.

The **key evaluation question** this section seeks to answer is:

- Was the involvement of parents/guardians throughout the trial appropriate?

General findings on family engagement and perspectives with the ELLA program

- ***Parent/guardian understanding:*** family awareness of the ELLA program was relatively low, with 36% of parent/guardian responses stating they were unaware of the ELLA program prior to receiving the survey. However, parents/guardians were required to provide consent for their children to participate in ELLA.
  - Of the families that were aware of the trial, more than 60% were happy with the level of information received, while one in five families would have appreciated additional information – particularly around trial delivery methods, expected outcomes and screen time.
- ***Parent/guardian perspective:*** parent/guardian's expectations of the trial are in line with the objectives of the ELLA program
  - The vast majority of educator survey responses indicated that parents/guardians had a positive view of the ELLA trial.
  - Parent/guardians are generally supportive of the policy rationale underpinning the ELLA trial, including the benefits of tablet use, language learning and cultural awareness in preschools.
  - Concerns raised included screen time, sedentary behaviour and the ability of children to contextualise tablet learning into real life.
  - Families observed some positive impacts of the trial, with more than two-thirds of survey respondents stating that their children spoke words/phases in another language at home; however, observations around increased interest in other cultures was mixed.
  - More than 60% of survey respondents stated they would recommend other preschools to engage with the ELLA program.
- ***Parent/guardian expectations:*** parents and guardians had high expectations of the ELLA program impacts – including that their children would continue to learn another language after concluding the ELLA program and would continue to increase their interest in other cultures.

- ***Parent/guardian engagement:*** the parent and guardian interactions varied amongst trial sites, from no involvement to significant engagement from families with ELLA program delivery.
  - Parent engagement typically relied on encouragement from the preschool to participate in complementary ELLA program activities.

This section primarily draws on evidence from the family survey. The family survey was designed to obtain evidence on parent/guardian awareness, participation, expectations and concerns about the ELLA trial. The role of technology and languages spoken at home also provided important insight for the trial evaluation. Evidence cited in this section is also drawn from the educator survey (where some questions related to family engagement in the trial) and consultations.

The family survey was completed by 406 participating families. A breakdown of survey respondents is provided in Appendix A.

The survey revealed that English was the primary language spoken at home for two-thirds of the respondents, with 34% speaking a language other than English. The primary language amongst the sample was rather broad, with 39 languages (excluding English) spoken as a first language at home. Chinese, Italian, Japanese and French were the most common of these languages, at a frequency of 16, eight, seven and six respectively.

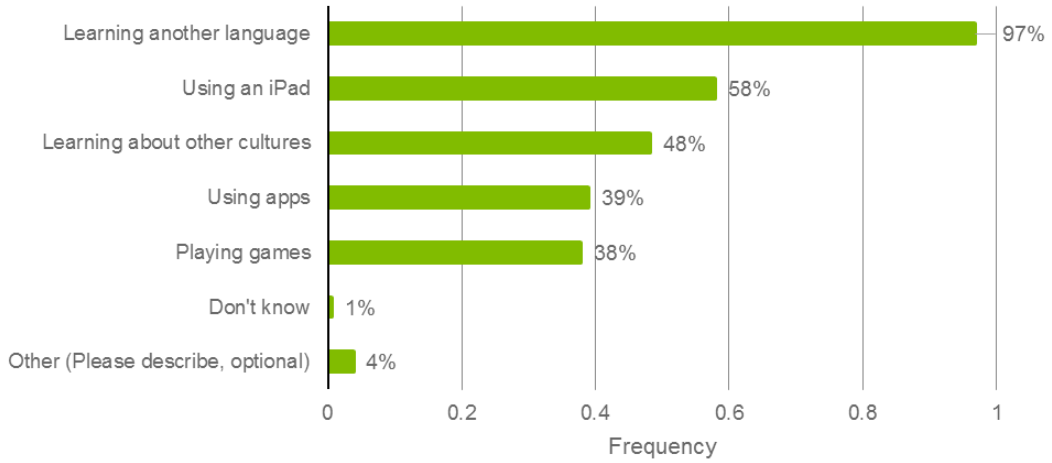
6.1 Family participation in the ELLA trial

6.1.1 Preschool and family interactions

Despite parental consent being required before children could participate in the ELLA trial, awareness of the program amongst family survey respondents was somewhat low, with 36% of respondents stating they had not heard about the trial until receiving the Deloitte Access Economics survey. Unsurprisingly, the majority of respondents (93%) that had heard of the ELLA trial prior to receiving the survey were informed by their preschool.

As shown in Chart 6.1, almost all respondents to the family survey believed that the ELLA trial involves learning another language (97%), with just more than half (57%) believing that it involves using an iPad and almost half (48%) expressing their understanding of the cultural learnings involved.

Chart 6.1: Parent/guardian beliefs on what ELLA trial involved



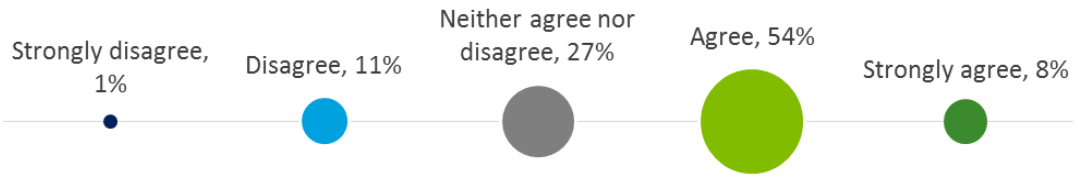
Source: DAE ELLA parent/guardian survey (n=185)
Note: Respondents were able to select multiple responses.

The majority of respondents to the educator survey either agreed or strongly agreed that parents/guardians understood the intention of the ELLA trial. As shown in Chart 6.1 below, 12% of educator respondents felt that parent/guardians did not possess a good understanding of the program. Some of the respondents that disagreed with the sentiment detailed their reasoning. These responses included:

- *"Seems to have been very little family engagement. Most families were very willing to sign their children up for the program but few seem to have engaged themselves".*
- *"I believe with further communication from educators, parents would have been more aware of the ELLA trial, however there was potentially not enough communication about the app given to parents".*

However, 43% of these respondents stated that parent/guardian understanding increased during the trial.

Chart 6.2: Educator agreement with statement 'Parents/guardians understand the ELLA trial'

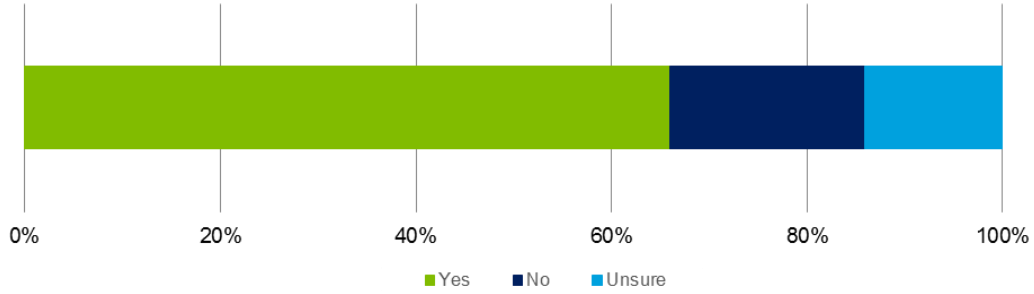


Source: DAE ELLA educator survey (n=192)

Two-thirds of the parents/guardians that stated that they were previously aware of the ELLA trial said that they were comfortable with the level of information provided. The respondents that expressed they were dissatisfied (20%) stated that it was due to a lack of information on potential outcomes, screen time and delivery.[14]

[14] 14% of respondents stated answered "unsure"

Chart 6.3: Whether parent/guardians were satisfied with the information provided



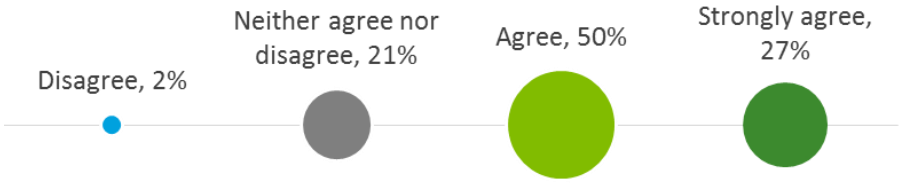
Source: DAE ELLA parent/guardian survey (n=185)

The majority of educators either agreed (50%) or strongly agreed (27%) with the notion that parents had a positive view of the ELLA trial. Only four of the educator survey respondents were under the impression that parents did not have a positive view of the ELLA trial.

A number of trial sites stated in consultations that once they informed parents/guardians on how the ELLA trial was going to be implemented (for instance with limits on screen time), families were generally supportive. A few sites also stated that due to the ELLA apps being attached to an Australian Government initiative, it legitimised the educational benefits for parents/guardians.

Trial sites that completed the educator survey stated that parent engagement varied from zero to full involvement[15]. A few trial sites encouraged parents to come into the preschool to witness the children using the program. One site had a French café, where the parents were invited to help prepare and enjoy the French food. Other educators also stated that that they asked parents/guardians to bring in items from different countries to show to the children.

Chart 6.4: Educator agreement with statement 'Parents/guardians have a positive view of the ELLA trial'



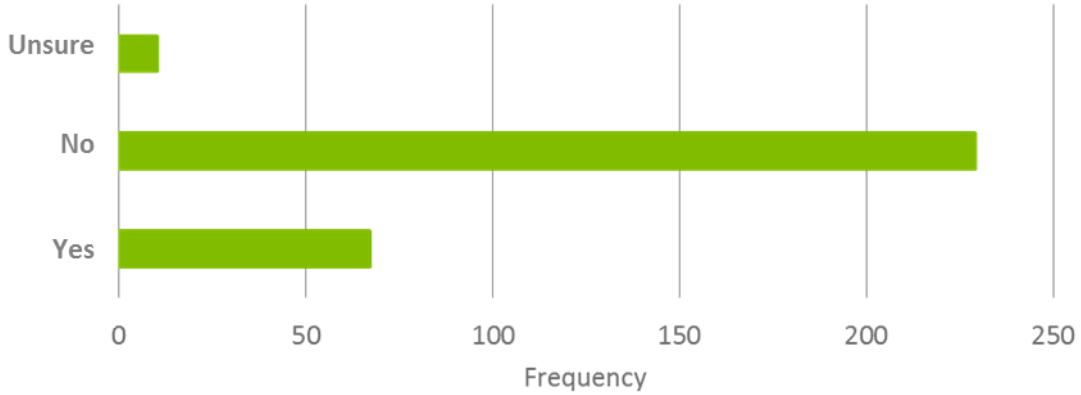
Source: DAE ELLA educator survey (n=192)

6.1.2 Family app

The family app was introduced in this year's trial to increase family engagement and understanding of the program. However, as shown in Chart 6.5, a large percentage of respondents to the family survey were unaware of the family app (75%).

[15] This question was an open-ended question, so there was no definitive level of parent engagement taken from this survey question.

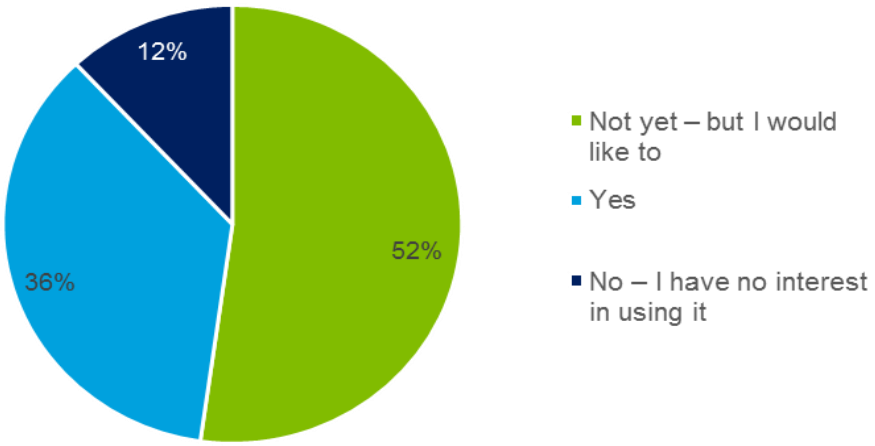
Chart 6.5: Whether parents/guardians were aware of family app



Source: DAE ELLA parent/guardian survey (n=306)

Of those family survey respondents who were aware of the family app, 36% of respondents stated they had downloaded the app (Chart 6.6). A small percentage (12%) indicated they would like to download the app, with 52% stated they have no interest in using it.

Chart 6.6: Parent/guardian attitudes towards downloading family app (if aware of it)



Source: DAE ELLA parent/guardian survey (n=67)

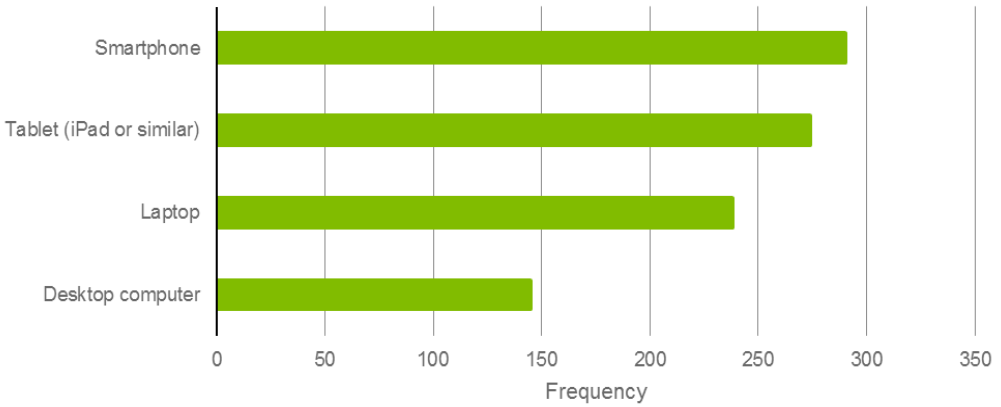
6.2 Family observations of the ELLA trial

This section includes an overview of family observations on technology use, trial outcomes and family support for the trial.

6.2.1 Technology use

Chart 6.7 shows the types of devices that family survey respondents have in their homes. More than two-thirds of the families surveyed stated that they own a smartphone, tablet and laptop, with 90% owning a tablet. Note that it is possible these results are slightly biased towards regular technology users, given the family survey was largely distributed in an online format.

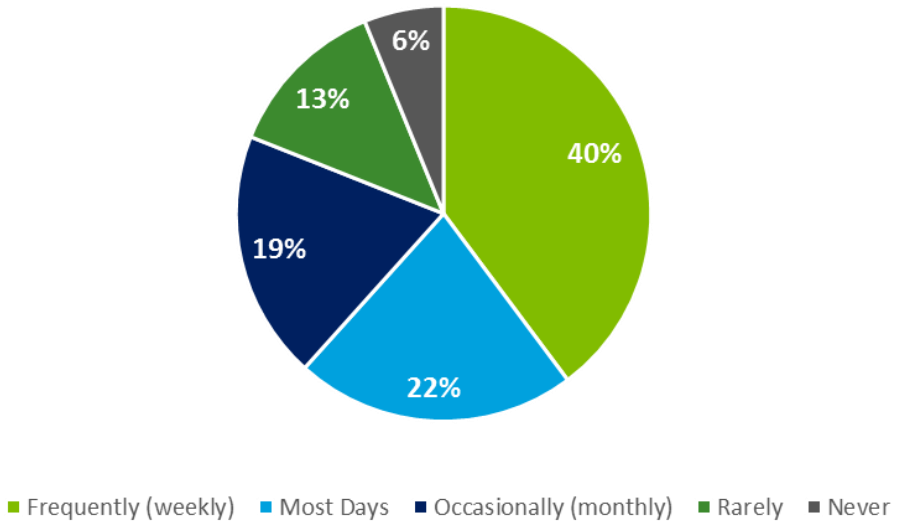
Chart 6.7: Prevalence of digital technologies within home of ELLA participants



Source: DAE ELLA parent/guardian survey (n=306)

The parent/guardian survey showed the frequency of technology use at home, with 40% using a tablet frequently and 22% using a tablet on most days.

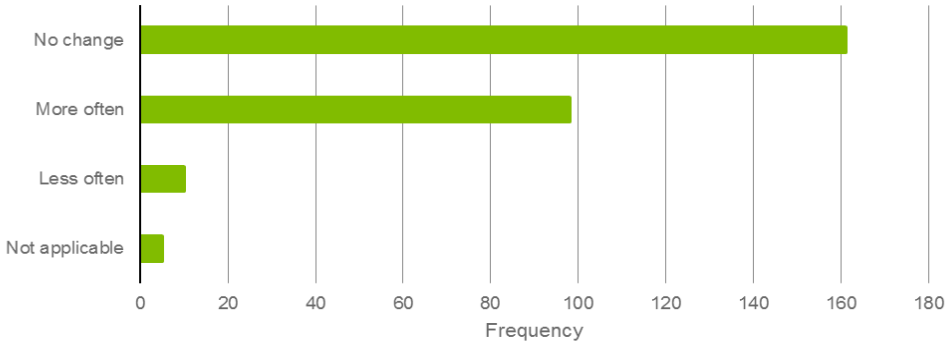
Chart 6.8: Frequency of tablet use at home among children in ELLA trial



Source: DAE ELLA parent/guardian survey (n=274)

The majority of respondents (59%) stated that there has been no change in the frequency of tablet use this year, as shown in Chart 6.9. However, 36% reported that they noticed their child using a tablet more often.

Chart 6.9: Change in tablet use at home among children in ELLA trial



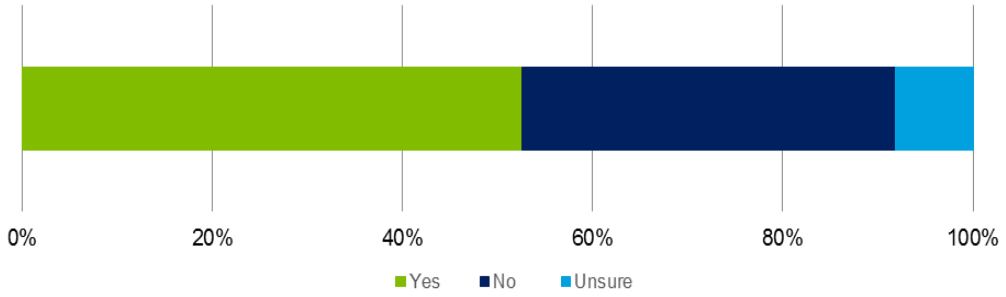
Source: DAE ELLA parent/guardian survey (n=274)

The trial site consultations revealed that children are generally confident with using tablets, and children who regularly use a tablet at home were noted to usually show a greater interest in the program. The majority of educators expressed in trial consultations that regular technology exposure at home did not always lead to parental support for the ELLA trial, as parents felt that preschool was a respite from technology.

6.2.2 Observations on trial outcomes

More than half of the family survey respondents stated that their child had spoken about the ELLA apps at home, with 40% saying they had not (Chart 6.10).

Chart 6.10: Whether parents/guardians observed their children speaking about the trial at home



Source: DAE ELLA parent/guardian survey (n=306)

Survey respondents noted that children had mainly spoken about the apps at home to show their parents/guardians the new words, greetings and numbers they had learnt. A few respondents stated that their child would come home and discuss the games that they had played on the tablet[16]. Responses included:

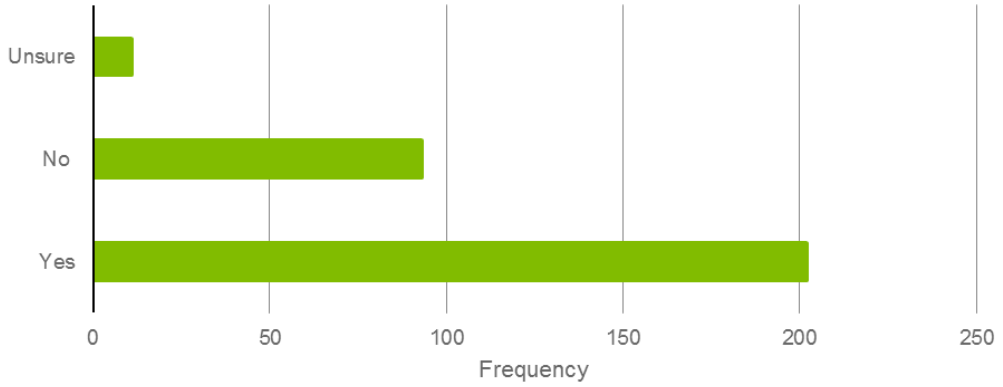
- *"My daughter talks about using the iPads at daycare* (sic)*, and playing the games".*

[16] Is it difficult to determine if ELLA was the only play-based app used at the preschool.

- *"Discussion of words from other countries and interest in the country the language is from".*
- *"My child greets us in* [M]*andarin".*
- *"Constantly singing in Japanese".*
- *"She will tell me words that she has learnt, although sometimes I am not sure if she is just making up words or they are actually Indonesian".*

Two-thirds of family survey respondents stated that their child had spoken at least one word of the target language since using the ELLA apps (Chart 6.11).

Chart 6.11: Whether parents/guardians observed their children using language from ELLA apps



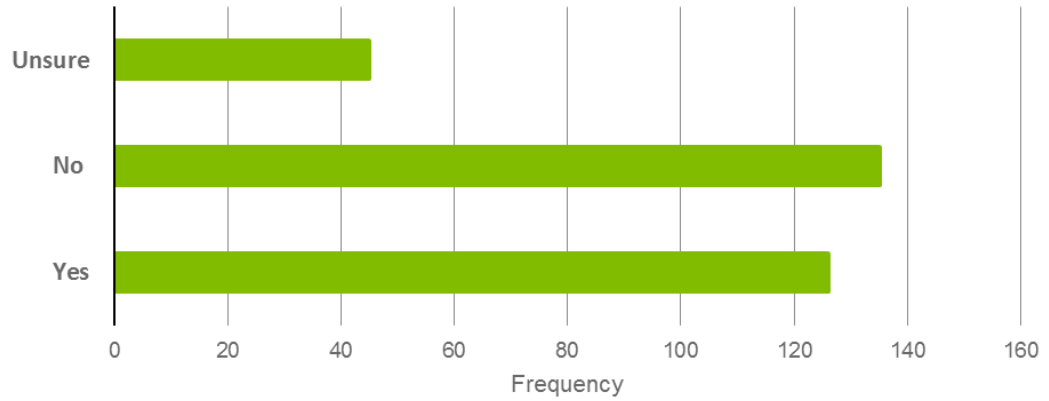
Source: DAE ELLA parent/guardian survey (n=306)

Respondents noted how their children used the language they have learnt in daily life, with observations, including:

- *"Greeting us in* [M]*andarin and using words to describe things like presents, ingredients to make a cake and egg, milk etc* (sic)*".*
- *"Saying out colours in Japanese at the traffic light".*
- *"In conjunction with the app the preschool also teach the children songs in Japanese. At home my daughter will sometimes sing these songs - e.g. sing 'head, shoulders, knees and toes' in Japanese".*
- *"Just repeating them on the day or week they are been learnt when she remembers".*
- *"My son tells us the words he has learned - greetings, colours and numbers".*

Parent/guardian awareness of their child's interest in the culture associated with the language they were learning through ELLA was mixed, with 44% reporting they did not observe any cultural interest and 41% stating they did (Chart 6.12).

Chart 6.12: Whether parents/guardians observed their children being interested in culture associated with language from ELLA apps



Source: DAE ELLA parent/guardian survey (n=306)

Survey respondents detailed the divided perceptions of ELLA's effectiveness in increasing cultural awareness, with observations, including:

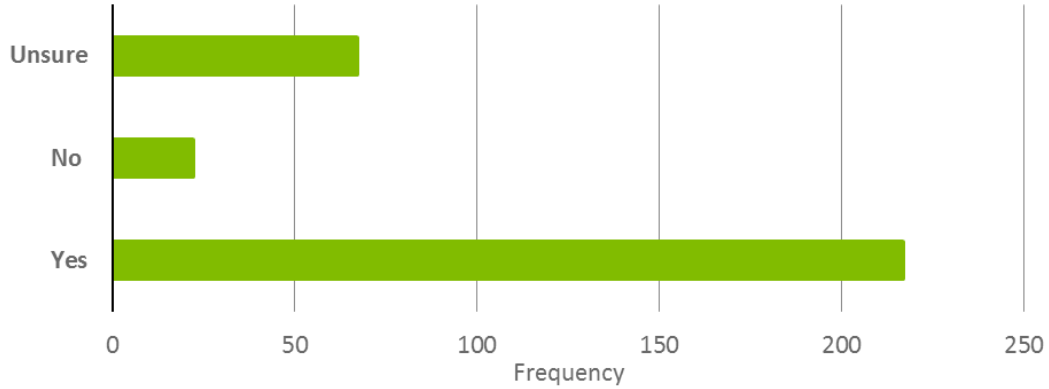
- *"Any time Indonesia is mentioned he needs to know every detail".*
- *"She often speaks of Japanese culture & is obsessed with origami & cherry blossoms".*
- *"It has given her a good understanding of different cultures in general, she regularly discusses where her friends come from and different* [c]*ountries and how people speak and dress differently. She likes to find the* [c]*ountries on her globe".*
- *"They are using greetings in everyday language. We were also at a park when a large Sudanese family walked past and they identified these people* [as being] *from another culture and asked what language they spoke as they noticed it wasn't English.* [They] *wanted to know what country they were from".*
- *"My kids just think it is to play games on. There is no way that they know it is from another language or culture and I see it as a waste of time".*
- *"Not sure it has had any influence at all".*

The majority of parents/guardians noted in open-text responses, that the biggest change they noticed in their child since participating in the trial was an increase in cultural awareness. Some of these responses included:

- *"My child understands there are different languages, and that we speak English".*
- *"More open to foreign language".*
- *"Confidence has improved and now enjoys learning about other cultures".*
- *"He is beginning to understand that English,* [M]*andarin and Greek are separate languages".*

The family survey revealed that parents/ guardians' expectations from the ELLA trial are in line with the objectives of the program, with the majority of parents/ guardians (71%) expecting their child to continue to learn another language in the future (Chart 6.13).

