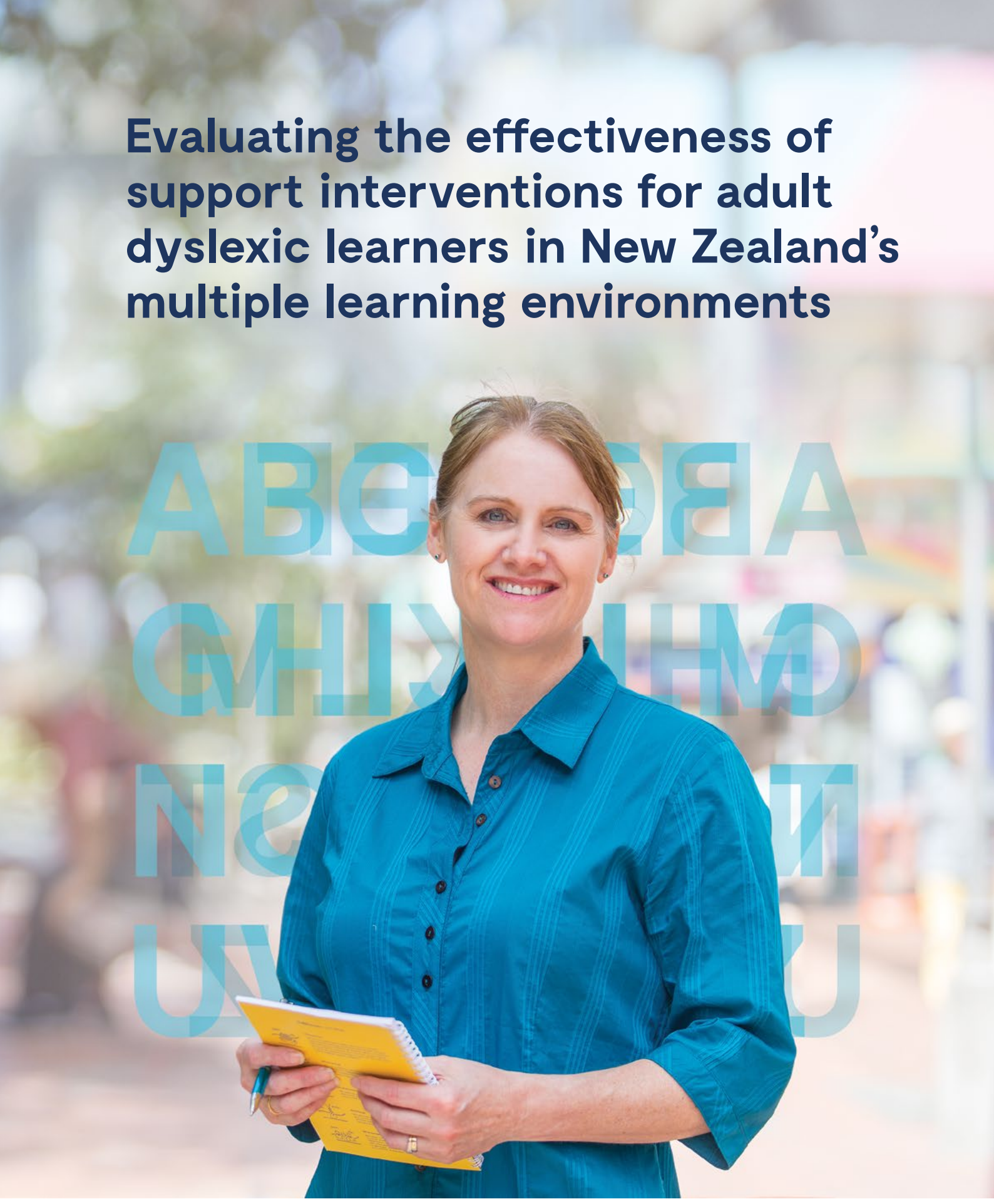
Evaluating the effectiveness of support interventions for adult dyslexic learners in New Zealand's multiple learning environments



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This national project is co-funded by Ako Aotearoa with Primary ITO, The Skills Organisation, ServiceIQ, Capital Training, Whitireia New Zealand and Petersen Consulting.

Visit the Ako Aotearoa website at: www.ako.ac.nz/knowledge-centre/interventions-for-learners-with-dyslexia/ for more information and outputs relating to this project.

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Executive summary

"Dyslexia is not a disease to have or be cured of, but a way of thinking and learning. Often it is a gifted mind waiting to be found and taught."

(Sagmiller, 2013, p. 186)

Project rationale

It is estimated that one in ten people are dyslexic and yet, until relatively recently, their particular learning needs have been little researched, understood, or provided for. The condition means that many learners have left formal education with few or no qualifications, and with a reduced sense of self-esteem and confidence. Many have found their way into trades and primary industries, where the academic entry requirements may be lower, but still grapple with misconceptions which can prevent them reaching their full potential. Fortunately, in the last decade, considerable strides have been made in this country and overseas. Many educators are realising that, with the right tools and strategies, dyslexic learners can negotiate their way through the education system and into the workforce as fully functional and highly successful members of our community. What is needed now are formal studies which identify and share understanding about these tools and strategies, and provide guidelines to empower learners with dyslexia and those who work alongside them – in the home, the classroom, and the workplace.

In 2016, some members of the current project team completed a Regional Hub investigation entitled *Supporting dyslexic trainees in classroom and workplace environments*, which developed a 'wrap-around' model of support, based on learnings from a study of 20 learners in an Industry Training Organisation (ITO). The much larger National Project Fund study described in this report builds on this earlier work by expanding the study to five organisations representing a cross-section of the tertiary education environment: three ITOs, one Institute of Technology or Polytechnic (ITP) and one Private Training Establishment (PTE). The project objectives were:

- To test findings from international literature in a New Zealand setting
- To evaluate learning support interventions with dyslexic learners, employers and teachers
- To evaluate the wrap-around model for use across the tertiary sector
- To ensure relevance and usefulness to learners across the wider tertiary sector
- To create a series of resources and practical 'Good Practice Guides'.

Literature review and methodology

The project design, data collection and reporting were informed throughout by the literature which we believed resonated most closely with our objectives. A starting point was the New Zealand Ministry of Education's (2008) position that every dyslexic person is different and intervention strategies will need to change with the needs of the individual. Determining what dyslexia is (and is not) and how it impacts people is therefore critical, and an examination of the literature revealed considerable confusion and a lack of an internationally agreed definition (Learning Support, 2018), although several useful frameworks and descriptions were identified (e.g. Brunswick, 2012; Dyslexia-SpLD Trust, 2015; Singleton, 2009; Tunmer & Greaney, 2009).

The review also outlines multiple support strategies reported in the literature, from a range of settings, including academic, workplace and individual, and delivered via various mechanisms, such as specialist agencies and technology applications. Studies discussed range from theoretical (Fossey, Chaffey, Venville, Douglas, & Bigby, 2015) to practical (Dymock & Nicholson, 2013; 2015), and assisted the project team to draw up the list of interventions we felt best suited our New Zealand context and learners. Reviewing the literature also enabled us to re-consider the diagnostic tools available and re-confirm our use of the Dyslexia Adult Screening Test (DAST) (www.dyslexia.uk.net). The final section of the review was perhaps the most important for our team, as it focused on the 'Positive Dyslexia' movement, a strengths-based approach which focuses on the person, not the condition (Davis, 2010; Darwin, 2014; Nicholson, 2015).

Responding to the above key principles from this review of the literature, the team designed an 'applied dyslexia' research approach, using an action research methodology, focused on trialling support interventions that could improve outcomes for learners with dyslexia – not just at some future juncture, but during the project itself. The interventions ranged from support personnel to educational technologies; each learner was able to choose what items they wanted to trial (Table 5).

To keep learners and their narratives at the centre of the project, we designed a series of interviews with our 107 learner participants, 26 teachers and 20 employers

at multiple points during the year-long intervention trial. This was our primary source of data, complemented by the team's own reflection records of our processes and learnings throughout the project. We used a project 'logic model' to monitor initiation (inputs), implementation (activities), outputs, and predicted institutionalisation (Table 3).

Data was analysed thematically, according to each participant group: learners, teachers and employers. Where possible, we have chosen to present our findings incorporating as much participant voice as possible, to allow them to represent their own reality, rather than imposing our interpretation.

Findings and discussion

This project was constructed to evaluate a range of interventions designed to benefit dyslexic learners, and support those who work with them – from a user's perspective. Interviews therefore addressed participants' perceptions and experiences, both before and during the year-long trial period. To emphasise our learner-centred study design, we have included as much participant voice in our reporting as possible, so that the contexts, realities and coping mechanisms shared are described in their words, and their enthusiasms and frustrations are allowed to show. One of the most notable findings was that the learners had very clear ideas about strategies which helped them learn, and the things teachers and employers did which helped, and those which did not. They often understood their condition better than many of those around them, and often already had ideas about how they could further support themselves. Teachers and employers also had useful observations and strategies to offer, and a strong sense of the personal attributes needed to bring out the best in learners and employees with dyslexia.

Direct responses to the benefits, challenges and outcomes of dyslexia support interventions trialled by participants are collated in Tables 6 and 7. With so many learners represented, some basic statistics have been included here to indicate the weight of enthusiasm for different tools, e.g. 90% of learners who trialled the Open Dyslexia font (26 learners) found it helped their academic study. However, even here, we have chosen to include representative quotations to personalise these findings and remind readers of the person behind the reporting.

The 'Discussion' section of this report opens with the following eight themes, each of which includes one or more practical implications for education providers. These themes are:

- Dyslexia is a persistent challenge to success and achievement for dyslexic learners in the tertiary setting
- Dyslexia affects tertiary learners in a variety of ways
- Tutors need a range of skills and teaching strategies to best support dyslexic learners
- Learning technologies are essential to assist dyslexic tertiary learners
- Assessments are highly stressful for dyslexic learners and need to be fit for purpose
- Learning support strategies that work in the classroom are similar to those that work in the workplace
- The impact of family, parents and partners is a key element of success for dyslexic learners
- Leadership is a key determinant of any initiative to support dyslexic learners.

There is also discussion about how dyslexia support interventions link to learner success, followed by the project team's reflections and the challenges of implementing an ambitious, inter-institutional research project in a sector itself undergoing constant change.

Conclusion, outputs and future directions

Participants and stakeholders, including the learners, tutors, employers, project team members and their respective organisations, have been positive about the learning resulting from this project. The training and workshops provided by some team members and attended by others have raised awareness within participating sites, and several early presentations of the work have been well received by other forums and bodies interested in the topic.

An updated Dyslexia Support Wrap-around Model (Figure 4) has been developed, with a new dimension added to emphasise the end goal of an empowered, and independent learner. Confirming the findings in the literature (e.g. New Zealand Ministry of Education, 2008a) that all dyslexic learners are unique, and that the support and tools they need must be personalised to each individual, the model emphasises the learner's centrality. It is the learner, rather than the context, which needs to determine the best strategy for empowerment. Multiple resources and 'Good Practice Guides' have also been written and reviewed by the team (Table 10; Appendices) for use across the vocational education and training sector.

Finally, each participant organisation has plans in place to introduce, or improve, practice as a 'dyslexia-friendly organisation':

"There is much greater awareness which we plan to continue building."

"Support for dyslexic learners is recognised as a point of difference here..."

The project team is buoyed by the positive reception to this study so far, both internally within the five participating organisations, and further afield. We hope the report which follows will be of interest and use to others seeking to understand both dyslexia and dyslexia research.

Introduction

"It is estimated that one in ten people are dyslexic. Dyslexia can affect the way people learn and it is different for everyone. It is not just about reading and spelling, and it is not an indication of low intelligence. Unidentified, dyslexia can result in low self-esteem, high stress, behavioural problems, and low achievement. With the right support, children and adults with dyslexia can achieve as much as anyone else."

(Positive Dyslexia, n.d.)

"Due to the limited number of rigorous research studies carried out in New Zealand, the impact of improving literacy levels of dyslexic New Zealand learners needs to be researched further. The current challenge is to design and undertake rigorous research studies that assess the effectiveness of international findings in a New Zealand setting."

(New Zealand Ministry of Education, 2008a)

The quotes on the previous page encapsulate the essence of this study: dyslexia is a widely experienced condition; dyslexia is not about intelligence, but rather a different set of learning needs which needs to be addressed so that individuals can reach their potential; and it is an area which is under-explored in Aotearoa New Zealand.

In 2016, some members of the current project team completed a Regional Hub investigation entitled *Supporting dyslexic trainees in classroom and workplace environments*. This report describes the learning experiences and needs of 20 dyslexic learners in the New Zealand ITO environment and introduces a 'wrap-around' training and support model to help inform decisions about how to best support learners with dyslexia.

The current project builds on this earlier work to offer a nationwide intervention package with a suite of resources for supporting dyslexic learners and stakeholders across the tertiary and vocational education sector in different learning settings including the classroom, workplace and home.

Core objectives were:

- To design and undertake rigorous research that assesses the effectiveness of international findings from the literature in a New Zealand setting
- To trial and evaluate a range of learning support interventions with three key participant groups – learners who have been tested and identified as dyslexic, their employers and their tutors
- To revisit, evaluate and extend the 'Wrap-around Model for Supporting a Dyslexic Learner' as a conceptual framework for use in the tertiary sector
- To ensure relevance across the wider tertiary sector in New Zealand by expanding the providers and study sites represented in the project team from a single ITO in the Regional Hub project to include ITPs and PTEs
- To create a series of resources for learners, tutors, organisations and employers that demystify the condition, at-risk results and challenges, and that distil the findings from this study into practical 'Good Practice Guides'.

These objectives reference the underpinning rationale for this study: a real and unmet need in tertiary education and in the workplace for better information and effective tools. While the collective international understanding of dyslexia has grown exponentially over the last three decades, the understanding of the needs of dyslexic adults in tertiary education and employment is still minimal. This is evidenced by the relative dearth of peer-reviewed research that examines dyslexia in adults in these two contexts, especially in New Zealand, as emphasised in the opening quotation from the New Zealand Ministry of Education. In fact, the project leader, who has worked in adult and workplace literacy and numeracy matters since 2001, believes that we have been somewhat slow to grasp the scope and significance of this learning condition: "The official position of the New Zealand Ministry of Education until 2007 was that dyslexia did not exist" (Styles, 2018, Personal Communication). The change in the Ministry of Education post-2007 was the result of a number of factors, including mounting international evidence that dyslexia was real and could be addressed. The Ministry's earlier position of denial was in part the influence of Dame Marie Clay, who believed that all reading issues could be addressed by her 'Reading Recovery' programme. The change in the Ministry position coincided with the death of Dame Marie Clay. There was also increasing pressure from parents seeking better support for their dyslexic child.

Like the project lead, the team and the wider advisory group, who supported this project and offered critical feedback and guidance, have all had first-hand experience of working with learners with dyslexia. From the beginning we have adopted a shared philosophy of 'seeing the person, not the condition', and this has shaped the study, and this report, which differs from most published research in that it is 'applied dyslexia' research. Our study examines how best to support people who are in full-time employment, full-time academic study, or a combination of both, trialling support interventions that could fit around the already busy lives of the learners. Where possible, we have chosen to present our findings incorporating as much participant voice as possible, to allow them to represent their own reality, rather than imposing our interpretation.

With learners and their narratives at the centre of the project, this account has become not just about the dyslexia support intervention they trialled, but a more holistic investigation that included the antecedents that had influenced and determined the learner's reality and context, their coping mechanisms and the existing support mechanisms in place. As a project team, we have also reflected on our own processes and learning throughout the project, as we faced the inevitable challenges that arise in a lengthy and ambitious inter-institutional endeavour. These are included in our findings and discussion, and, we hope, serve to add additional dimensions for others seeking to understand both dyslexia and dyslexia research.

The study context

2

The project team involved five New Zealand educational organisations representing a cross-section of the tertiary education environment

There were three ITOs: Primary ITO, ServiceIQ and The Skills Organisation (Skills); an ITP: Whitireia New Zealand (Whitireia); and a PTE: Capital Training Ltd. (Capital Training). The scale of the collaboration aimed to enhance the breadth and reach of the project findings and outcomes, recognising that the issues of dyslexia are not unique to one specific context or sector.

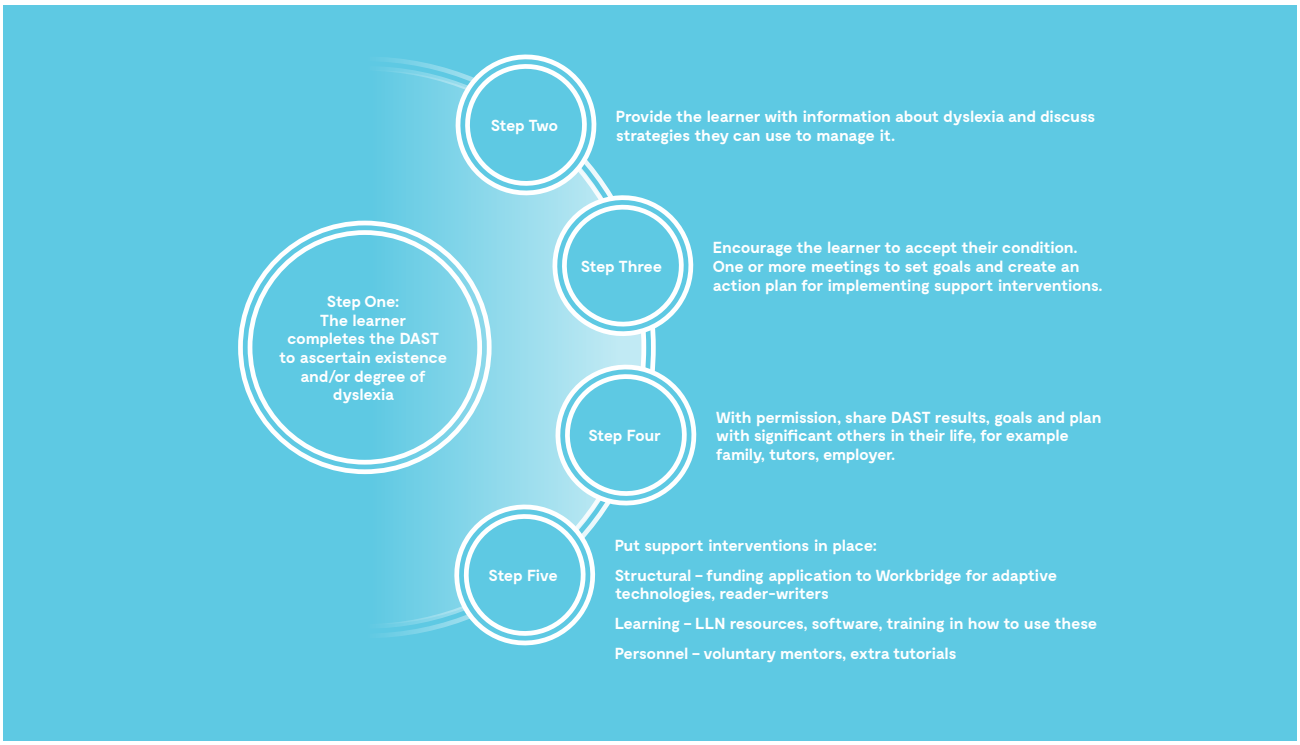
The strength of the project team was the broad collaboration of experienced vocational practitioners, as well as the mix of those who had a strong working knowledge of the needs of learners with dyslexia, and those who were dyslexia novices. Such a mix ensured that the resources developed were pitched appropriately for those new to the topic, but also extended understanding for those already conversant with this specific learning difficulty. The following text provides a profile of each team organisation and summarises each team members' level of understanding and experience with dyslexia prior to the project commencement.