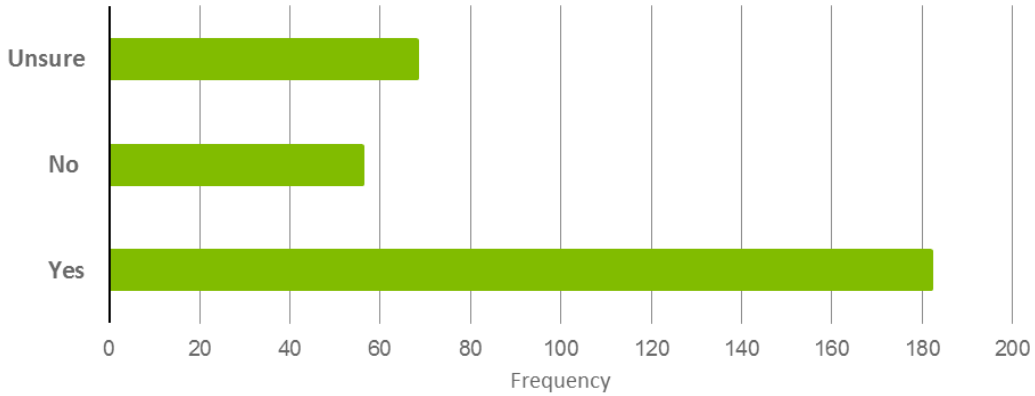
Chart 6.13: Whether parents/guardians expected their children to continue to learn another language



Source: DAE ELLA parent/guardian survey (n=306)

Fifty-nine percent of respondents to the parent/guardian survey also expected their child to use more words from another language (Chart 6.14).

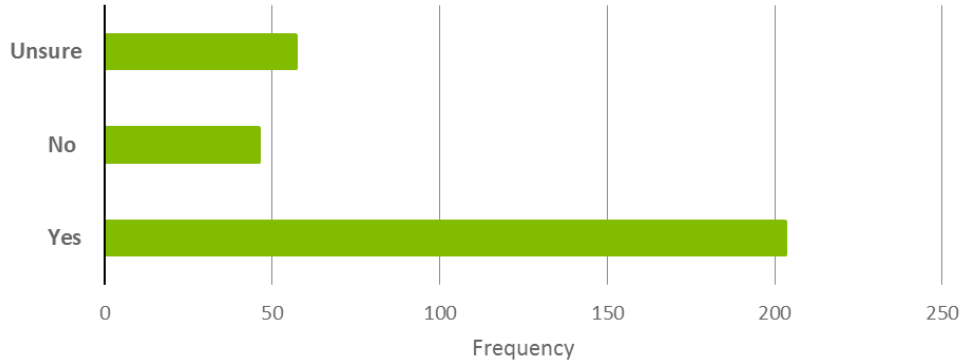
Chart 6.14: Whether parents/guardians expected their children to use more words from another language



Source: DAE ELLA parent/guardian survey (n=306)

Further, 66% of respondents expect that their child would be more informed of the culture associated with the language they had learnt through the ELLA trial (Chart 6.15).

Chart 6.15: Whether parents/guardians expected children to learn more about the culture associated with the ELLA trial language



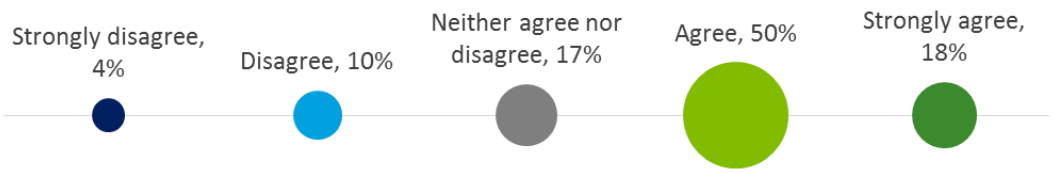
Source: DAE ELLA parent/guardian survey (n=306)

6.2.3 Support for the trial

The majority of parents/guardians who completed the family survey either agreed or strongly agreed with the notion that tablets are a good educational tool for preschool children (Chart 6.16). The respondents that disagreed or strongly disagreed believed that technology should not be used as an education tool and that the learning outcomes would not match those of a qualified teacher. However, most survey comments revealed that parents/guardians have a positive outlook on technology and the key role that it will likely play in their children's future education. Written responses included:

- *"I do think children need to be exposed to technology, but in my experience, learning through iPads, computers and TV is too passive".*
- *"I think they still need guidance and assistance to convert what they have learnt from iPad into their own world in order for info to have meaning".*
- *"In this day and age they are going to need to learn how to use technology well. I feel they may as well do this at a young age so they are well aware of it all by the time they really need to use it".*
- *"Good for problem solving, not sure regarding languages".*

Chart 6.16: Parent/guardian agreement that tablets were a good way for preschool children to learn



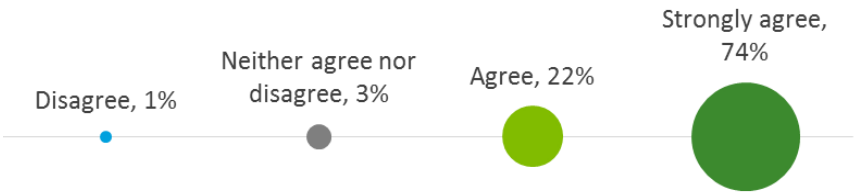
Source: DAE ELLA parent/guardian survey (n=185)

Overall, family survey respondents agreed with the notion that learning another language and culture is good for preschool children (Chart 6.17). The reasoning for this was quite consistent,

with parents/guardians generally believing that children should be accepting of Australia's multicultural society and forever increasing global interactions. Detailed responses included:

- *"Exposing our children to foreign languages fosters a cultural awareness and appreciation, irrelevant of the extent to which they master it".*
- *"The more exposure kids have to positive messages and learning opportunities about other cultures, the greater the chance of building a generation with more acceptance and kindness towards others in general".*
- *"We live in a multicultural country and we must be open to the different cultures around us".*
- *"While I think inclusivity is important, focusing on one culture is not. Given the vast array of backgrounds as well as Indigenous culture, there should not be a tokenistic approach but a holistic one".*

Chart 6.17: Parent/guardian agreement that it was good for preschool children to learn about another language and culture



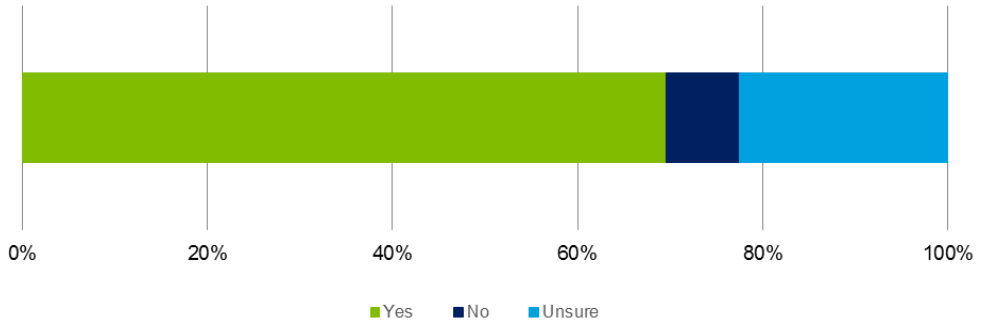
Source: DAE ELLA parent/guardian survey y (n=185)

In the parent/guardian survey, respondents were asked whether they had any concerns about the ELLA trial. Only 11% stated they did, with the main concerns relating to:

- better uses of government resources, such as a casually employed qualified language teacher;
- sceptical that the children are learning anything through engaging with the apps;
- that the apps were a game to be played, and would not result in meaningful learning; and
- children will forget what they learn without an established link between preschool and primary school languages.

As shown in Chart 6.18, the majority of survey respondents recommended that the ELLA program be adopted in other preschools. However, one in five families said they were unsure whether they would recommend further adoption. This could be partially due to the concerns highlighted in previous sections or the lack of understanding of the ELLA program.

Chart 6.18: Whether parents/guardians would recommend the ELLA program being adopted in other preschools



Source: DAE ELLA parent/guardian survey (n=306)

6.3 Considerations for family engagement

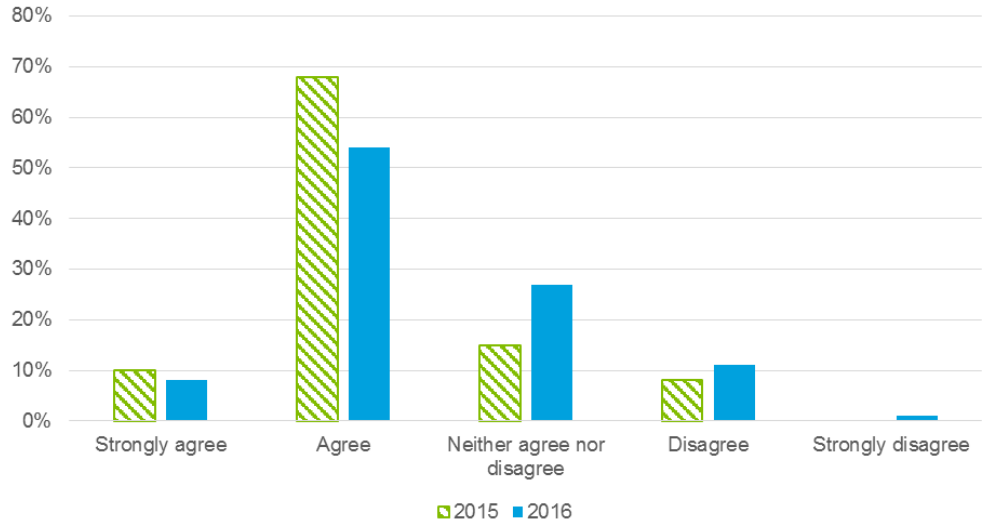
This section considers the family engagement considerations for the ELLA program arising from the findings above, and a brief comparison with the 2015 ELLA trial evaluation findings.

6.3.1 Comparisons with the 2015 ELLA trial findings

A key difference in the 2015 and 2016 ELLA trials, from the perspective of families, was the introduction of the family app. This was introduced to meet an observed demand from parents to better understand the ELLA trial, and be able to support the trial at home. However, the awareness and uptake of the family app were relatively low due to the late release of the app. This suggests that the demand for increased engagement with, and understanding of, the ELLA trial has not yet been sufficiently met. In 2017, an evaluation of the effectiveness of the tool in meeting this need will be able to take place.

In terms of educator views on parent/guardian understanding of the ELLA trial across the two years, it appears educators in the 2016 trial thought that parents/guardians understanding was slightly weaker than in the 2015 ELLA trial (Chart 6.19). Approximately 78% of educators strongly agreed or agreed that parents/guardians understood the trial in 2015, whereas 62% of educators thought the same in 2016.

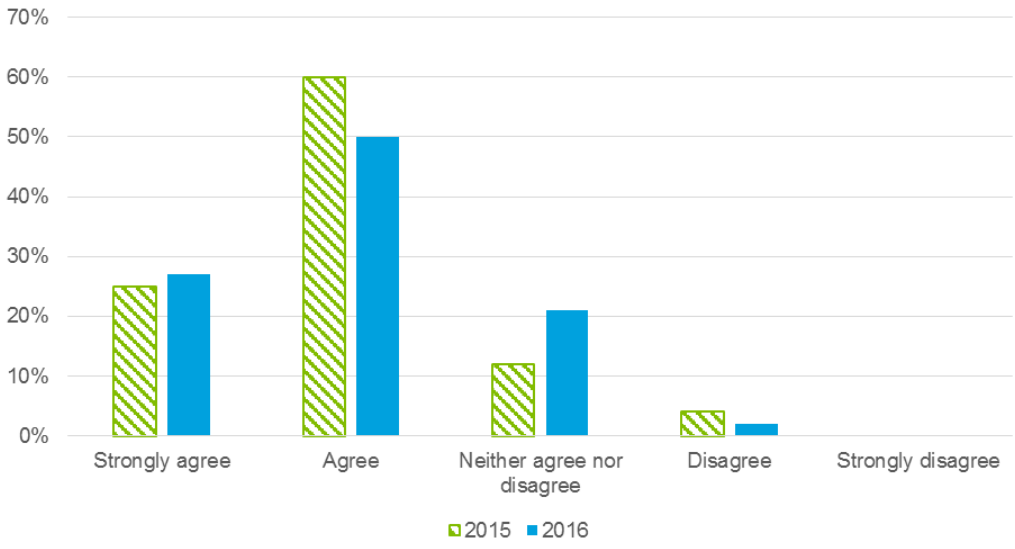
Chart 6.19: Educator agreement that parents/guardians understood the ELLA trial, 2015 and 2016 trials



Source: DAE 2016 ELLA educator survey (n=192), DAE 2015 educator baseline survey (n=40)

Likewise, a greater proportion of educators thought that parents/guardians had a positive view of the ELLA trial in 2015 than in 2016 (Chart 6.20). Eighty-five percent of educators strongly agreed or agreed that parents/guardians had a positive view in 2015, whereas this was 77% in 2016.

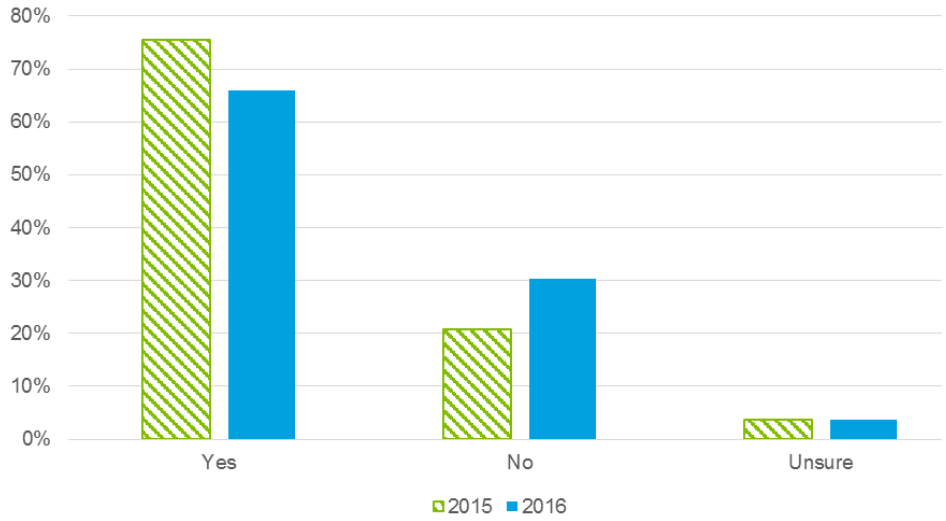
Chart 6.20: Educator agreement that parents/guardians had a positive view of the ELLA trial, 2015 and 2016 trials



Source: DAE 2016 ELLA educator survey (n=192); DAE 2015 educator baseline survey (n=40)

In terms of the observations of parents and guardians themselves, a slightly lower proportion of parents/guardians stated that they had observed their children using words from the ELLA trial language in 2016 than in 2015 (Chart 6.21).

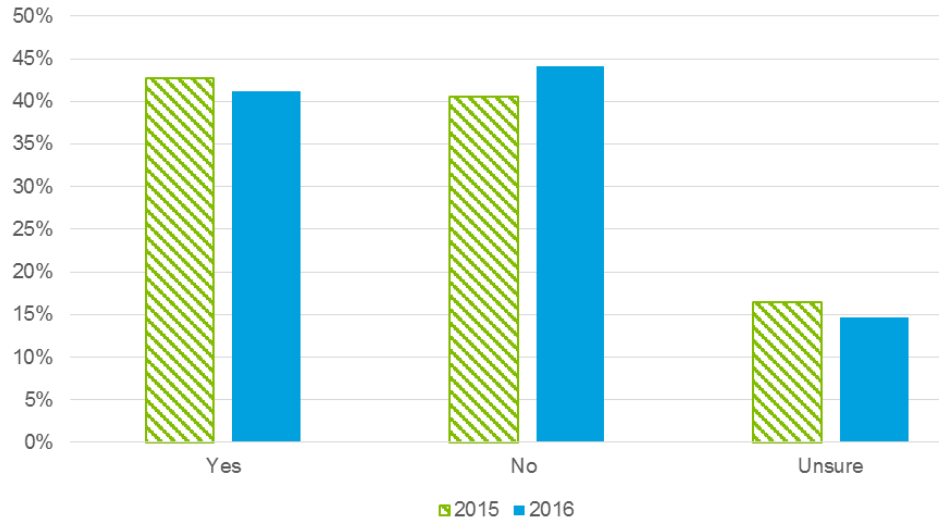
Chart 6.21: Whether parents/guardians observed their children using words from the ELLA trial language, 2015 and 2016 trials



Source: DAE 2016 ELLA parent/guardian survey (n=306), average of DAE 2015 parent/guardian survey - August 2015 survey (n=252), December 2015 survey (n=199)

Similarly, a slightly lower proportion of parents/guardians had observed their child expressing interest in the culture associated with the ELLA apps in the 2016 trial than in the 2015 trial (Chart 6.22).

Chart 6.22: Whether parents/guardians observed their children being interested in the culture associated with the ELLA trial language, 2015 and 2016 trials



Source: DAE 2016 ELLA parent/guardian survey (n=306), average of DAE 2015 parent/guardian survey - August 2015 survey (n=252), December 2015 survey (n=199)

Overall, however, the results across 2015 and 2016 in regards to family engagement, understanding and perspectives are broadly similar.

6.3.2 Considerations for family engagement

In consideration of the findings above, it is noted that:

- The high proportion of families that indicated they were unaware of the ELLA program suggests that family engagement and information dissemination could be improved. Specific guidance and materials to assist preschools in informing families about the trial may assist in this.
- Similarly, the lack of awareness and uptake of the family app, noting the late release date of the app, suggests a need for more active promotion. If families are not aware that the app is available, its ability to address the demand from families for more information is compromised.
- Families are primarily supportive of the ELLA trial, and the benefits of participation, offering a positive mechanism for promoting the ELLA program more widely.

7 Child engagement

This section analyses the available evidence on the appropriateness and effectiveness of children's engagement with the ELLA trial. This section

- provides an overview of child engagement with the trial;
- reports the survey findings on child engagement;
- analyses the data on child tablet usage, as well as engagement by app and activity; and
- analyses the data on the language exposure by app.

The **key evaluation questions** this section seeks to answer are:

- Did children use the program?
  - *To what extent were children engaged with the apps?*
  - *Why did children use the apps more or less?*
  - *Did usage vary across languages?*
  - *Why did usage vary across certain apps or app series?*
  - *Why did usage vary across sites?*

General findings on child engagement levels with the ELLA trial

- Over the duration of the trial, and across all children eligible to participate in the trial, there was an average of almost two sessions a week, and seven minutes per session.
- 78% of educators reported that children were 'very engaged' with the apps.
- However, the app usage data indicated that not all children engaged equally with the apps. Some children logged in almost every week of the trial, while other children logged in less than a quarter of possible weeks throughout the trial.
- The irregularity of use resulted in an unequal use of the apps among children. The top 10% of users (by total time with the apps) account for 36% of total app use.
- Once children had logged on, they demonstrated relatively consistent usage patterns across all users.
  - 83% of children spent between 5 and 10 minutes with the apps *per session.*
  - App 3 ("Polyglots at the Circus") was the most popular app at most trial sites.
  - The Cake activity (within App 3) was consistently found to be the most popular activity.
- Language exposure (the proportion of time children spent listening to the target language while spending time with the apps) is greatest in App 2 and App 7.
- There is little evidence to suggest there is a relationship between app popularity, and the degree of language exposure.
- Many of the above findings are similar to those identified in the 2015 evaluation. For example, app usage was concentrated in among the top 10% of users, most users spent between 5 and 10 minute per session with the apps, the Cake activity was the most popular activity and language exposure was fairly consistent across apps.
- The main difference was frequency of tablet use, particularly among those who used it least. In 2016, 50% of users logged in less than once a week. In 2015, only 25% of children logged in less than once a week.
- There was little evidence to suggest language choice affected total app usage.
- Regional and remote preschools, and preschools in low socioeconomic areas, appear to use the apps less frequently. However, further investigation is required to determine why this may be the case.

7.1 Overview of child engagement

Table 7.1 details the release schedule for the seven apps in the ELLA trial for 2016. It should be noted that not all sites downloaded the app as soon as it was available.

Table 7.1: App release schedule

App	Release date (week beginning)
App 1 – Polyglots in the Playroom	28 February
App 2 – Polyglots at the Beach	13 March
App 3 – Polyglots at the Birthday Party	24 April

App	Release date (week beginning)
App 4 – Polyglots at the Zoo	29 May
App 5 – Polyglots at the Circus	17 July
App 6 – Polyglots in the Park	21 August
App 7 – Polyglots in the Town	23 October

Box 1: Major assumptions and limitations underpinning the app data analysis

Assumptions

- Active user – an active user was defined as a user who attended an 'active' site.
- Active site – an active site was a site that had:
  - successfully implemented the trial; and
  - not disengaged with the trial.
- Implementation – implementation was assumed to occur after the preschool accrued a cumulative 30 minutes of usage in one week.
- Trial disengagement – trial disengagement was assumed to occur when a site failed to use the apps for four consecutive weeks. In such instances, the *first* week was assumed to be the week a site disengaged from the trial.
- Sessions or minutes per user – where practical, this analysis presents figures on a per active user basis. This per active user measurement controls for preschools that may have experienced delays in implementing the trial, or withdrawn from the trial.

Limitations

- Children not selecting their avatar – while educators reportedly encouraged children to log in and out using their own avatar, it was reported that children did not always remember to do so. If children use a tablet without logging the previous user out, this will overstate the length of each session, but understate the number of sessions. This issue cannot be controlled in the analysis.
- Children joining the preschool midtrial – given the relatively erratic frequency with which children used the apps during the 2016 trial, it was determined there was no reliable measure for children joining a preschool midtrial. Children that finished the trial at an ELLA trial site were assumed to have attended that preschool all year. The analysis should be interpreted in light of this caveat.
- Children leaving the preschool midtrial – throughout the trial, children (and some preschools) were removed from the trial, and these children's (and preschools) usage statistics have been removed from the sample. The analysis therefore only pertains to children (and preschools) who remained registered until the completion of the trial.

Despite the above assumptions and limitations, it should be noted that:

- The approach is broadly consistent with the analysis undertaken for the 2015 evaluation.
- Where relevant, the handling of data and counting rules are consistent with those applied by the software vendor.
- Validation of results has occurred with both the Department, the software vendor, and in comparison with 2015 results.

7.1.2 Child engagement overview

As at 20 November 2016, there were a total of 8,502 users (across 285 sites) that had engaged with the apps at some stage throughout the year. On average, each child logged in approximately 1.7 times per week, with each session lasting an average of 7 minutes. As such, children engaged with the ELLA apps for an average of approximately 12 minutes each week. An overview of child engagement with the ELLA apps is shown below in Table 7.2.

Table 7.2: Overall usage statistics, by child

	20 November 2016	2015 trial
Total active users	8,502	1,771
Number of sessions	434,097	234,956
Average sessions per child per week	1.8	4
Median sessions per child per week	1.1	3.9
Total hours	50,376	27,661
Average minutes per child per week	12.6	28.5
Average minutes per session	7.0	7.1
Median minutes per session	6.9	7.0
Number of users above average	26%	24%
Users with average sessions at least 5 minutes	84%	92%
Users with average sessions at least 10 minutes	14%	7%

Source: DAE analysis of ELLA app data

Engagement varied significantly between sites, so average usage statistics should be interpreted with caution. This was compounded as several sites had difficulties starting the trial, and only managed to commence after a number of weeks had elapsed (as discussed in section 3).

7.2 Child engagement

There are two aspects of child engagement that were considered as part of this evaluation. First, the *frequency* with which children accessed the apps, and second, *how* the apps were used. Child engagement was largely assessed through analysis of the ELLA app usage data, although some educator survey and consultation responses were used to support findings.

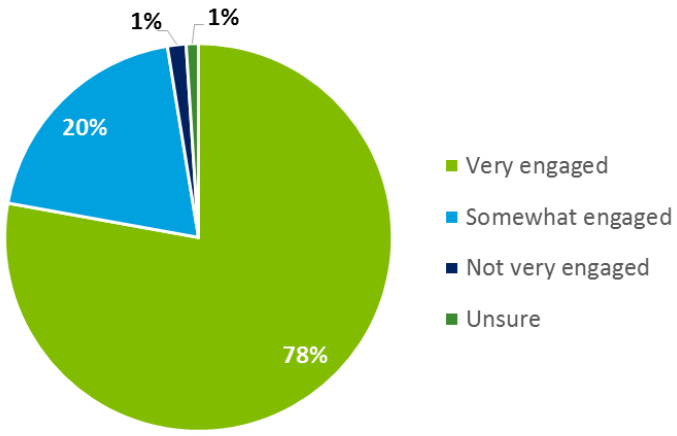
Sections 7.2.1 and 7.2.2 describe the frequency with which apps were used. This distinguishes children that used the apps consistently, those that were inconsistent in their engagement with the apps, and those that were not engaged with the apps at all.

Sections 7.2.3, 7.2.4 and 7.2.5 consider *how* the apps were used. These sections assess the use of apps, aspects such as which apps or activities were most popular and the degree of language exposure each activity can account for.

7.2.1 Survey findings

Educators found that practically all children were engaged with the ELLA apps. According to the educator survey, as shown in Chart 7.1, around 98% of respondents thought that the children were either 'somewhat engaged' or 'very engaged' when using with the apps.

Chart 7.1: Educator views on how engaged children are with ELLA apps

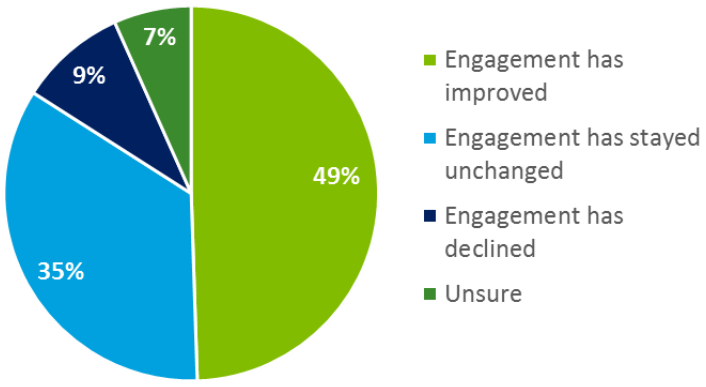


Source: DAE ELLA educator survey (n=194)

From the consultations, the educators reported that most children were engaged and that there were no consistent characteristics as to why some were more interested than others. Children, regardless of whether they came from an English or language background other than English, were generally engaged with the app.

Further, around half of educators observed that engagement levels actually improved over the course of the ELLA trial, while around a third observed that engagement stayed unchanged (Chart 7.2).

Chart 7.2: Educator views on changes in child engagement levels since start of the 2016 trial

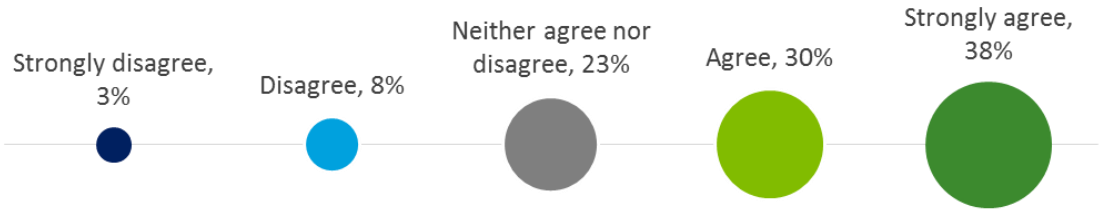


Source: DAE ELLA educator survey (n=194)

Preschools that were involved in the 2015 trial also reported that the level of participation, engagement and enthusiasm among children between the two trials has been generally

consistent (Chart 7.3). This indicates that these preschools have observed this has continued beyond the first year. This is considered further in the program data presented below.

Chart 7.3: Educator agreement with statement 'Child participation, engagement and enthusiasm have remained consistent compared with the 2015 trial'



Source: DAE ELLA educator survey (n=40)

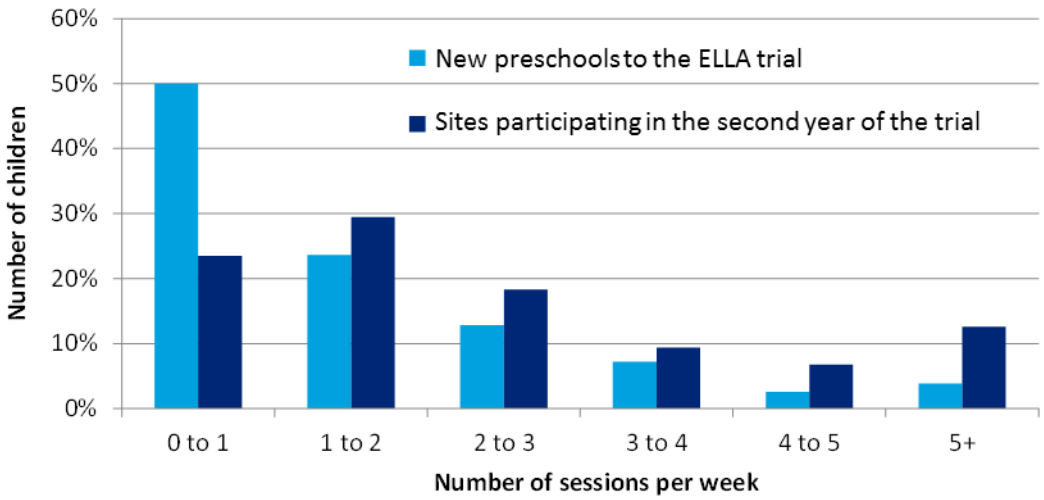
7.2.2 Tablet usage data

While educators reported generally high level of engagement, the tablet usage data suggested that among all 8,500 children involved in the trial, use (on average) appeared somewhat reduced relative to 2015 levels. However, it should be noted that children can engage with the ELLA trial not just through the apps, but with additional activities introduced by educators, especially considering findings in section 5 indicated that nearly all preschools introduced additional activities to complement the ELLA trial. As the tablet usage data only reveals the time spent with *tablets,* the analysis in this section should be considered in light of this caveat.

Chart 7.4 shows that nearly half the children involved in the trial logged in less than once a week (after taking into account the delayed start some preschools experienced).

Further analysis of this data indicated that the number of sessions per week by child is significantly different between the *new* trial sites, and preschools that trialled the ELLA apps in 2015. Chart 7.4 shows the number of sessions per week only for children attending a preschool that participated in the trial for the second year.

Chart 7.4: Number of sessions per week, by child, new and second-year trial sites

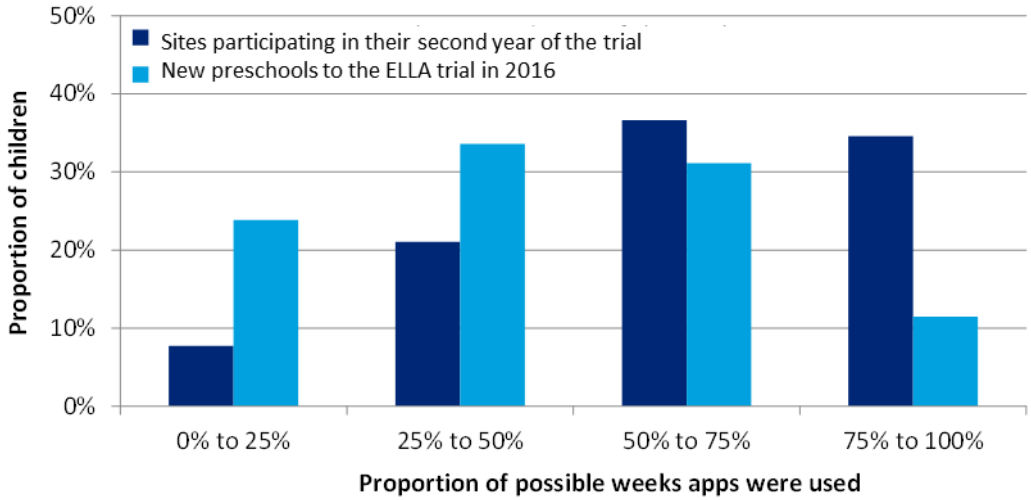


Source: DAE analysis of ELLA app data

This discrepancy in usage could, in part, be the result of how preschools were introducing the tablets into their preschool. As shown in Chart 7.5, more than 20% of children used the apps for less than quarter of the trial (after implementation) at the new trial sites, while a further 30% of children were only logged in during less than half of available weeks. By comparison, more than 70% of children at preschools participating for a second year logged in more than half of all possible weeks.

To some degree, this reflects that new preschools to the ELLA trial have been limiting children's access to the tablets throughout the trial. However, this may also reflect children at preschools participating in the ELLA trial for the first time in 2016 were less engaged with the apps. It indicates that the additional supports and structured approach to the ELLA apps adopted in 2015 was vital to ensuring ongoing use and participation.

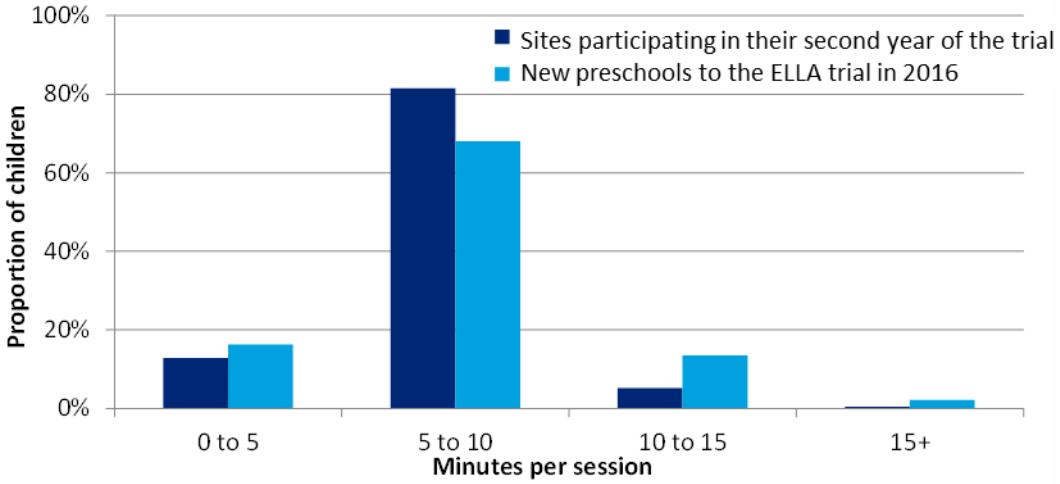
Chart 7.5: Share of possible weeks logged in, by child, new and second-year trial sites



Source: DAE analysis of ELLA app data

Once logged in, children typically spent between 5 and 10 minutes per session with the apps (Chart 7.6). Only 2% of children spent, on average, longer than 15 minutes per session.

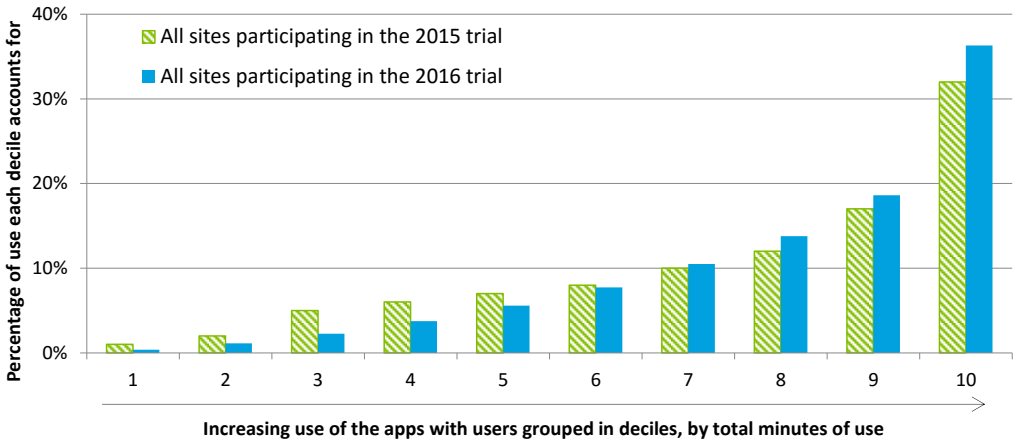
Chart 7.6: Session length, by child, new and second-year trial sites



Source: DAE analysis of ELLA app data

The variability in app usage across the cohort of participating children is shown in Chart 7.7, which suggests the top 10% of users account for 36% of total usage. The least frequent 50% of users account for only 13% of total use. The inequality of use among children indicates there is also likely to be varying levels of exposure to the target language.

Chart 7.7: Distribution of child app usage by decile, 2015 and 2016 trials

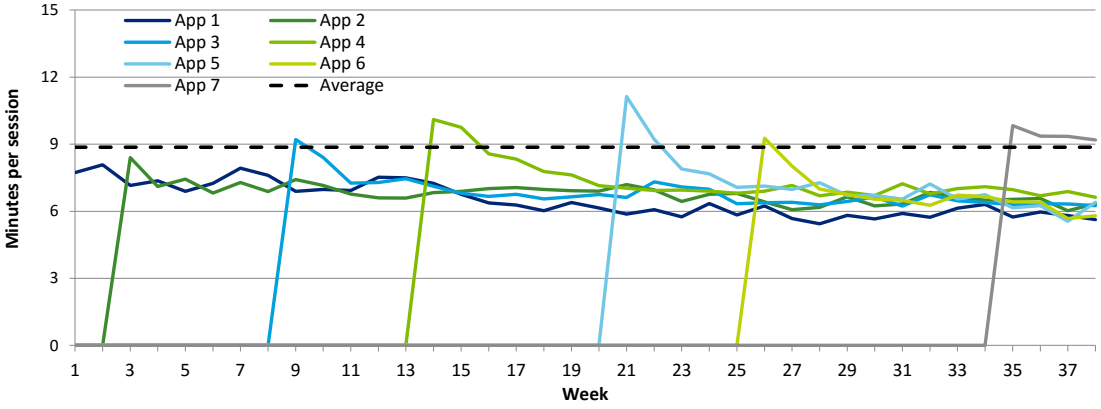


Source: DAE analysis of ELLA app data

7.2.3 Engagement by each app

Each app kept children engaged for the longest when it was first released, suggesting there is an initial burst of enthusiasm associated with the release of a new app (Chart 7.8). Following this initial spike in usage, the length of each session across each app was fairly consistent throughout the remainder of the trial (noting that at the time of the report, minutes per session from App 7 were still elevated as it had not evolved into its reduced state of usage). A similar pattern of usage was observed in 2015.

Chart 7.8: Average minutes per session over time, by app



Source: DAE analysis of ELLA app data
Note: The dotted line represents the average session length within apps across the trial.

While usage *per session* may have been consistent between apps, App 3 ("Polyglots at the Birthday Party") was the most popular app by overall usage. Throughout the trial, children have used App 3 an average of 3,535 sessions, or 399 hours, per week, which exceeds the observed usage of all other apps. It should be noted that although use of App 7 ("Polyglots in the Town") exceeded that of App 3 (486 hours per week), there is some difficulty in interpreting this figure given the limited availability of App 7.[17]

Minutes per user of App 1 ("Polyglots in the Playroom") exceed that of the other apps. This could be explained by children and educators not being familiar with the ELLA apps at the beginning of the trial, which resulted in a significant amount of 'learning by doing' taking place. The usage by app is detailed below in Table 7.3.

Table 7.3: Usage by app

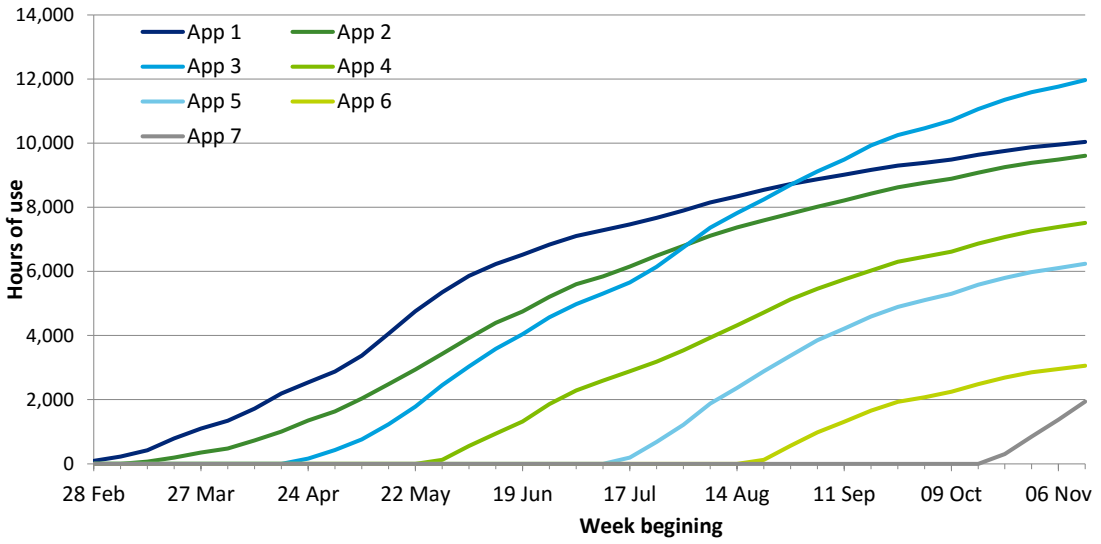
	App 1	App 2	App 3	App 4	App 5	App 6	App 7
Number of sessions per week	2,368	2,359	3,535	2,466	2,889	2,074	1,775
Minutes per user per week	3.8	2.5	2.9	2.1	2.3	1.5	1.6
Hours per week	264	267	399	301	347	235	486
Minutes per session	6.7	6.8	6.8	7.3	7.2	6.8	9.0
Number of sessions per week per user	0.5	0.4	0.4	0.3	0.3	0.2	0.2

Source: DAE analysis of ELLA app data

Further, Chart 7.9 also shows that App 3 ("Polyglots at the Birthday Party") is by far the most popular in terms of cumulative app use. With the exception of App 3, the cumulative app use observed throughout the trial follows the sequential release of the apps – e.g., App 4 has greater cumulative use than App 5, which is greater than App 6. This is to be expected given that earlier apps in the series have been available longer for children to engage with.

[17] As App 7 had only been available for 4 weeks, usage per week would be elevated as it is still in the initial 'excitement' phase of use. As App 7 is used for longer periods of time, total use (and therefore, average usage per week) is expected to decline.

Chart 7.9: Cumulative app use, by app

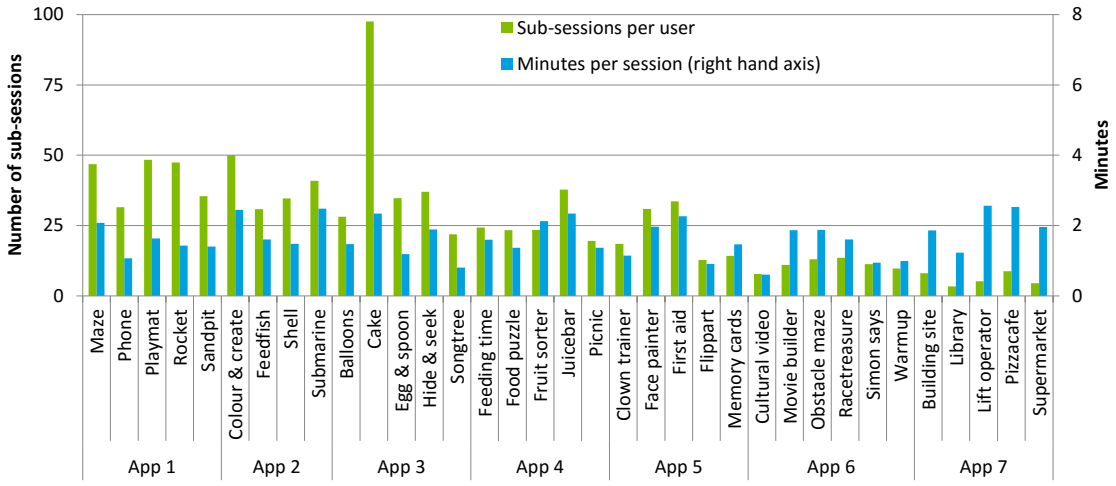


Source: DAE analysis of ELLA app data

7.2.4 Engagement by activity

The most popular activity, measured in terms of number of sub-sessions per user, from across all the apps was the Cake activity within App 3 (Chart 7.10). This observation was supported by a number of the educators in the consultations and survey responses, as well as by the family responses from the parent/educator surveys. When measuring engagement by minutes per session, there was no such significant standout among the different activities. Each activity was used for approximately 2 minutes per session, although the 'Cultural Video' activity within App 6 ("Polyglots at the Park") was used noticeably less than other activities.

Chart 7.10: Activity use, by app



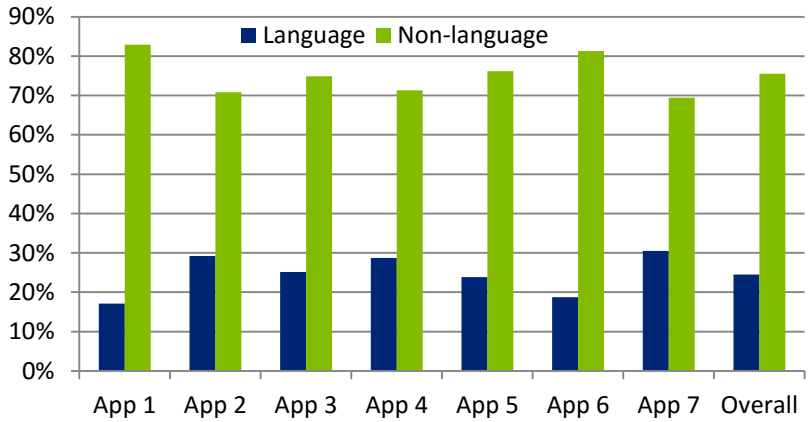
Source: DAE analysis of ELLA app data

7.2.5 Language exposure by app and activities

Language exposure by app

For the purpose of this report, language exposure is defined as the length of time children spent listening to audio files of the target language, relative to the overall time children spent playing with the app. The purpose of including language exposure as a key metric of engagement is to consider *how* children used the apps, in particular if time with the apps was typically spent listening to the target language or engaging in other tasks (such as popping bubbles). Chart 7.11 shows a relatively similar level of exposure to the target language across the apps.

Chart 7.11: Proportion of language exposure, by app



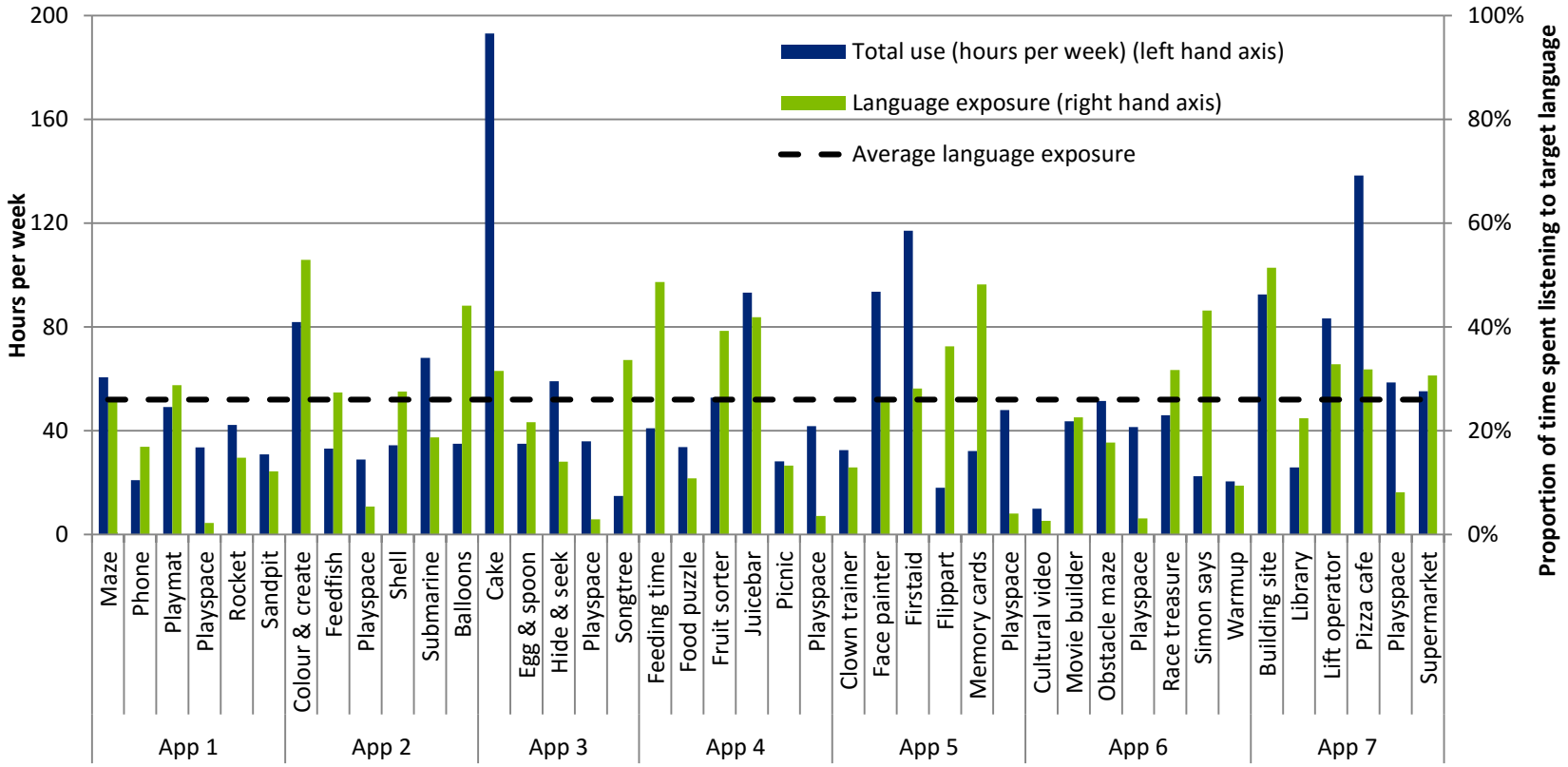
Source: DAE analysis of ELLA app data

Language exposure by activity

There is a significant difference in the language children are exposed to across each activity (Chart 7.12). During some activities, children are exposed to the target language as much as 50% of the time; for other activities, this ratio is lower than 5%, suggesting the choice of activity could potentially impact children's language exposure throughout the program. This may not present an issue if children are cycling through each activity, but may be a problem if some children are only using the 'low-exposure' activities.

Colour & Create (App 2), Building site (App 7) and Feeding time (App 4) are the three apps most effective at exposing children to the target language, according to the app data analysis. Both Colour & Create and Building site are also popular among children, suggesting these activities were more likely to expose children to the target language. Feeding time was somewhat less popular and, therefore, may be less likely to contribute significantly to overall language exposure of trial participants.