Primary ITO

Based in Wellington, Primary ITO provides training and qualifications to over 30 primary industries, such as farming, rural services and seafood, from Level 1 through to Diploma level, with around 30,000 (learners) a year (NZQA, 2016a). Primary ITO employs approximately 100 training advisors who sign-up learners into training agreements and support them through their on-job training. Primary ITO also contracts training providers who employ tutors to deliver the theory component of the training to the learners. The Industry Training Act prevents ITOs from delivering this training themselves.

In common with most of the other ITOs, Primary ITO facilitates industry training for people who are in employment, that is, theory training for the learner must take place alongside their day job and the on-job training component. For some industry sectors this means learning by distance, where the learner completes

Fig 1. Primary ITO's wrap-around model for supporting a dyslexic learner (Farrell, Styles & Petersen, 2016, p. 28).



the theory learning in their own time, at home or in the workplace. For other sectors, there may be off-job training days where learners work in a group to complete the theory component of their training. For many learners it is a combination of attending training day events and learning by distance.

Estimates suggest that 15-20% of learners have dyslexia; they are drawn to industries in which they can achieve despite their difficulties with academic study (Styles, March 14, 2018, Personal communication: interview on TV1's Breakfast programme). Dyslexia support is becoming a key part of the pastoral care offered to learners, that is, the human support that Primary ITO provide to support learners in completing their training. For example, the provision of a mentor or personal contact with the learner's training advisor. Further, Primary ITO has extensive experience in conducting the DAST (dyslexia diagnostic tool explained further in the following section) and setting up support strategies to assist their learners. The ITO had already completed an Ako Aotearoa Regional Hub-funded project as a platform for this research, an outcome of which was a wrap-around dyslexia support model (Figure 1). As the lead organisation, and the only one with extensive knowledge of dyslexia, Primary ITO initially administered all the DAST testing for this project, until they had trained other members.

The model identifies how an individual dyslexic learner can be responsible for managing their dyslexia and identifying and meeting their own learning needs. It also suggests how the employer, the teacher, and an organisation can provide targeted support strategies within the workplace and classroom settings. This model of multiple stakeholder engagement with the learner and their dyslexia was central to the project team's approach, guiding both the purpose and practice of our engagement with our study participants.

ServiceIQ

ServiceIQ is the Wellington-based ITO for a range of service industries in the accommodation, retail, hospitality and tourism sectors. They support over 10,000 learners a year in industry training and apprenticeships with approximately 130 staff. The number of companies and learners engaged in training is growing, but the service sector has a high proportion of workers with no qualifications at entry level compared with other sectors (NZQA, 2016b).

ServiceIQ's working and learning environments are on-job, which means that the learners involved in service sector training do not engage in additional classroom-based learning. Some workplaces have training or meeting rooms and a training manager or equivalent, but many do not. The learners receive learning materials directly from ServiceIQ training advisors who signed up the learners, and spend time assisting the learners with understanding the learning materials and assessment processes. Generally, learners need to find time to work on the written assessments themselves and arrange suitable times with their workplace-based supervisors and/or assessors, so they can be verified and assessed.

ServiceIQ has not focused on learners with literacy, numeracy or learning difficulties to date, and many of the staff were trained as teachers in an era where "there is no such thing as dyslexia". They were invited by Primary ITO to participate in the research to ensure a wider cross-section within industry. Due to the nature of their service industries and issues around learning difficulties and/or low schooling, ServiceIQ made the assumption that there would be learners with dyslexia. At the onset of the study time-frame, ServiceIQ had no established support programme in place; team members and colleagues attended several dyslexia workshops to begin to address this gap.

The Skills Organisation

This Auckland-based ITO supports learners (apprentices) in real estate, trades, the state sector, and business, offering distance learning, on-job training, night school, block courses, or a combination of these. The ITO has 13,500 industry learners, as well as 500 Gateway learners transitioning from secondary schooling, with around 150 staff. Gateway programmes provide school learners with an opportunity to do work experience and gain credits in some of Skills' industry areas. Learner achievement is strong, with approximately 30 learners participating in literacy support programmes each month, a third of whom have reported pre-diagnosed dyslexia or other learning disabilities, and an organisational interest in evaluating the effectiveness of this support (NZQA, 2016c). The project team member from Skills says:

"We are seeing that, increasingly, dyslexia is no longer being seen in such a negative light; we have considerable resource and organisational support to sustain the pastoral care that will be required for these learners, and The Skills Organisation has a whole of organisation approach to literacy and numeracy provision and is now ready to recognise that dyslexia is, in itself, a separate and equally important component of our overall learning support strategy." (Ako Aotearoa internal document: NPF Application)

The organisation was aware that not enough was known about dyslexia to support their learners effectively. Skills wanted to develop awareness and capability across the organisation that was sustainable and systemic, that is, supporting dyslexic learners is 'business as usual'. In terms of experience or expertise in developing strategies to specifically support learners with dyslexia, these were described as "virtually nil".

Whitireia New Zealand

Whitireia New Zealand comprises an ITP and a PTE, with sites in Wellington, Porirua and Auckland. They deliver a broad range of campus-based and distance courses from New Zealand Qualifications Framework Levels 2-8 to around 4,500 equivalent full-time learners (EFTs), with over 400 full-time equivalent staff members. Courses are also offered in Auckland, Christchurch and Tonga; however, only the Wellington and distance courses were included in this project. Subject areas fall generally under Creative Arts, Business and Information Technology, Construction, Health, Service Industries, Trades and

Te Wānanga Māori. The creative arts, information technology, service industries and paramedicine courses attract learners with dyslexia, a key premise for Whitireia's decision to participate in the project.

Some staff have adult teaching qualifications, but many have only discipline-specific qualifications and no experience teaching learners with specific learning issues. The assumption is made that, in keeping with the general population, approximately 10% of learners have dyslexia. This assumption is supported by the number of learners accessing support services and the organisation's knowledge of its learners. However, measurement is difficult; whilst some learners disclose dyslexia on enrolment, many others do not. Often, says the Whitireia project team member, learners with dyslexia will disclose their learning difficulty to their tutor during a one-to-one discussion. If they are not willing to access support services (and many are not) they will not be included in the organisational data gathered about learners with particular learning needs.

The team member's personal experience with supporting people with dyslexia was minimal, and mostly based on a prior position working for Literacy Aotearoa. Attendance at a dyslexia workshop, and a dyslexia conference, provided learning alongside DAST training from Primary ITO, and findings from the current study.

Capital Training

Capital Training is a PTE based in Wellington with five delivery sites in the lower North Island, delivering Foundation programmes at Levels 1-2 to just under 900 learners, with 50 staff members. Their foundation programmes include the NZ Certificate in Foundation Skills Level 1, from which learners can pathway to Level 2 Computing, Retail and Hospitality, Building and Construction, and Business Administration programmes. The target learner population is specifically at-risk youth, adults with low literacy and numeracy skills, and adult beneficiaries. There is a rolling intake in this learning environment, which means learners start at different points throughout the year and then work at their own pace through the material, with tutor support.

Capital Training is also a large provider of workplace literacy and numeracy training (NZQA, 2018). As they primarily recruit learners who have not succeeded in education first time round, it is expected that the percentage of individuals with dyslexic tendencies are likely to be higher than in the general population. Prior to participating in the project, Capital Training had estimated that 20% of their learners were dyslexic, but institutional knowledge of dyslexia was at a 'basic understanding' level.

"The strength of the project team was the broad collaboration of experienced vocational practitioners, as well as the mix of those who had a strong working knowledge of the needs of learners with dyslexia, and those who were dyslexia novices."

Literature review

Three seminal works provided a platform for the following review

First was an international literature review on dyslexia undertaken by the New Zealand Ministry of Education (2008) which acknowledges that identification of effective intervention methods for dyslexic people is a challenging process because every dyslexic person is different. For interventions to be effective, says this report, they need to be focused on individual learner strengths and weaknesses and have the flexibility to change with the needs of the individual. Therefore, no one type of intervention is better than another for teaching dyslexic people, and a wide range of strategies and settings must be considered. Second, Dymock and Nicholson's (2013) project, *Dyslexia Decoded*, offers research and practice suggestions for tutors of dyslexic adult learners with evidence-based examples of teaching and learning strategies which informed this project's design, specifically evaluating tutor practices in the PTE, ITO and ITP contexts. Third, the same authors' later publication, The *NZ Dyslexia Handbook* (Nicholson & Dymock, 2015), presents practical strategies for classroom teachers in the compulsory school context. The current project, and particularly this review of the academic literature, draws extensively on each of these publications as it aims to investigate the 'triangulated' learning reality of the dyslexic adult learner as they traverse the classroom setting, and workplace and home environments throughout their learning journey.

The starting point for this review is the current definitional ambiguity and misconceptions about dyslexia which add to the challenges tertiary teachers and trainers face when seeking approaches to help their le00arners. Next, a raft of support strategies reported in the literature from both this country and overseas are considered, grouped by context: academic, workplace and individual; and by facilitating mechanisms: specialist agencies and technology applications. Examples of some of the most widely used screening/diagnostic tools are outlined to offer an indication of the various approaches currently in use by authorities in the field. The review concludes, deliberately, with a description of the 'Positive Dyslexia' movement, an aspirational, strengths-based approach which resonated with many of the participants in this project and offers a beacon in the pathway ahead for both dyslexic learners, and the educators who work with them.

A. Defining dyslexia

"Dyslexia is persistent literacy learning difficulties in otherwise typically developing children [now adults] despite exposure to high quality, evidenced based literacy instruction and intervention due to an impairment in the phonological processing skills required to learn to read and write." (Tumner & Greaney, 2009)

The literature on dyslexia is extensive, debating the causes and characteristics of dyslexia, with a predominant focus on the dyslexic learner in the compulsory school context and how schools and teachers can support them. There is minimal recent evidence-based literature on how to support dyslexic learners in multiple environments including the vocational education environment, the workplace, and the home. There is also some confusion and cross-over regarding definitions of the condition, varying from cognitive to psychological and physiological explanations for its occurrence.

The New Zealand Ministry of Education (2008b) offers a working definition of dyslexia:

"Dyslexia is a spectrum of specific learning difficulties which is evident when accurate and/or fluent reading and writing skills, particularly phonological awareness, develop incompletely or with great difficulty. This may include difficulties with one or more of reading, writing, spelling, numeracy, or musical notation."

They explain dyslexia as falling into two broad categories: 'acquired' and 'developmental'. Acquired dyslexia is when the person loses (at least some of) the ability to read and spell due to a brain injury, whereas developmental dyslexia describes the learning patterns of the child who has trouble with reading and spelling from the

outset. In layman's terms, says this report, some parts of the brain over-react while the other parts under-react when listening and reading. In other words, the report concludes, the person processes information differently.

The UK-based Dyslexia-SpLD Trust (2015, p. 2), one of the forefront agencies involved in research and support for this condition, offers a description, rather than a definition, which shares a number of these points:

"Dyslexia is a specific learning difficulty that affects auditory memory and processing speed which impacts on literacy development, mathematics, memory, organisation and sequencing skills to varying degrees. Dyslexia can occur at any level of intellectual development. It is neurological in origin and is seen to run in families. It affects up to 10% of the UK population at some level and can affect anyone of any age and background."

Tunmer and Greaney (2009) cover similar ground, but build a four-part framework to define dyslexia:

1. Persistent literacy learning difficulties;
2. in otherwise typically developing children [now adults];
3. despite exposure to high quality, evidenced based literacy instruction and intervention;
4. due to an impairment in the phonological processing skills required to learn to read and write.

In these, and other modern definitions, the underlying theme is that dyslexia involves an unexpected and persistent difference in learning to read, write and spell that cannot be explained by other factors. These differences relate specifically to decoding and encoding of print; they do not usually affect a person's ability to understand what is read to them or to formulate text that others write down for them (New Zealand Ministry of Education, 2008b).

Singleton (2009), in his review of *published evidence on the impact of specialist dyslexia teaching*, provides a summary list of statements which have been developed to define dyslexia across the breadth of possible presentations (echoing the New Zealand Ministry of Education's (2008a) position that all dyslexia experiences are individual):

- Dyslexia primarily affects the skills involved in accurate and fluent word reading and spelling
- Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory and verbal processing speed
- Dyslexia occurs across the range of intellectual abilities
- It is best thought of as a continuum, not a distinct category, and there are no clear cut-off points
- Co-occurring difficulties may be seen in aspects of language, motor coordination, mental calculation, concentration and personal organisation, but these are not, by themselves, markers of dyslexia
- A good indication of the severity and persistence of dyslexic difficulties can be gained by examining how the individual responds or has responded to well-founded intervention.

Overall, the acceptance of the individual, personalised nature of dyslexia is gaining mainstream acceptance. Brunswick (2012, p. 3) notes that "dyslexic individuals differ in the severity of their reading difficulties just as non-dyslexic readers differ in their reading abilities". The causes of differences within the condition are complex and interrelated, he says. The specific difficulties of dyslexia may depend on factors such as family background (whether close relatives are dyslexic), educational experience (the level of support and specialist teaching provided), and the individual's use of compensatory strategies (Brunswick, 2012, p. 3). Ultimately, this awareness of difference means that firm and narrow definitions are equally impossible and undesirable, or, as Learning Support (2018) state: "Defining dyslexia is a complex and contested area, with no internationally agreed definitions."

B. Misconceptions of dyslexia

Related to the difficulty with defining dyslexia, several authors highlight the extent of popular misconceptions of dyslexia. Their approach is to supply information which helps to unpack the 'myths' and increase people's understanding. For example:

- *Dyslexia is a visual defect.* It was believed for many years that altering print including the use of colour overlays would assist dyslexic students. However, over the years these theories and techniques have demonstrated little effect for assisting dyslexic students (Colson, 2013)
- *Dyslexia is a verbal defect.* While dyslexia is a language-based problem, the issue is not with verbalisation, it is with processing (Culbertson, 2011/2012)
- *Word reversal is the dominant indicator of dyslexia.* While some dyslexic people may occasionally reverse letters, it cannot be used as a diagnostic tool, and it is not universal (Colson, 2013)
- All dyslexic students have similar characteristics *but to different degrees.* Dyslexia comes in many shapes and forms and what is true for one student may not be for another (Colson, 2013)
- *If dyslexic individuals can read a passage, then they will also be able to comprehend what they have read.* Reading comprehension can be extremely difficult for the dyslexic individual because they are focusing on reading the words and not understanding the text (Colson, 2013)
- *Dyslexia is not hereditary.* Most dyslexic people have at least one parent who also has dyslexia (Wadlington & Wadlington, 2005).

The findings from this approach help learners, families, educators, employers and the wider public to understand what dyslexia is and how it does and does not influence

the person's ability to learn. Many of the authors cited here also offer intervention options which have informed this project, providing for comparative analysis in the different educational contexts represented.

C. Support strategies for the dyslexic learner

Most commentators recognise that dyslexic people often develop compensatory strategies, and these can disguise their difficulties. Dyslexic people can also develop compensatory strengths which provide an opportunity to further advance their learning (New Zealand Ministry of Education, 2008a). Although the Ministry of Education made this statement as a starting point for their work in NZ schools, they do not provide examples of the compensatory strategies and strengths a person may develop. They do emphasise the importance of early identification of dyslexia followed by a systematic and sustained process of highly individualised and skilled teaching primarily focused on written language, with specialist support. This is critical to enable learners to participate in a range of social, academic, and other learning opportunities across all areas of the curriculum.

Support strategies in the academic environment

Fossey et al., (2015) explored the complex factors affecting the implementation of learning supports for learners with disabilities in tertiary education and emphasised how decisions about what supports/adjustments are offered by the institution should focus on the needs of the individual learner. Collaboration and consultation are critical, involving a range of people such as teachers, support workers and/or technical experts, as well as the learner, to decide appropriate support for the individual. The authors talk about how the "lines are often blurred" between individualised reasonable adjustments, the institution-level learning supports available to all learners, and the learners' own strategies for managing their studies. Understanding the perspectives of teachers, support workers, technical experts and learners enables the institution to identify where reasonable adjustments are necessary or where institution-level learning supports, or interventions, may be more advantageous.

In 2007, the New Zealand Ministry of Education (2008) formally recognised dyslexia for the first time, noting several key characteristics of an inclusive learning environment which recognises and responds to dyslexic learners' needs. Although framed in the compulsory schooling context, many of these characteristics are applicable to the vocational and other tertiary education sectors when establishing contextual influences on the success of dyslexic learners. Examples include:

- Strong and supportive leadership
- The use of a range of specialists to support teachers to assess and help plan instruction for learners
- A whole-of-school approach to identifying and meeting learners' learning needs, with some shared understandings (for example, regarding task completion, homework, and specialist support)
- Teachers work together to ensure the whole school takes responsibility for learners' strengths and needs, not just the individual teacher
- The use of evidence-based effective teaching and learning strategies
- Ongoing professional development for teachers.

Institutional level support

"It is so important for educators to make a conscious effort to know and be aware of the signs and symptoms of dyslexia and know what they can do in the classroom to promote learning for these students." (Colson, 2013)

Institution-level learning supports refer to the structures and practices that enable the participation of most learners most of the time (Fossey et al., 2015). Some institution-level learning supports, particularly those involving technology (for example, smart phones, online tools) and inclusive classroom supports can be useful to learners with a wide range of learning disabilities. A significant aspect of these authors' research was determining what reasonable adjustments could be made by the institution to support dyslexic learners. They define a reasonable adjustment as: "An action or measure taken to assist an individual student with a disability to participate in education by taking into account the student's learning needs and balancing the interests of others affected, for example other students, the education provider and staff" (p. 10). They also emphasise that a reasonable adjustment should not:

- Advantage learners with disabilities above other learners
- Alter course standards or outcomes
- Guarantee success
- Weaken the integrity of the qualification.

The New Zealand Ministry of Education (2008) likewise highlights numerous ways in which schools and individual teachers can make a difference for older learners who may be dyslexic. Alongside instructional practices, there are accommodations that will make life easier for these learners and help them maintain engagement and self-esteem. Some commonly used classroom accommodations which allow a learner to demonstrate knowledge and strengths even if their reading, writing or spelling is not yet at their age level include:

- Support for tests and examinations for learners who are unable to effectively read or write work that they can do orally and will benefit from extra time or the provision of a person who reads texts aloud to them and/or writes the responses as the learner dictates
- Ask the learner how they learn best as often they can explain the strategies and techniques that help them learn
- Reduce and/or adapt the homework load. A dyslexic learner may need three or four times longer than other learners to complete homework
- Assignments can be adapted so a learner can present

their information in a variety of media. Allow a parent, caregiver or others to act as a scribe for work the learner dictates

- Provide alternative assignments for the dyslexic learner to show mastery of material other than a written paper
- Conduct a class review session before a test. Alternatively, provide learners with a study guide with key terms and concepts
- Computer technology can be helpful, including continuous speech recognition software, portable electronic dictionaries, word-processing keyboards, taped books, touch-typing programmes and any word-processing packages with good spellcheckers. Teachers need to be aware of the degree of proficiency a person has to have in order to use these tools effectively.