Chart 7.12: Language exposure by activity

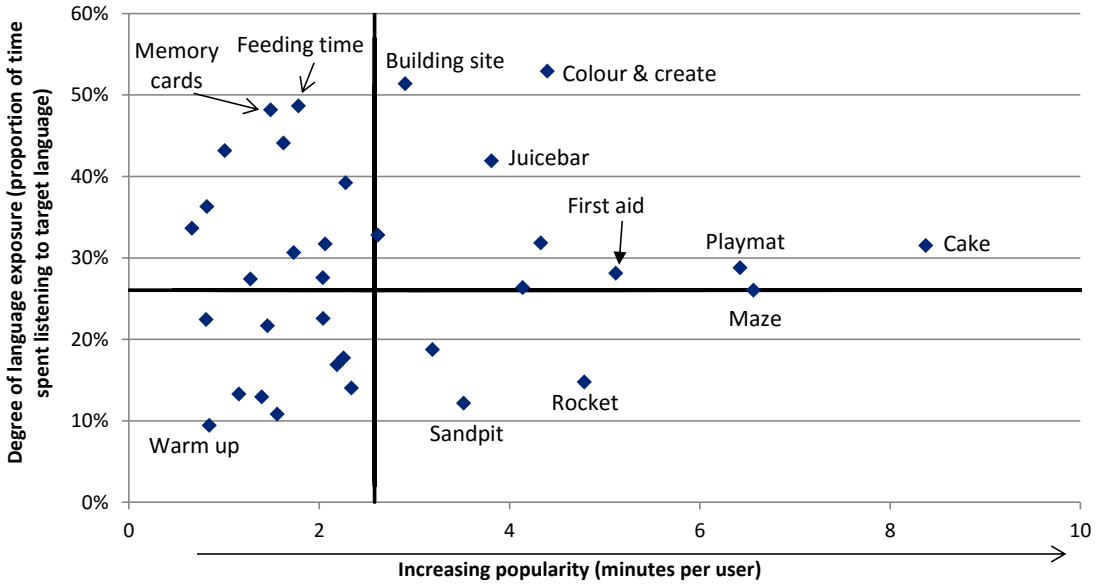


Source: DAE analysis of ELLA app data

This information can also be presented as in Chart 7.13, which demonstrates the effectiveness of each activity at exposing children to the target language. The chart shows app popularity (as measured by minutes per user) sketched on the x-axis, and language exposure sketched on the y-axis. Each activity is represented by a marker on the chart. Activities located in the top right quadrant can be considered both popular and effective at delivering the target language.

Notably, relatively popular activities (such as Cake, Playmat and First Aid) also demonstrated slightly above average effectiveness at language exposure (these are located in the top-right quadrant of Chart 7.13). Activities such as Memory Cards and Feeding Time (located in the top-left quadrant of Chart 7.13), whilst very effective at exposing children to the target language, demonstrate below-average popularity with children, while activities such as Warm-up are both relatively unpopular with children and have not proven to be effective at exposing children to the target language.

Chart 7.13: Language exposure and popularity of activities



Source: DAE analysis of ELLA app data
Note: The measure of popularity (minutes per user) measures total time *only in the first four weeks after an app is released.* This way, all activities are analysed over comparable time periods.

7.3 Factors contributing to children using the apps

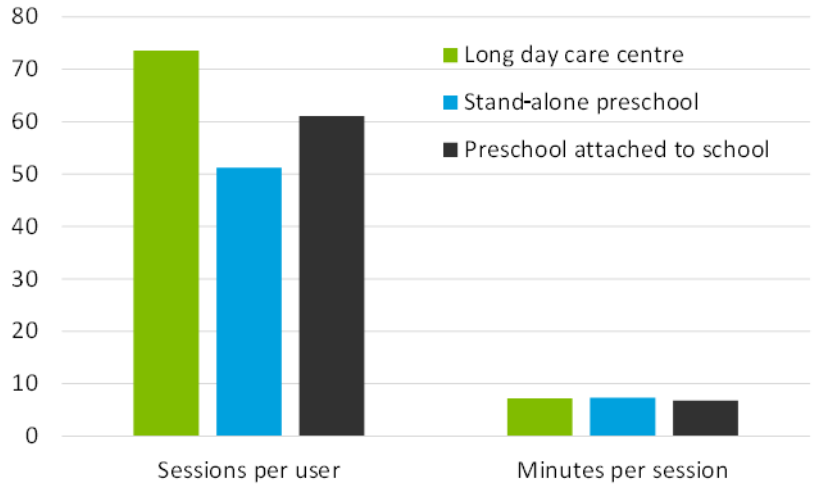
Given the variation in use among children, analysis was conducted to determine which factors (if any) were able to explain differences in use. The factors explored included:

- the type of preschool;
- the language the preschool is trialling;
- the location of the preschool (metropolitan or regional/remote); and
- socioeconomic status of the preschool.

First, there is expected to be differences by preschool type as users attending LDC preschools are likely to have more access to tablet devices (as children attend LDC for more days of the

week than children attend kindergarten). This can be seen in Chart 7.14, with users in LDC preschools having (on average) more sessions than users in other preschool types.

Chart 7.14: Sessions per user and minutes per session, by preschool type



Source: DAE analysis of ELLA app data

Analysis of use by other factors is therefore divided between LDC preschools and other preschool types. Table 7.4 shows the number of sessions per user by each explanatory factor.

Table 7.4: Number of sessions per user, by different explanatory factors

Explanatory factor	LDC preschools	Other preschool types[1]
Analysis by language		
Arabic	63	40
Chinese	69	61
French	79	63
Indonesian	84	54
Japanese	73	51
Analysis by location		
Metropolitan	77	62
Regional and remote	63	49
Analysis by SES[2]		
High	75	54
Medium	76	62
Low	65	50

Source: DAE analysis of ELLA app data
Note (1): Other types include stand-alone preschools and preschools attached to schools.
Note (2): The socioeconomic status of each child is unknown. Rather, the socioeconomic status of the suburb the preschool is located in has been applied to all children attending the same preschool. High SES preschools were assumed to be those located in suburbs in the top 30% according to SEIFA rankings, while low SES preschools were assumed to be those in the bottom 30% according to SEIFA rankings.

None of the factors analysed stand out as being a consistently strong driver of use. For example, LDC preschools with apps in Indonesian use the apps more regularly than preschools with other languages. However, stand-alone preschools or preschools attached to schools with apps in Indonesian do not appear to use the apps more regularly than other languages. This suggests Indonesian is not a key underlying factor driving increased use. In fact, no language stands out as being more popular than any other.

Within other factors of interest, preschools in metropolitan areas demonstrate marginally more use than preschools in regional areas, and preschools in low SES areas appear to use the apps slightly less frequently than preschools in medium or high SES areas. However, further investigation is required to determine what could be causing these differences in use.

It should be noted the findings articulated above are not definitive, as it could be the case that there are unobserved, underlying factors that influenced the results. For example, different usage patterns between preschools may be driven by different rules relating to tablet use. Further, much of the data is analysed at the preschool level; however, it may be the case the children within the same preschool have different experiences during the trial. There are often different groups within preschools, and several different educators within each group (each of which may employ different trial delivery methods). The analysis should be interpreted in light of these caveats.

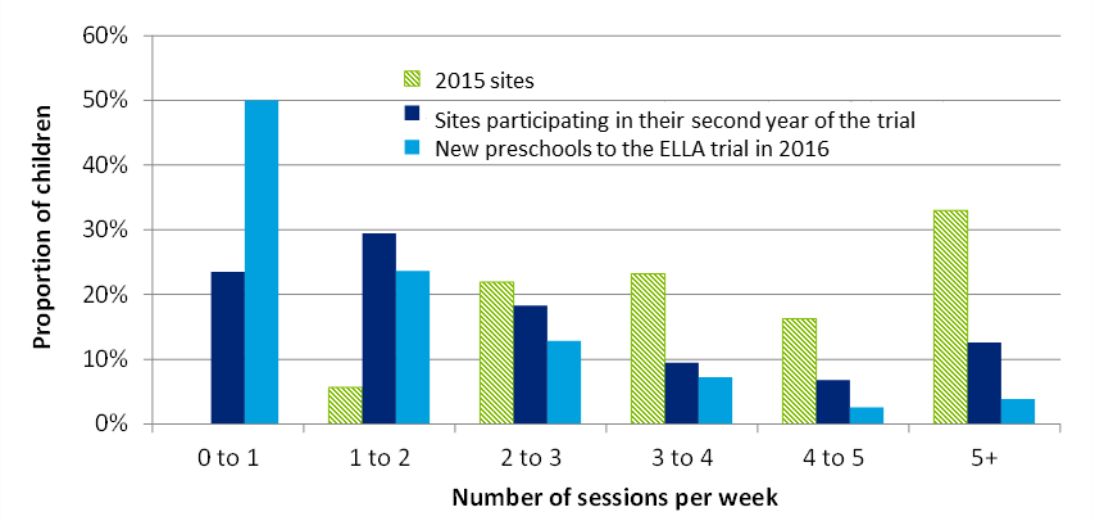
7.4 Considerations for child engagement

7.4.1 Comparisons with the 2015 ELLA trial findings

Given the delays in program commencement, and the increased likelihood of preschools disengaging with the trial, comparison between 2015 and 2016 is complicated. While all steps were taken to ensure the data analysis best reflected the engagement levels of participating sites (see Box 1), comparisons should be treated with a degree of caution.

The most noticeable difference between the 2015 and 2016 trials was the frequency with which children logged in to use the apps. In the 2016 trial, nearly 50% of children used the apps less than once a week; this is in contrast to usage in the 2015 trial, where 33% of users recorded more than 5 sessions per week.

Chart 7.15: Proportion of children by number of sessions per week, 2015 and 2016 trials

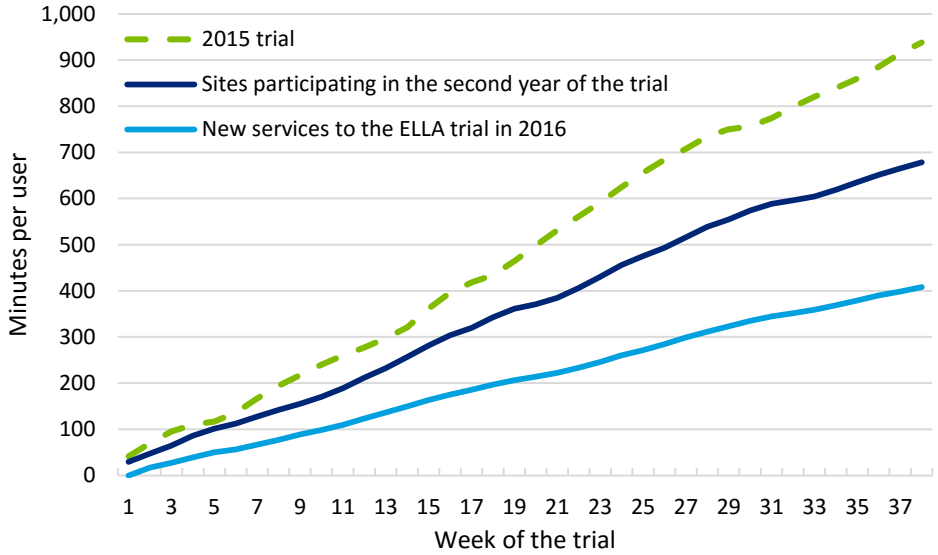


Source: DAE analysis of ELLA app data

This appeared to be a function of implementation approach adopted by preschools, with a large number of preschools not recording any data use for a number of weeks throughout the year. This stands in stark contrast to the 2015 trial, where children often logged in at least once a week, and preschools recorded app usage data almost every week.

As a result of the more infrequent use, overall usage per user per week was less than observed in the 2015 trial (Chart 7.16).

Chart 7.16: Minutes per user by week of trial, 2015 and 2016 trials



Source: DAE analysis of ELLA app data

However, once the apps were being used, patterns of use were similar for the 2015 and 2016 trials. Both trials exhibited the same length of use per session (an average of about 7 minutes per session), distribution of use (largely concentrated in the highest 10%-20% of children); and usage patterns (an initial burst of activity whenever an app was released, followed by a moderation of use). Further, the popular activities (in particular, Cake) and the extent of language exposure remained consistent across both trials.

7.4.2 Considerations for child engagement

In consideration of the findings above, it is noted that:

- It is important to ensure educators feel sufficiently supported to use the apps in the manner and frequency they are intended to be used – including guidance on what level of usage is appropriate to maintain meaningful engagement with the ELLA program.
- Despite some differences in the *frequency* of app usage, the analysis demonstrates that once used, the apps are used in a consistent manner across all preschools. There was little observable difference between preschools in regard to minutes of use per session, or the degree of language exposure.
- There is little evidence to suggest any factors, such as language or preschool location, influence app usage. Differences in app use is likely to be attributable to idiosyncratic factors of preschools.

8 Trial impact

This section provides an overview of the available evidence on the *impact* of the ELLA trial on child, educator and preschool outcomes across trial sites and the *efficiency* of the ELLA trial (that is, the relationship between the impact of the trial and the benefits invested in it), by:

- discussing educator observations on child outcomes;
- examining the trial usage data to infer child outcomes;
- discussing the outcomes that educators themselves have experienced from the trial; and
- exploring the future expectations that educators and preschools have for the trial.

The **key evaluation questions** this section seeks to answer are:

- Did the ELLA program make a difference to children's outcomes?
  - *What did children learn as a result of the ELLA trial?*
  - *In what ways did exposure to another language through the ELLA trial contribute to the development of children?*

General findings on the impact and efficiency of the ELLA trial

- ***Child outcomes:***
  - ***Language learning:*** In the educator survey, 17% of respondents stated they had observed or heard 'all' participating children at their preschool using language from the apps. Around 36% of survey respondents said 'most' children have used language from the apps. In contrast, in the 2015 trial, less than 10% of educators observed 'all' children speaking the language and 31% of educators observed 'most' children speaking the language.
  - ***Reinforced learning:*** Most respondents to the educator survey agreed that children learn more from the ELLA apps when they are scaffolded with other learning activities.
  - ***Levelling analysis:*** The levelling analysis reveals a clear positive relationship between time spent with the apps and average levelling score, where a levelling score is defined as the weighted sum of the highest levels achieved by children across the three ELLA apps activities that are designed to get progressively more difficult.
  - ***App use:*** In the survey, most educators stated that almost all children were able to easily use the activities in the app. Further, most educators believe that the ease with which children were able to engage with the ELLA apps had improved over the course of the year.
  - ***Cultural learning:*** 70% of respondents to the educator survey stated that the ELLA app has encouraged children to show more of an interest in, and understanding of, other cultures.
  - ***Social outcomes:*** Other educator observations from consultations and survey results on child outcomes related to ELLA program participation included sharing skills and increased curiosity and confidence in terms of interacting with others from different cultural and language backgrounds.
- ***Educator outcomes:***
  - ***Language teaching:*** Most educators (75%) stated in the survey that they have more confidence after the ELLA trial in incorporating language learning into their preschools.
  - ***Cultural teaching:*** Similarly, most survey respondents (71%) stated they have more confidence after the ELLA trial in incorporating learning about other cultures.
  - ***Digital literacy:*** 68% of educators stated in the survey that, as a result of the ELLA trial, they have become more confident incorporating digital technology into their preschool program beyond the ELLA trial.
- ***Future expectations of outcomes:***
  - In the educator survey, 87% of educators either agreed or strongly agreed that they expect children to continue to demonstrate an interest in learning about additional languages beyond the completion of the trial.
  - Most educators also expected continual benefits to emerge during the trial as it progresses, such as children learning new words (90%), demonstrating a continued interest in the language (71%) and showing more interest and understanding of other cultures (67%).

8.1 Child outcomes

This section considers the child outcomes that have emerged from the ELLA trial, drawing on educator perspectives from the consultations and surveys, as well as levelling analysis from the ELLA apps usage data.

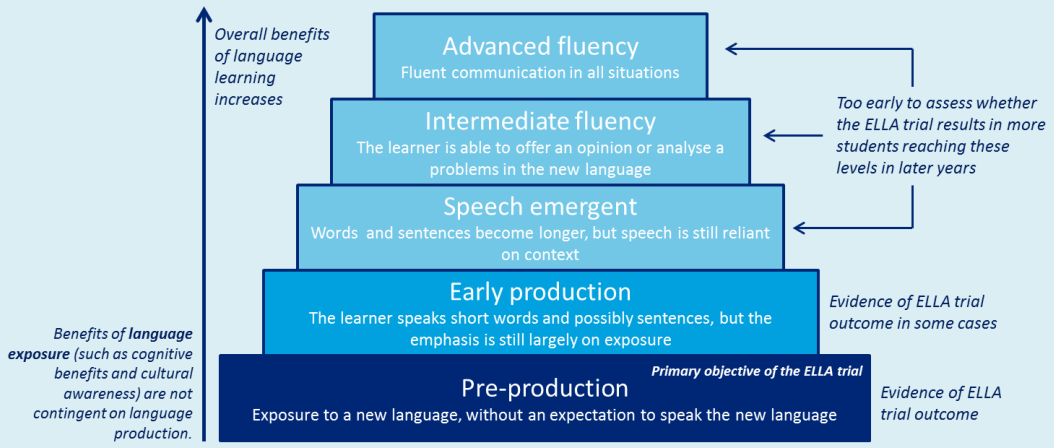
The link between language exposure, language learning and benefits

Within the language learning spectrum, there is a hierarchy of outcomes: exposure, early production of words and sentences, emergent speech, intermediate fluency and advanced fluency in all situations.

Even if higher levels on the hierarchy of outcomes, such as language production, does not occur, there are still benefits associated with language exposure. The benefits to language exposure at an early age include an increased propensity to successfully produce language later in life, increased awareness of other languages and cultures and more advanced cognitive capabilities.

To the extent that a number of these outcomes are immediately observable in children, the evaluation has been able to assess the ELLA trial's effectiveness. However, many benefits associated with exposure will only become apparent over a longer timeframe.

While there is a theoretic link between language exposure in early years and increased language learning in later life, there are a range of factors that may impact the achievement of this ultimate outcome, such as a scarcity of language programs for children immediately after preschool and the inconsistency of connected language pathways between preschools, primary schools and secondary schools.



Source: DAE, based on Krashen and Terrell (1983)

In light of the above, the assessment of the ELLA trial's effectiveness within this evaluation has been primarily focused on the program's ability to expose children to languages and to look at early signs of effective exposure, including educator observations of language production. The evaluation does not attempt to link the impact of language exposure for participating children to potential long-term benefits of language learning.

8.1.1 Educator perspectives

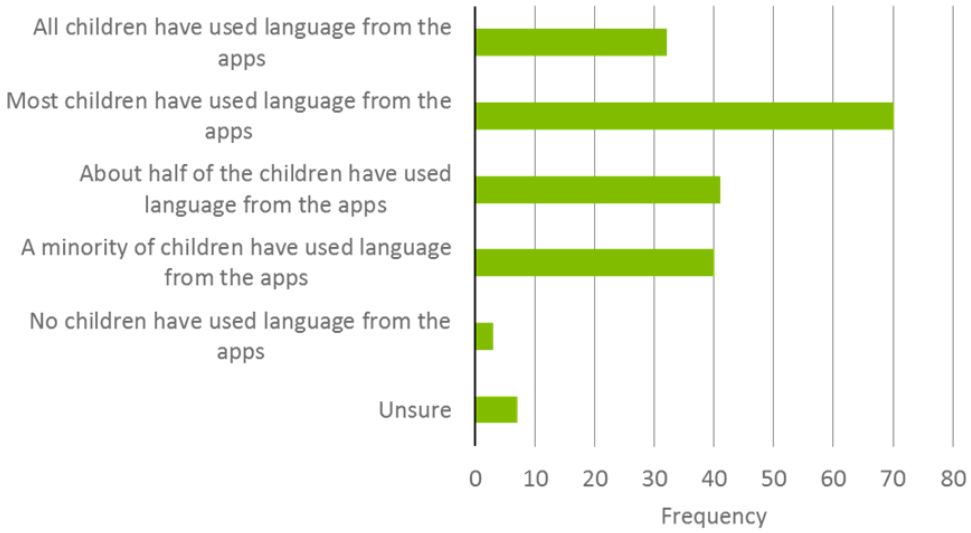
From the surveys and consultations, educators gave insights on language outcomes and factors that may have influenced these outcomes. Additionally, they provided insights on other outcomes, such as cultural learning and digital literacy (see section 8.1.3 for this discussion).

Observations on language outcomes

Educators have frequently observed children in their preschool using the language from the ELLA apps (or heard such observations from families). The below observations are all from preschools that participated in the 2016 trial. It is noted that trial sites in their second year of the trial (i.e., that began the trial in 2015) have been included in this analysis as they were working with a new group of participating children – and in some cases, new educators. A comparison between 2015 and 2016 evaluation findings is provided in section 8.4.2.

Seventeen percent of educator survey respondents stated that they have observed or heard 'all' participating children using language from the apps (Chart 8.1). Around 36% of survey respondents said 'most' children have used language from the apps, 21% have indicated around half did so and 21% stated that less than half did so.

Chart 8.1: Educator observations on proportion of children observed using language from ELLA apps



Source: DAE ELLA educator survey (n=193)

During consultations, the majority of educators stated that the most common language outcome observed was children attempting to repeat the words or sing the songs from the ELLA apps while engaging with the tablets.

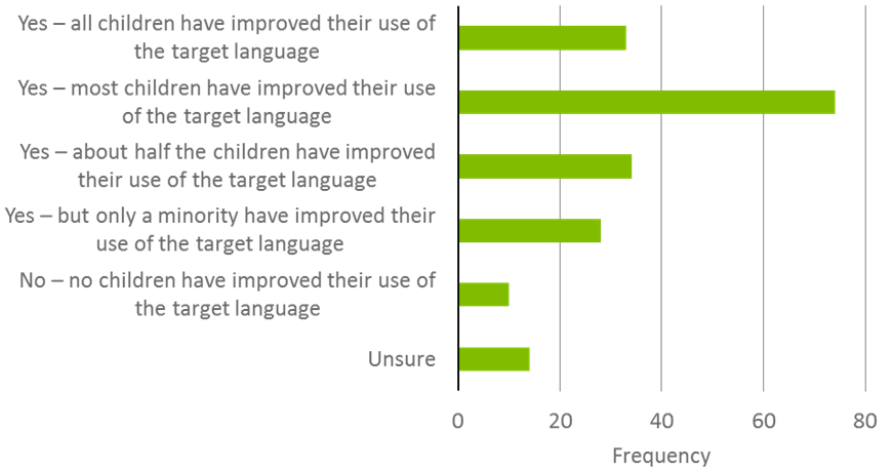
In many instances, this learning was also observed at times children were not engaging with the apps. For example, children were observed singing the ELLA app greeting song in groups. Others were seen spontaneously using the language, such as greetings, counting and talking about the weather. Children who were observed using the language were stated to do so unhindered and sometimes without prompts.

In the survey, educators provided examples of language outcomes they have observed:

- *"One of the children was at the park and he saw a Japanese boy similar to his age and said "Konnichiwa"(Hello) and they started to play together".*
- *"Counting in [M]andarin along a number line displayed in the classroom, greeting each other throughout the day, teaching the teacher the names of colours/numbers/body parts".*
- *"One child replied to an educator out of the blue did you know that rouge is red in French whilst painting. Another whilst in our doctors dramatic play area used the French name for leg".*
- *"Naming fruit as we made our own juice, saying please and thank you in Indonesian during snack times, saying good bye to each other at the end of the day in Indonesian".*
- *"2 boys in the sandpit were* […] *counting how many holes they had dug in Japanese".*

Many educator survey respondents also stated that use of the target language by children has improved as the trial has progressed (Chart 8.2).

Chart 8.2: Educator observations on whether children improved in their use of the ELLA trial language as the trial progressed

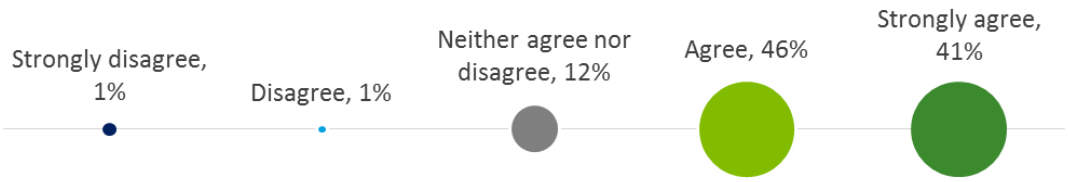


Source: DAE ELLA educator survey (n=193)

Factors influencing language learning

Educators also agreed that children learn more from the app when it is combined with other learning activities, with 87% either agreeing or strongly agreeing with this statement (Chart 8.3).

Chart 8.3: Educator agreement with statement 'Children learn more when app is combined with other learning activities'



Source: DAE ELLA educator survey (n=193)

Language outcomes, where the learning was being exhibited outside of the tablet sessions, were commonly associated with preschools that attempted to reinforce the learning through complementary activities (such as educators asking the children to repeat the words as a group or during mealtimes). This was confirmed through consultation with educators and survey responses:

- *"As a new app is introduced we participate in a game/song/story/activity to reinforce the messages on that app- e.g. counting in Indo*[nesian] *and making the birthday cake, colour games using* [Indonesian]*".*
- *"We have participated in the apps as a class on our smart screen, the children really like participating in* (sic) *as a whole group. More opportunity to learn and engage with others, allows opportunity to reinforce outcomes being explored and investigated".*

Even for sites where the outcomes were not as strong and there was no indication of words being spoken in other activities, they were still observing children trying to speak the words while engaging with the tablet. During consultations, a small number of educators that reported weaker language outcomes noted that they did not implement as many complementary activities as they would have liked.

8.1.2 Data analysis

This section draws on the ELLA trial usage data. The analysis tracks the progress children made through certain apps to assess child learning outcomes.

Summary of levelling activities

There are several activities within the ELLA apps containing logic that change the difficulty of the activity in response to the user's performance. Such activities contain 'levelling' information, with a user's progression through these levels indicating their ability to accurately complete the tasks within each activity.

Within Apps 6 and 7, three activities have been designed so that progression through the levels can be interpreted as a demonstration of language learning. In theory, the successful completion of tasks is contingent on a user understanding the meaning of particular words in the target language (although in practice children may be able to advance between levels due to their persistence, rather than knowledge). These three activities are:

- Race treasure

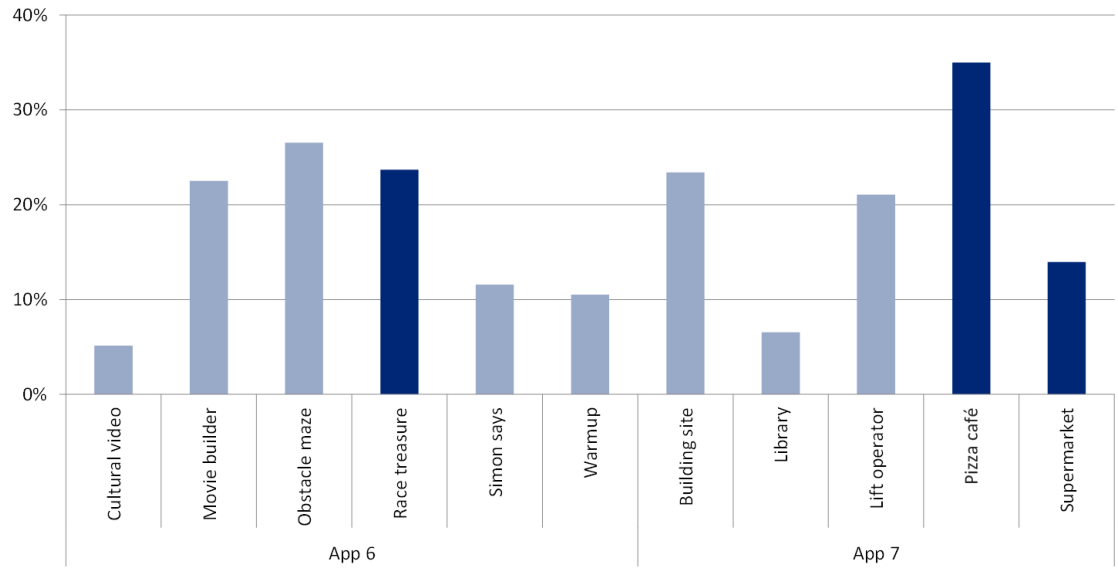
- Pizza café
- Supermarket.

It therefore may be possible to infer some language learning, based on progression through these 'levelling' activities. This is not an exact measure for learning, as other factors would also contribute to a child's language learning and ability to progress through the levels. However, the analysis below of progress to higher levels is considered instructive in indicating whether language learning has occurred.

Performance of children

Firstly, it is worth noting that the three levelling activities had varying levels of popularity within their respective apps. Race treasure is close to the most popular activity in App 6 and Pizza café is the most popular in App 7[18], while Supermarket in App 7 is one of the least popular activities within that app. It does not appear that children's behaviour changed when faced with levelling activities – that is, the levelling aspect of an activity did not appear to influence whether or not children played an activity, as shown in Chart 8.4. It is also important to note that of the 8,500 children who had used the apps throughout the year, less than 50% had played Race treasure and less than 30% had played Supermarket and Pizza café.[19] Overall, nearly 4,000 children logged into Race treasure at least once, while approximately 2,200 and 2,400 children logged into Supermarket and Pizza café, respectively.

Chart 8.4: Proportion of time spent in each activity, within Apps 6 and 7



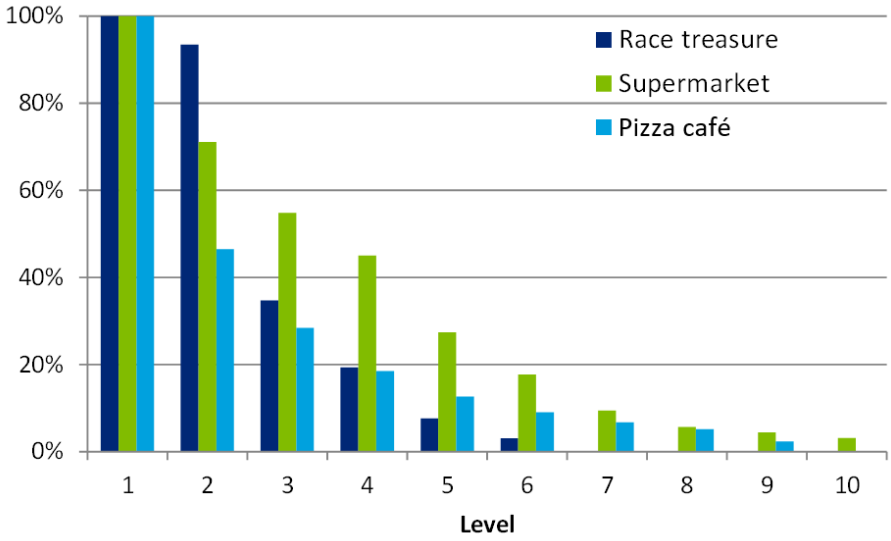
Source: ELLA app data

The progress that children were able to make through each levelling activity is shown in Chart 8.5 (the chart only includes children that logged into the activity at least once). As seen in the

[18] It should be acknowledged that Pizza café also has a 'free play' section; so, it is possible its popularity is driven by this, rather than the fact children enjoy the 'levelling' element of the activity.
[19] At the time of the analysis, App 7 had only been available for about four weeks, which is expected to have contributed to the lower-than-average engagement levels.

chart, only a small fraction of children were able to reach the final level of each activity – only 3% of children managed to reach the final level of Race treasure and Supermarket, while only 2% were able to reach the final level of Pizza café. Most children did not progress past Level 1 of Pizza café or Level 2 of Race treasure. Children appeared to be able to progress through Supermarket with slightly more ease, with a fairly consistent proportion of children able to advance past each level.

Chart 8.5: Proportion of children reaching each level, by activity

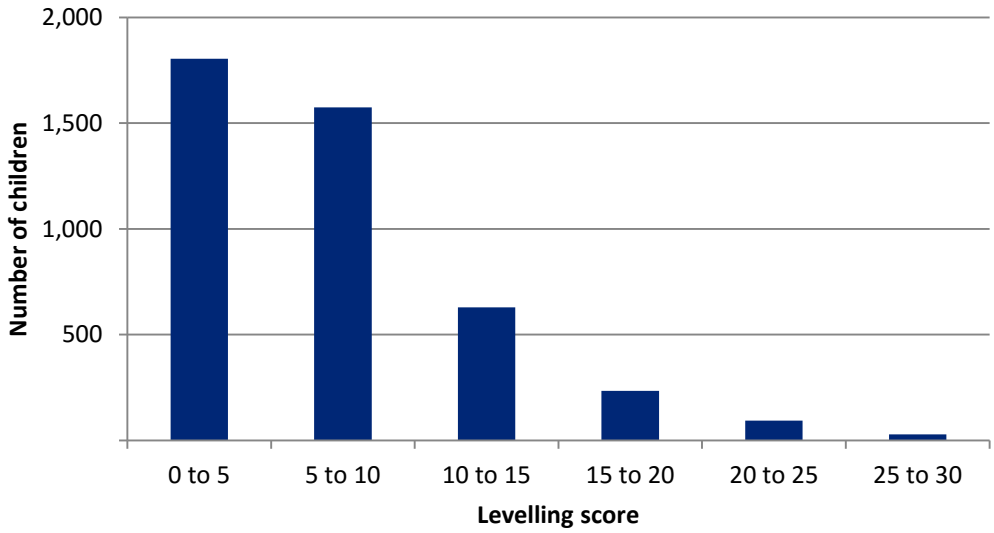


Source: ELLA app data
Note: The highest level for Race treasure was Level 6, the highest level for Supermarket was Level 10 and the highest level for Pizza café was Level 9.

Overall, 216 children were able to reach the highest level of *at least* one of these activities, while four children managed to progress all the way through all three activities. All four children attended preschools that were involved in the 2015 trial.

In order to summarise their performance using the levelling activities, each child was assigned a 'levelling score'. A child's levelling score was the sum of the highest level reached across the three activities (with scores from Pizza café and Race treasure scaled up to a maximum of 10). The maximum score was therefore 30. The distribution of scores is shown in Chart 8.6.

Chart 8.6: Number of children by levelling score



Source: ELLA app data

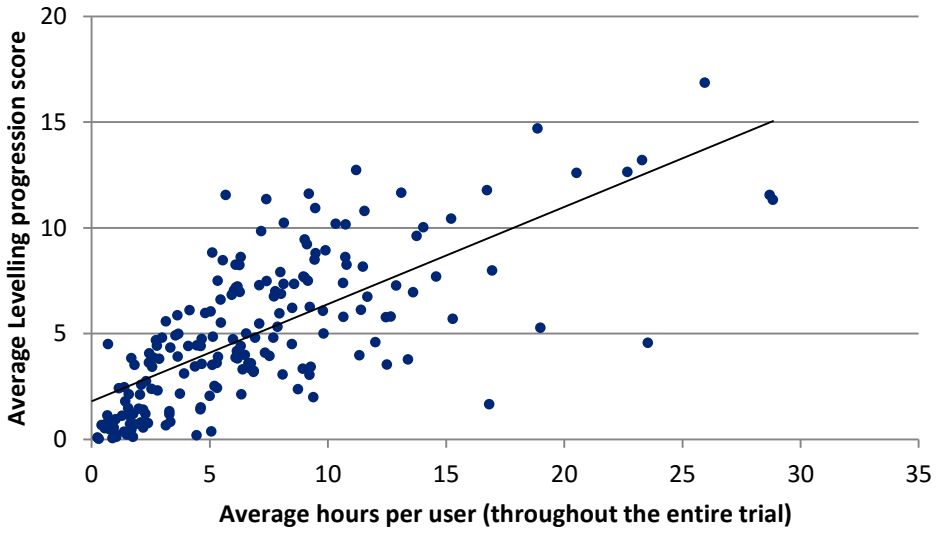
Chart 8.6 shows that, for children who started a levelling activity, a majority had scores between 0 and 10 – in other words, on average, they were able to reach Level 3 in each activity.[20] Given the number of potential levels, this indicates that children were generally unable to progress far through the levelling activities. This data appears to suggest that only a minority of children were able to demonstrate their learning by progressing through the various levels of those activities.

Finally, the analysis considered whether there was a relationship between the levelling score and the time a child spent with the ELLA apps. Every preschool is represented by a dot in Chart 8.7 – the x-axis shows the average time spent on the tablets per child in each preschool, while the y-axis shows the average levelling score at each preschool.

The analysis reveals a clear positive relationship between time spent with the apps and average levelling score. However, analysis was unable to establish the causality of this relationship. For example, one explanation could be that children who spent time with the apps were able to demonstrate their knowledge by progressing through these activities; another potential explanation is that these activities reward persistence, and children who spent time with the apps were able to advance through the activities as they had ample opportunity to attempt the activities. The analysis was unable to reveal which alternative was more likely.

[20] The limited availability of App 7 at the time the report was written may negatively impact children's score, as they may have had reduced opportunity to advance through *Pizza café* and *Supermarket*.

Chart 8.7: The relationship between levelling score and time with apps, by preschool



Source: ELLA app data
Note: The data does not include 98 preschools that had yet to participate in any levelling activities.

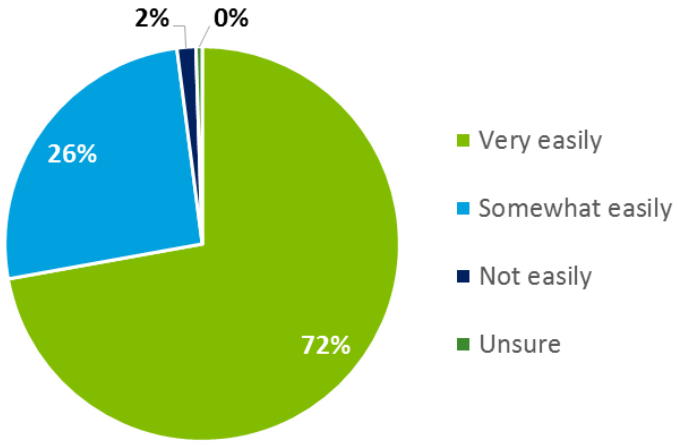
8.1.3 Other outcomes

Other outcomes observed by educators included children's ability to navigate and engage with the apps and digital technology, as well as increased interest and understanding in cultural learning.

Ease of app use

In the survey, most educators stated that almost all children were able to use the activities in the app with ease (Chart 8.8). Almost all educators thought the apps were well designed for preschool children, with an intuitive control scheme that was easy to learn.

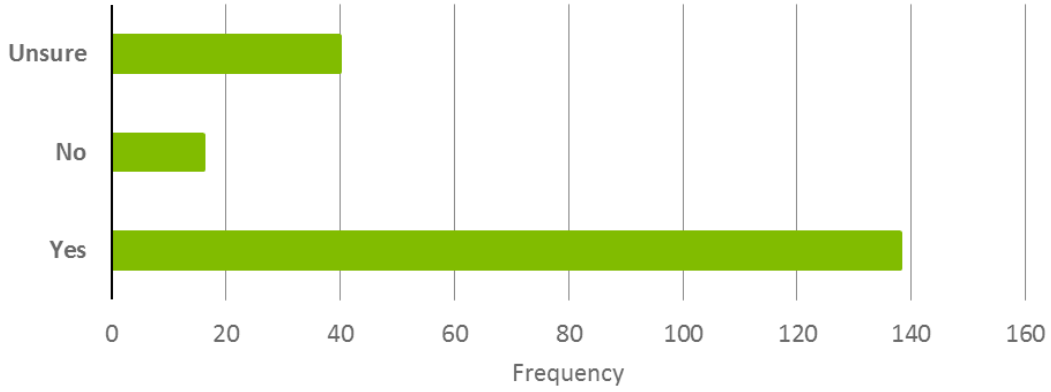
Chart 8.8: Educator views on ease with which children can use activities in ELLA app



Source: DAE ELLA educator survey (n=194)

Further, most educators believed that the ease with which children were able to engage with the ELLA apps had improved since the start of the trial (Chart 8.9).

Chart 8.9: Whether educators believed child engagement with ELLA apps has improved



Source: DAE ELLA educator survey (n=194)

A large number of the survey responses indicated that the ELLA trial has helped strengthen the digital literacy of children in their preschool:

- *"More comfortable to use iPad and technology in classroom".*
- *"Their fine motor skills and screen navigation has improved".*
- *"Better skills with using digital technologies".*

Children teaching the educators

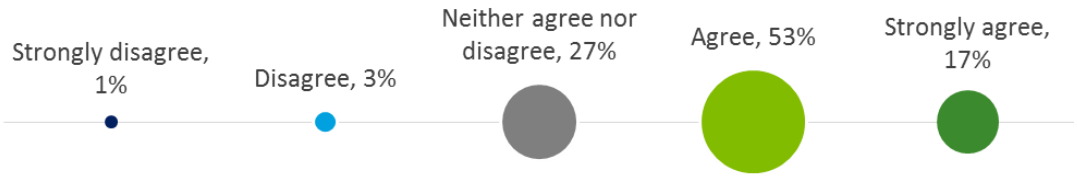
A number of educators that were interviewed said they observed strong levels of digital literacy among the participating children, with many children seeming to have a natural proficiency at being able to navigate and use the ELLA apps and their activities. Some educators believed this was largely because the children had exposure to tablets and other digital technologies in their homes, while others thought that children were generally better at learning how to use the apps, particularly given their tactile, interactive nature.

Some preschools indicated that because the children learnt to navigate the apps so quickly, their understanding of the apps sometimes exceeded that of the educators. They noted occasions where the children discovered new features or new ways of interacting with the apps that the educators had not noticed before. This resulted in children, at times, playing a positive teaching role in helping the educators better use the apps.

Observations on cultural outcomes

Seventy percent of educator survey respondents noted that the ELLA app has helped children show more of an interest in and understanding of other cultures (Chart 8.10). Around a quarter neither agreed nor disagreed with this statement.

Chart 8.10: Educator agreement with statement 'Children are showing more interest in, and understanding of, other cultures'



Source: DAE ELLA educator survey (n=193)

Some of the survey responses reaffirmed that the ELLA trial has helped increase children's interest and understanding of other cultures:

- *"Children* [are] *more willing to try food from Japan - such as bringing sushi to kindy".*
- *"Children are more excepting* (sic) *of other languages spoken* […] *at first the children thought it was quite funny when they heard the Chinese language*[,] *now they just see it as someone else's culture and language and way of communicating".*
- *"The children are showing more interest in other cultures and are bringing in information from home about their culture and heritage".*

According to the consultations, interest in other cultures manifested in activities, such as building the Eiffel tower after engaging with the French app or sitting cross-legged (micking traditional Japanese eating postures) after using the Japanese app. Children were also reported to ask a number of questions and were generally enthusiastic to learn about other places and cultures. Most educators that were consulted noted that children were naturally curious about these other cultures and that the apps helped direct and prompt their questions.

Observations on other outcomes

Many educators in the consultations noted that children would often naturally sit together in groups while using the ELLA apps. In these instances, educators noticed that there were few issues with children taking over the tablets. Generally speaking, children were observed to share with and help each other. This was considered by educators to be a positive outcome of trial participation, with the ELLA program promoting sharing among children.

Survey observations to this effect included:

- *"Being respectful and supportive of another child's turn (10 minutes) without touching* [the] *iPad during their game".*
- *"Social connections learnt while using the tablets, allowing other children to have a turn when they are finished".*
- *"Working together and taking advice from peers to try a different way of using the program".*

Another observed social outcome was increased curiosity and confidence of children in terms of interacting with others from different cultural and language backgrounds. A number of survey respondents observed this:

- *"Children who speak different languages at home are more confident to talk about it and share. Different children who speak the same home language are connecting".*
- *"Children from Chinese speaking backgrounds are becoming more confident in their friendships and show enjoyment when other children are speaking their language".*
- *"Some children use Mandarin to initiate interaction with their Chinese friends and greet others".*

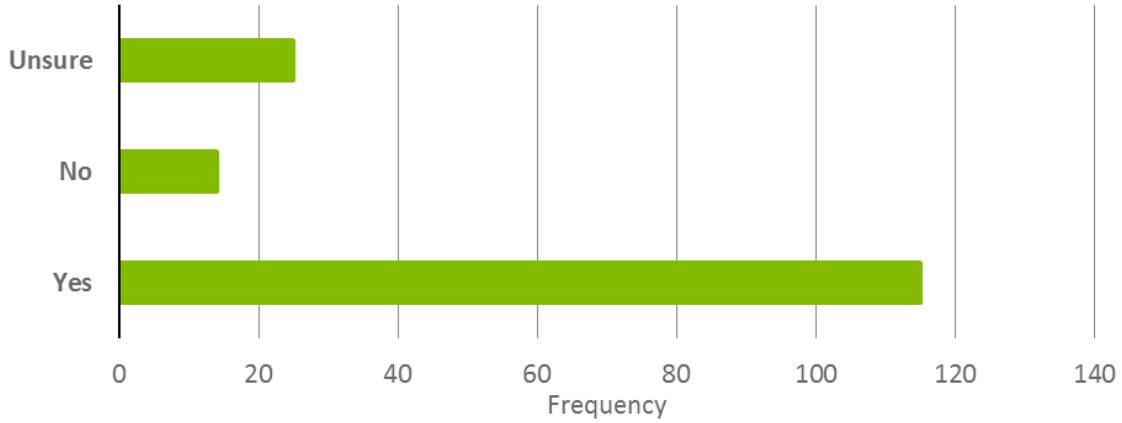
8.2 Educator outcomes

This section considers the educator outcomes that have emerged from the ELLA trial, drawing on educator perspectives from the consultations and surveys.

8.2.1 Language and cultural learning

In the survey, most educators (75%) stated they have more confidence after the ELLA trial in incorporating language learning into their preschools (Chart 8.11).

Chart 8.11: Whether educators felt more confident incorporating language learning beyond ELLA trial



Source: DAE ELLA educator survey (n=154)

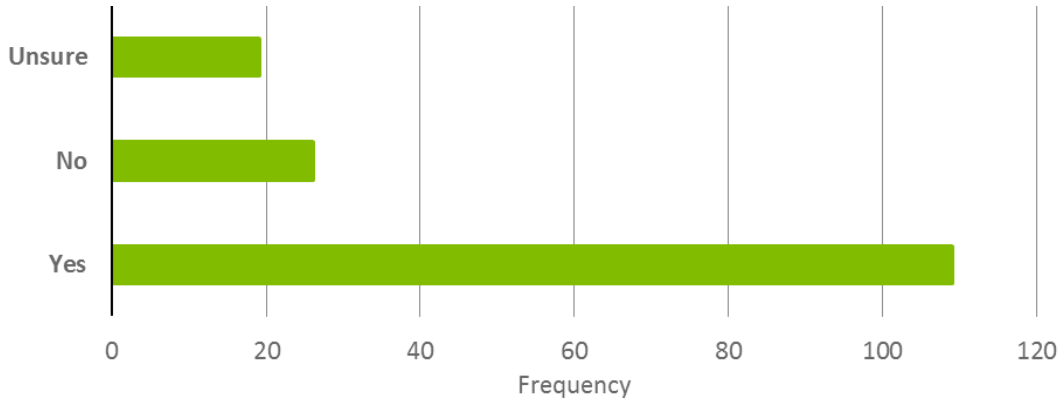
According to some of the consultations, several educators were even inspired to take language courses, such as night classes, in Indonesian.

In a few of the survey responses, educators reported the following:

- *"*[We] *are becoming more confident in interacting with the children, in terms of using the language in counting and naming colours and greeting words".*
- *"I've learnt some French!"*
- *"Parents with* [a Chinese] *background are impressed with pronunciation from educators and children".*
- *"It has enhanced awareness amongst the* [e]*ducators at the enjoyment* (sic) *of engaging in a language program and the benefits in children's development".*

In a similar vein, most educator survey respondents (71%) stated they also have more confidence after the ELLA trial in incorporating learning about other cultures into their preschool program.

Chart 8.12: Whether educators felt more confident incorporating learning about other cultures beyond ELLA trial



Source: DAE ELLA educator survey (n=154)

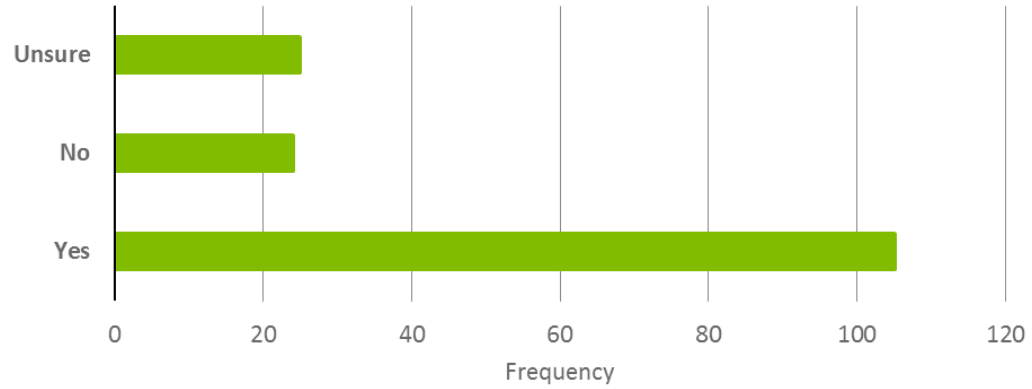
These results are supported by several survey comments:

- *"Greater confidence in discussing and incorporating aspects of diversity into everyday program".*
- *"Educators are more aware of other culture*[s] *and the importance of implementing this into our programs".*
- *"It's opened the door to me to do more research and develop knowledge about different cultures and* […] *share this knowledge with the children".*

8.2.2 Digital technology

Similar to confidence in incorporating language and cultural learning into preschool programs, most respondents to the educator survey (68%) stated that as a result of the ELLA trial, they have become more confident incorporating digital technology into their preschool program beyond the ELLA trial (Chart 8.13).

Chart 8.13: Whether educators felt more confident incorporating digital technology beyond the ELLA trial



Source: DAE ELLA educator survey (n=154)

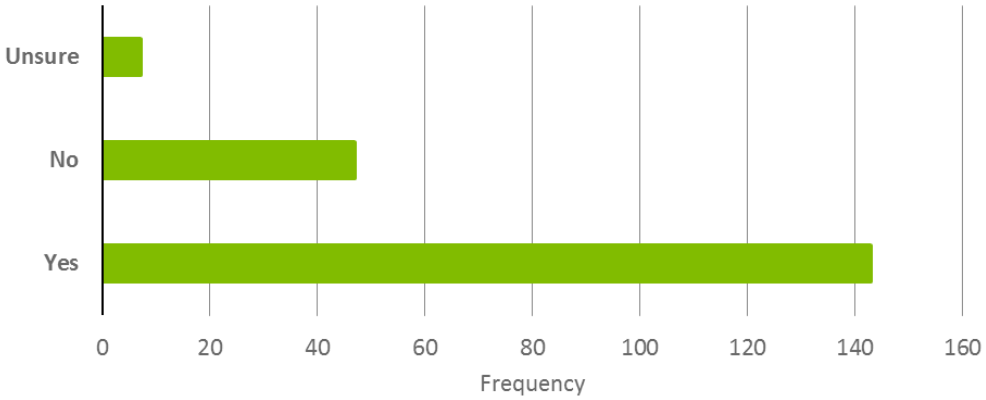
These findings are confirmed by comments in the educator survey:

- *"Overall confidence with the use of iPads and how to manage them effectively".*
- *"We all seem more accepting of the technology in the classroom".*
- *"The* [ELLA] *trial has increased other staff's interest in using technology".*

Digital literacy of educators

In the survey, a majority of educators (73%) stated they were already using digital technology in their preschool program (Chart 8.14). Common activities included the use of tablets, laptops and digital whiteboards to show children videos, play music and for investigation purpose (e.g., to search topics the children were interested in on the internet). Occasionally, learning apps on tablets were also used with the children prior to the ELLA trial, such as scrapbook apps or counting and colouring apps.