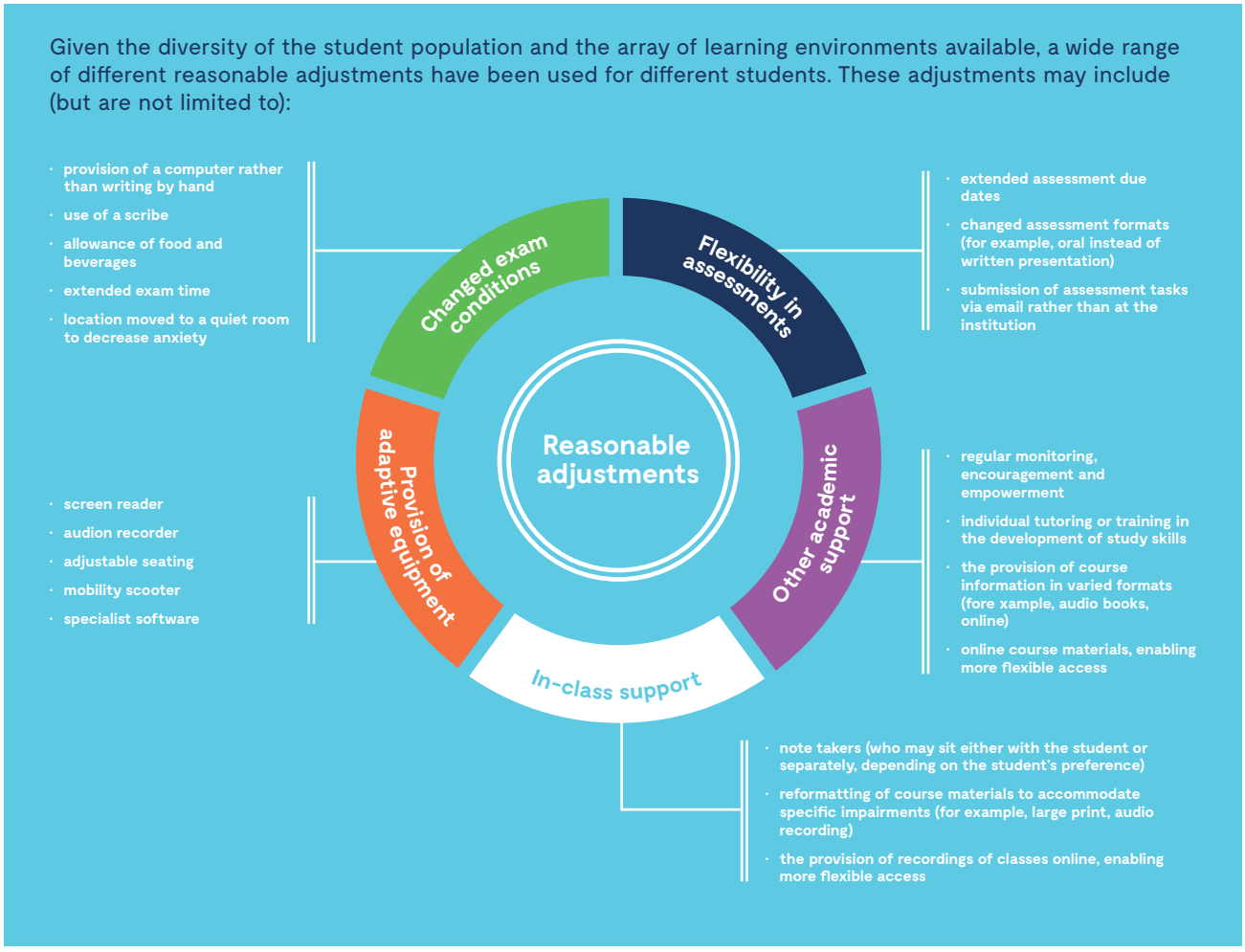
Colson (2013) adds another perspective of the considerations needed to be made by institutions to support dyslexic learners, emphasising the importance of institutions examining the amount of training that teachers receive on how to teach dyslexic learners in their class. She stresses that to fully meet the needs of dyslexic learners, teachers must have a firm understanding about how dyslexia affects the brain and what can be done in the classroom to assist learners. She states; "There is a basic assumption that teacher education programmes and continuing teacher education are preparing teachers to meet the needs of all students" (p. 10).

The National Centre for Vocational Education Research's (NCVER) (2015) Good Practice Guide for supporting tertiary learners with a disability builds on Fossey et al.'s (2015) work, stating that for learners, the markers of effective learning support are: a better understanding of their own needs; an increased ability to cope; more enjoyment; and doing their best work. In deciding which reasonable adjustment to use for a specific learner, institutions should:

- Consider the reasonable adjustment that is least disruptive or intrusive but beneficial for the learner
- Consider whether the learning supports routinely provided for all learners could be useful either in addition to, or instead of, the identified adjustment
- Assess whether the adjustment may need to be changed over the period of a learner's education or training, as their needs change. (NCVER, 2015, p. 2).

The Good Practice Guide offers the following model which provides examples of 'reasonable adjustments' that can be made by an institution.

Fig 2. Reasonable adjustments to support improved learning for dyslexic students (NCVER, 2015, p.3).



"It is so important for educators to make a conscious effort to know and be aware of the signs and symptoms of dyslexia and know what they can do in the classroom to promote learning for these students."

As the Guide stresses, adjustments need to be based on a thorough needs analysis of the individual learner and decided collaboratively with other key stakeholders.

In addition to the supports indicated in Figure 2 above, tertiary education institutions typically provide a range of learning supports for learners in general; that is, structures and practices designed to enable the participation of most learners most of the time. Examples may include study skills assistance and library, technical and language skills support (Fossey et al., 2015).

To improve learner access to support and to decrease the need for learners to be singled out or disclose their disability to receive support, there have been calls for more systemic approaches to the provision of learning supports. Examples in the Vocational Education and Training (VET) and higher education contexts include the application of the principles of inclusive or universal design to take account of learners with diverse backgrounds and learning styles in the development of curriculum, teaching materials and instructional methods (Schreuer & Sachs, 2014; Shevlin, Kenny & McNeela, 2004; Wray, Aspland, Taghzouit & Pace, 2013).

An important corollary here is noted by Webster (2016, p. 78), who describes the difficulties dyslexic learners encounter utilising a dyslexic learner survey. Interviews, rather than questionnaires, may be more effective; in any case, the learners' voices need to be heard before deciding what strategies will support them best. Such an approach has enabled Webster to make several concrete suggestions about her own UK setting, but which are also pertinent to our own context and study:

- Dyslexic learners need to read more for pleasure to increase their lexicography and topic understanding
- Higher education institutions need to implement strategies to empower learners and lecturers to be aware of learning styles
- Staff need to reduce the speed of delivery of lectures and be more approachable to learners
- Examinations should be reduced, and course-work increased to be more inclusive
- A lecturer/support staff/learner feedback loop should be implemented to further improve inclusivity.

Support strategies in the workplace

"Adjustments do not give extra knowledge, talent or abilities; they just allow dyslexic people to show that they can do the job." (Brunswick, 2012)

The difficulties of dyslexic adults do not stop once they leave school; the need for appropriate support continues into the workplace (Dyslexia Foundation of NZ, n.d.). As the individual transitions from classroom to employment, the difficulties the dyslexic person experiences can be compounded by reliance on written formats and organisational requirements of rapid email communication and understanding instructions. As the Foundation points out, even in jobs which are manually oriented, processing instructions and filling in work forms can be sources of challenge and frustration.

An added factor is that individuals can be fearful of disclosure because of victimisation by the employer or bullying by workmates, whether this is unfounded or not, and result in many people not accessing appropriate support and therefore not reaching their full potential. In addition, the longer-term impact of not seeking appropriate tailored support, note Beetham and Okhai (2017), may lead to work performance issues and "Can have a negative impact on overall well-being (plus if not acted upon could result in negative mental health in the longer term)" (p. 1). DeBeer, Engels, Heerkens and van der Klink (2014) also note that where there is a lack of positive attitudes toward dyslexic employees – with the exception of the attitudes of dyslexic teachers – on the part of colleagues, supervisors, and employers, the negative impact will increase, rather than decrease, over the course of the dyslexic person's life.

Brunswick (2012) also talks about how the provision of appropriate support depends on the individual disclosing their dyslexia to their employer and colleagues and this disclosure being met with understanding of the nature of dyslexia, and the strengths and difficulties it brings. She cites a study undertaken by the University of Buckingham with 44 dyslexic learners that identified several reasons why a dyslexic person chooses not to disclose that they have a learning difficulty to their employer. The participants' responses included:

- Dyslexia is associated with education and is not applicable to the workplace
- The employer would discriminate against the dyslexic person
- If they disclosed, their employer would feel they are not able to do the job as effectively as someone else
- They would not be considered for a job if they disclosed upon application
- Embarrassment.

The net result, says Darwin (2014), can include relegation to unskilled jobs, employment changes and barriers to promotion. Hence, he claims, dyslexic adults have often become adept at "The art of concealment" (Slide 6). Gerber and Price (2008) add to this as they point out that part of the process of disclosure involves educating the person one is disclosing to. "The greatest expert on an individual's dyslexia should be the dyslexic person themselves" (p. 134). Disclosure is an exercise in self-advocacy, so people need to develop their understanding of their own thinking and learning style, and how dyslexia affects them in the workplace. When done positively, disclosure should ensure that employers are able to meet a dyslexic person's needs and enable him or her to become increasingly successful.

Dymock and Nicholson (2012) describe how a very small percentage of employers who have employed a dyslexic employee are aware of it, and how an even smaller percentage of employers create a supportive workplace environment. They state, "Many adults with dyslexia give up chances for promotion or further study because they involve paperwork even though they have all the skills a company or learning institution needs to be successful" (p. 115). And where the condition is disclosed, dyslexic

people need to be supported in education and the workplace, which often requires specific interventions as well as awareness and understanding (NZ Dyslexia Foundation, n.d.). Darwin (2014) says this requires a paradigm shift, achieved through a three-pronged attack, involving 1) Learning strategies to counteract difficulties, for example, teaching the use of visual techniques and organisational skills; 2) Upskilling in basic reading and writing, for example, writing conventions or spelling; and 3) Overcoming the mental barriers of dyslexia and negating the low self-confidence and self-esteem that hinders them which has been built up over a long period of time (Bartlett & Moody, 2000, p. 59, cited in Darwin, 2014, Slide 10). Specific examples of this third approach are: an inclusive work culture; training for all staff; on-site literacy programmes; workspaces that are quieter and not distracting to dyslexic employees; using diaries, mind maps and action lists to help prioritise tasks and reduce anxiety; and not overloading dyslexic staff with tasks or pressure of deadlines (Darwin, 2014).

Self-support strategies

"Successful dyslexic people attribute much of their achievement to the support, both emotional and practical, they receive from those closest to them – parents, care-givers, partners, siblings." (New Zealand Ministry of Education, 2008)

Hammond and Hercules (2015), in their book about how dyslexic learners can support themselves in their learning within the higher education context, describe a learning support strategy as a flexible plan of action which aids the learner's learning process by using their strengths (p. 33). They emphasise the importance of the dyslexic learner being aware of how they learn and applying knowledge of their strengths as an essential part of the learning process. The book offers practical suggestions for the dyslexic learner managing the learning requirements in higher education and how they can support themselves.

Brunswick (2012) describes how the dyslexic person can employ different strategies to help themselves cope with (or even hide) their reading difficulties. She cites examples such as the person avoiding situations in which reading and writing are required; delegating tasks to others that involve reading and writing; using spellcheck and grammar-check facilities on a computer; using mind maps to organise ideas; having other people read through written work to check for errors; and recording lectures or meetings to avoid the need to take written notes. Brunswick adds that even with the assistance of compensatory strategies, dyslexic learners need to invest greater time and effort than non-dyslexic peers in order to complete a piece of work (that may still not reflect their actual ability).

Technology as a support strategy

Technology allows teachers and tutors to take a more varied approach. Instead of writing their own notes during a lecture, learners may find it easier to follow discussions if they can record their lessons and listen to or watch it afterwards (Taylor, 2015). If teachers and trainers provide digital handouts, learners can adapt these for themselves. Using technology gives all learners – but especially dyslexic learners – the means to work independently and nurtures the digital skills they will need to maintain that independence throughout life.

Learners can take advantage of a range of software and apps on their personal devices to plan or organise their work, meet deadlines, and manage assignments

and revision – as long as their institution supports them to do so (Darwin, 2014). Examples of effective investment in technology by education providers and/or employers include visual software for creating charts, software for converting speech into text, and digital voice recorders (Darwin, 2014; Dymock & Nicholson, 2013). It is important to note such supports are not at the expense of any superior learning provision. Instead, by enabling individuals to pursue 'computational thinking' and 'student-centred', 'self-directed' and 'active' learning, such strategies promote a 21st century pedagogy (Fraser, Honeyfield & Boal, 2017).

Assessment is another area in which technology can support dyslexic learners. Often referred to as 'alternative assessment', digitised collections of learners' work showcase learning that can be accessed and shared beyond graduation to potential employers, and have been found to be especially useful in vocational education and training (Fraser et al., 2017). E-Portfolios are one way of enabling learners to creatively demonstrate knowledge and understanding of their learning in a way that is flexible enough to meet diverse learner needs. Learners can demonstrate and develop a range of skills such as problem solving, collaborative learning, creativity and digital literacy, which are all key employment skills. These portfolios can be produced using a range of software solutions, and incorporate videos, podcasts, wikis, blogs or mind maps, all viable alternatives to writing an essay or report.

External agency support

There are several agencies around the world that have a remit to support dyslexic learners, predominantly in the school classroom and academic environments. Table 1 lists the New Zealand agencies and provides a brief description of their services.

SPELD	A not-for-profit organisation that provides information, assessment and tuition to families, whānau and individuals living with dyslexia and other specific learning disabilities (www.speld.org.nz).
Workbridge	Workbridge's mission is to enable people with disabilities to participate and experience equal opportunities in the labour market (www.workbridge.co.nz).
Literacy Aotearoa	Core activity is delivering learning services to adults in the community and in workplaces, assisting them to improve their literacy and numeracy, and communication skills (www.literacy.org.nz).
Dyslexia Foundation of New Zealand	Formed in 2006 to provide a voice for and services to dyslexic New Zealanders as well as to those supporting the dyslexic person. The Dyslexia Foundation is an advocacy, action and lobby group for dyslexia in New Zealand (www.dyslexiafoundation.org.nz).

Table 1. NZ dyslexia support agencies

Solutions for People Experiencing Learning Difficulties (SPELD) New Zealand is an offshoot of the original UK organisation, and is probably the best-known advocate for dyslexic people and those with associated conditions. SPELD offers training programmes, support and resources and is a passionate advocate "To ensure the accessibility of education, employment and training for people with dyslexia" (Dyslexia-SpLD Trust, 2015); and to address the current over-representation "In all areas of poverty and disadvantage" (p. 1.). Much of SPELD's work is to raise awareness at a Government level, and act as a public watchdog for any loss of advantage in public funding available.

This concern over sustainability of funding in the face of changing policy and politics echoes the under-resourced, precarious position many agencies find themselves in, with a heavy reliance on a volunteer workforce. Learning centres within tertiary institutions experience similar needs for advocacy and awareness-raising to ensure funding, so that universities and schools can recognise the needs of dyslexic learners and empower them to contribute to their potential in socially just and inclusive societies (Borga, 2006).

D. Screening for dyslexia

There are several types and levels of screening methods including the use of observation checklists, detailed screening which examines key areas, dyslexia specialist assessments, and psychological assessments (British Dyslexia Association, 2012, p. 28). Assessment of dyslexia in general terms involves building a profile of the individual's strengths and weaknesses in literacy, numeracy and/or social skills, and looking at how certain tasks are performed (Malpas, 2012).

Diagnostic testing firstly analyses the person's underlying ability, known as Intelligence Quotient (IQ), that is, what the person might be expected to achieve (Malpas, 2012). The second area for investigation is educational attainment, that is, how well is the person doing in reading, spelling, and numeracy skills? They should be able to perform as well in these areas as their underlying ability suggests. A discrepancy between the two means there is an unexpected gap in their IQ test score and actual level of achievement, which indicates that something is preventing the person from achieving their performance levels (p. 35). Malpas states that diagnostic testing helps pinpoint reasons for the discrepancy. Three key areas tested are: i) Language processing; ii) Memory; and iii) Speed of processing. Assessment tools fall in to three categories, as outlined in Table 2.

The Dyslexia Adult Screening Test (DAST) was designed to be used as a screening instrument for dyslexia, based on research and testing conducted by Dr Angela Fawcett and Professor Rod Nicholson, the authors of DAST (www.dyslexia.uk.net). The test provides a first step in deciding whether a more comprehensive dyslexia assessment is warranted. It also provides a profile of the strengths and weaknesses of the person that can be used to guide the intervention strategies for supporting them. For adults, the assessment report may be used by teachers, to make adjustments in the classroom, and by

1. Comprehensive Dyslexia Assessment	› Intensive full assessment. › Administered by a SPELD expert (if a child) or by an educational psychologist. › Takes several hours to complete.
2. Mid-range Adequate Alternative	A. The Dyslexia Adult Screening Test (DAST). Takes 35 minutes to administer by a person with a lower level of expertise (than that required for the comprehensive assessment). The DAST is accepted by professionals as a reliable and cheaper alternative to the full assessment. B. The Lucid Adult Dyslexia Screen (LADS). A computer-based assessment used in the tertiary education context to determine learner allowance for extra time to sit exams.
3. Introductory Assessment (an indication)	› Self-administered assessment for dyslexia endorsed by the British Dyslexia Association (BDA). › Not intended to be a definitive assessment but rather an indication for the person to decide whether to take a higher-level assessment.

Table 2. Dyslexia assessment tools

employers to make adjustments within the workplace. In addition to specific diagnostic tests such as the DAST, the New Zealand Ministry of Education (2008) suggest other assessment approaches such as:

- An initial screening gathering birth and early childhood education information (for example, birth, health, emotional and social impacts, family history)
- A cognitive assessment (in the broadest sense, not an IQ test), which can also give information about discrepancies between skills
- A diagnostic assessment, including reading, writing, spelling, self-concept
- A teacher report of strengths and concerns in school
- A user-friendly report to inform the planning team (parents, caregivers, whānau, teacher, teacher aide and the learner, if appropriate). The report also acts as a reference point for a reflection and review process the following term, after two terms or at the end of the year, as decided by the planning team.

While a diagnosis of dyslexia can be empowering for individuals who have struggled with study and erroneously believed themselves to be 'slow', a cautionary note must be added. The University of California, Los Angeles (UCLA) (n.d.) warns of the possible negative consequences of diagnostic labelling, when this is not handled by trained professionals. Possible detrimental and unforeseen outcomes include:

- People see only the diagnosis, not the person
- All-or-nothing diagnosis – rather than recognising a continuum
- Diagnostic labels can lead to self-fulfilling prophecies and stigmatisation
- Diagnostic labels may mislead understanding of cause
- Medications with aversive side effects may be prescribed (p. 3).

UCLA argue that the advantages of enhancing access to treatment, increased understanding and self-awareness, and improved communication easily outweigh the above concerns, but reiterate the call for extreme care, expert application and validated assessment instruments.

E. Positive dyslexia

Much of the literature on dyslexia focuses on the problems and challenges dyslexic people face, particularly in the areas of reading, writing and spelling. Davis (2010) comments in his book The Gift of Dyslexia that the official definition of dyslexia is good for defining some of the symptoms but it generally does not acknowledge the positive side of learning difficulties. The Dyslexia Foundation of New Zealand (DFNZ) highlight many of the strengths of dyslexic learners, describing them as tending to be top-down rather than bottom-up thinkers, that is, they learn from getting the big picture or the overall idea or meaning first, and then fill in the specific details. They identify a range of strengths for dyslexics which include:

- Higher-level thinking processes
- 'Out-of-the-box' thinking
- High-level conceptualisers
- High learning capacity
- Exceptional empathy (p. 2).