Chart 8.14: Whether educators were using digital technologies prior to ELLA trial

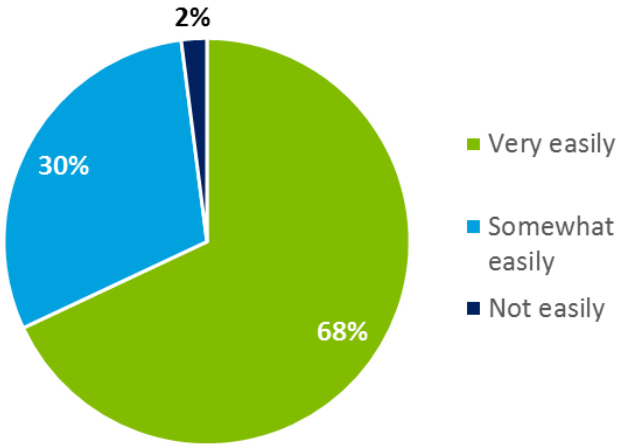


Source: DAE ELLA educator survey (n=197)

Related to this, 68% of educators expressed that they could use tablets 'very easily' (Chart 8.15). These educators stated that they found it very easy to use tablets because they had these technologies in their own homes or had implemented it already in their preschool.

However, from the consultations, a few educators expressed lower levels of confidence with the use of digital technology than they would have liked. These sentiments came primarily from preschools that had very little engagement with digital technology prior to the trial.

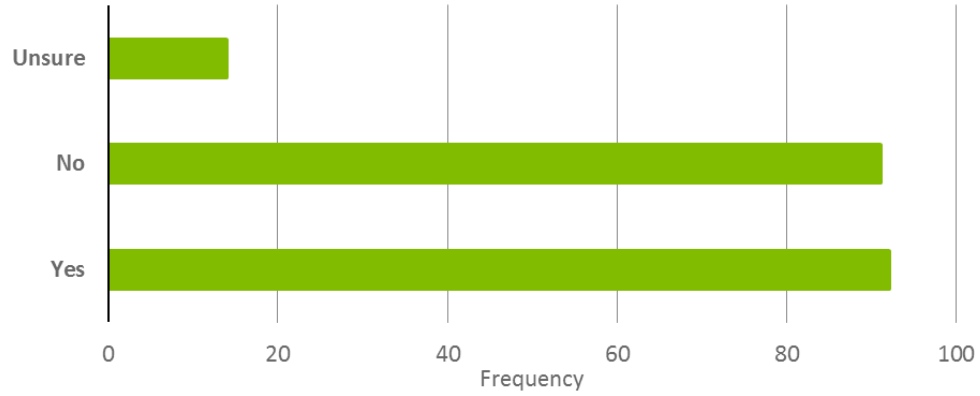
Chart 8.15: Educators views on personal ease of tablets use



Source: DAE ELLA educator survey (n=197)

Interestingly, the numbers of educators that stated their tablet skills *did not* improve from engagement with the ELLA trial was roughly equal to those that stated their tablet skills *did* improve since the start of the 2016 ELLA trial (Chart 8.16).

Chart 8.16: Whether educators felt personal improvement in tablet use since trial engagement



Source: DAE ELLA educator survey (n=197)

From the survey responses, educators stated the following about their improvement in digital literacy since the start of the trial:

- *"I am now more confident when using the iPads in the classroom* […] *knowing they are a lot more manageable than I thought".*
- *"The* [ELLA] *trial has increased other staff's interest in using technology".*
- *"Great to see more staff who don't usually use technology* [become] *more confident in using ELLA".*

Many educators said their digital literacy did not improve because they already felt competent in using digital technology:

- *"We were already using digital technology with the children on a regular basis so my confidence in this area remains the same".*
- *"We were using various tech prior to the program".*
- *"I've always been interested in and comfortable with technology and digital media and therefore have never had an issue incorporating it into the program".*

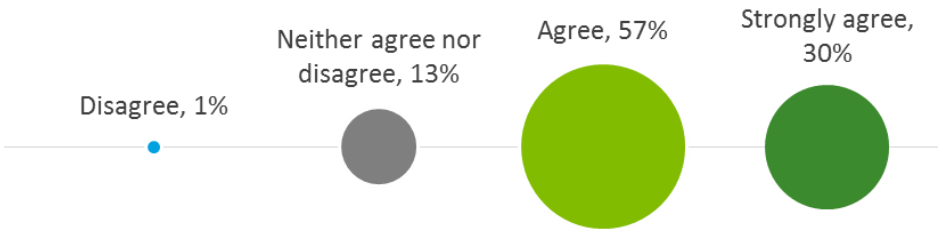
Further, some of the survey responses also revealed a degree of reluctance from some educators with the development of digital literacy:

- *"Other educators who are not ICT competent are reluctant to extend programs in other areas as this requires further technical skills".*
- *"The ELLA trial have been giving all the staff members opportunity to learn a new level of technology practices and to corporate it with our principles although it* [wasn't] *that easy to ensure the elderly staff members that are not very open to this".*

8.3 Future expectations

In terms of future expectations of trial outcomes, most educators (87%) either agreed or strongly agreed that children will continue to demonstrate an interest in learning about additional languages following the completion of the trial (Chart 8.17).

Chart 8.17: Educator agreement with statement 'Children continuing to demonstrate interest in learning about additional languages'



Source: DAE ELLA educator survey (n=191)

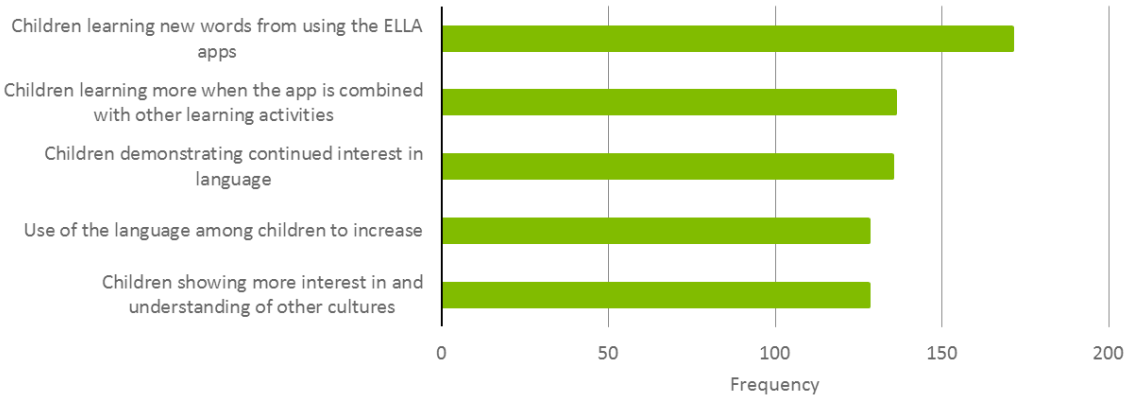
A couple of the survey responses that supported these outcomes expectations in terms of children learning additional languages are:

- *"That the children will be more confident when learning Japanese when they transition to the junior school".*
- *"Confidence at school when engaging with language learning".*

Most educators also expected continual benefits to develop from the ELLA trial itself as it progresses through the rest of the year (Chart 8.18), such as children learning new words (90%),

demonstrating a continued interest in language (71%) and showing more interest and understanding of other cultures (67%) during the trial.

Chart 8.18: Educator expectations of outcomes as trial progresses



Source: DAE ELLA educator survey (n=191)

A couple of the survey respondents also expected growing digital literacy for the children at their preschool following the ELLA trial:

- *"Increased digital technology skills".*
- *"Better exposure and use of digital technologies".*

8.4 Considerations for trial impact

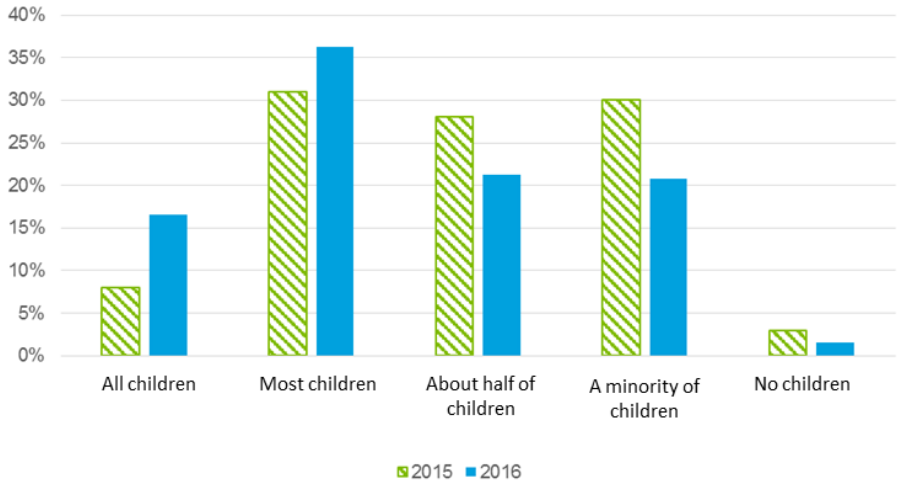
This section considers the trial impact considerations for the ELLA program going forward arising from the findings above, as well as a brief comparison with the 2015 ELLA trial evaluation findings.

8.4.1 Comparisons with the 2015 ELLA trial findings

According to the 2016 and 2015 educator surveys, educator perspectives on child outcomes were slightly stronger in the 2016 trial, with a higher proportion of educators in 2016 observing high levels of language use and believing children will continue to be interested in language and culture. For example, 17% of 2016 survey respondents observed all the children using language from the apps, compared to 8% in 2015. Likewise, 21% observed only a minority of children using the language in 2016, compared to 30% in 2015.

However, it is worth noting that in 2015, the survey response rate was significantly higher than in 2016, with almost 100% of preschools responding to the 2015 evaluation educator surveys. In 2016, the survey response rate covered 49% of preschools. Given that it is more likely that preschools who were actively engaged with the ELLA trial completed the survey, and that preschools that are more highly engaged with the trial would also be more likely to observe positive outcomes, some level of positive response bias may be present in the 2016 sample.

Chart 8.19: Educator observations on the proportion of children using language from ELLA apps, 2015 and 2016 trials

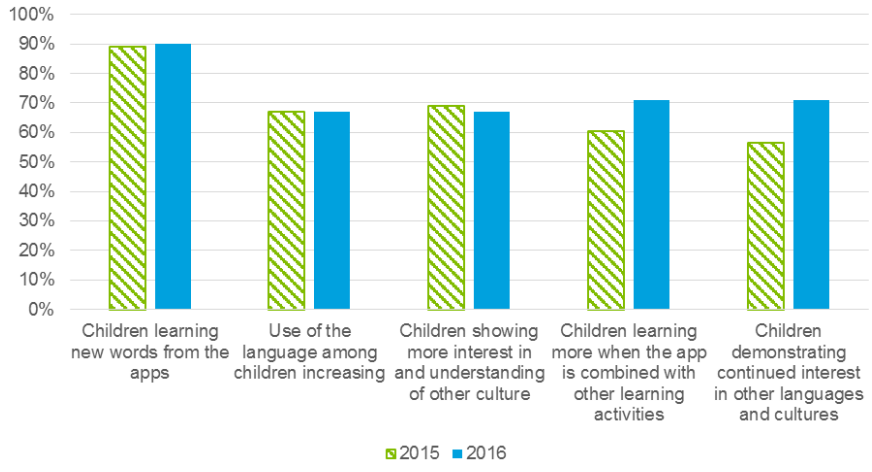


Source: DAE ELLA 2016 educator survey (n=193), average of DAE 2015 educator surveys – baseline 2015 survey (n=39), August 2015 survey (n=109), December 2015 survey (n=69)

Educator views on the impacts of the ELLA trial have remained surprisingly stable over the 2016 and 2015 trials, with roughly similar proportions of survey respondents agreeing on impacts, such as children learning new words from the apps or showing more interest in, and understanding of, other cultures (Chart 8.20). As seen below, while the responses are from two distinct sets of educators, over two evaluation periods, the results are notably similar.

A slightly higher proportion of 2016 trial educators thought children would learn more when the app is combined with complementary activities and that children will continue to be interested in other languages and cultures.

Chart 8.20: Educator expectations of outcomes as trial progresses, 2015 and 2016 trials



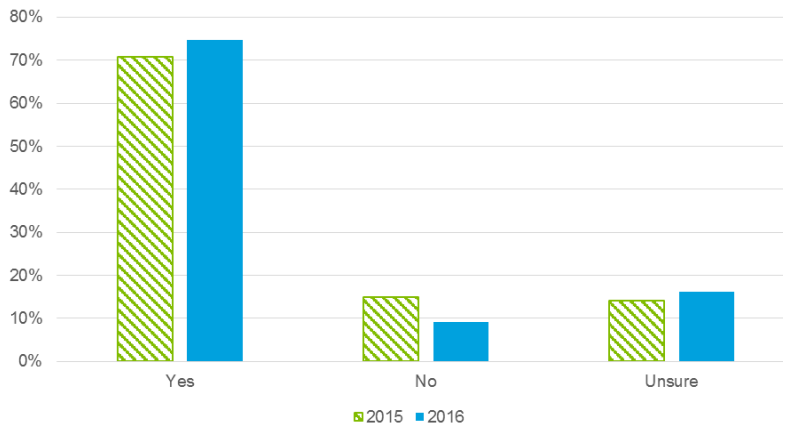
Source: DAE ELLA 2016 educator survey (n=191), average of DAE 2015 educator surveys – August 2015 survey (n=98), December 2015 survey (n=69)

In terms of outcomes for the educators themselves, changes between the two trial years were also very minor. A slightly higher proportion of educators in 2016 felt an increase in their

confidence in incorporating language learning, the proportions were unchanged in cultural learning confidence and a slightly lower proportion in 2016 felt an increase in their confidence in incorporating digital technology.

In the 2016 trial, 75% of educators felt they had increased their confidence in integrating language learning into their preschools, compared to 71% of educators in the 2015 trial (Chart 8.21).

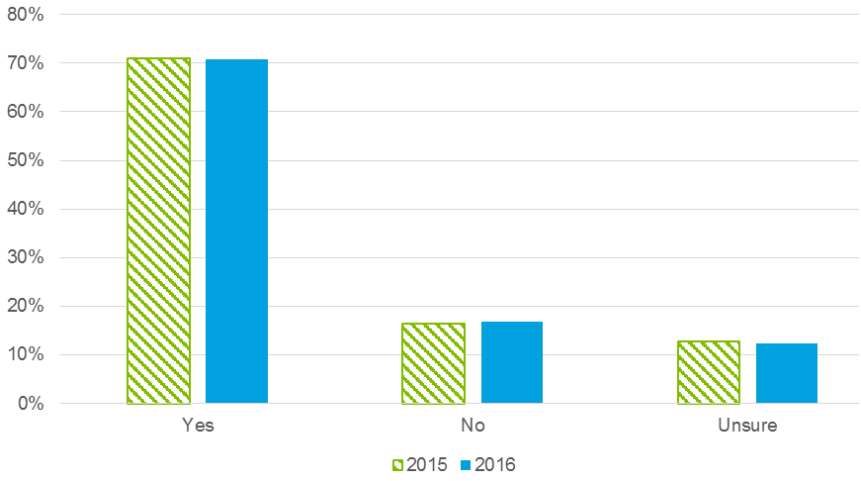
Chart 8.21: Whether educators felt more confident incorporating language learning, 2016 and 2015 trials



Source: DAE ELLA 2016 educator survey (n=154), average of DAE 2015 educator surveys – August 2015 survey (n=91), December 2015 survey (n=71)

Educator confidence in incorporating cultural learning into preschools as a result of the trial remained unchanged between the 2016 and 2015 trials (Chart 8.22), with around 71% of educators in both trials believing the trial increased their confidence.

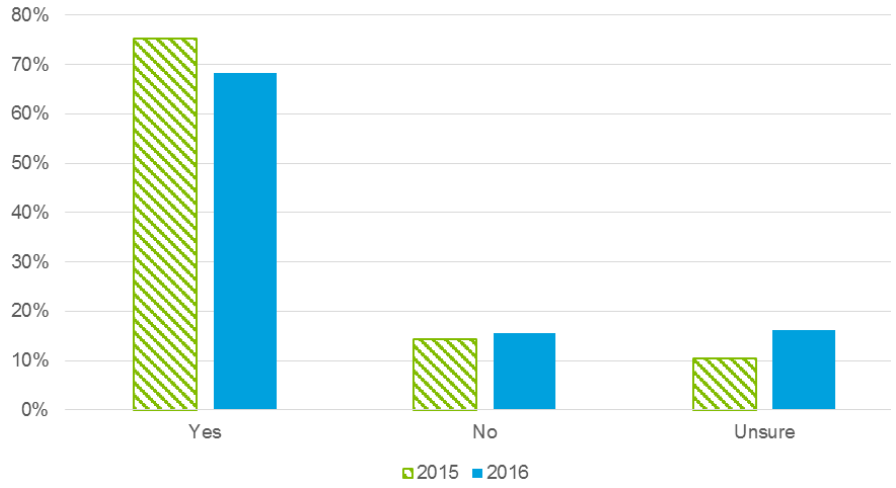
Chart 8.22: Whether educators felt more confident incorporating learning about other cultures, 2016 and 2015 trials



Source: DAE ELLA 2016 educator survey (n=154), average of DAE 2015 educator surveys – August 2015 survey (n=91), December 2015 survey (n=71)

Further, 68% of educators in the 2016 trial stated they experienced an increase in introducing digital technology into their preschools as a result of the ELLA program, a slightly lower proportion compared to 75% educators in the 2015 trial (Chart 8.23).

Chart 8.23: Whether educators felt more confident incorporating digital technology, 2016 and 2015 trials



Source: DAE ELLA 2016 educator survey (n=154), average of DAE 2015 educator surveys – August 2015 survey (n=95), December 2015 survey (n=72)

8.4.2 Considerations for trial impact

In consideration of the findings above, it is noted that in terms of trial impact:

- While the impact of the ELLA program on child language exposure can be assessed to some degree through an analysis of engagement (as measured by app usage) and educator and family observations of app usage, further research is required to link participation with the ELLA app with language learning.
- Given the variability of engagement with, and use of, the ELLA apps, it would not be expected that the trial impact would be consistent across all participating preschools and children.
- Educators and families displayed high expectations for future benefits to children, such as continued interest in language. An area of future inquiry should be whether or not these expectations were satisfied and identifying the barriers and enablers to these future outcomes.

A high proportion of educators attributed increased confidence in incorporating language learning, cultural learning and digital technology in their preschool program to the ELLA program. This suggests that the ELLA program can potentially serve as a gateway for preschools into new capabilities and education approaches.

9 Future considerations

This section, informed by the evaluation findings, provides an overview of considerations for the future of the ELLA program, by:

- discussing observed trial limitations and suggested refinements;
- analysing mechanisms through which to maximise the impact and efficiency of the ELLA program; and
- considering the implications of the above for the ELLA program into the future.

The **key evaluation questions** this section seeks to answer are:

- What would be the cost of expanding the program to more children?
  - *Are there economies of scale which will reduce the per child cost if the program is expanded?*
- Are there other options or pathways for the ELLA model?
  - *What are the key lessons from the ELLA trial that should be applied to any future program or service model?*
  - *What are the options for models of ongoing delivery of early childhood language education utilising digital technology?*
  - *What model is recommended?*
  - *What role should the Australian Government play in this area?*
  - *What role should state and territory governments play in this area?*

Deloitte Access Economics undertook demand modelling in parallel with this evaluation, to estimate the likely rate of uptake for the ELLA program when it becomes nationally available in 2017. Some of the findings of the demand modelling have been utilised in developing the discussion below.

9.1 Trial limitations and refinements

This section discusses the trial limitations observed through the evaluation, and potential refinements suggested by trial participants and stakeholders.

9.1.1 Observed trial limitations

Consultation findings and survey results demonstrate broadly positive reflections on the ELLA trial, from both educators and families. However, there were some concerns raised throughout the evaluation regarding the trial's efficacy. Each of these concerns, aside from the impact of the BYOD model on adequacy of language exposure, were also limitations observed in the evaluation of the 2015 ELLA trial.

At a high level, these concerns included:

- **Educator engagement:** It was found that the effective integration of ELLA within each participating preschool was highly variable and, often, dependent on the approach of individual educator(s) within each site. This was evident in the variation in usage across

sites, as well as the variation in reports of interactions with children while using the app and the nature and frequency of complementary activities.

Meaningful educator engagement is crucial for successful implementation of the ELLA program, providing a more satisfying and effective ELLA program experience. While providing a high degree of flexibility for program delivery has been appropriate, particularly during the trial phase, there is an opportunity now to encourage continual sharing and adoption of learned best practice. Preschools can be encouraged to use existing practical guidance that has been informed by the evaluation and other trial learnings. This includes encouraging the access to, and use of, guidance and case studies on appropriate scaffolding activities and implementation techniques.

It is noted that as the program expands, regional networks and technology-based supports may become increasingly critical to supporting a large number of preschools, increasing financial sustainability in the long term. However, evaluation findings suggest that workshops are likely to continue to be needed for the foreseeable future.

Finally, frequent contact and tailored support with sites that experience delays implementing the program will be important to maintain sites' engagement with the program. A similar approach to that adopted during the 2016 trial (throughout which ESA identified preschools that were yet to commence using the apps, and contacted sites directly to offer support) would be considered appropriate.

- **Educator confidence and capability:** The effectiveness of the ELLA program will be enhanced if steps are taken to ensure that educators have the confidence and skills needed to support the program, particularly in relation to supporting children's contextual use of the language. Although ELLA has been designed to support language exposure and learning without the need for a language educator who is fluent in that language, it is important to ensure that educators are capable and confident to support the program's implementation and delivery.

  The educator app is a positive development to support this, but due to the release date of the app relatively late in 2016,[21] the app has not been evaluated in depth at this time. It should also be that there is a range of material made available to educators that supports their delivery of the ELLA apps. The Department should take necessary steps to ensure educators make the best use of available supports.

  Similarly, there is variability across the educator cohort regarding their ability to appropriately integrate digital technology in the classroom (i.e., unsure of appropriate screen time limits for children). If digital based learning – whether in languages or other areas (e.g., STEM) is to become more widespread, then such capabilities should possibly also be incorporated in early childhood education through the higher education and VET systems.

- **Continuity in language learning:** Language education in Australia is primarily undertaken within the school system. There is variation across Australia regarding the year of schooling when language education commences. There is also considerable variability between jurisdictions and individual schools in the language(s) offered. These factors result in the lack of a clear path for language learning for children who have participated in the ELLA program at preschool.

[21] The development of the educator app commenced following the findings of the 2015 ELLA evaluation trial and as such, was not ready for release until August 2016.

This is a problem if it would be preferable for children to have the opportunity to continue language learning during their first year of schooling, and further, for them to continue in the same language. However, while a seamless pathway of language learning may be considered ideal, there is clear evidence of the benefits of language exposure at an early age, even if this is not continued in the immediate subsequent year and/or if subsequent exposure to language education is in another language (Stewart, 2005).

- **Ensuring adequate language exposure across all children**: There was variation in the use of apps by children within and across sites. While this is appropriate in a play-based preschool environment, it does imply that there will be variability in the level of language exposure and language learning across the ELLA cohort. This would be a problem if there was an expectation that children attending preschools participating in ELLA would achieve a certain level of language ability by the end of the trial as a form of preparation for subsequent learning. However, this is not the case and is not anticipated to become an issue given the play-based nature of the preschool learning environment.

  Additionally, the move towards a BYOD model has seen a rise in the average tablet-to-child ratio across trial sites. If preschools do not have an adequate number of tablets available for use, there is a risk that children who would like to use the apps at a greater frequency do not have the opportunity to. Guidance on appropriate tablet-to-child ratios is another area where additional guidance would be beneficial for sites that choose to participate in the program. It is noted that a ratio of 1:5 will be recommended for sites participating in the program from 2017.
- **Undertake a longitudinal study of the ELLA cohort**: A longitudinal study that tracked language learning and other learning outcomes among children exposed to the ELLA program compared with a matched control group would be the most robust method possible to determine outcomes and cost effectiveness of the ELLA intervention over time.

It is noted that one state educational authority expressed significant concern about the design of the ELLA trial – stating that the program undermined the fundamental principles of language learning. This jurisdiction felt that the language exposure provided through the apps needed to be embedded in a scaffolded pedagogical approach to provide contextual and deeper learning opportunities for children. As the educators delivering the ELLA trial were not qualified language teachers, the jurisdiction felt the majority of educators would lack the capacity to facilitate this scaffolded approach, to the potential detriment of children if errors or misunderstandings were not corrected. However, it should be noted that the educator app and ELLA information did provide educators with ideas on scaffolding.

The Literature Review presented in section 2 and appendix B supports that the rationale underpinning the design of the ELLA program is strong – and the program does have the potential to meet its objective of providing language exposure for preschool children to help address barriers to language education in the early years of education. However, the above concerns highlight the importance of guidance and support for program participants to ensure the program is delivered in a manner that at best, helps to realise these anticipated benefits, and at least, minimises the risk of potential misuse or harm.

The concerns raised also demonstrate the need for an extensive stakeholder engagement strategy in the context of a nationally available program, where there is likely to be increased exposure of the program. It is recognised that the Department and ESA have been liaising with

peak early childhood bodies and representatives from states and territories to encourage ongoing engagement and support of the ELLA program.

9.1.2 Suggested refinements

The responses from the educator and parent/guardian surveys, and the trial site consultations, have also revealed a number of suggested refinements to ELLA. The recommendations made by educators that participated in the 2016 trial are listed here:

- ***An earlier workshop:*** A common suggestion from both the consultations and educator survey was to have training and professional development opportunities made available earlier in the year. In particular, a number of preschools wished that the workshop could have been held earlier in the year as they found it useful for trial implementation and delivery.

  It is noted that this finding is specific to the 2016 trial and that the 2015 trial found that educators were generally satisfied with workshop timing. It is also noted that the workshops are scheduled to be held earlier in the 2017 ELLA program, in April.

- ***Language flexibility:*** During consultation, a few preschools indicated that they would have liked the flexibility to change the language they were delivering partway through the trial. This option would be useful if the initial language they chose was not being effectively engaged with by the educators or children, or they felt it was appropriate to cater to particular children by switching to another language option. For example, two sites said they wished they could change languages to help a newly arrived child from a non-English speaking background settle in better, by offering them the ability to hear a language they were familiar with.
  - This echoes a recommendation from the 2015 trial, which was a desire by some educators and/or families for multiple languages to be explored within a single preschool, particularly if it has a strong multicultural ethos.

  It is noted that the language flexibility of the trial increased from 2015 to 2016 through trial sites now being able to choose their own language.

- ***Device compatibility:*** A couple of the educator survey responses also stated they would like increased device compatibility for the ELLA apps. For example, some wished they could also run the apps on an interactive whiteboard or a desktop/laptop computer or smartphone.

  It is noted that the ELLA app device compatibility has been increasing since 2015, with Android tablets added in 2016 and more economic tablet device compatible apps to be made available in 2017.

- ***Increased language choice:*** Another refinement, suggested in a couple of the consultations and a few of the survey responses, was a broader range of language choices. Some of the languages suggested included Greek and Italian (to cater to preschools with a large community from these backgrounds).

  It is noted that a desire for broader language choice – particularly English or Aboriginal languages – was also a feature of the 2015 evaluation findings. The Australian Government has committed to increase the languages available, with Italian and Spanish included from 2017 and Hindi and Modern Greek from 2018.

- ***Physical support tools:*** Some survey responses and sites made suggestions about creative, physical support tools. These included cultural items, flash cards and Polyglot toys or props to help reinforce the learning from the ELLA apps. Another suggestion that

was made was to have the music and spoken words from the apps available in an easily accessible audio format, such as on a CD.

The desire for increased supporting materials was also expressed in the 2015 trial evaluation findings.

9.2 Maximising ELLA program impact

In 2017, the ELLA program will become nationally available to all Australian preschools. This section explores questions of cost efficiency over time, and how the potential impact of the ELLA program may be maximised.

It is noted that the 'costs' cited below, are based on government expenditure – and therefore are not a pure representation of the cost of the ELLA program. The figures do not include costs faced by any non-government players (such as the preschools themselves) and also assume that government spending equated to the cost of administering the program, which may not necessarily be the case. This analysis does not constitute a cost-effectiveness or cost-benefit analysis in which definitive findings are able to be made regarding the program's return on investment.

9.2.1 The cost of the ELLA program

In 2016, the cost to the government of the ELLA trial over the 2016 trial period was $2.464 million. The ELLA trial reached 8,502 children, representing a cost per child of approximately $311 over the course of 2016. It is worth noting, however, that this cost per child does not include the significant development costs that were incurred during 2015. If the trial costs are aggregated over both 2015 and 2016, the trial cost per child is approximately $1,200.

The majority of the cost per child differential across 2015 and 2016 is explained by (1) the program development costs – including app development – being included in the 2015 cost base; and (2) the larger number of trial sites participating in 2016 (resulting in a lower per unit cost).

However, the reduced cost per child in 2016 was also driven by several changes to the trial:

- Under the BYOD model, sites provided their own tablet devices, rather than having these provided by the Department. As such, the cost burden associated with supporting hardware was transferred to trial sites. Given this, the estimate of $311 per child over 2016 is underestimating the true cost of the ELLA trial as a portion of this was borne by preschools.
- Project management efficiencies (at the Departmental and project management level) were likely to have been realised in 2016, drawing on experience from the first year of the ELLA trial. However, the increased number of sites in 2016 meant that support could not feasibly include an individual visit per site (which occurred in 2015, when an ELLA liaison officer – employed by ESA – visited each site to ensure preschools were implementing the trial in an appropriate manner and provide tailored support) reducing the per site cost of providing support.

Overall, the level of support model for sites was less intensive during 2016 than in 2015, with preschools required to provide their own devices and individual site visits not taking place due to a significant increase in participating preschools. The refined support model was appropriate

given the expanded nature of the trial. As the number of participating sites grows, it is increasingly important for the ELLA program to move towards a more cost-efficient model of support, as evidenced in the changes this year.

9.2.2 Increasing efficiency over time

As suggested in the previous section, reflecting the fact that the ELLA program required significant development costs, but has a relatively low marginal cost, the cost per child associated with the ELLA program is expected to continue to decrease over time as the number of participants increase.

The Australian Government has allocated $5.9 million for the ELLA program expansion over 2017 and 2018. It is anticipated that over this time, the ELLA program will cater to approximately 2,000 participating sites.[22] As such, it is expected that the cost of the ELLA program per child would continue to decrease, as shown in Table 9.1.

Note that the below table assumes a linear increase of site participation up to 2,000 in 2018, and an average number of users per site of 30 (based on 2016 trial site averages). The cost of the trial per child is provided for both the year (isolating prior costs) and for the trial in its entirety (including all costs and participation to that date).

Table 9.1: Estimate of potential ELLA program cost per child

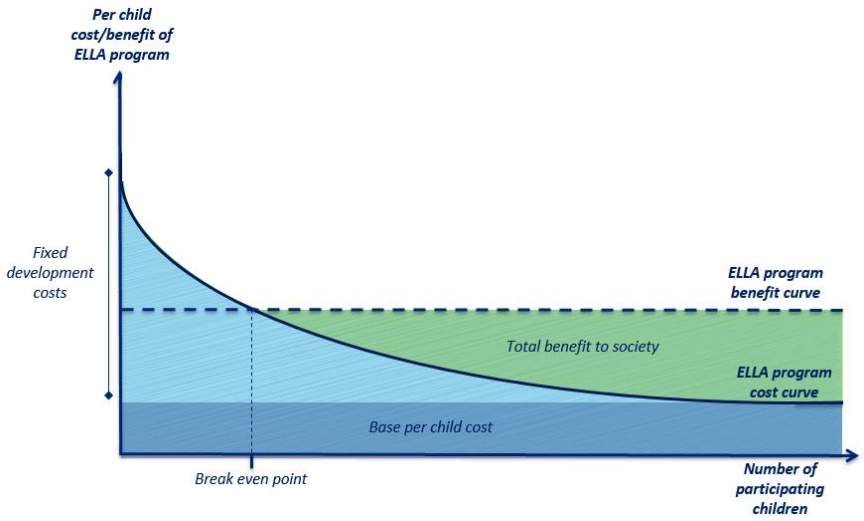
	2015	2016	2017	2018
No. participating preschools	41	285	858	2,000
No. participating children	1868	8,502	25,740	60,000
Cost of program (by year)	$9.8m	$2.47m	$2.95m	$2.95m
Average cost per child (by year)	$5,246	$311	$114	$49
Average cost per child (program total)	$5,246	$1,200	$421	$189

Assuming that the program quality remains constant (that is, that an increase in participants does not adversely affect program quality and, therefore, program outcomes), ***the cost efficiency of the ELLA program on a per participant basis would be expected to continue to improve***. However, it should be noted that it is not within the scope of this evaluation to identify if this investment represents the most cost effective approach to increasing language exposure and learning within preschools and beyond.

As seen in Figure 9.1, there will always remain a base per child cost associated with the delivery of the ELLA program. This is driven by variable costs, such as administration and support for preschools, which will increase as participation numbers increase. However, the fixed costs of the ELLA program, those which do not vary with participation numbers (such as app development, data storage, advertising and provision of set resources) will decrease on a per unit basis as the program grows. Therefore, as the number of participants grows, the ELLA cost per child decreases towards the level of the base per child cost.

[22] This estimate is an internal Australian Government estimate.

Figure 9.1: ELLA program cost curve (illustrative representation only)



Source: DAE (2015)

It can also be assumed that there is a minimum benefit per child as a result of participating in the trial, however, it is not possible within the scope of this evaluation to determine the magnitude of this benefit. While there are positive signs that the benefits associated with early language exposure would be gained by participating children, many of the benefits associated with learning a language, and language exposure, will not become apparent until a later time period, hence the need for a longitudinal study as referenced above. Also, the nature of the benefits of the ELLA trial, including increased cultural awareness and acceptance, community cohesion and increased interest in language learning, are in many cases intangible and difficult to quantify. It is also noted that engagement with the ELLA trial was highly variable on a per child basis, and as such, the benefits accruing to each child would vary significantly.

As the magnitude of the costs and benefits are at this stage unknown, Figure 9.1 above is purely illustrative. Additionally – it is worth reiterating the underlying assumption that the above case for increased cost-efficiency through increased numbers of participating children holds true only if ***the quality of the program remains constant.*** As such, ensuring that the program is expanded in a manner that preserves quality of delivery is imperative in ensuring the potential benefits associated with the ELLA program are realised.

9.3 Implications for 2017

From 2017 onwards, as the ELLA program becomes nationally available, it is expected that the ELLA program will enter a period of significant growth (see accompanying demand report for additional detail). Given this, there are several considerations that become increasingly important.

Preserving quality

As discussed in the context of cost efficiency in section 9.2.2, the ability of the ELLA program to continue to realise a similar per child benefit as the program is expanded, is dependent on the quality of the program remaining consistent. As seen through the expansion in participating

preschool numbers from 2015 to 2016, implementation and delivery of the ELLA program became increasingly variable, with child app usage also increasing in variation.

As such, a successful expansion of the program will depend upon a number of preconditions, including:

- timely and effective support for preschools and educators (detailed further below);
- engaged educators able to scaffold app use in the preschool with complementary activities and interactions with children while using the apps; and
- participant access to the apps to a level that enables meaningful engagement with the program.

Support for educators

The current model of support is broadly appropriate although there is scope for further refinement. An overall evaluation finding is that there is, in the immediate term, a continuing need for a face-to-face workshop component combined with access to a helpdesk and online resources. This observation has taken account of the following:

1. A number of educators reported that their site required a high level of guidance, even though the preschool was in the second year of the trial, due to high staff turnover – reflecting a need for ***ongoing support***.
2. The ability for the ELLA program to be implemented and delivered effectively is highly dependent on the level of educator engagement and confidence in the program – reflecting the need for ***effective educator support.***
3. The evaluation found that the ELLA workshops, and an opportunity to share ideas and learn from other educators and experts in a dedicated, face-to-face environment was a highly popular and helpful method of educator support – reflecting a need for ***face-to-face support.***

However, there is a trade-off between the effectiveness of face-to-face support provision and the resources required to facilitate this. As the ELLA program expands, funding the workshop model may become less feasible. As such, it is worth the Department considering alternative models of face-to-face or technology enabled support. As the program matures further, an online-based model of support may be adequate, particularly as the educator app is further embedded in educator supports and as more resources (including additional case studies and guidance on best practice) are made available to preschools.

Regional networks, in which established ELLA trial sites can offer support and guidance to new sites (or new staff), are also likely to be an ongoing feature of the support model. It is noted that the current plan to increase the Champions Network from 5 to 25 by 2018 should help to facilitate this.

Preschool capacity to participate

The BYOD model relies on preschools being able to access tablet technology to support the ELLA program. This raises concerns over whether the ELLA program will be accessible to all preschools who wish to participate, and if tablet-to-child ratios support children within each participating preschool to have adequate access to the apps to ensure full program participation.

It is noted that the Department is undertaking several measures to lower the risk that cost barriers will prohibit preschool participation. Additionally, a low-specification version of the ELLA apps is being created to allow the apps to be used on less expensive tablet devices. From 2017, preschools will also be provided with guidance regarding the number of devices required per participating children, with a ratio of 1:5 being recommended.

Language pathways

The current gap between the ELLA program and formal language education, which typically exists in Australian school systems from Year 3 onwards, poses some risk to the long-term effectiveness of the ELLA program, as related to language learning.

Into the future, strong relationships with educational authorities to facilitate language pathways and linkages between the preschool sector and schooling may help to enable children to access a continual language learning journey from preschool through to the later years of schooling. While this would further strengthen the benefits of the ELLA program, it is not considered essential for the program to continue to make a worthwhile contribution to language exposure and learning.

Currently, there are observed linkages made at the local level, such as trial sites choosing languages based on local school or community language accessibility. These approaches also facilitate increased opportunity for continued language learning following completion of the ELLA program, and should be encouraged.

The capacity of the ELLA apps (or an extension of the ELLA apps) to facilitate language exposure in the early years of primary school could also be explored – reflecting the sentiments of several educational authorities consulted with, which stated this was a logical next step.

Emerging competition for educational apps

As the concept of digital technology as a learning device in preschools grows, so might the availability of high quality educational apps. Given national guidelines relating to the appropriate amount of screen time for young children and the emerging public debate on this topic, the proliferation of digital learning through apps and tablets may affect the ELLA program. This is likely to require careful monitoring from a broader policy perspective among both the Australian Government and state and territory authorities.

Although the ELLA apps are currently differentiated from other like products by their high quality, educational apps and digital learning programs are rapidly evolving. It would be prudent to consider the implications of the emergence of more apps in preschools over time.

Appendix A – Overview of evidence sources

This appendix provides a more detailed overview of the evidence sources informing this report.

A.1 App data from DT Millipede

This appendix describes the app data provided by the software developer – DT Millipede – from a technical perspective.

The ELLA apps have been designed to collect raw data every time a child or educator interacts with the tablet (i.e., data is collected every time a tablet is touched). Identical raw data extracts are provided to Deloitte Access Economics, ESA and the Department by DT Millipede once a week. Fields are included for apps and (de-identified) user identification, enabling changes in app, preschool and individual use to be analysed over time. There is also an event field, with further descriptive columns for the tasks undertaken – these fields are explained in the data dictionary in Table A.1.

Table A.1: Data dictionary

Data field	Description
Device_time	The device time is a unix EPOCH UTC (the number of second since 01/01/1970).
Language	Which language does the entry relate to?
App	Which app does the entry relate to? (1 through 7).
Centre	Which preschool is the data entry from?
Group	Each group has their own ID. This is useful for comparing different groups within the same preschool.
Year	The year the observation took place.
Month	The month the observation took place.
Week	The week of the trial.
Day	The day of the month the observation took place.
Day of year	The day of the year the trial took place, with January 1st being 1, and December 31st being 365.
User_id	The unique user id attached to each child.
Type	The nature of the child's interaction with the tablet (access, app, activity or language). The analysis is mainly interested in activity and language.
Event	Each interaction has a range of associated events. For example: • Select user: A child has logged in on the log-in page • Begin: a child has selected an activity to enter • Interaction: a child has touched the screen to perform a task within an activity
id1	Each event has a range of associated values in id1. The analysis is mainly focussed on which activity the children are choosing to engage with.

Data field	Description
id2	Each id1 entry has a range of associated values in id2. For example, within the maze, there are several actions a child can take, or several phrases they are exposed to: • maze.tam.problem_thankyou – Tam says 'thank you' in the target language • talo.found – the child finds Talo (one of the characters) in the maze

The functional specifications and language transcripts of each app are also provided to Deloitte Access Economics, which allows code in the raw data to be matched with app usage. This has been used to understand app usage, popular activities within the app, language exposure and progression through activities.

Finally, DT Millipede also provides two summary reports in Microsoft Excel:

- event_summaries – This report presents the total time, mean and median usage time, in seconds by each site over the duration of the entire trial to date. It also divides usage into activity type (for example, time spent playing with maze or the spaceship), and interaction type (for example, the user opened a gate, or popped a bubble).
- event_by_group_by_week – This report presents the time, mean and median usage time, in seconds, by each site for each week of the trial. It also divides usage into activity type (for example, time spent playing with maze or the spaceship).

These reports have been used to cross check results from Deloitte Access Economics' analysis.

A.2 Profile of educator surveys

The educator survey responses were received from 139 (49%) of the 285 registered trial sites in November 2016.

- A total of 235 responses were received, of which 191 (81%) were successfully complete and 44 (19%) were partially completed.

Of the total responses, 215 (91%) stated their role while the remaining 9% did not state their role.

- Of the 215 that stated their role, 106 (49%) were from early childhood teachers, 47 (22%) were from directors and 41 (19%) were from educators. Table A.2 below provides the breakdown of roles by frequency and percentage:

Table A.2: Profile of roles of survey respondents

Role at the preschool	Frequency	Percentage
Early Childhood Teacher	106	49%
Director	47	22%
Educator	41	19%
Principal	1	1%
Other	20	9%
Total	**215**	**100%**

Source: DAE ELLA educator survey (n=215)

Of the total responses, 215 also stated their preschool type.

- Of the 215 that stated their preschool type, 118 (55%) were LDC preschools with a preschool program and 55 (26%) were stand-alone preschools. Table A.3 below provides the breakdown of preschool types by frequency and percentage:

Table A.3: Profile of preschool type of survey respondents

Preschool type	Frequency	Percentage
Long day care with a preschool program	118	55%
Stand-alone preschool	55	26%
Preschool attached to a government school	15	7%
Preschool attached to an independent school	12	6%
Other	15	7%
Total	**215**	**100%**

Source: DAE ELLA educator survey (n=215)

A.3 Profile of trial sites for consultation interviews

The descriptive statistics for the sample of 24 sites participating in the consultation phone interviews are compared to those for the total trial population in Table A.4.

Table A.4: Profile of consultation interview sample

Variable	Site interview sample No. of sites (percentage of total sample)	All sites No. of sites (percentage of total sites)
State/territory		
New South Wales	21%	40%
Victoria	21%	15%
Queensland	21%	32%
Western Australia	8%	5%
South Australia	13%	4%
Tasmania	8%	2%
Northern Territory	4%	1%
Australian Capital Territory	4%	2%
Language		
French	21%	25%
Indonesian	21%	12%
Chinese	25%	32%
Arabic	4%	3%
Japanese	29%	28%
Accessibility/Remoteness Index of Australia (ARIA) categorisation		
Metropolitan	67%	69%
Inner/outer regional	33%	29%

Variable	Site interview sample No. of sites (percentage of total sample)	All sites No. of sites (percentage of total sites)
Remote/very remote	0%	2%
SES^		
Low	21%	14%
High	13%	27%
Preschool type		
Stand-alone preschool	13%	15%
Preschool attached to school	38%	13%
Long day care with a preschool program	50%	72%

^ SES was determined on the basis of the Australian Bureau of Statistics (ABS) index of relative advantage and disadvantage. Suburbs in the lowest 20% of scores were classified as low SES, while suburbs in the highest 20% of scores were classified as high SES.

A.4 Profile of parent/guardian surveys

The parent/guardian survey was received from 83 (28%) of the 285 registered trial sites in November 2016.

- A total of 402 responses were received, of which 306 (76%) were successfully completed and 96 (24%) were partially completed.

Table A.5: Profile of parent/guardian survey sample

Variable	Parent/guardian responses (no.)	All Parent/guardian responses (percentage)
State/territory		
New South Wales	116	38%
Victoria	70	23%
Queensland	75	25%
Western Australia	11	4%
South Australia	2	1%
Tasmania	6	2%
Northern Territory	0	0%
Australian Capital Territory	26	8%
Language		
French	104	31%
Indonesian	32	10%
Chinese	104	31%
Arabic	3	1%
Japanese	89	27%
ARIA categorisation		
Metropolitan	207	62%
Inner/outer regional	124	37%
Remote/very remote	1	0%

Variable	Parent/guardian responses (no.)	All Parent/guardian responses (percentage)
SES^		
Low	52	35%
High	97	65%
Preschool type		
Stand-alone preschool	38	11%
Preschool attached to school	54	16%
Long day care with a preschool program	240	72%

^ SES was determined on the basis of the ABS index of relative advantage and disadvantage. Suburbs in the lowest 20% of scores were classified as low SES, while suburbs in the highest 20% of scores were classified as high SES.

Appendix B – Detailed literature review

Introduction

A literature review was undertaken to provide a qualitative understanding of the current rationale for, and best practice approach to, using digital technology for language learning in preschools. Approximately 65 documents were canvassed in the course of the literature review, and consequently sorted to determine relevance to the ELLA trial.

The ELLA program is now being expanded to more preschools across Australia. Deloitte Access Economics was engaged to undertake the second evaluation of the expanded ELLA trial in 2016. The literature review conducted in the first evaluation was updated to incorporate any new research in language learning and digital technology in preschools.

The findings of the literature review are structured as follows:

- Part 1 illustrates the current policy context in relation to both language education in preschools and the integration of digital technology in preschools.
- Part 2 details the literature supporting the underlying rationale for the learning of languages and the use of digital technology in preschools.
- Part 3 presents the literature findings relating to the best practice approaches to the use of digital technology in preschools, the teaching of languages in preschools and the design of apps.

1. Policy context

This part outlines the policy context for the ELLA program trial, including the growing emphasis on the importance of language education in Australia, the current national early childhood education policy framework and emerging policy design relating to the use of digital technology in educational settings. The design of the ELLA program trial, and how this aligns with the policy context, is also considered.

Language education

Over the past 40 years, policy on language education in Australia has advocated for a greater uptake of language learning (Lo Bianco & Slaughter, 2009). Policy documents recognise the advantages of learning a foreign language, specifically citing the benefits to cognitive development, the improvements to intercultural understandings and the broadening of social, personal and employment horizons (ACARA, 2011). The White Paper *Australia in the Asian Century* (2012) suggested that Australia should increase Asian languages education, to prepare students for their inevitable exposure to Asia, given the rapid growth of several Asian economies. The *National Statement on Asia Literacy in Australian Schools 2011-2012* supports this recommendation, stating that learning an Asian language will provide students with a competitive edge in an increasingly globalised world.

Jones Diaz (2014) argues that explicit policy initiatives for children between birth and five years of age are needed in Australia as 'language shift in early childhood and primary education occurs when children are exposed to English-only educational settings at a young age'. In light of this, the introduction of, or maintenance of, alternative languages in preschool is expected to be of importance in reducing the language loss of bilingual children attending English-speaking preschools.

The Australian Government's *Quality Schools, Quality Outcomes* policy agenda consists five main areas of focus:

1. Boosting literacy, numeracy and STEM performance.
2. Improving the quality of teaching and school leadership.
3. Preparing our students for a globalised world.
4. Focusing on what matters most and those who need it most.
5. Increasing public accountability through improved transparency.

Language learning is encompassed within the "Preparing our students for a globalised world" focus. Under this area of focus, the government will:

- start teaching students a second language from the early years;
- support developing new languages curricula;
- expand the Early Learning Languages Australia program into the early years of schooling;
- encourage states to free up their Permission to Teach requirements to allow fluent languages speakers to be employed in schools without the requirement of a four-year degree; and
- work with states and territories, the non-government sector and higher education providers to develop innovative ways to improve the supply of competent language teachers.

The ELLA trial is intended to support this stated government objective by exposing preschool children to languages other than English through the use of tablets. It is anticipated that early exposure will encourage further language learning in later years of education.

Early childhood education

The current national early childhood education policy framework for learning outcomes is outlined in *Belonging, Being & Becoming: The Early Years Learning Framework* (Australian Government Department of Education, Employment and Workplace Relations, 2009). The ELLA apps used in the 2016 trial have been mapped to the Framework to deliver on specified outcomes, such as effective communication skills and building confident and involved learners.

Drawing on findings from Sigel (1987), children are active learners and as such, present opportunities for self-directed learning through play. This is supported by the optimal learning environment presented in Copple, Sigel & Saunders (1987), which they describe as being an environment that supports physical and cognitive exploration that encourages self-simulation and healthy development.

The use of tablets in early childhood education

The use of tablets in education is still a relatively new, though increasingly emerging concept. Results from initial trials suggest tablets support positive educational outcomes for young children.

In the United States, current guidelines on the use of interactive media provide a very broad 'do no harm' approach. Australian policy has taken a similarly broad approach that does not provide prescriptive guidelines around the use of digital technology as a learning tool in early childhood education. Most states and territories in Australia have implemented programs to ascertain the effectiveness of digital tablets in education (for a list of past trials, see Table B.1 below). As most of these programs are either ongoing or only recently completed, tablet use in education, particularly early childhood education, is yet to feature explicitly in policy documents.

While the use of digital technology is encouraged, there is no specific policy objective to increase the use of tablet technology as a teaching aid. Some states, however, do offer targeted support and guidance in this area. For example, the Western Australian Department of Education outlines methods and techniques educators can employ to support the use of tablets in an educational setting.[23] A number of program trials that are comparable to the ELLA trial have been identified (Table B.1 below).