Similarly, Darwin (2014) agrees that society as a whole need to "Change their perception of dyslexia and look past the associated stigma [in order to] exploit the strengths and talents many dyslexics have" (Slide 13). He argues that dyslexia should really be thought of as a gift, due to the way those with the condition often have advanced 'picture thinking', intuitive thought, multidimensional thought and curiosity skills, an asset to a classroom or organisation. Darwin cites West (2009) who says that "The 'visual thinkers' and 'dyslexic visionaries' may see things that others do not see" (p. 353).

The Positive Dyslexia movement founded by Nicolson (2015) is based on the Positive Psychology movement, a term coined by Abraham Maslow in 1954. Positive dyslexia is about dyslexic people working to their strengths, not their weaknesses. It highlights and capitalises on the skills and positive attributes commonly found in dyslexic people, such as:

- Strong visual, spatial and 3D skills
- Innovative, creative thinking
- Logical problem-solving
- Empathic
- Collaborative
- Good verbal communicators.

Proponents of this approach eschew the traditional, problematised 'deficit definition' of dyslexia, which defines the condition by all the difficulties and shortcomings shown by those with the condition. But that is not enough, they say. Curing the negatives does not produce the positives. The goal is not merely to cope, but to be happy, fulfilled, or in Maslow's terms, achieve 'self-actualisation'. Nicholson (2015) describes three strengths (work strengths, mental strengths and social strengths) that must be built, through three steps which must all be present:

1. Identify and empower to work to Signature Strengths (working for one's own development rather than to someone else's tune)
2. Identify and guide toward careers involving Strengths (better career advice and better diagnostic information)
3. Empower and involve stakeholders – learners, parents, employers, institutions, and agencies.

Positive dyslexia is a concept which benefits the individual, as well as their wider society. Just as we recognise and embrace diversity in our educational and training institutes in gender, culture and age, so too we need to recognise diversity in cognitive talents. Realistic positivity has the potential to improve outcomes for this large group of learners, by empowering everyone to use their skills. As this review has shown, we already have the tools and the technology to rebrand dyslexia – it is hearts and minds that now need to change.

Methodology

4

The project used action research methodology and employed a triangulated approach to qualitative data collection across the five team organisations by including participants from three key stakeholder groups: learners, tutors and employers

Project design centred around a one-year trial of dyslexia support interventions by the learner participants, during which time formative and summative interviews were conducted. These interviews provided an iterative process for evaluating the impact and outcomes of the interventions trialled by the learners. Impact evaluation methodology was applied across the project to analyse all data collected. In addition, the project team actively reflected on their own process and progress, using a logic model to map their expectation of change and evaluate learner success interventions.

The following section outlines these elements in greater detail.

A. Conceptual framework

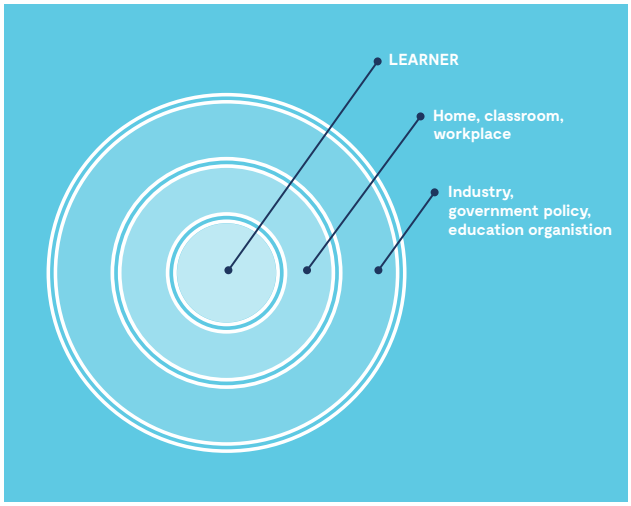
The guiding conceptual framework developed for this project identifies the stakeholder groups involved and external factors that influence these (Figure 3). The middle circle emphasises the centrality of the learner whilst the outer concentric circles identify the influencing contexts which guided the choice of learner support interventions trialled in three key environments: i) the classroom; ii) the workplace; and iii) the learner's home environment. The outermost circle recognises that there are additional external factors impacting on the learner, including industry, Government policy, and the education organisation. (Of course, these two outer rings impact not only the learner, but also the project team's capacity to undertake the data collection phase and complete the project according to the original plans. Challenges which arose during this project due in part, or full, to these external wheels of influence are discussed in a later section of this report).

Placing the learner at the centre of the action also aligns with the five-step approach to supporting a learner shown in the wrap-around model developed by Primary ITO (Figure 1.) This perspective means that all objectives and phases of this study were about ultimately empowering the learner and improving their academic, life and work outcomes. The project team, in keeping with funding body Ako Aotearoa's guiding philosophy, was committed throughout to bringing about benefits to learners and shifts in teaching practice, through better information and tools. Therefore, both models were approached through a critical theory lens, and developing praxis as an evolving synthesis of theory and practice to inform change (Freire, 1970).

B. Team process

The five team organisations were located across the North Island. Communication was predominantly via email and three team meetings. The project leader also maintained regular contact with each team member through on-site visits, and facilitating dyslexia workshops and DAST training sessions. A DAST Training Guide was developed to enable team members to conduct further DASTs independently (Appendix A). Eleven workshops were conducted with the team members and staff within their respective organisations and five workshops were facilitated for training providers of Skills, ServiceIQ and Primary ITO.

Fig 3. Conceptual framework



Briefing management

In addition to the workshops for team members and their colleagues and teaching teams, it was important at the beginning of the project to ensure that senior leadership at the five collaborating organisations fully understood the intricacies of the project purpose, process and focus. An ethics approval process was conducted in the respective organisations, ensuring rigour of the research activities. This process detailed how the project would directly improve educational outcomes for learners; a fundamental element to gain approval by the research and ethics committees.

It was evident early on that the managers at each participating organisation wanted (and needed) briefing on the key project features. This was undertaken by the project leader in a series of presentations at each site, covering the following key points:

- The time requirement/commitment from the organisation
- A good explanation of what dyslexia is, and isn't
- Information for key people inside the organisation, additional to the project team members
- Benefits to the participating organisation from involvement in the project and capitalising on these benefits
- Changes that might happen as a result of the project – processes, practices, attitudes, commitment to improving the dyslexic learner's experience, resourcing
- Improved service to learners that could result from the project.

The Advisory Group

At the same time as this preparatory work was taking place, an Advisory Group was established to act as a reference group to provide advice and key information to the project team as required throughout the two-year project period. They provided a conduit for the team to discuss the ethics of the project and engage in dialogue throughout the project regarding any ethical considerations or issues as they arose. The Advisory Group met three times during the project, predominantly providing feedback to the team on the project progress.

Although not a direct participant, it is important to profile Workbridge, which is a national organisation that is contracted by the Ministry of Social Development and Work and Income to fund and assist people with disability into employment and to keep them in employment. With respect to dyslexia, the team members applied to Workbridge for funding support to supply the technology

Initiation: Inputs	Implementation: Activities	Outputs	Institutionalisation: 6 months - 2 years following project completion
Personnel: Learners; Project leader; Project team members; Training advisers; Training providers; Tutors; Employers; Organisational champions **Equipment:** Learning technologies **Organisational documents:** Policies; Value statements; Existing dyslexia support models	**Team self-management:** Project team meetings; Literature review **Baseline data collection & analysis:** Organisational document analysis; Demographics; Websites; Learner data (completions, retention) **DAST Screening:** To identify learner participants **Trialling dyslexia support interventions & iterative evaluation:** Classroom observations; Interviews; Learner focus group meetings; Online questionnaire; Data analysis **Develop dyslexia support resources:** Develop good practice models; Dissemination	**Wrap-around dyslexia support model revisited** **Range of dyslexia support resources developed:** › Tutor self-evaluation checklist › Dyslexia self-support guide package for learners › Dyslexia support guide package for employers › Dyslexia support guide package for tutors › Dyslexia support guide package for mentors **Project completion:** Published report of project findings and recommendations for future practice; Workshop facilitation through Ako Aotearoa's professional development series; Journal article/s; Organisational policy documents	**Learners:** 80% or higher increase in qualification completions of dyslexic learners; 80% or higher increase in retention of dyslexic learners across the multiple education contexts (PTE, ITO, ITP, wānanga, university); 80% or higher increase in learner satisfaction; Increased capabilities and confidence of dyslexic learners to self-manage in multiple contexts (home, classroom, workplace) **Teachers:** Observable changes in teaching approaches and choice of learning support strategies; Mentoring provides targeted support for teachers of dyslexic learners; Wider (national and international) awareness of dyslexia and how to support dyslexic people **Project team:** Increased project management capabilities; Increased change management skills; Enhanced skills and knowledge of collaborative projects

Table 3. Project logic model

and human resources drawn upon (for example, reader-writers) to assist the learner participants who had been screened as dyslexic. The majority of learners received assistive technology funded by Workbridge. The receipt of assistive technology such as Smartpens, Reading Pens, and Dragon Naturally Speaking computer software was transformative. The learners used the technologies to assist their reading, writing and spelling so that they could better engage with the text demands of their tertiary study and the workplace. These results are based on the learners' feedback as summarised in Table 6 (p. 36).

Using a logic model to set and monitor progress

An important part of our team process was our deliberate self-monitoring and ongoing reflection. To undertake this study, the team developed the following logic model (Table 3). A logic model is a causal sequence diagram of how a programme or project is understood or intended to contribute to its specified outcomes, often used as a management tool to guide and evaluate an intervention. Based on Rincones-Gomez's (2009) student success evaluation process and Fullan's (2007) approach to educational change, the logic model in Table 3 was used to guide and undertake the planned phases of the project. The model also enabled continuous evaluation and improvement where it was seen that this could benefit the learner participants.

Critical questions were asked during each of the project phases, based on Alkema's (2012) framework for conducting projects in tertiary education, to ascertain project progress and impact. These questions provided the evaluation methodology that was applied iteratively throughout the project time-frame, for example:

- What are the intended and desired learner outcomes? (initiation)
- What specific activities will be undertaken? (initiation)
- How does the literature inform the project's purpose and process? (initiation)
- How is activity progress being evaluated? (implementation)
- Is the support intervention providing the expected results? (implementation)
- Are the interventions making a difference to the learners? (implementation)
- How are the project learnings and results being shared? (institutionalisation)
- How are the support resources being embedded as business-as-usual across the multiple contexts, by the learners, tutors, employers, mentors, educational institutions and organisations? (institutionalisation).

C. Participants

Learners

Twenty learners originally involved in the earlier Hub-funded project were invited and agreed to participate in this project. Primary ITO had access to additional learners, who had already been identified as dyslexic, who were also invited to participate. The other four team member organisations had varying levels of access to potential learner participants given their minimal involvement with dyslexia prior to the project. For example, at enrolment in 2017, 56 Whitireia learners, out of 5721, declared dyslexia. Subsequently, several more learners who had not self-identified were screened using the DAST and found to be potentially dyslexic.

Skills identified their learner participants via learner progress reports from off-job providers which indicated learners who were struggling with the theory component of their qualification. These learners were followed up to discuss their learning history. At ServiceIQ, discussions about dyslexia had occurred with Primary ITO prior to the project commencement and some of their learners had already completed the DAST having self-referred or been identified via workplace supervisors and training advisors. At Capital Training, the project team member visited their campuses and talked to all the Youth Guarantee learners about dyslexia and what the symptoms are. If the learners identified with those symptoms or their tutor had, the learners were offered the opportunity to be screened using the DAST.

Table 4 provides a profile of the 107 learner participants across the five team organisations, illustrating the different demographics. These demographic variations had an impact on the data collection process; for example, in Whitireia and Capital Training Ltd., the learners were not in full-time employment.

The teachers and employers

Twenty-six teachers and 20 employers participated in the project. Again, the demographic of these two participant groups varied across the team organisations and their employer communities. For example, Whitireia and Capital Training Ltd had teacher participants but no employers, as this was not part of their learner groups' programmes of study. Learners in the other three organisations were juggling academic study with an apprenticeship or full-time employment, as identified in Table 4, so employers from these three organisations were invited to participate. Employers who were actively involved in the work-study matrix which saw learners gaining vocational qualifications were therefore an important stakeholder group and an integral part of the workplace environment where the impact of dyslexia is so keenly felt, and where the need for positive strategies to support learners with dyslexia has the potential to bring powerful change.

Primary ITO	Whitireia New Zealand	The Skills Organisation	Capital Training Ltd	ServiceIQ
n=38	n=24	n=13	n=21	n=11
Juggling study and apprenticeship or employment	Not in full-time employment	All in full-time employment, juggling study and apprenticeship	Not in full-time employment; Youth Guarantee learners	All in employment, juggling study and apprenticeship
Attempting tertiary study for the first time	Attempting tertiary study for the first time	Attempting tertiary study for the first time	Attempting tertiary study for the first time	Attempting tertiary study for the first time
Pathwaying through tertiary study	Pathwaying through tertiary study	Pathwaying through tertiary study	Pathwaying through tertiary study	Pathwaying through tertiary study
Mix of night school and block course delivery	On-campus programmes and courses	Mix of night school and block course delivery	Campus-based programmes and courses	On-job training only
Predominantly rural-based and distance learners	Predominantly urban campus-based. Some distance learners	Urban-based	Predominantly urban campus-based	Predominantly urban-based in small and large workplaces

Table 4. The learners

D. Data collection and analysis

A central design of the project and the main source of data was a one-year trial of dyslexia support interventions by the learner participants. A Data Collection Process Map (Appendix B) was designed for the team members to establish a clear process for the data collection and achieve consistency of approach across the team. Subsequently, a tool was developed to assist each team member with tracking the intervention trialling by their learner participants (Appendix C). An embedded aspect of this tracking tool was the regular contact the team members maintained with their learners, to monitor progress and identify if the dyslexia intervention was appropriate, that is, it was supporting the learner in their given environments – the classroom, the workplace and their home.

Phase 1: Confirming the learner participants

Signing up the learners was contingent on accessing and testing them using the DAST diagnostic tool before firstly confirming they were dyslexic and to what degree; and secondly, explaining the project to them and gaining consent to participate. This process, and the positioning of the DAST as a tool to determine learner participation and needs, was clearly and carefully explained to them verbally, and also articulated in the consent form. Those learners who completed the DAST and were found to not be dyslexic did not continue with the project.

In addition to the DAST, other strategies were used to identify learners for the project. These varied across the five participating organisations and included:

i. Organisational records: learners who had previously completed the DAST and were identified as dyslexic
ii. Learners who had been assessed by SPELD
iii. Referrals from ITO training advisers
iv. Self-referral
v. Referrals from tutors
vi. Low Literacy and Numeracy for Adults Assessment Tool (LNAAT) scores (The LNAAT is a national requirement for all Level 1-3 programmes).

Phase 2: Interviews with the learners

The one-year trial was the main source of data, as the learners were interviewed at the beginning, mid-point and conclusion of the trial period to ascertain the usefulness and impact of the selected interventions on their learning experiences and outcomes in the classroom, workplace and home environments.

The first interview involved the project team members having a conversation with their learners to establish a context and reality (base) from which to commence the one-year programme of dyslexia support intervention trialling (First Interview Schedule, Appendix D). A Suite of Dyslexia Support Interventions (Table 5) was developed and provided for the learners from which they could select one or more interventions to trial taking into account their specific circumstances, such as the nature of their workplace, their location, and access to support people/mechanisms (study nights for example).

Subsequent interviews were conducted at three-month and six-month points during the intervention trialling period (Interview Schedules, Appendix D). The three-month interview was an important feedback loop opportunity to inform the next period of intervention trialling, that is, guiding decisions about whether the interventions needed adapting, or a different intervention was required. The interviews at the six-month point provided a further feedback loop to inform the remaining six months of the one-year trial period, at which time summative interviews were planned with all learners. The inclusion of multiple interviews at determined points

in the trial period allowed for some comparative data collecting as a before-during-after sequence. However, due to several major challenges faced by some of the team members, summative interviews with the learners at the conclusion of the one-year trial period were only conducted by Whitireia. These challenges are described further on in this section of the report.

Phase 3: Interviews with the teachers and employers

Interviews were conducted with the employers to gather their feedback about the considerations they made for their dyslexic employees (the learners) (Appendix E). They were also asked to identify any strategies they used to support the learner in the workplace.

Regarding the collection of data about how teachers worked with dyslexic learners, the original intention of this project was to complete classroom observations and follow up with individual teacher interviews. Observations would help characterise the learning context of the dyslexic learners in real time, whilst the follow-up interviews further explored what the teachers determined as good teaching practice for supporting dyslexic learners. However, although every attempt was made to organise the classroom observations, there was great reluctance to this, even though measures had been taken to assure teachers that the observation was to gain a sense of the learning environment, not to evaluate their practice. Therefore, the team agreed to forgo this part of the process and focus on interviews. As with the employers, the teachers were asked to identify the strategies they used to support dyslexic learners and any challenges they experienced with meeting the learning needs of these learners (Appendix F).

Phase 4: Data analysis and outputs

Thematic analysis was used to analyse the interview data from the learners, teachers and employers. A comparative analysis of the findings from the one-year intervention trialling was made possible because of the 'before', 'during' and 'after' interviews with the learners.

The process followed here was again strengthened by the inclusion of project members from different organisational settings. As the team read and re-read transcripts of interviews conducted by other team members, new insights often emerged about a practice that might otherwise have been taken for granted or seen as business-as-usual. Team members' reading about vocational programmes and training approaches that were new to them also assisted with avoiding

assumptions about what learners thought and believed, or what would be best for them. During this process, repeated ideas and concepts were identified, and finally tagged with codes to identify the emerging themes. The team felt that this general research method was a good fit for this project as it was not associated with any one field or discipline, nor did it elevate the perceptions of those with more experience in working with dyslexia over those who were relative newcomers to the issue. There were numerous outputs from the project. These included:

- All team members were trained in conducting the DAST
- Staff (other than the project team member) in the five team organisations were also trained in conducting the DAST
- Video vignettes showing interviews with dyslexic learners and gathering their stories
- A series of YouTube clips providing an audiovisual version of the Good Practice Guides
- Four national conference presentations. To report on progress and interim findings from the project
- Four international conference presentations, to report on progress and interim findings from the project. (Oxford UK, Modena Italy, Hobart Australia and Telford UK.)
- 11 dyslexia training workshops facilitated across the five team organisations
- A suite of dyslexia support resources:
  - Best practice font use, type setting and presentation to support dyslexic learners
  - Advice for employers on how best to support dyslexic learners
  - Best practice for employers on supporting dyslexic learners
  - Script for approaching suspected dyslexic adults
  - Positive dyslexia in adults' information guide
  - Sharing dyslexic learners' tips and tricks
  - Dyslexia support interventions matrix detailing the what, why, how and for whom, of strategies and tools that support dyslexic people.

E. Dyslexia interventions available for participant selection

Our learner participants were studying in a wide range of settings: at home, in class, on worksites, and on farms, some in relatively remote rural locations. Similarly, the teachers, tutors, training advisers, and employers supporting them were working anywhere from a classroom in a wifi-enabled organisation to a commercial operation, to mobile delivery from the back of their vehicle. The range of interventions that the team developed as having potential for improving learner outcomes also needed to be diverse, from interpersonal relationship-strengthening, to accessible education technology aids and tools. Table 5 summarises the intervention approaches learners could select from (with guidance from the project team and their teachers as necessary). The following description from a member of the project team offers one example of how this worked in practice:

"When a student tested positive for dyslexia, I sat down with them and worked out a plan of what we could trial that would suit their needs. I then sat with the tutor and went through the plan of what they can do in the classroom to help the student and through the specific interventions that the student had decided to trial. If they were ready to try Ghotit Read/Write for example, I arranged for the IT guy to set it up for them. I think making it as easy as possible for tutors is really important. I then followed up with them to see how it was all going."