[23] Available at http://www.det.wa.edu.au/curriculumsupport/primary/detcms/navigation/tablet-technology-for-education/

Table B.1: Trials related to the ELLA program

Study name	Author(s)	Jurisdiction	Target participants	Study description	Key outcomes
iPads for Learning - In Their Hands Trial	I & J Management Services, 2011	Victoria	Primary and Secondary students	The purpose of the trial was to assess if iPads enrich children's learning experience across all fields of education. More than 650 iPads were placed in 10 primary, secondary and special schools around the state. The trial ran for 13 months. Schools were provided with $100 spending money per iPad, to download apps.	• Students found learning was more fun with an iPad. • Most teachers noted iPads improved learning outcomes. • iPads had a greater impact on younger students.
Use of Tablet Technology in the Classroom	Goodwin, 2012	New South Wales	Grades 3-6	The trial was rolled out to six classrooms across three primary schools. In some classes, there was one iPad for each student; in others, there was one iPad for every two students. Schools were provided with $50 spending money per iPad, to download apps.	• iPads place additional demand on teachers. • Both students and teachers found that iPads supported and enhanced learning.
Smart Classrooms	Queensland Government	Queensland	Years 8-10	The iPads were used in four classrooms across two schools. One school gave one iPad to every student; the other shared the iPads between students. The trial ran for 6 months.	• Outcomes improved when there was one iPad for every student.
Early childhood iPad initiative	Western Australian Department of Education	Western Australia	Grades 1 and 2	The trial was implemented in 19 schools in metropolitan, regional and rural areas, with a focus on teaching literacy and numeracy. More than 850 iPads were distributed to schools, and were used by 1,671 students. iPads were generally used on a shared basis.	• Students usually disinterested with learning were engaged when using the iPad. • Teachers reported the iPads created a more relaxed learning environment.

Study name	Author(s)	Jurisdiction	Target participants	Study description	Key outcomes
Schools going mobile	Oakley, Pegrum & Faulkner, 2013	Western Australia	Kinder – year 12	This was a two-phase project, with researchers examining the use of handheld digital devices in 10 schools across Western Australia. The focus was on literacy outcomes, but this evolved throughout the trial. The initial phase was concerned with schools existing practises with handheld technologies. Only schools already using digital technology in the classroom were eligible.	• At younger levels, one handheld digital device for many children was the preferred model. • Children are more motivated and engaged when using handheld digital devices.
Exploring the Pedagogical Applications of Mobile Technologies for Teaching Literacy	Oakley, Pegrum, Faulkner & Striepe, 2012	Western Australia	Kinder – year 12	This is the second phase of the above trial. It involved six case study schools, again with a focus on teaching literacy. The focus of this study was on teachers' views on the benefits and challenges of digital technology.	• Preliminary empirical studies show the iPad improves test results among primary school students. • iPads work best for younger children, as the iPad allows freedom for play-based learning.
Studying Asian languages with web technology	Salt Group, 2012	Victoria	Secondary students	The study was conducted over two years. 51 schools partook in the first year; 41 schools in the second year. The study sought to uncover whether digital technology improved learning outcomes in language education.	• The tablets generated a positive student attitude toward learning. • Students took responsibility for their learning. • Teachers were confident the tablets were leading to increased language skills.

Study name	Author(s)	Jurisdiction	Target participants	Study description	Key outcomes
iPlay, iLearn, iGrow	Yellend & Gilbert, 2013	Victoria	Children aged 0-6	The study was designed to explore the use of tablet technology with young children. There were 95 children (including 20 in kindergarten) involved in the trial. The trial ran for six weeks. Tablets were introduced to the classroom as necessary.	• Tablets stimulated conversation. • Children self-regulated their use of the tablets.
AlphaEU	Lazar, 2014	Various countries	Children aged 2-6	The study used digital media to promote multilingualism in the European Union, through digital alphabet books, alphabet-related games and interactive activities. It aimed to develop perception and recognition of sounds and concepts of at least one foreign language, and to then understand and use the language in an interactive manner.	• Tablets found to effectively teach additional languages.
Not applicable	McPake & Stephen, 2016	Scotland	Preschool	A four-week trial teaching Gaelic in preschools, rolled out across several playrooms. The trial was aimed at reducing teaching load and acting as a new strategy to more effectively teach Gaelic to preschool children. The app involved arranging a sequence of photos that either the child or teacher would take on the tablet device, and then add captions and related sound files. The children could therefore repeatedly listen to the retelling of familiar events, which stimulated them to respond in Gaelic.	• Children were found to be enthusiastic about their learning. • Those who were relatively unfamiliar with tablet use and navigation quickly learnt from their peers. • In doing so, the app encouraged collaboration and scaffolding among children. • Ground rules needed to be set by teachers in order to ensure that the tablets were equitably shared.

Study name	Author(s)	Jurisdiction	Target participants	Study description	Key outcomes
iPad at School: A Holistic Evaluation of the Opinions of Students, Teachers and Parents Concerning iPad Usage	Ağır, 2015	Istanbul	Primary school	Students and teachers usage of the devices and applications was actively monitored throughout the year. In the courses, all the visual and digital content on the course topics was built in to send out to the teachers' Mac mini, which is connected with smart boards, and students' iPads.	• Students were generally very eager to use the device, and able to pick it up and use it intuitively with little instruction. • There needs to be a plan for managing things like recharging batteries, application deployment, backups, and protecting, repairing and replacing iPads as needed.
Young children's transfer of learning from a touchscreen device	Huber et al., 2016	Australia	4- to 6-year-old children	Through two experiments, researchers examined the ability of 4- to 6-year-old children to learn how to solve a problem (Tower of Hanoi) on a touchscreen device and subsequently apply this learning in their interactions with physical objects.	• Children's learning on the touchscreen smoothly transferred to a subsequent attempt on the physical version. • Children are quite capable of transferring learning from touchscreen devices.
Not applicable	Crichton, Pegler & White,	Canada	Primary and high school students	Students completed surveys regarding their digital technology preferences	• Students preferred tablets "for a variety of commonplace tasks," while preferring laptops "for searching the Internet, creating media, and checking email." • In relation to handheld device use in the classroom, high school students and teachers were more critical (than primary students), as both appeared to struggle to find educational uses for the devices.

Study name	Author(s)	Jurisdiction	Target participants	Study description	Key outcomes
Not applicable	Foote, 2012	United States	High school students	1-to-1 iPad deployment in one high school, surveyed students and teachers on this experience.	• Program fostered an exploratory climate - teachers, students, and administrators learnt at the same time how to use the iPad.

2. Supporting rationale for ELLA

This part of the review documents the literature on the benefits of learning a second language, the benefits associated with early exposure to foreign languages and the benefits of integrating digital technology in preschools. Together, these three separate elements form the evidence base that underpins the rationale of the ELLA program design.

Benefits of early language exposure for language learning

It has been consistently found in literature that the early years are a crucial period for the successful acquisition of a second language. Griva & Sivropoulou (2009) surveyed all of the relevant literature around early language intervention in kindergartens, and found that the early years are critical period for a child to learn a second language, as it interacted with the development of their linguistic system. The review also found that children's enjoyment and openness towards other languages and cultures are 'key factors' for the potential benefits of early language learning and that dual language exposure in the early years does not delay development in either language.

Stewart (2005) found that language learning is best done before the onset of adolescence, as younger children are more receptive to language learning and develop a more native-like pronunciation. Research finds that young children question language structure to a less extent, which helps with pronunciation and the learning of different grammar structures.

This was further investigated by Granena (2013), who conducted a study with 100 Chinese-Spanish bilinguals, looking at the difference in language development between those who began learning the second language early in life (between 3 and 6 years of age) and those who began learning at the age of 16 years or older. The study found that the learning mechanisms of early learners was not fundamentally different to native speakers, whereas, the learning mechanisms of those who started language learning later on in life, relied on reference to their first language and learnt problem-solving mechanisms, rather than accessing the intrinsic learning mechanisms which children use to learn a first language. The study found that although learning mechanisms of children are similar to native speakers, the overall success of the uptake of the language differed from native speakers.

Other benefits of early language exposure

Cognitive ability

Studies have demonstrated that learning a second language at an early age improves (among other things) children's cognitive development and problem-solving skills. Stewart (2005) found that learning another language expanded children's cognitive abilities, creative thinking, adaptability and problem solving skills, which are all transferable to other academic areas. Findings in Jones Diaz (2014) supported this and added that just an introduction to learning an additional language in the early years 'improves cognitive abilities, positively influences achievement in other disciplines, and results in higher achievement test scores.'

Furthermore, these effects have been shown to continue beyond childhood, with bilingualism shown to offset age-related declines in executive functions, such as memory, reasoning, and problem-solving ability (Bialystock & Craik, 2010; Gold et al., 2013). Craik et

al. (2010) found that bilingualism is a cognitively demanding skill and in turn, increases the brain's resistance to damage that can delay the early onset of dementia.

Cultural Awareness

Learning a second language has been shown to facilitate cultural awareness, and improve people's understanding of human behaviour (Crozet & Liddicoat, 1997; Baker, 2006). Not only does this prepare people for the increasingly globalised economy, it can also lead to improvements in social unity and harmony (UNESCO, 2008). Further, Graddol (2006) found the ability to engage and communicate with diverse cultures is fundamental to participation in the global economy.

Stewart (2005) identified that possessing a second language allows children to participate in multiple social settings and become more attuned to subtleties of communicative interaction learning. Developing an understanding of geographical and cultural perspectives also presents greater achievements in subjects, such as social studies, science, art and music.

Digital technology as an educational tool

A gap was found in the literature that linked the use of digital technology as an effective educational tool for language learning in the preschool setting. As such, this section first presents the findings relating to digital technology and the teaching of other languages, and then discusses digital technology as an early childhood educational tool more broadly.

Second language learning and digital technology

In relation to the increased opportunities presented by digital technologies, one of the primary constraints in providing language education in preschools is the difficulty of recruiting and retaining qualified language educators (Stephen et al., 2012). In this context, technology offers an alternative teaching method to relying on the language capabilities of preschool teachers (Nemeth & Simon, 2013).

Rather than focusing on skills in a particular area, there is an increasing focus on the capacity of teachers to effectively use technology to facilitate learning across a broad range of subject areas (Sadik, 2008). A national position statement made in the United States on the use of technology in education drew an explicit link between the emergence of new technologies and the ability to better support second language speakers. This is highlighted in an excerpt from the position statement, which is given below.

> *'Digital technologies allow teachers to find culturally and linguistically appropriate stories, games, music, and activities for every child when there may be no other way to obtain these resources…with technology, adults and children can hear and practice accurate pronunciations so they can learn one another's languages. If teachers do not speak a child's language, they may use technology to record the child's speech for alter translation and documentation of the child's progress. As linguistic and cultural diversity continues to increase, early childhood educators encounter a frequently changing array of languages. Appropriate, sensitive use of technology can provide the flexibility and responsiveness required to meet the needs of each new child and ensure equitable access for children who are dual language learners'*

– National Association for the Education of Young Children, 2012

Peterson (2010) investigated the use of computers as a support tool in language learning and found that the integration of language learning in computer games enables the language to be situated in the context of dialogue. This provides an ideal environment for language learning as verbal information is given in an appropriate context. The study also found that the use of personal avatars creates a high degree of immersion that increases motivation and is a key factor for successful language learning.

A recent Spanish study found multimedia games (that is, games that incorporate a combination of content forms, such as text, video, audio and graphics) to be a useful tool in early childhood language learning. The study found that multimedia games could (1) increase vocabulary, (2) improve pronunciation (3) reinforce learning through repetition, and (4) contextualise learning, through the engagement of children with shapes, colours, sounds and letters (Agudo, Rico & Sanchez, 2015).

Digital technology in early years education

The compatibility of technology and the play-based structure of early education is recognised in literature, as explored below. However, concern over excess screen time has been found to lead to inconsistences in its application throughout the preschool sector.

The Australian Government Department of Health and Aging (2009), recommends that children younger than two years old should not be exposed to any screen time, and three and five years olds should have no more exposure than an hour a day. Hinkley et al. (2012) discovered that 78% of children aged between three and five years old exceeded an hour of screen time and these children were not participating in a sufficient amount of physical activity, as recommended by the guidelines of Australian and United States professional organisations on preschool physical activity and screen time. Wijtzes et al. (2012) identified several challenges for parents to reduce children's screen time to under an hour.

There is currently a weight of evidence to suggest that on balance, digital technology enhances the learning experience for preschool children and results in increased child outcomes in relation to learning and development. Hinkley et al. (2013) states that the outcomes of programs encouraging technology use may differ depending on the level of screen time children are being exposed to.

Evidence supporting digital technology as an educational tool

Rushby & Surry (2016) note that during the preschool years, children learn to sort and match items, to arrange objects in order of size, and to understand 'more' and 'less'. These changes in cognition means that preschool-aged children are increasingly able to actively engage with digital technology, and that digital learning tools can be developed to meet their abilities and needs.

It is generally considered that children born into a Westernised society after the 1980s are exposed to technology on a daily basis (Rodrigues & Bidarra, 2014). As this technological engagement is vastly different from the childhood experience of some parents, teachers and early childhood educators, the integration of technology into the learning environment of children has been met with some level of concern. The main concerns are around social isolation and reduced learning outcomes.

Hsin et al. (2014), reviewed 87 studies relating to the effectiveness of digital technology as a learning tool. They found that the learning outcomes from digital technology was dependent on the child's age, experience, gender and time spent using technologies.

Table B.2: Impacts of digital technology on learning effectiveness

Domain	Learning effectiveness			
Developmental domain	**Positive**	**Negative**	**No difference**	**Depends**
Cognitive aspect	53	2	20	47
Social aspect	13	1	4	3
Emotional aspect	10	0	1	1
Physical aspect	2	0	0	0
Cognitive domain of development	**Positive**	**Negative**	**No difference**	**Depends**
Language and literacy	26	1	16	32
Math	8	0	2	7
Science	4	0	1	3
Digital literacies	17	1	0	5
Cognitive abilities	7	0	2	3
Others	2	0	0	0

Source: Hsin et al., 2014

Arnott (2013) found that technology use in the education setting increased social interactions and peer collaboration, as well as a large body of literature that supports the learning outcomes of digital technology (Hsin et al., 2014).

Other impacts of early use of digital technology

An American study found that providing iPads to 266 kindergarten children improved their literacy scores, specifically in the Hearing and Recording Sounds in Words subtest, in which the iPad group scored 2.1 points higher than the control group on identifying the letters that corresponded to sounds in a spoken sentence (with an average score of approximately 13.7 for the iPad group compared to 11.6 for the control) (Bebell & Pedulla, 2015). Subsequent years of education showed that the iPad group experienced greater benefits, with better reading and writing skills.

Other research observes that the ongoing evolution of digital technology is expanding conceptions of literacy. Hutchison, Beschorner and Schmidt-Crawford (2012) note that digital texts (increasingly in the form of iPad apps) are more oriented around literacy as doing, and as such, require different skillsets to decode, analyse, interpret and compose. Mallia (2013) noted that children are increasingly becoming multiliterate through their capacity to interpret images, media and new technologies. McLean (2013) suggests that literacy definitions will continue to evolve as technological advancements influence the way people communicate.

In relation to the impact of digital technologies on social interactions between children, the following studies found positive correlations:

- A Scottish study analysing the impact of digital technologies in a kindergarten found that 'one of the fundamental aspects of children's interactions around technologies is

the need to negotiate with, and mediate, the other children'. The study observed children managing the social aspects of sharing the technology between themselves, and concluded that the introduction of technology in the classroom 'moves beyond technological affordances to considering children as active agents who have considerable influence over their own social experiences'(Arnott, 2013).

- A recent Australian study found that after the distribution of several forms of digital technology in a classroom 'the most common activity children engaged in were 'social interactions'…including cooperating together using a device.' It was found that even though an iPad is typically a solitary device, children rarely used it by themselves. Instead, groups of children would watch and encourage the user (Bird, 2013).
- The literature review of 87 studies (outlined above) of relevance found that 'only one reviewed study revealed that the use of a touchscreen increased children's behaviour of pursuing individual goals instead of collaboratively achieving the same goal…most of the studies, however, showed that various technologies support children's social development' (Hsin et al., 2014).

Impact of digital technology on learning style

Aside from social learnings, the experiments with the use of digital technologies in early years education have generally found that the technologies encourage a high level of self-motivated learning. It has been found that 'kindergarten children benefit from technology when technological tools are integrated into learning tasks that allow children to work at their own pace with adult support' (Gimbert & Cristol, 2004). Specifically, tablets have been found to be an appropriate tool for engaging learning among preschool children. A study analysing the use of touch screen tablets to increase literacy in young children found that 'in contrast to traditional computers, touch screen tablets provide an easier to use and more intuitive interface for a child' (Neumann & Neumann, 2014).

More generally, an Australian study found that the distribution of iPads and iPod touches in a kindergarten practice gave the participant children an increased independence and agency in their choices and experiences of play. Overall, the early years practitioners involved in the study found that 'the introduction of this technology has strengthened many areas of early education practice and encouraged our children to be more capable, enthusiastic and independent learners' (Forbes, 2013). Similarly, the Western Australian study highlighted in Table B.1 found that 'the standout conclusion in the current literature is that m-learning (learning using a mobile device) is highly engaging for students' and cited 'greater student ownership of learning processes' as a key contributor to the increase in student motivation (Oakley et al., 2012).

Transferring learning from digital technology

Huber et al. (2016) conducted a study of preschool aged children that focused on their capacity to transfer what they learnt using digital technology to the real world. This research examined the ability of 4- to 6-year-old children to learn how to solve a problem – building a tower – on a touchscreen device and subsequently apply this learning in their interactions with physical objects. Participants demonstrated significant improvement at solving the task irrespective of the modality (touchscreen vs. physical version) with which they practiced. Children's learning on the touchscreen smoothly transferred to a subsequent attempt on the physical version.

A growing acceptance

As the evidence base supporting digital technology as an education tool grows, and as society becomes more accustomed to the integration of technology in everyday life, it is anticipated that the historical concerns of parents and educators will be further dispelled. Supporting this, a study conducted across several European countries regarding parental attitudes towards technology found that rather than feeling concern towards the use of technology in preschools, parents felt a level of concern around the lack of use of technology**.**

Specifically, the study found that 'parents felt there was a 'generational digital gap' between how their children interact with digital technologies at home and in their early years settings'. Whilst the parents still believed in and valued teachers and the classroom, a desire was expressed for classrooms with no boundaries that 'bound the home experience with that to be found in early years settings' and stated that pedagogical practices needed to incorporate the changing technologies (Palaiologou, 2014).

3. Best practice approaches

Given that both language education and the use of tablets are relatively new additions to early childhood teachers' pedagogical repertoires, there is a level of uncertainty surrounding:

- how to best integrate tablets into a preschool environment;
- which app design features are most useful for preschool children; and
- the best techniques for teaching a second language in preschools.

This part of the review explores the findings of previous trials and studies in relation to best practice digital technology approaches in the preschool setting, and early learning language techniques.

Digital technology integration in preschools

While this literature review focusses on the integration of digital technologies in preschools, relevant findings from primary schools have been included to ensure all relevant learnings were canvassed.

Lesson 1 – Tablets do not replace good teaching

Tablets have proven to be an effective and engaging learning tool. However, studies have found that tablets work best as an instrument to support, rather than replace, teachers. Apps, when designed well, create an environment of enquiry for students, and teachers reported better outcomes when some responsibility for learning fell on the students (I & J Management Services, 2011).

As digital technology is still relatively new, teachers may require support in expanding their teaching techniques to unlock the potential of new tablet technologies in early childhood education (Yellend & Gilbert, 2013). However, given the myriad of ways a tablet can be used, there is no 'typical' lesson structure that can be detailed for teachers using tablets is detailed (Goodwin, 2012).

Lesson 2 – Provide a range of pedagogical support for teachers

As mentioned in Lesson 1, the notion of best pedagogical practices in relation to digital technology in education is still evolving. Consequently, most trial managers developed a range of tools to support teachers and students (Western Australian Department of Education, 2014; I & J Management Services, 2011; Oakley et al., 2013).

The most popular tool developed was a forum for educators to suggest new ideas and discuss educational techniques. Other support tools offered in the trials included, social media platforms, professional learning, handbooks, guides, resource lists, protocols, research summaries and a trial website.

Some schools noted the significant cost in familiarising teachers with the apps. Support tools were found to reduce time costs, and improve the quality of outcomes (Western Australian Department of Education, 2014).

An alternative method of pedagogical support is through the provision of technology to complement the tablet, to enhance children's learning experience. For example, children's learning outcomes were found to improve when their tablets were integrated with other digital technologies, such as interactive whiteboards and Apple TVs (Western Australian Department of Education, 2014).

Lesson 3 – Provide technical support to schools

Technical support was offered to manage technological issues that arose on the trials. The literature acknowledged the importance of solving technical issues promptly, as inoperative technology deters children from using digital devices (Goodwin, 2012).

Lesson 4 – Tablets are most effective when used in a supportive school and home environment

Child outcomes from the trials were generally enhanced when the teacher used the app as an enabler to broader lessons. Ideally, the teacher would encourage activities that transfer a child's interaction with the app into the real world, enabling children to consolidate what they have been taught (Goodwin, 2012).

In the Victorian trial, *iPads for Learning: In their Hands,* schools made deliberate efforts to promote the trial to parents, finding that widespread parental support is an important part of using iPads in education. Schools acknowledged that to keep parents engaged, they should be informed of the positive influence tablets can have on a child's education and development.

Lesson 5 – The ratio of tablets to children matters

There is a trade-off to consider when deciding the optimum tablet-to-child ratio. Using fewer tablets was found to encourage greater collaboration amongst the children, but will also allow less scope for children to personalise their learning experience, as they experience less face-time with the app. As learning often comes from direct interaction with the apps, some teachers were uncertain as to whether the benefits transferred to children who are merely watching (Oakley et al., 2013). To maximise the individualised outcomes of tablet use,

teachers must establish a plan so that individual screen time is shared equitably amongst children (McPake & Stephen, 2016).

Lesson 6 – The choice of app is important

In previous trials, trial managers provided spending money for teachers and students to purchase publicly available apps. This approach allowed students to personalise their learning experience due to the wide range of educational apps available (I & J Management Services, 2011). The greater choice and flexibility give to educators and students was associated with positive outcomes, as students will choose content most relevant to their learning interests.

Teaching a second language in preschools

The research describes various approaches towards teaching languages to preschool-aged children. Some accepted techniques in supporting language learning amongst young children include:

- **Play-based learning** – it has been recommended that play be utilised as a method of teaching young children to develop language abilities, with one study finding that 'play is considered to be a powerful, flexible, amusing and pleasant learning experience that promotes oral communication and interaction' and encourages children to use language in meaningful exchanges (Griva & Sivropoulou, 2009).
- **Repetition** – the greater the frequency with which a child hears new words and sounds, the more familiar they become and the easier it is for them to learn the language (Harris et al., 2011).
- **Develop listening skills** – preschool children are generally preliterate, and therefore need to hear the language spoken in order to learn it. A common approach to encourage children to listen is to rely on songs, rhymes and games, which ensure children maintain their attention (Clarke, 2009).
- **Using contextualised language** – visual cues, facial expressions and hand gestures can all provide meaningful contextual clues to children, which can support children in understanding new words and phrases.
- **Social and cultural context** – the use of cultural symbols, music and food encourages engagement among children, reinforces opportunities to develop intercultural understanding. This is particularly relevant for educators who have little experience in language teaching (Nemeth & Simon, 2013).
- **Use of decontextualised language** – as language skills develop, children may be able to learn without relying on visual materials (Clarke, 2009). Educators should question or prompt children, encouraging them to actively participate in a dialogue with their teacher (Parish-Morris et al., 2013).
- **Language production** – as their skills develop, children should be encouraged to use the second language (Clarke, 2009).

Optimal app design features for early learners and language education

The ELLA trial is unique in that an app has been designed specifically for the trial; it is therefore important to determine the optimal design features for apps to support early childhood education. Features listed below were found to improve child educational outcomes consistently across most, if not all, trials.

- **Allowing content creation** – at an early childhood level, teachers and children generally expressed a preference for content-creation apps, also referred to as 'productivity' or 'constructive' apps, instead of content receiving, or instructive apps (see for example: Yellend & Gilbert, 2013; Oakley et al., 2013).[24] Such app design has been found to pique curiosity and engender commitment from children, which facilitates longer-term learning (Agudo, Rico & Sanchez, 2015).
- **Mixed learning methods** – the apps should provide access to multimodal learning. In other words, there should be opportunities for children to learn via visual, spatial, oral and aural means (Yellend & Gilbert, 2013). This is particularly pertinent for language exposure, as relative to relying on traditional educational tools (such as story books), the technology can increase oral and aural learning opportunities (Strickland & Grantham, 2013). Hirsh-Pasek et al. (2015) note that the visual, spatial, oral and aural aspects of the app must be related to the learning goal to ensure children remain on task.
- **Personalised pathways** – the app should provide multiple tasks and pathways for children to complete, allowing them to personalise their learning experience. Early child outcomes improve if a child has some control over their learning, as they can adopt practices best suited to themselves, and develop at their own pace (I & J Management Services, 2011; Hirsh-Pasek et al., 2015).
- **Engaging content** – to fulfil the tablet's potential as a learning device, the tasks within the app should be sufficiently complex that children maintain attention and do not get bored with the content. On the other hand, the content should not be too challenging, as children will not use the device if they do not understand the activities (Goodwin, 2012). The tasks within the app should be interesting, fun, and something children can relate to.
- **Flexibility in play options** – the apps should provide context and opportunities for solitary and social play (see for example: Yellend & Gilbert, 2013; Oakley et al., 2012; Hirsh-Pasek et al., 2015).
- **Appropriate hardware** – the display needs to be appropriately sized, to get maximum benefit from tactile interactions.
- **Encourage skill development** – playing with the apps should provide an opportunity to encounter and use foundational skills for learning (Yellend & Gilbert, 2013). In the case of the ELLA trial, the apps should allow children opportunities to practise their language and literacy skills, not just to listen and watch the characters speak another language.

[24] A constructive app is more open-ended, and allows users to create their own content, while an instructive app involves the app delivering a predetermined task, which elicits a homogenous response from the user.

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