Tool	Description
Smartpen (or 'Livescribe')	A smartpen captures everything that a learner writes and everything that is spoken. Inside the pen is a camera that takes a picture of the notes as they are written, while a built-in microphone records what is being said. Notes can then be transferred to a computer through Livescribe Desktop software. http://dyslexia.yale.edu/resources/tools-technology/tech-tips/livescribe-smartpen/
C-Pen Wizcomtech	Two examples of pens which scan across the written word and then read out loud. Navigation buttons allow learners to look up definitions, check spelling and listen to pronunciation. Selected text can also be uploaded to a computer. https://www.mentis.co.nz/wizcomtech-readingpen-ts-oxford
Dragon Speech Recognition Software	Dragon 'Naturally Speaking'. Software that directly translates voice to text on the computer screen. Up to three times faster, and more accurate than typing. https://www.nuance.com/en-nz/dragon.html
iPad and computer (BYOD – Bring your own device)	Devices include numerous built-in features and apps that are beneficial for learners who are dyslexic – examples include 'Ask Siri', 'Speak Selection', 'Predictive text', fonts and spacing, screen brightness. http://www.perkinselearning.org/technology/posts/ipad-and-mac-tips-students-dyslexia
Smart phone apps	iPhones and other Smart Phones have a voice to text option which can be used for texting, making notes or writing emails. There are many phone apps which include dictionaries, spellchecker and phonemic awareness. A few are: Sight Words, Ghotit Real Writer and Write in Style. There are many more.
Natural Reader Inspiration mind-mapping software	Dyslexic people often struggle to organise their thoughts, or link a wide range of thoughts together. This mind mapping software assists with ordering complex information about a topic and sub-topics. http://www.inspiration.com/
Irlens glasses	Coloured lens can help with perceptual processing / light sensitivity / reading difficulties. https://irlen.com/
Coloured overlays	Associated with Irlens condition, often experienced by learners with dyslexia, reading through a coloured overlay that changes the colour of the page can significantly improve reading speed and comprehension over an extended time period. http://www.crossboweducation.com/articles/dyslexia-coloured-overlays-and-visual-stress
Dyslexia font	'Dyslexie' font is specially designed for people with dyslexia with uniquely shaped letters to eliminate common difficulties dyslexic readers have with swapping, mirroring, changing, turning and melting letters together. https://www.dyslexiefont.com/en/typeface/
Typing up assessments instead of writing them	Handwriting often proves particularly difficult for learners with dyslexia. Mistakes made in handwritten texts are much more difficult to correct, so papers tend to end up covered in eraser marks and crossed-out words. With typing, muscle memory turns spelling into little more than a series of patterns on the keyboard, which makes mistakes in transposing or spelling words much less common. https://www.typekids.com/blog/how-can-touch-typing-help-people-with-dyslexia/
Mentor	A mentor can provide the learner with additional support and guidance in many forms such as helping with academic (class) work, literacy and numeracy, and general help with completing coursework and/or on-the-job tasks.
Reader-Writer	This can be the most important support a dyslexic person can be offered. Someone to support them to get their message across and put on paper the thoughts in their head. The Reader-Writer can be in a paid formal role or in a much less formal role with an unpaid mentor. Sometimes the human support is already in place in a very informal way (for example, partner, family member). http://www.danksdavisdyslexia.com/pages/reader.htm
Extra time with particular advisors	Advisors trained in literacy and numeracy, or learning difficulties, can coach learners one-to-one to develop new skill sets. Pathways Awarua, a website for adult literacy and numeracy skills, can be used: https://www.pathwaysawarua.com/ Advisors can also assist by setting up study groups – giving the learners the opportunity to work in small groups with other classmates, where they can talk through the course work and assignments with peers.
Extra time in exams and tests	To 'even the playing field', NZQA allows Special Assessment Conditions such as the use of a reader-writer and provision of extra time, if certain criteria are met. Learners and assessors need to be aware of these entitlements and advocate for access to these. http://www.danksdavisdyslexia.com/pages/reader.htm

Table 5. Dyslexia interventions discussed with participants

"When a student tested positive for dyslexia, I sat down with them and worked out a plan of what we could trial that would suit their needs."

Findings

Collecting the participants' voices was a core element of this project

The learner, teacher and employer voices informed, guided and decided the project outcomes as they provided a richness of data and 'realness' of evidence upon which to develop the range of dyslexia support resources and confirm the wrap-around model. The following summaries communicate the highlights, challenges and opinions of each participant group. The findings discussed in this section represent a cross-section of feedback from across the three participant groups and the five organisational settings, collected via dyslexia testing of the learners and interviews. The following 'Discussion' section introduces the recurring themes identified by the team as we interpreted the significance of these contributions.

A. Learners' experiences of learning with dyslexia: Pre-intervention

We began by asking learners about their prior experiences: whether they had been tested for dyslexia, whether they had received assistance if they had tested as dyslexic, and if they had received information that increased their understanding of dyslexia.

Whilst some of the learners did not acknowledge previous testing for dyslexia, two learners had been assessed at school, and others had been tested recently through their current academic programme. In regard to being supported once tested as dyslexic, four of the learners had received specific support through Workbridge, being allocated Smartpens, laptops and access to a reader-writer. One of the learners who had been identified as dyslexic upon entry to school had received no help and was awaiting screening through their current programme. All other learners mentioned getting some degree of 'help', mostly identifying technology and "someone to assist", for example, additional tutorial support with reading and spelling.

All learners in the study had a basic understanding of dyslexia, three of them stating that they had thought they were "an idiot and stupid", but now they had an explanation for their specific learning difficulties. Other learners commented on the importance of finding their capabilities. Understanding more about dyslexia gave them a sense of having "boxes ticked", and realising that dyslexic people have special skills, for example, spatial awareness.

Identified difficulties in the classroom, workplace and at home

"I've been working hard at reading, but processing is the problem. It takes me about ten minutes to get the information in and by then the tutor has moved on."

Questioning about what they found difficult and how they managed their learning across the different environments elicited a wide range of responses. In terms of things they found really difficult in the classroom setting, most learners talked about issues with recording, reading and understanding written information, and remembering information. A recurring refrain was the difficulty understanding unfamiliar words, concentrating, and putting their thoughts on paper. The pressure of time was apparent in much of the learners' feedback, such as needing more time to re-read, *"take lots of notes"* and *"not be rushed".*

Challenges experienced in the workplace reflected those identified in the classroom environment. For example, having to re-read instructions, processing information, and struggling to manage tasks which require reading and writing within the required time-frame. One learner said they often lost track of time and struggled with making decisions quickly. Another learner stated, *"I get flustered when I have to get things done quickly and my supervisor says I need to be faster. I'm already at my top speed with accuracy and when I speed up, I start messing up".*

None of the learners identified problems with managing their learning in their home environment. One learner said, *"In the classroom, I take notes. There's a lot of notes, medical terminology to write down. At work I'm a waitress so I struggle to add up people's bills and read menus. Nothing at home drives me crazy".*

Self-management techniques

When having to learn something new, strategies employed were similar across the learner group. These included:

- Searching Google, YouTube, TV documentaries, and books:

  "I read when I need to learn. If I don't get it I Google it to get the simple version, then to YouTube to watch it. Normally by then I understand."

- Asking a key person to explain a process or talk through an instruction and then watch what they did:

  "I want people to show me how to use or do it. Visually seeing someone else do it and then physically doing it."

- Taking lots of notes and creating memory aids to help engage learning and memory:

  "To prepare for things I need to know for an exam or test, I make flashcards and do mind maps."

- Ask how to do it again
- Ask more questions if the first plan for the learning doesn't work
- Listening and watching:

  "I like speaking; but although I'm okay with reading, it takes a while. If I want to learn something quickly, I prefer to watch a video."

- Asking classmates and/or the tutor:

  "If I want to learn, the first thing I do is talk to someone who knows something about it. Then what? Google."

There were some interesting comments from the learners about what action they took if the first strategy for learning something new didn't work. These are evidenced in the following statements:

"If I am struggling, I ask someone for help and if that doesn't work? It just puts me off and I move on to something else."

"I usually just try, give it a go. If that doesn't work for me, I'll ask my Mum or Dad or the tutor. They understand and that helps quite a lot."

"I find it hard to nut out what it is the tutor actually wants. Like comprehension I suppose. If that doesn't work, I keep at it until I get it. I don't give up."

Tutor/employer support

We asked the learners how their tutors and employers supported them in their learning, and how they managed their learning at home. Most learners were aware of overt teaching and learning approaches taken by their tutors that they found enhanced their learning, and were able to list these readily, including:

- Asking learners individually if they needed to know or get help with something
- Drawing pictures and diagrams on the whiteboard
- Reviewing assignment requirements
- Sending helpful emails
- Going over tests
- Being approachable
- Being well prepared
- Uploading the learning session on PowerPoint or Moodle before the class (with more than just bullet points)
- Using kinaesthetic activities
- Encouraging and creating opportunities for peer support
- Encouraging taking photos of the information on the whiteboard.

Learners were also quick to identify ways in which their tutor could further support them, for example, making PowerPoint slides available immediately, explaining clearly and then asking at every slide if everyone understands before moving to the next slide. Learners also liked knowing about additional sources of information they could access out of class, such as websites. In addition to these, the learners identified that tutors who help them learn use:

- Real life situations and interesting research
- Talking slowly during presentations and explaining things as they go
- Videos and Internet applications
- Whiteboard, especially labelling, mind maps and reviewing theory
- Practical sessions, demonstrations and hands on learning approaches: "We took the engine apart"
- Group work
- Verbal assignments such as presentations, rather than everything written.

More than half the learners identified issues with managing the assessment requirements of their study, emphasising how written assignments were especially difficult, stressful and overwhelming. They talked about the need for assignments to be in plain writing, and the value of a reader-writer to assist them. As one learner said;

"I am currently stressed out. I failed the course and failed this unit last time. It's not hard but there is SO MUCH information and it is overwhelming – a page for each answer. It's hard for me because although my spelling is better, I have to memorise it all."

A specific question about managing and completing assessments focused on whether the learners would find it useful to have a support person assist them. For some learners this was a resounding 'No', for example;

"No, it may be helpful, but I would get frustrated as me and my tutors have a pretty good chemistry already. It'd

be sort of like throwing water onto a grease fire" and "I don't think anyone else can help because the teachers only teach what they teach so no one person can help you with everything. My support person is my Dad".

In contrast, other learners stated that they would appreciate additional support in the classroom, whether a reader-writer, a mentor or a learning support person. One learner emphasised the positive experience and outcomes she had achieved as a result of having a support person;

"They were so useful last year. She corrected my work and helped me with spelling. She believed it wasn't fair that I could not get a good mark only because of my spelling when all the ideas are there. Student Support Services don't proof-read. They only make suggestions which isn't sufficient because I have no idea, I can't see the mistakes."

Prior experience of employer support was variable: at one extreme, a learner identified that "*They don't help me learn new tasks unfortunately; I barely see them"* whilst other learners made comments like, *"He will make sure I understand what to do and if I don't, he will go over it"* and *"My boss is lovely. She sits and explains it and dumbs it down pretty much. She explains it well and so clear, and sometimes writes the notes for me if it has big words in it".* A statement from one learner summarises well the level of support and care given by their employer:

"He actually takes the time to help me. He shows me how to do it first, watches me do it correctly and then leaves me to do it. He does more drawings and diagrams, equations and formulas. He tests me on my flashcards. He supports me in general and that makes it easier."

Several learners also mentioned different self-management techniques they used in the workplace, in conjunction with the support they received from their employer and the work team. Similar to the techniques identified in the classroom setting, they talked about asking someone to show them how to undertake a task, asking questions, and observing someone-else complete the task first. Doing the same task several times was mentioned by several learners as a key way to remember and manage the job requirement. As one learner said, *"I just do them over and over again until I get it. Listen, memorise, practise, practise, practise".* Other techniques the learners had developed to help themselves in the workplace included: asking a supervisor or manager to demonstrate; using Internet-based resources and videos; using smart phones and smartpens; strong time management; using photos to support recall; and writing notes and lists.

Learning at home

Most learners identified several techniques and approaches they took to managing their learning. As for the classroom and work environment, these included asking questions, using Google and YouTube video clips, and watching documentaries or informational videos. Additional strategies were:

- Being relaxed
- Studying in the morning *"when it is a quiet environment"*
- Writing on own white board
- Reading aloud.

Using various technologies as learning aids that they could access at home was a common strategy. As two learners explained, *"If I need to work on a car, I look it up on YouTube. The other day I was working on a brake while watching YouTube step by step. That's how I learn"* and *"If I don't understand I'll search up on the internet and watch a video which is easier to describe than reading".*

Although one learner said they needed to get away from home to learn, the majority described home as a quiet space, with family available to help. Several learners talked about their home as a place where they could take time to learn and access audio visual resources without feeling rushed and anxious:

"My father actually takes the time to help me. He shows me how to do it first, watches me do it correctly and then leaves me to do it. He supports me in general and that makes it easier. It's so much nicer and quieter at home."

"Mum and Dad are the ones who help me if I need assistance with assignments. My Dad helps me on the car. He has dyslexia as well, and me and him bond over cars. Mum helps with assignments and essays because I get so frustrated with all the writing."

Use of technology

Some learners in the study were already familiar with learning technologies to assist them in their learning. There were technologies that the learners generically used across the three learning environments – classroom, workplace and home – such as Smartpens, Google, Smart phones and laptop computers. They talked about how technology helps them with spelling, reduces frustration, makes note taking quicker and easier.

When asked what difference these technologies had made in their learning, a wide range of responses were elicited:

a. In the classroom

"The laptop makes notes easier to take. I don't have to worry about messing up and writing words down wrong that I didn't understand fully."

"I have a laptop with a touchpad screen and that helps me. It brings things up close, so I can focus."

"Better since using Siri (only when I am on my own though). Better than writing because I hit a wall when I don't know how to spell something. An idiot should know it. A baby should know it. I get frustrated and forget my methods, so Siri is really helpful."

"The laptop has made a big difference. It's easier and quicker to write and it's easier to read. It makes it a lot easier to take notes and go back to the information and check if I've missed anything."

b. In the workplace

"I take photos of lists and instructions so that I can refer to these and not have to try and remember everything."

"When I need to write progress notes I use the Google mick thingy which is a helpful and brilliant invention."

"I use S-note on my phone."

"I use my cell phone a lot. I phone people and ask them to send me photographs."

c. At home

"I can do homework a lot easier on a laptop. I don't have to spend as much time getting it down perfectly and I can spellcheck words. And I can watch videos on the topic."

"The computer has helped a lot and made a huge difference. It helps with any words I'm stuck on. It helps with time constraint issues as I can type faster than writing."

"Spellcheck."

What more did learners think they could do to support their own learning?

The final questions in the pre-intervention interviews sought the learners' feedback regarding what else they could do to support their own success and what other people could do to support them. These questions aimed to summarise the learners' feedback to earlier questions on self-management strategies and feed into the action research process as the project team developed and refined the list of interventions which would be offered.

A range of the suggestions offered included:

- Learning more about computers and using them more
- Not being afraid to ask questions about what things mean
- Getting more help with literacy
- Having one to one help
- Starting things earlier
- Having a good spellcheck system
- Using more technology aids such as a Smartpen or Dragon software
- Having a mentor
- Having a reader-writer in the classroom.

B. Learner responses during the year-long intervention phase

Following the first interview at the commencement of the one-year support intervention trial, two more interviews were conducted with the learners, providing additional, iterative data collection. The second interview was conducted at the three-month stage following trial commencement and a third interview at the six-month point. The focus of these interviews was on the support interventions (tools) being trialled by the learner, with the following prompt questions used on each occasion to guide the interview:

1. What do you really like about the support tool?
2. Is there anything you don't like about the tool?
3. Have you needed any help with using the tool?
4. How is the support tool helping you in the classroom? In the workplace? At home?
5. What difference has the support tool made in your learning overall so far?
6. Would you use this tool in the future?

Tables 6 and 7 summarise the benefits, challenges and outcomes that the learners experienced using the interventions in the academic environment. Overall, many learners either did not use dyslexia support tools in their work, and/or were not currently working and those who were employed and using a support tool provided minimal feedback on this.

Tracking the trialling of support tools in the workplace was relevant for the ITOs and the PTE only (Table 6); Whitireia's learners (Table 7) were not in employment. A further reason for separating results for Whitireia is that they were the only organisation able to complete the second and third interviews with all learner participants; the other four sites were impacted by significant challenges which affected access and ability to complete the data collection phase as originally planned (outlined later in this report). Hence, Table 6 is the combined findings from the ITOs and the PTE and Table 7 summarises the findings for Whitireia. Although we chose to include representative quotations to personalise the findings, using coding and theming to analyse the data, some basic statistics have been included in both tables to indicate the weight of enthusiasm for different tools. For example, 90% of learners who trialled the OpenDyslexic font (26 learners) found it helped their academic study.

C. Project team reflections on learner interviews

Reflections from the project team members and project leader were recorded as they tracked the learners through the one-year support intervention trial period and provided another perspective on dyslexia interventions and the value of acknowledging and respecting the dyslexic learner as a person. Given some of the learners' past experiences of being told they are 'stupid' and 'dumb', a radical change in this thinking is imperative. Representative comments from the project team included:

"I think dyslexic learners are still extremely vulnerable learners who tend to be stressed by the assignments and assessments in their programme. They are often emotional about their educational background and may have experienced bullying. Students are relieved to find out they are not stupid or slow learners. Not many

Interventions Trialled	n =	Benefits	Barriers/Challenges	Outcomes
Smartpen Livescribe Pen	20	› Improvement for memory spelling and recording. › Very useful in meetings.	› Over 30% did not get the tool during the study phase. Proposals to Workbridge were not actioned in a timely manner or *"slipped through the cracks"*. › Misfit between the tool provided and what the learners wanted. › Complex instructions and set-up issues. › Technology connectivity issues: *"I found it quite difficult to install the software to enable the Smartpen to connect with my tablet. Otherwise it was all straight forward."*	› 20% identified improvement in memory, spelling and recording. › Increased confidence. › 80% stated no difference or difficult to determine impact because of timing of course (not enough time to trial for a suitable period). › *"Both bits of technology have transformed my life. I use both things every day."*
Irlens Glasses	1	Transformed the life of one learner	NA	Irlens glasses transformational: *"I now wear blue tinted glasses for most of the day."*
Dragon Software	10	› Helps define new words. › Work at own pace. › Improves reading. › Good for definitions. › Used to write all assignments.	› Need for access to hardware and people to assist in its use to improve uptake and outcomes: *"I don't know how to use the Dragon or the laptop; I haven't been shown how."* *"I don't have the Dragon installed on my laptop. I am using my partner's laptop."* *"I did not get a lot of instruction and that has been a problem for me."*	› Complete modules more quickly and accurately. › Frustration due to lack of hardware, and IT and utilisation issues. › Changed learning experience and outcomes: *"I could not do without it and I wouldn't have considered doing this training without the help of this technology. I hope to do a teaching degree."*
Blue paper	32	› Words stand out and are easier to read. › Improved focus. › Less frustration and struggle with reading. › Increased concentration.	› Overlays a challenge as the person cannot write on sheets of blue paper. › Did not work for all learners who trialled it.	› 81% reported positive support from tool in the classroom. › 72% required no additional help. › Increased literacy and numeracy skills. › All said they would continue to use.
OpenDyslexic font	26	› Less frustration and struggle. › Increased success.	NA	› 90% positive comments as to value of the font, especially in their academic study. › All stated they would continue to use.
C-Pen	2	› Reads out text.	› Need to move slowly or comes up unreadable.	› None as yet as it has not been able to be used to its full potential
Mentor	24	› Help with understanding the learning requirements. › Mentor availability. › Keeps you on track.	NA	› Managing the training material more easily.

Table 6. Benefits, challenges and outcomes of dyslexia support interventions

students have strategies to separate a word into syllables. A pen that reads and pronounces words is an extremely valuable learning tool for students." (Project leader)

"Most of the learners seemed to have worked out their own coping strategies for the things they found difficult or frustrating, although all of them were keen to trial the resources offered. Because the participants on the project had several people involved, such as training advisers and mentors, I think this kept some of them motivated, as that alone was a form of support. This situation of multiple support, in my mind, could be enough to enable all learners who may struggle, including those with low literacy and numeracy skills, to keep going towards qualification completion. So, a good solid network of support is crucial." (Project leader)

"Most learners diagnosed throughout the project, have found it an incredible revelation that they are dyslexic, and they have felt validated and understood. They felt relieved that their struggles now finally have a name." (Project team member, ITP)

"The students I interviewed were generally happy to have a chance to tell their story to an interested listener. Many of them keep up contact between interviews. I think that participating in the project improved their confidence as well as their grades." (Project team member, ITP)

Interventions Trialled	n =	Benefits	Barriers/Challenges	Outcomes
Livescribe Pen	15	› Ability to go over material in own time and not have to read it. › A study resource. › Reduced struggle. › Important revision tool reducing confusion. › Reduced stress and anxiety. › Reduced rushing. › More comprehensive notes for study. › Improved spelling and help in exams.	› Need for additional resources (specific paper). › Noise interference in classrooms. › Issues with access and setting up tool and needing expert/outside/ family support. › Teachers not knowing how to set up and use. › IT support required and not readily available. › Not as useful in practicals and workshops. › Delay in receiving funding from Workbridge. › Importance of an appropriate manual and the need for assistance to read/interpret: *"It was pretty straightforward if you read the manual. But for a dyslexic, the manual was far too long, and the pen couldn't read it because the font was too small."*	› 73% reported extra time being created by use of Livescribe Pen. › Managing the teaching pace in class. › 66% identified positive perception of increased helpfulness to complete assessments and reduce re-sits. › Improved memory. › Improved confidence with spelling. › More positive study experiences. › Increased problem solving. › Reduced stress and anxiety. › Reduced rushing. › Improved success. › 33% reported the tool was unhelpful.
Natural Reader Inspiration software	12	› More comprehensive notes for studying. › Reduced stress and anxiety.	› IT issues/firewalls in large institution. › Computer systems incompatibility. › Inspiration mind map not so useful. › Not useful in labs/practical settings. › Scanning of font size issues. › Issues with access and setting up tool and needing expert/outside/ family support. › Teachers not knowing how to set up and use tool. › Lack of timely access to software meant interference with study for exams. › Need for ongoing analysis of tools to assist individuals and groups.	› 53% used the software for study purposes. › 66% identified increased helpfulness to their learning, completing assessments and reducing re-sits. › Reduced stress and anxiety. › Learners developed initiatives to source and use other dyslexia-specific tools when they realised how such resources could improve their experiences and success. › Learners with aspirations for higher level/further education now keen to access other support tools/resources. › 33% reported the tool was not helpful.

Table 7. Benefits, challenges and outcomes of dyslexia support interventions trialled in Whitireia tracked at 3- and 6-month intervals after selection of the support tool

D. Teacher interview feedback

"Take a reflective look at your classroom, including your teaching methods, assessment processes, materials and the ways you construct learning tasks. Consider how it works for your dyslexic learners." (ITP tutor participant)

Whilst there were commonalities in the feedback across the five organisational contexts, there were also differences between the ITP – Whitireia – and the three ITOs and the PTE. At Whitireia the learners came to one place to learn and teachers had consistency of learner cohort and presence. In the PTE and ITO contexts, the learners were often geographically isolated, which impacts on access and regularity of attendance. Also, in these latter contexts, most of the learner participants were in employment, creating an additional 'juggling' of tasks, commitments and time-frames for themselves, but also for the teachers, tutors and training advisers who worked with them.

The tutors who had a background or grounding in English for Speakers of Other Languages (ESOL), and/or training in Literacy, Language and Numeracy (LLN), stated they had high confidence in working with dyslexic learners. However, all 26 tutors stated that they had either minimal or no experience with teaching dyslexic learners. One tutor from Whitireia talked about feeling *"generally*

Effective tutor attributes	Effective teaching and learning strategies
› Knowing about how they may be managing	› Work with smaller groups – try to get everyone involved in answering the questions
› Knowing what difficulties dyslexic learners face	› Use more pictures and diagrams in the content
› Someone who can and wants to learn from the learners	› Simplify the theory and content – re-word and re-phrase some of it
› Giving learners time to understand the question	› Present case studies
› Think about the language you use	› Visuals, Visuals, Visuals
› If they are struggling, find out what they need, spend a little time with them	› Use practical examples and show them in other ways how to get the concept
› Some might come up to you at end of the lecture and admit they don't understand – so I spend a bit of time then to explain again	› The environment you create influences everyone's learning, being inclusive of dyslexic learners – everyone shares their stories, lot of group discussion
› Be inclusive	› One to one support
› Be willing to give a little more support	› Don't let them not participate – do this gently
› Patience	› Find out the reason why they are asking the questions
› Empathy and caring	› Give them a bit of extra time – take the pressure off them
› Find out their roadblocks and ways around these with them	› If learners can watch a demo (YouTube for example), they can go away and practise. Textbooks or having to read off the board doesn't compute as well
› Knowing what their strengths are and encouraging their learning to capitalise on these	› Ask if they have learning difficulties and hook them up with remedial services as appropriate
› Have a conversation with them that your purpose is to help them	› Encourage them to regularly attend the study nights
› Open communication; don't judge them	› Set goals
› Tell them my story and ask for theirs	› Use phones for recording

Table 8. Effective tutor attributes and strategies for supporting dyslexic learners

confident" in her teaching and applied fundamental teaching and learning principles when working with dyslexic learners:

"If the student has a problem, we meet, I talk with them and work through the problem with them. For example, writing an essay. I ask them to tell me about it, which gets them started on the process. Then we meet again and talk again, have a look at what they have done. I also talk to other teachers with expertise in this area."

Fifteen tutors across the five organisations had attended a dyslexia workshop facilitated by the project leader; this was the only training they had received. An interesting comment was given by one tutor at Whitireia:

"I haven't had specific training in dyslexia, but the students have their own strategies, so we learn from them."

Despite having little formal professional development, most of the teachers in our sample had reflected on the needs of their learners with dyslexia and how they could best support these. Asking about attributes of an effective tutor for dyslexic learners elicited numerous responses, and multiple teaching and learning strategies were identified. These are presented verbatim in Table 8.

The comments made by the tutors highlighted the depth of consideration and planning they engaged in to support dyslexic learners in and outside the classroom environment. There was also apparent pleasure and satisfaction in the dyslexic learners' achievements, illustrated by tutors saying, *"You see them gain confidence in themselves. That's what it's all about"* and *"He is now confident and excited about learning. He is building belief in himself and having lots of lightbulb moments, which is just great".*

Although many of the teaching and learning strategies identified could be described as 'good teaching practice' to support all learners, some of the tutors' ideas indicated specific consideration of how they best supported dyslexic learners, such as giving more time to take off the pressure, *"I give them more time in exam environments. The time pressure in these is absolutely horrible"*; taking time to talk with the learner; and re-phrasing or re-wording the course content, *"Create your own abbreviations then later get them to find the full term when they have got more time".* Several tutors also mentioned support strategies such as setting up a mentor for the learner, having a reader-writer in the classroom, using phones, and using specific technology such as Livescribe.

Teachers' ideas for improvements to support in their own organisations

When asked about suggestions for improved support for learners with dyslexia in relation to their classroom context and own teaching, as well as the larger institution/organisation context, there were similar responses across the five organisational contexts, but also some differences between Whitireia and the two ITOs and one PTE. Given the contrasts between the ITP environment and the ITO and PTE environments, their comments are provided respectively:

Whitireia

- Provide smaller, separate tutorials
- Increase skills in, and the number of staff, conducting the DAST
- More awareness and understanding of dyslexia across the institution so that people feel more comfortable with how they can support dyslexic learners
- More colour around the place
- Upskilling in recording yourself talking and teaching
- Encourage learners to record lectures
- Introduce and incorporate technology that supports their learning – recording lectures, teachers recording themselves teaching and making it available to all learners
- Be a resource person and refer on
- Have a more streamlined process to connect dyslexic learners with learning support services.

Primary ITO, Capital Training Ltd., Skills Organisation, ServiceIQ

- Those providing training for learners need to become aware of dyslexia and get more involved with it – upskill, attend dyslexia training
- More understanding and awareness of dyslexia in the wider organisational context. People care and want to change things to support the dyslexic learner; they need to know what they can do
- Time and more understanding by tutors. We have all got different learning styles, but dyslexic learners really struggle
- Having processes in place to identify when there is an issue for their learning
- The ITO following up with the training provider or tutor if it is deemed there is a potential issue
- A system highlighting learners who need extra support
- As a team, learn how to teach and support dyslexic learners
- A dyslexia screening and support pack needs to be planned ahead
- Follow up with the learners so they are being tracked and monitored, to ensure they are supported.

In summary, the tutors interviewed appeared to be very committed to supporting their learners to achieve and had put strategies in place to support dyslexic (and all) learners to succeed. They expressed a genuine desire to help learners achieve, an innate attribute that translated into later comments about not singling out dyslexic learners, providing extra support, and learning from them as they already have learning strategies in place.

As well as some specific focus on dyslexia support strategies, many of the strategies and teaching methods identified by the teachers represented good teaching

practice generally, that is, methods and approaches to learning that support all learners and will support the dyslexic learner. The tutors all viewed their role as an important part of the organisation's support for dyslexic learners.

E. The employers

"Don't give them ten things to do that could get lost in translation. And the things you do give them to complete, get them to repeat the instructions back and encourage them to say if things are not clear." (Employer)

Sixteen of the twenty employers who participated in this study stated that they had little or no knowledge of dyslexia. Some talked about being aware of dyslexia 'in general terms', whilst others disclosed that they were dyslexic themselves or had a dyslexic family member. Most of the employers said they had received minimal information about how to support dyslexic learners in the workplace. As one said, *"I have had a little bit from the ITO. I was sent information but I am not a good reader myself so that wasn't really very helpful. It would have been better to be told the information I needed".* However, two employers were aware that their learner had been given information from the ITO, *"so they are definitely supported, they are not alone".*

Employers identified a wide range of approaches they take to work effectively with dyslexic learners, alongside personal attributes they thought were important. They gave examples of their approach, such as clarifying instructions whenever necessary, engendering cooperation and mutual responsibility for learning the job, and going over the study material with the learner. As one employer said, *"Learning and working alongside the trainee is a great way to develop young people. I am here to help, and the trainee can ask for help as well if they need it; it's a two-way process".*

Several employers mentioned the importance of having respect and consideration for the learner, being encouraging, and having clear two-way communication. There was also substantial emphasis on the need for the learner to be supported and encouraged by all team members, indicating a sense of whole team investment in the learner's success. This was evidenced by the following comments:

"There is a lot of reliance to be part of a team in this job. He does struggle with communicating in the team environment, but the guys accept him for who he is."

"We work hard at working as a team and ensuring all team members understand dyslexia and the trainee's needs in this area, how they can support him. We work alongside the trainee."

"They know there are others around to help if they need it."

Several challenges for the dyslexic learner in the workplace were also noted by employers, such as the learner requiring help with record-keeping, staying motivated, and limited access to technology. Other challenges mentioned focused on other people creating issues for the learners, with comments like, *"There is still a lack of understanding about dyslexia in the workplace"* and *"Working with others – they don't always understand the dyslexic's situation".* One poignant comment sums up the challenge of other people's ignorance of dyslexia:

"The biggest challenge I see is people who don't understand and are ignorant, when you hear them say things in front of the trainee like "We have a real problem here with this trainee, she's dyslexic". The trainee could have just given up then and there."

Strategies employers found helpful

We asked the employers what strategies they found helpful in supporting the dyslexic learners to make the most of their strengths in their work role. In conjunction with this question, we were also interested to know if they had made any adjustments to help the learner manage the work tasks and complete their qualification.

Several strategies and adjustments were identified. They indicated either job-specific support strategies or a combination of supporting the learner in balancing work and study. Examples of the strategies used by the employers and strategies they encouraged the learner to use were:

"He does a lot of learning via YouTube video clips, which is fantastic."

"I regularly encourage her to practise even when she doesn't need to so that she gets better at the task."

"Modern technologies are really useful. The trainee uses a smartpen to take photos and then makes a note or two to accompany the photo."

"You can't be too harsh when things don't go well. I take him aside and explain so that he gets it. You've got to keep positivity going with him."

"If he can see what to do, he can then go back to his books and complete the assignments."

"I give him an instruction and ask him to feedback that he has understood, rather than expect him to get on with it having only given one instruction."

Most of the adjustments mentioned centred around helping the learner balance their time and efforts between learning the job and completing their study. Support of the learner was very much about achieving in their academic study as much/as well as learning the job and succeeding in this. The employers talked about going out of their way to accommodate the learners' needs for managing the on-job tasks and studying whilst at work, one employer saying, *"We have an 'Apprentice Room,' which gives him the opportunity to do study and I can help him out while he is on-site. I go through the unit standards with him and he gets good support from the team"*. Several employers explained how they have set up designated areas for the learners to study, one employer stating, *"This means he can do his study at work along with the other trainees and is not trying to study with books on his knee in the lunch room".*

Other examples of adjustments being made included encouraging the learner to take photos for her portfolio, so she doesn't feel rushed; having the learner work on their study books for short periods at a time; and pairing the learner up with another team member who understands dyslexia. One employer described himself as the learner's reader-writer. The employers' description of these adjustments intimated it was 'par for the course' to support the dyslexic learner, encourage them to achieve, and give them as many opportunities as possible to succeed with their work and study.

Employers' views of qualities and skills required to work effectively with dyslexic learners

The wealth of responses to this issue again indicated how much the employers respected the dyslexic learner as part of the team, acknowledging that at times the learner required additional help, and wanting them to be successful in their work and academic accomplishments. Comments included:

- Gain a good understanding of dyslexia and find ways to work with it
- Respect and consideration for the person
- Make sure they feel fine about asking if they are not sure about something
- Take time to work with them and help rather than leaving them alone and working on their own
- We don't treat him differently and accept him for who he is
- There is a strong culture of non-discrimination here
- Communication definitely – listening and talking
- Patience. Take the time to repeat instructions; give them the chance to think about it, then come back to talk it through
- Review. Encourage her to think about how else she could approach and complete the task
- Spend a bit more time with them
- Make sure they have the concept clear before they go away to complete the job.

Some of the employers offered additional comments at the end of the interview, which seemed to sum up much of what had been said across the employer group. For example, one employer said, *"Dyslexia is not an excuse, they are not dumb. It's an attitude thing. If you give them the skills to be like everyone else on the team, then they feel like everyone else and not different or on their own",* and another stated, *"He has his own area of responsibility now which he is managing really well. He has gone from strength to strength".* A final remark by another employer centred on the person within the learner, saying,

"I would describe her as amiable, slow-talking, with a slow temperament. She doesn't go at 100 miles an hour, is not scared to ask for help, is quite forthcoming, self-managing, proactive and pretty good at time-keeping. She is an asset in our team."

In summary, although all of the employers stated that they had minimal knowledge of dyslexia except in general terms and this was the first dyslexic learner whom they had employed, they described a wide range of practical and personal support mechanisms that they used to assist the learner in the workplace setting. From their feedback, there was a strong focus on a team approach, expecting the dyslexic learner to get support from everyone if or when they need it, and a real sense of employers genuinely wanting the learner to learn and succeed, in their study and in the workplace – *"We (the team) are all happy to support him and watch him grow".* As well as setting up designated areas in the workplace for the learner to study, many employers had put systems in place to provide routine, so that the learner knew what was expected and when to start and finish a task.

There was a clear expectation that the workplace environment and the learner's learning in this space is a two-way relationship, that is, the employer is more than willing to help but they expect the learner to ask for help if they need it as well. Their approach and attitude were about giving the learner responsibility and supporting them to achieve.

Discussion

"I would say it has been like 'seeing the light'. We can now have a greater understanding into why some learners struggle so much. We can now pinpoint and understand why they struggle and help them in a way that we couldn't before. We estimate 20% of our learners have dyslexia, so that means we can now understand and assist these learners much better than we could before."

(Project team member)

Through analysing the substantial participant feedback summarised in the 'Findings' and reviewing the literature on dyslexia, the project team identified eight key themes which encapsulate the overall learning from this project. These themes reflect the dyslexic learner's reality as they traverse multiple contexts, engaging in ongoing learning and development as they encounter, and respond to the challenges created by this condition in the classroom, workplace and home settings. The themes also indicate how significant stakeholders within these contexts can support the dyslexic learner in their journey, including the roles played by tutors and employers. These themes incorporate learners' experiences pre-intervention, as well as outline how the use of dyslexia support interventions link to learner success.

A. Eight key themes

1. Dyslexia is a persistent challenge to success and achievement for dyslexic learners in the tertiary setting

While over a third of the learner participants had been diagnosed as dyslexic prior to commencing tertiary study, the remaining two thirds had not. Those diagnosed were offered a range of support strategies including a reader-writer, additional learning and literacy support, laptops, more time to complete exams, and/or specific dyslexia support technologies such as Dragon Software. Regardless of the support offered, and the positive impact on their learning, all of the learners also reported a continuation of their challenges with learning.

There are two implications from this observation for tertiary education providers. First, **diagnosis and additional support is critical to the learner's success and achievement.**

All of the learner participants identified needing a level of support as tertiary learners. Most of them recall struggling at school as they did not know what was wrong. They mentioned several strategies they used to manage the demands of tertiary study, including technology tools such as Smartpens, Livescribe Pens, or having *"someone to assist",* such as reader-writers and additional tutorial support, with reading and spelling. A small number reported having access to and the benefits of laptops. One learner reported,

"I did 'reading recovery' at Kip McGrath until I had a panic attack. It was all a bit too much. When I entered college, I was part of their learning support for all five years I was there. That helped quite a lot. I only got it in year 11 when I got a reader-writer to help with tests. A mixture of the help and the problems got very frustrating. I have a good memory, but I couldn't get the words from up here (my brain) to my mouth."

The second implication is that, for learners, **understanding their dyslexia is essential to participate fully in their programme and increase likelihood of success.**

All learners reported an increased understanding of dyslexia from this project. Three identified that they had previously thought they were "an idiot" and "stupid",

but they now have a label to explain why they have difficulties in learning and in everyday life. Other learners reported the importance of understanding the reasons for their learning issues, and how this helped to reduce their struggle and appreciate the positive aspects of their dyslexia. Comments from two learners illustrate this:

"I understand why I have poor memory, why I am slow at writing and why spelling is hard, I understand myself better. I am really creative so that makes sense too, why things are difficult for me. It explains how I tick."

"It sort of opened my mind to say I'm not just stupid. I knew I had something. I learnt differently, and it answered a whole heap of questions I'd been asking for years. I just about cried with happiness. A light bulb went off almost straight away. Whenever I entered a new class I would state I had dyslexia to the teacher when I took them aside, so they would understand that although I learned differently I was just the same as any other student."

2. Dyslexia affects tertiary learners in a variety of ways

Most of the learners identified issues with recording, remembering information or instructions, and summarising written information. Twenty-five per cent needed more time to re-read, take copious notes and not rush. Reading and concentration, and issues with focusing, affected nearly 50% of the learners. They reported a range of strategies to assist them with managing these challenges, for example, learning from listening and watching, accessing Google during class, asking classmates for help, and participating in laboratories and tutorials. They also mentioned the importance of being able to ask (and receive) the tutor for additional support in their learning. Most cited issues with access to Google and YouTube while in class because of lack of time, trying to keep up with the tutor, or poor connectivity. In-class learning was a challenge for nearly half of the learners, one stating;

"It sounds really strange, but I don't really learn in class. I have to go home and work one on one in a quiet environment to help me understand it."

Twelve learners identified they learned best through visual learning aides, ten of them also using Google simultaneously to look up words used by the tutor. Having opportunities to interrupt to ask questions of the tutor was important. Fifty per cent of the learners preferred demonstrations and explanations to text and slide show presentations. A comment like "*I sit there and hope for help"* was not a common response; most of them engaged in numerous activities to actively engage in learning. For example, one learner said;

"I sit down and keep reading it until I figure out what they want. I ask people for an example of what they want. For example, an automotive company wants a SQL database which is described in two paragraphs. I find it hard to nut out what it is that they actually want. Like comprehension I suppose? If that didn't work, then what? I keep at it until I get it. I don't give up."

Clearly, it is important that **learners are supported to use whatever additional aids they require in class**, so that they can actively engage, rather than being forced to take a more passive role and wait for offers of help.

3. Tutors need a range of skills and teaching strategies to best support dyslexic learners

The learners reported numerous strategies used by their tutors which they found effective in helping them learn in and outside the classroom environment, including:

- Be aware of and encourage the learner to get tested for dyslexia

  "I always thought there was something wrong from when I was a kid and I was told I was stupid and you'll never amount to anything and as a kid you believe it. I should have brought my school reports in because you look at them and wonder how come it was never picked up. I am absolutely relieved to know. My tutor has said that my intelligence lies in different places to the mainstream and I'm not stupid."

- Ask learners individually if they need to know something and give one-to-one support
- Use visual resources and videos as often as possible and post material to the Learning Management System (LMS) for learners to access
- Be well prepared, go over theory, reviews, assignments and tests again
- Provide and encourage group work and peer support

  "For example, we were asked for some nutrition information on vitamins and minerals. The tutor told us all, and I didn't understand, so I asked my classmate. She (the tutor) said "No! I've told you. Just go and do it!" so when she walked away I asked (my classmate) and got what I needed. I just needed a different way of explaining it. Some people just repeat the same thing which doesn't work if I don't understand the words. You need to use different words."

- Use lots of kinaesthetic exercises, demonstrations, laboratory activities, mix and match, practical sessions using real-life situations and interesting research

  "Labs are easy because they just ask you to do things and I am good at doing. I understand everything they ask us to do – it's just difficult to get it out onto a piece of paper."

- Able to communicate well – talk slowly during presentations, explain things as they go, be approachable, and send helpful emails

  "I can't take notes fast enough in class or while I'm processing verbal stuff. Sometimes I record it on my phone so that I can play it back at home and get the notes. Or I take pictures with my phone of the board."

- Embed learning strategies in their teaching, for example: encourage learners to take photos of the white board and use internet apps and mind maps;

write notes on the white board and explain verbally; use colours, borders, fonts, and reduce busyness of work sheets; and give the big picture before describing the detail

"My tutors always say we can have a chat with them. They recommend peer tutors if needed. They are quite easy to talk to. Nice people, but because I have dyslexia and haven't mentioned it to them it may not make a difference because I don't think they have been taught how to teach dyslexics. I get there eventually."

"I have to read stuff many times to understand, to get past just the letters and the words. Letters to words to sentence to what it means and then I know what it's asking me. If I know in advance what it's about and what's about to be asked of me I don't have to read the whole question. I have a very good memory. My family have jaw dropping moments when I remember something in detail."

Teaching and learning strategies teachers found worked well for dyslexic learners included:

- Using pictures and diagrams in the content
- Small groupwork and tutorials
- Reviewing content, assignment requirements, and theory
- One-to-one support
- Giving them extra time
- Incorporating Google searches and YouTube videos as learning tools
- Asking them what they need, what will support their learning.

Two implications central to effective teaching delivery here are: **teachers need to understand the condition and talk to their learners about what approaches work best for them;** and second, **teachers need to include variety in their delivery techniques**, just as they would do to cater for a range of learning styles and preferences (e.g. visual, auditory, reading/writing and kinaesthetic).

4. Learning technologies are essential to assist dyslexic tertiary learners

Learning technologies were identified by over one-third of the learners as useful interventions for supporting their learning in the classroom and workplace. This was in comparison with the other learners who identified other interventions as supporting them such as reader-writers, mentors, and taking photos and writing down instructions.

Smartpens, Google, and smart phones were the top technologies used, followed by Siri and using a laptop. Technology helps with spelling, reduces frustration, makes note-taking easier, and predictive text is helpful, quicker and easier. Cell phones, the internet, and audio books were all mentioned singularly, but a few learners voiced some hesitancy over making too many assumptions about the value of technology. One example offered was that searching online for information or resources was a challenge for learners with dyslexia not recognised by their tutor;

"They have a great line to "search it out yourself on Google". For me, I feel I don't have time to do that and I might find the wrong thing. I need more time to nut out the specifics of the assignment. Some have said "we can't keep spoon feeding you". I thought they should have it there for us to learn rather than go look, find something and then learn. Frustrating."

In the home environment, cell phones, a quiet space, having their own study space, and family support were all identified as supporting their learning. Assistive technologies were used at home but not as extensively as in the classroom or workplace, one learner saying that they did not use a computer at home or work as this increased their anxiety and panic.

Again, the implication for teachers is the need to recognise that no two learners are the same, and that solutions which work for one, will not necessarily be as effective in supporting another. **The use of learning technologies needs to be driven by, not imposed on, the learner.**

5. Assessments are highly stressful for dyslexic learners and need to be fit for purpose

More than half of the learners identified issues with assessments, describing these as "exhausting", "repetitive", "boring", "pretty hard", and "stressful".

Written assignments were particularly challenging for most learners, creating a feeling of being overwhelmed and highly stressed. Verbal assessments were described as easier to manage, especially presentations. The learners thought that assessments needed to be in plain writing, otherwise they required a reader-writer to help interpret the task. Additionally, several learners thought it unfair that they were marked down for incorrect spelling and grammar.

Assessments are designed to measure learning, and their ability to do so needs to be unimpeded by their formatting. **Assessments need to be flexible and designed and administered with the needs of the learners – all the learners – in mind.**

6. Learning support strategies that work in the classroom are similar to those that work in the workplace

Responses from the learners who were studying and working mirrored those offered by the learners in the classroom learning environment. As with the need for their tutors to take time to find out what they need and go over learning material, these learners relied on their supervisor or manager to explain the job task and repeat instructions. They talked about following a process of trying out the job task first, watching someone else do it, and trying again. Self-support strategies included:

- Searching on Google

- Looking up information on a smart phone
- Using Siri and Smartpens
- Keeping a detailed planner for time management
- Starting a task as soon as possible
- Writing information and instructions down to support recall.

"Getting on to the task earlier rather than later is helpful. Managing my time. Not being afraid to ask for help when I need it. Really putting in as much effort as possible. I'm very pedantic about my work and insist that it has to be just right, and it helps in a kind of way."

The underpinning attribute of effective teaching and training is patience. Dyslexic learners may require a little more input, but their focus on the task and determination to get it right ensures a better outcome, long-term.

7. The impact of family, parents and partners is a key element of success for dyslexic learners

Learners who had 'significant others' to support them at home credited a significant part of their success to this. One learner stated, *"I wouldn't be anywhere without that woman"* (referring to his mother) and another said, *"I could not have done it without my partner. She helps me with the spelling and writing".* Several learners referred to their parent as their mentor.

Home was described as *"a good place to study"* as it provided a quiet space, with family available to help, and where the learner could take as much time as they needed to learn. Several learners talked about using the quiet home space as a place to use audio visual resources to supplement the learning experience, although internet connectivity and access could be an issue. Commonalities about what learners liked or found helpful within this theme included:

- They are relaxed, in a quiet place, and listening or watching
- They can listen to music while they study
- They are observing and have opportunities to ask lots of questions
- They write on their own white board and read aloud
- Their family takes the time to help them
- They can use diagrams, or be tested on flash cards.

"My father actually takes the time to help me. He shows me how to do it first, watches me do it correctly and then leaves me to do it. He does more like drawings and diagrams, equations, formulas. He tests me on my flashcards. He supports me in general and that makes it easier. It's so much nicer and quieter at home."

The implication for education providers here is the need to create a learning environment with a similar 'feel', that is, quiet spaces, media rooms and withdrawal rooms for one-to-one coaching.

8. Leadership is a key determinant of any initiative to support dyslexic learners

The value of strong organisational leadership, along with the presence of a policy framework and/or central government funding and legislation plays out at several levels. Firstly, within this project, it was obvious that the existence of an in-house champion to drive the project in each of the team organisations was essential, however this level of support was not consistently provided across the five organisations. The team members were capable, talented and passionate people, but did not always receive the support from their leaders, which impacted the full enactment of the project on their site. If this was so for qualified, experienced and articulate practitioners, how much more of an impact does a lack of interest or momentum from senior management have on learners and resourcing?

Physical settings also made a difference. The project team observed that providing support for dyslexic learners is much more straightforward in educational institutions with a campus, as opposed to those – like ITOs – that do not have campuses. Training advisers visiting sites have constraints around time and location access that further exacerbate this effect.

At a national level, Government policy, priorities and agencies are also crucial to a stable funding framework for supports and aids. Several teachers and employers noted that the support from funders such as Workbridge was central to the interventions that could be provided for dyslexic learners. The private sector too, has a part to play, with the technological advice and service received from companies such as Desktop Technology Services Ltd., cited as one example.

Another observation from the project is that it can't be overlooked that leaders and managers are people, with family and community connections. Within the project, several employers identified as dyslexic or as having a dyslexic family member. These people understood the nature of dyslexia and responded with understanding and empathy towards the learner, leading the culture within their workplace by example. Clearly learners in these settings enjoy an advantage of fewer barriers and a more receptive ear to requests for additional time or repeated directions.

How to replicate this commitment? The project team had attempted to address the gap in the understanding of dyslexia at management level by creating the opportunity for the lead researcher to brief senior executives at the other four participating organisations and promoting the dyslexia workshops which team members attended. Some gains were clearly achieved: for example, all management groups signed off on participation in this co-funded research project. Yet, as described in the following 'Limitations and Challenges' section, attention shifted from the needs of this learner group, as other priorities and imperatives intruded. **Long-term, sustained interest and support for learners with dyslexia needs both an internal champion and ongoing professional learning development to build institution-wide, and 'top-down', understanding and empathy.** It takes a definite period of time to instil a culture of

"The value of strong organisational leadership, alongwith the presence of a policy framework and/or central government funding and legislation plays out at several levels."

support for people with learning differences inside an institution. Institutions that have a pre-existing culture of understanding about dyslexia therefore have a head-start in a project like this.

B. How dyslexia support interventions link to learner success

The core focus of this project was investigating the benefits and challenges of dyslexia support interventions and strategies as they impact on learner success. Feedback from learners, teachers and employers on the outcomes of using a range of interventions over the period of a year emphasised the following:

- Technology has a strong role to play in helping with numeracy and literacy but is not a one-size-fits-all solution. Different learners respond differently to particular tools and applications, so that to fully realise the gains to be made from educational technology aids, the learner needs to be informed about options, and empowered to choose. Training and support may also be required before the learner can utilise the tools to their potential and become fully autonomous and independent.
- Reader-writers, mentors and learning support people were valuable assets (often described as 'invaluable') in assisting the learners in the classroom environment. However, access and availability require a commitment to resourcing from organisational leadership, often beyond the control of individual learners and teachers.
- Teacher education is critical. Across the project team and the teacher participants in this study, there was complete accord that teachers, tutors and training advisers need to have more knowledge and awareness of dyslexia, so that they use activities and approaches that assist dyslexic learners to learn. The parallel observation is that without this understanding, teachers may be inadvertently creating a learning environment that actively impedes these learners' opportunities to learn.
- Teacher upskilling in modern pedagogy is also important. Almost all, if not all the principles of good practice in adult education that support all learners, are especially applicable to learners with dyslexia. This includes the importance of building relationships of respect and trust, recognising prior learning, catering for a range of learning styles, making learning practical and relevant – and more (Honeyfield & Fraser, 2013).
- A final point to make here is that whatever interventions are put in place, nothing will cancel out the condition. Learners will not train their brains to switch off dyslexia, nor will they outgrow it. Learners themselves know that issues with reading, writing, numbers, spelling, and interpreting questions and gauging meaning, will likely persist life-long and affect their functioning life-wide: at home, in the classroom and in the workforce. Learners want to be seen as people, not problems, and they want their successes to be recognised, and their efforts appreciated.

However, poignant comments made by three learners reflect the challenges dyslexic learners face daily:

"I find it really frustrating how no one seems to understand the amount of energy me as a dyslexic person has to put in versus normal people. I work at least 100% harder and not to get the results out. Some people are naturally brainy and lazy, and they get good grades out. And I put in 110% effort and it is physically draining."

"People don't even recognise the effort I put in. If they saw me at home they'd see my parents having to physically stop me from working."

"I don't really think it's up to other people – it's up to me. She could recognise that I'm asking questions to understand and if it isn't interfering with other people's learning it shouldn't matter. It's not meaning she's doing anything wrong, just it means something is missing. I have the same goal – to graduate. It's been the same issue throughout my learning with all my teachers. It's quite funny. I know people get frustrated, not necessarily with me but the condition and I think 'what do you think it's like to be me living with it?'"

C. Project team reflections

"The project has been received positively within our organisation. The GM was motivated to see our organisation become dyslexia-friendly and cater to the needs of dyslexic students. I think as an organisation we are much more educated in what dyslexia is, how to work with students who have dyslexic tendencies, and tutors are now motivated to get learners tested, so they can better assist them. The learners are now receiving more specialised support and tutors are equipped to help dyslexic students." (Project team member)

There were several important outcomes we aimed to achieve when we proposed this project. Each of these have been achieved to varying degrees, evidenced by statements from the project team members. The five outcomes are:

1. Increase awareness, understanding and knowledge of dyslexia of stakeholders in academic and workplace contexts

Early in the project it became apparent that there was an increased awareness of, and attention to, dyslexia in the team organisations. For example:

"There has been a deluge of DASTs completed and initial interviews are in full swing." (Whitireia)

"People are excited about dyslexia. There is a marked increase in the conversations being had with tutors, students and within the project team. Project members are taking every speaking opportunity to spread the word about dyslexia. Increased knowledge and awareness of dyslexia across the organisation, but in particular with tutors." (Project leader)

"An increasing number of learners are coming forward to reveal their dyslexia and to seek assistance with it. In

many cases it has had the impact of changing a learner's attitude to learning. Many learners have been empowered by the increased self-awareness that a screening has provided." (Whitireia)

"It is vitally important that everyone including the dyslexic learner makes changes to the learning environment to ensure success." (Primary ITO)

"It has raised awareness of dyslexia, through the students themselves, conversations with their tutors, and through the training workshops. It was quite a substantial time commitment to do all the interviews with the students, but the interviews were intrinsically valuable for the students as they felt heard, their contributions were valued. It was incredibly valuable for the interviewers too." (Project leader)

"There has been a growing awareness especially from field staff who used their knowledge of the research/ project to further ask questions of me, late into the project, and to see if we were still screening learners." (ServiceIQ)

2. Increase the capabilities of stakeholders, including project team members, to identify dyslexic learners and implement strategies to effectively support them in their learning journey

A considerable growth in capability has occurred across all participant organisations, involving not only the project team members, but also teaching colleagues and support staff:

"Strategies to support tutors have been put in place – they have been given a plan for each student, with which tools to trial, and were sent a short video as to how to use the tools. Some tutors have done a fantastic job and have trialled the tools." (Capital Training)

"I think the DAST diagnosis is heartening to have and acts as a planning tool. Learners who have been identified feel better cared for and supported. They are hugely relieved and validated to know there was a reason why they were struggling and that they could use some strategies and technology to function more effectively in class." (Whitireia)

"The positives have been that we have been able to help a lot of students, as we were able to identify that they were strongly at risk of dyslexia, and were able to assist them, which has had a huge impact on them now and moving forward." (Whitireia)

"Upskilling in the use of the DAST continues within the five team organisations. A process to train project team members in the use of the DAST was developed to enable future DASTs being undertaken in their respective organisations." (Project co-leader)

"Before the project I did not have any experience assessing dyslexic learners. After receiving training on the DAST assessment, it was a learning curve to administer the test, but after testing a number of learners, I feel confident using the assessment." (ServiceIQ)

"A large number of the staff in each institution have had an introduction to dyslexia. For many of them it has filled in some significant gaps in their knowledge of their learners. All staff trained now have a set of skills on how best to recognise dyslexic learners and how best to support them with their learning. They are becoming familiar with the use of a range of technologies, learning from the students; for example, iPad, voice-to-text, Google voice search, and Natural Reader software." (Capital Training)

3. Influence organisation decision-makers about the worthiness of enabling tutors and other organisational stakeholders (learning support staff, training advisers) to support dyslexic learners' success

The project team agreed from the outset to take any and all opportunities to promote the project internally throughout the two-year life cycle, rather than to wait until data collection was complete and then to disseminate findings. This has proven to be a successful approach, with a lot of interest and support generated, meaning that staff beyond the project team members accessed training and overall became more aware of this group of learners in their classrooms:

"My experiences have been very positive, and it has been a real privilege to support other organisations to assess and put support in place for their dyslexic learners. The project has been a wonderful collaboration of various organisations and we have been able to get real insights as to what support is being provided – and needs to be provided – for dyslexic learners." (Project leader)

"Initial information sharing about the project with other staff in the organisation has been well received. There definitely seems to be a 'step change' among managers regarding their acceptance of the project." (Skills)

"The dyslexia training workshops were an open invitation to all staff within the organisation. Feedback from participants has been very positive and indicated a desire for further professional development opportunities on how to effectively support dyslexic learners." (Project leader)

"The message that Whitireia supports learners with learning differences has gone right though the organisation, with students doing third year nursing degrees now showing up for support. Needs and support are not limited to those on lower level courses." (Whitireia)

"Increased knowledge and awareness of dyslexia across the organisation, but in particular with our youth guarantee tutors, and a greater interest by them in learning difficulties generally, and how we can better support our foundation learners." (Capital Training)

"There is less institutional resistance to accommodations for these students – e.g. extra time in exams." (Whitireia)

"We went from project to business as usual (whenever we can get screening completed). We know who to call, who to talk to and which websites have the best solutions. The organisation is much more open to discussing learning differences with each other, with our clients and with some learners." (Skills)

4. Trial different dyslexia support interventions with dyslexic learners and identify what supports dyslexic learners in the classroom, workplace and at home, and what doesn't

The trial was aided by the flexible project design, which enabled learners to select their own preferred interventions, as well as the action research framework and project logic model which both called for continual reflection and fine-tuning. This meant that project organisations encountered a wider range of interventions than they would have if we had selected a smaller set of options and required everyone to trial the same strategies.

"For us as an organisation, realising that so many of our learners have dyslexia was a key finding. If we really wanted to help this large group, it was imperative that we understood dyslexia and learned how best to help these students. The tools we trialled have had variable responses. Some tools worked incredibly well for some, and not well for others." (Capital Training)

"We have placed a considerable emphasis on getting the technology from Workbridge to support learners. It is one of the steps in our wrap-around support of the learners. Also:

- *For many learners the technology is valuable and important*
- *For many learners the supports that are on their regular iPhone is almost as useful as a smartpen*
- *The concern is that a lot of smartpens just sit around unused because no-one has shown the learner how to implement them*
- *For many learners, the personalised support of a person to assist them change their mindset about their capacity to learn is a great intervention it its own right*
- *I am finding that the advice and guidance to their employer, their parents and their tutor is as valuable as many bits of hardware."* (Primary ITO)

"When it comes to assessments we should move away from written assessments much more than we do currently. There are four related but different elements to this:

1. *The assessment question should be asked orally, not in written form, as often as possible. Too often we find that dyslexic learners knew the answer but did not understand the way the question was worded.*
2. *As often as possible we should have questions answered orally, or by demonstration. Gathering evidence is no longer a problem. There are plenty of ways to assemble a portfolio of evidence now with oral recordings and video recordings.*
3. *It is completely unreasonable to expect a learner to write a screed of text to show that he or she understands something, or can do something, if the only time they need to write about it is to answer a question to demonstrate competence.*
4. *Moving to non- written answers will significantly level the playing field for dyslexic folk."* (Project leader)

5. Review the original primary ITO dyslexia support wrap-around model in light of the project findings

The wrap-around support model that was initially developed by Primary ITO (Figure 1) has evolved based on the project findings. The original five-step model incorporated:

- Step One: DAST testing to establish an 'at-risk' result
- Step Two: Provide the learner with information and strategies
- Step Three: Acceptance of condition, and action plan
- Step Four: Share diagnosis with wider stakeholder groups
- Step Five: Support interventions in place.

As discussed earlier, the project team had always seen the learner as at the centre of all initiatives to improve outcomes and shift practice. The use of the DAST tool, and the value of the results as a basis for planning interventions was also endorsed by our findings:

"It is incredibly empowering for students when they are given an 'at-risk result' of dyslexia and what a positive impact this has had on them. It's been great to see them benefiting from the tools we are trialling." (Project team member)

In many ways, this project has explored Step five, the possible support interventions, adding a layer of 'what' and 'how to' to the findings from the earlier Regional Hub findings (Styles et al., 2014-15). But it has also gone further. As the learners' feedback highlights throughout this report, dyslexic adults have a lot of natural resilience and coping skills, and many have developed their own

support strategies. The model now encompasses the dyslexic learner's self-knowledge and self-support which reflects their determination to succeed in their learning and improve their life. The revised model incorporating this change (Figure 4) is presented in the 'Conclusion, Outputs and Future Plans' section, below.

D. Project challenges and limitations

"There was a long wait between screening the learner and confirming the dyslexia, and finally getting the equipment to them. Often this meant that the momentum we had generated by the screening and the provision of information during the first interview was lost in the long wait until the equipment arrived." (Project team member)

Several challenges were reported by the team members as they progressed through the project phases. These challenges had a significant impact on the timing of data collection and the team members' ability to conduct the learner interviews as originally planned.

Some of the challenges experienced were common to all five participant sites, and some were specific to the organisational context. For example, whilst Whitireia was able to track the learners' progress through the one-year trial period and complete the post-intervention interviews with these learners, the reality for the ITOs and the PTE was quite different. A major challenge for the ITOs and PTE was the large distances between the learners and their training advisors and tutors. This made face-to-face communication difficult and infrequent. The support required to get the technology to an individual learner, show them how to use it, and provide ongoing support was therefore problematic. This 'tyranny of distance' is an ongoing reality for ITOs, PTEs, and their learners.

Then too, there was the reticence of some teachers to use the tools and collaborate with the learners who were trialling these tools in their classroom, even though they had embraced the concept – in theory. Table 9 identifies the key challenges that were reported by the project team from the commencement of the project through to its conclusion.

The project team had foreseen some of these challenges, such as gaining the learners' interest and willingness to participate in the project, and had built in approaches to mitigate this risk, with generous time-frames for participant recruiting and screening. Although all learners undertaking the trialling of support interventions were keen to be screened, and several learners talked about how the result was heartening to have, still more were too shy or embarrassed to participate or changed their minds about participating. This meant the number of learners participating in the project could have been much higher, although the team were still pleased with the figure of 107 who did take part, in line with the 80-100 stated in the original proposal.

Early in Project	Mid-Project	Ongoing
Process from screening to interview to intervention trialling took longer than anticipated	Reluctance of tutors engaging in the project in relation to being observed in the classroom environment	Time constraints: A 'team of one' conducting all screening, confirming project participants, interviewing and monitoring learners trialling the support interventions
Tutors not recommending learners for screening	Tutors slow in implementing support strategies	Turnaround of Workbridge (funder) for providing support tools excessively slow
Locating tutors and employers willing to participate	Tutors slow in working with technology tools	Minimal support/championing by team organisations
Learners screened as dyslexic too embarrassed to participate in the project	Disrupted work environment and services to learners (due to the Kaikoura earthquake)	Cost of support technologies prohibitive
Steep learning curve for project team members to feel comfortable using and interpreting the DAST	Reluctance of tutors engaging in supporting dyslexic learners	Lack of trained staff within the organisation to assist with screening and action planning with the learners
Signing up learner participants	Employers withdrawing from the project	Rolling learner intake
No screening tool in the organisation. Reliance on coordinating with Primary ITO to supply	Tutors didn't trial any support tools with learners, resulting in some learners left without being assisted	The reluctance of some organisational members to learn how to assess their own learners – more of a nervousness – and some are still requiring support to assess
	The time taken to assess, follow up and interview learners for the project was punishing	Training the learners on use of support technologies not provided
		Remote connection between learners, tutors and training advisors

Table 9. Key challenges

Other delays were more difficult to manage, such as the delay in applying for the technology tools (via Workbridge), having the funding approved, and receiving the tools several months later. For Whitireia, an extenuating circumstance affecting this delay was the Kaikoura earthquake which struck Wellington in late 2016. The earthquake magnified the problem as Workbridge faced a significant backlog in applications to be processed. The flow-on effect of this was that learners lost their initial excitement and, for some, did not receive the technology support tool within the project data collection time-frame.

Employers were an important stakeholder group in the project, and the team had expected they would need to manage withdrawals, even after employers had signalled their initial interest in participating, and recruit replacements. What perhaps hadn't been anticipated was the number of employers who were sole proprietors, or small enterprises. All team members reported some difficulty confirming and communicating with employer participants, who were *"Busy and difficult to tie down"* and *"Often a 'man-in-the-van' situation".*

Finally, there were some internal negotiations required. Some of the team members worked solo for the project duration and were reliant on other staff – for example, Training Advisers – in their organisation who were 'closer to the ground' in order to identify and access dyslexic learners. Reliance on other staff, outside the project team, interfacing and networking with employers and tutors influenced the rate of confirming participants for the project within the timeline originally planned and continued to affect timing for the later interview rounds. The project team agreed that, ideally, communication and process worked better when a team member was able to manage participant access directly, rather than rely on an intermediary with less of a vested interest in meeting deadlines and maintaining contact.

Despite these economic, political and structural challenges, the team felt that the core concept of the project had been retained, and all key objectives met. The only important impact of the challenges and limitations outlined here was the loss of the final twelve-month exit interview of learner participants by the ITOs and the PTE, relying instead on the interview data from the three-month and six-month interviews. Depending on the intervention(s) selected, this did mean that in cases where the technology had required funding from Workbridge, there might not have been a lot of time spent using the tool (Tables 6 and 7). Comments contributed here may well have reflected first impressions rather than longer-term proficiency; it will be interesting to include observations from team members' organisations in future Impact Evaluation Reports and the dissemination of findings.

"One of the most notable findings was that the learners had very clear ideas about strategies which helped them learn, and the things teachers and employers did which helped, and those which did not."

Conclusions, outputs and future plans

7

"My knowledge has exponentially grown, and I now feel that I have a much better understanding of what dyslexia is, how to diagnose it, and how to assist dyslexic learners. I also didn't realise how common it was prior to commencing this project."

(Project team member)

Learnings from this project can be attributed to all the participants and stakeholders including the learners, tutors, employers, project team members and their respective organisations. Continuing challenges to and positive changes in their learning across multiple contexts were reported by the learners as they were tracked, monitored and interviewed throughout the one-year intervention trial. Many of these challenges and changes were also identified by the tutors and employers as they were asked to consider what support they thought the learners needed in the classroom and workplace, and what support they provided and/or adjustments they made for them.

The learners who were tested and diagnosed as dyslexic at the commencement of this project talked about how much they appreciated having an explanation for the difficulties they experience in their learning and in life generally. Many of them had been called *"lazy"* and *"stupid"* by previous teachers and/or employers. Interestingly, some of the learners continued to denigrate themselves in the interviews, making statements like, *"Any idiot can do this"* and *"An idiot should know this stuff. A baby would know this".*

The employers and tutors who were interviewed for the project all identified ways in which they supported the dyslexic learner, which reflected comments made by the learners. There was an obvious care and concern for the learner to succeed both academically and on the job.

As reported, several learners identified a family member or partner as a significant support for them. Empowering, supporting and providing information to those family members close to the dyslexic learner is a valuable and inexpensive way to support the dyslexic learner.

The team hope, and fully expect, that the revised model (Figure 4) and the outputs (Table 10) below, resulting from this project will change practice and outcomes for learners with dyslexia, and for those who work with them, as the programme of dissemination already underway gathers momentum. But change has already occurred within the project team, and the colleagues they work alongside. This project has been a huge force in consciousness-awakening, as testified to by the opening quotation in this section, and the two which follow:

"I think that now I have a good grasp of the positive aspects of dyslexia, practical interventions at tertiary level, possible assistive technology solutions, and a huge appreciation of the experiences of dyslexic adult students." (Project Team Member)

"Dyslexic students need support in literacy-learning tasks and thinking strategies. Their strengths may include problem-solving, making connections, enhanced creativity, and an ability to see the big picture." (Project leader)

Demonstrable impact

The true value of this project is not just what was discovered about dyslexia and how best to support dyslexic learners in a range of tertiary education and work environments, but the contribution the project makes to advancing a wider awareness and understanding of dyslexia both in the tertiary education sector, in the workplace, and in the wider community. Some examples that amplify this breadth of impact include:

1. Literacy Aotearoa is currently engaging in a major project to support graduate plumbers with learning differences to pass their final examination, in collaboration with the Plumbers, Gasfitters and Drainlayers Board.
2. Ongoing training workshops have been facilitated with vocational training providers who deliver training for the Skills Organisation. One provider has taken up the challenge of becoming a dyslexia-friendly organisation.
3. The Department of Corrections are now considering a project to screen 100 inmates for dyslexia. This is a major initiative that has the potential to change the nature of prisons in New Zealand.
4. Dyslexia training workshops delivered as part of this project are generating an increasing number of inquiries from training providers, tertiary institutions and other vocational education organisations.

The project has also attracted international attention from dyslexia and learning differences associations around the world. The progress of the research was presented to conferences in the United Kingdom and Europe, and the final report of outcomes is to be presented at a conference in Telford, United Kingdom, in April 2018. An abstract has been submitted to present a paper at the National Vocational Education and Training Research Conference, co-hosted with New Zealand partners, the Industry Training Federation and Ako Aotearoa, in August 2018, in Sydney. Other project highlights can be reported, in particular activities and events that occurred external to but as a consequence of the project. These include:

1. Article published by Mike Styles (project leader) in the Human Resource Institute of NZ (HRINZ) journal.
2. Article published by Mike Styles in the NZ Plumber magazine.
3. Whitireia team members receiving comments from the public mentioning how their dyslexic children are now receiving targeted support at Whitireia.
4. A dyslexic learner success story written for Ako Aotearoa.
5. Article published on the NZ Tertiary Education Commission website describing the support provided to a dyslexic drainlaying apprentice in the Waikato.
6. Paper presented on ‘People who learn differently’ at the First Year Science Educators Colloquium at Victoria University, Wellington, in November 2017.
7. Presentation at the New Zealand Vocational Education and Training Research Forum in October 2017.
8. Presentation to a Skills Highway event in Christchurch, October 2017.
9. Content produced for Skills Highway website on supporting dyslexic learners and employees.
10. Appearance for World Dyslexia Day on Seven Sharp, TVNZ.
11. Several in-house workshops presented to training providers who are contracted to the project partners including: Manukau Institute of Technology (MIT), Auckland; The Electrical Training Company (ETCO), Wellington; Masterlink, Wellington; Taratahi Agricultural Training Centre, Wairarapa.

Within the project team organisations, momentum is also evident. For example, screening of learners has continued at Whitireia, reporting that 50 learners have now been tested since the start of the project. In Primary ITO, the screening is extensive, with complementary learner achievement in qualification pathways and attainment. Since the project commencement:

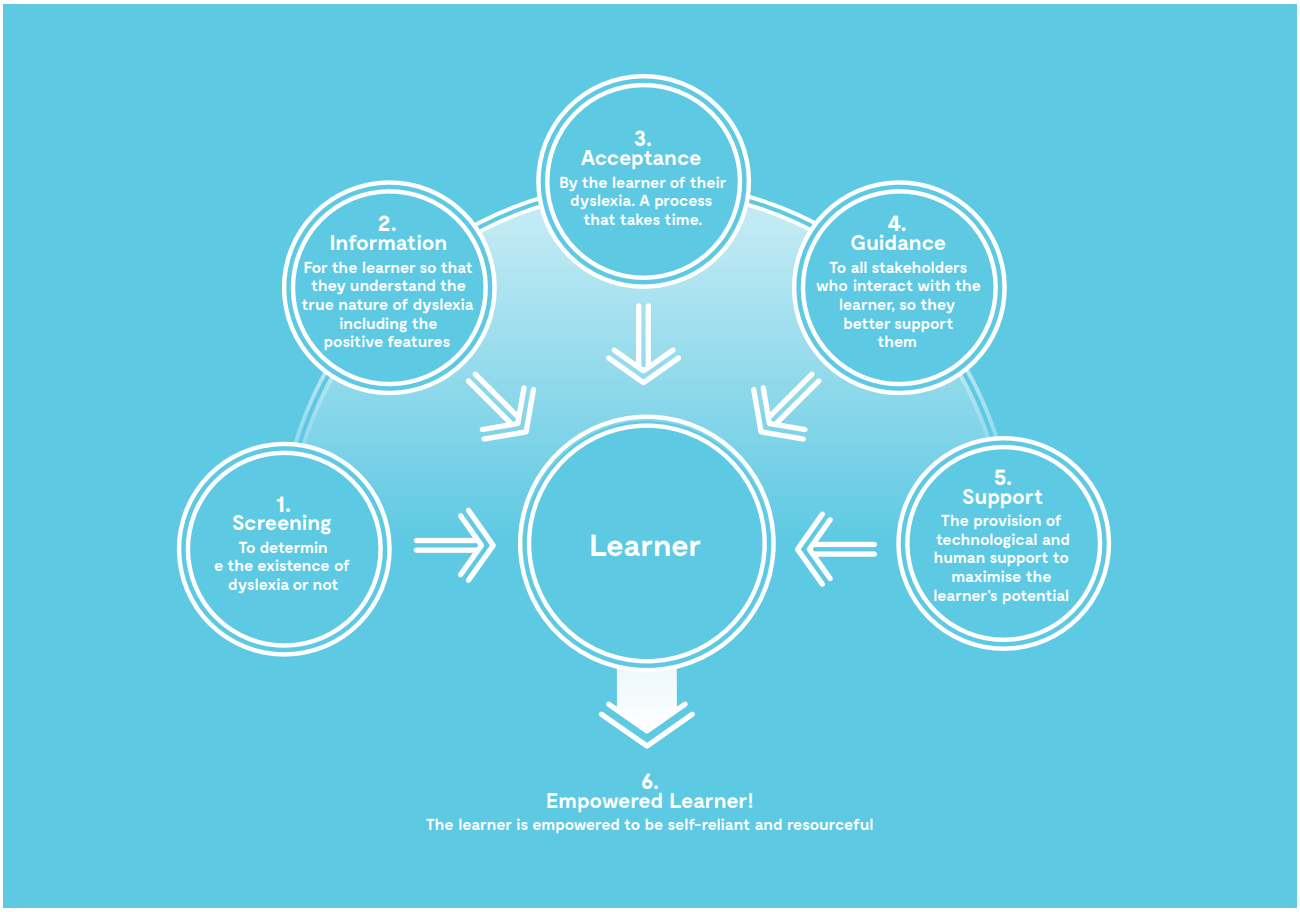
- 118 learners have been screened for dyslexia
- 96 learners have been offered Workbridge funding of which fourteen withdrew from training or changed sectors
- 82 learners have received Workbridge funding support
- Of the 118 screened, 61 are still actively involved in training; 55 have gained a level 2 qualification; 64 have passed a level 3 qualification, 11 have completed a level 4 qualification; and 40 are either working towards a level 4 qualification or have completed one.

An updated model

Our inquiry specifically referenced the original Wrap-around support model developed by Primary ITO (Figure 1; Styles et al., 2014–5) and sought to evaluate its fit across a wider range of vocational education providers. As the team reflected on early findings, as well as our own observations, we agreed that the model’s first five steps were still essential; we also affirmed our desire to keep the learner at the centre of all activities undertaken in their interest. What we did become more aware of as this project unfolded, was the importance of the dyslexic learner’s self-knowledge and sense of what they need, and what works best for them. We determined that what the model required was a sixth step, recognising the very real and achievable end goal of an independent, autonomous and empowered learner.

In the Revised Dyslexia Support Wrap-around Model (Figure 4) there are two opposite shifts in the locus of power and control. At Step One, the teachers, tutors or training advisers administering the DAST test are firmly in charge. They know the tool and how to read the results and inform the learner about the outcomes – whether or not they have dyslexia. But as the learner gains an understanding about their condition, accepts it and

Fig 4. Revised dyslexia support wrap-around model



starts to explore strategies and technologies that will assist them in their daily life, they become increasingly empowered to direct their own choices and paths. By Step Six, the scaffolded support is either not needed, or is very much part of the background. It is time for learners with dyslexia to shine!

A final important point to make is about what's *not* in the model; there is no mention, nor should there be, of any particular learning environment. The project findings confirmed very clearly that each learner is unique, just as previously identified in the literature (e.g. New Zealand Ministry of Education, 2008). They have their own experiences, preferences, struggles and strategies, and their responses to the various interventions trialled, even where commonalities occurred, were quite personal, as evidenced in the direct quotations from interview transcripts. Working through the steps in the model is therefore always about the individual, and *their* dyslexia experience. The model is not peculiar to any single sector: ITP, PTE, or ITO.

Outputs

A key objective of this project was to identify support strategies that worked for the learners, tutors and employers, and translate these into accessible resources.

Development of dyslexia support resources commenced early in the project. The project leader, Mike Styles, had already created several resources and training materials prior to the project commencement. These were utilised in the project and further developed iteratively in response to the participants' feedback. Table 10 provides a list of the resources including a brief explanation of how the resource can be utilised and the relevant stakeholder group who will benefit from using them. The resources are downloadable as complete packs in conjunction with this report.

Implications and applications

This project has highlighted that knowledge and understanding of dyslexia was limited across the employer and tutor participant groups. With many employers stating they had little knowledge of how dyslexic learners operate within the non-dyslexic world, this report and the project output 'Employer Good Practice Guide' will give them strategies and tools for supporting dyslexic learners in the workplace environment. This should create a more positive working and learning experience for dyslexics to the benefit of both themselves and their employers.

This report also highlights the fact that if teachers had more access to supportive technology, and training

Resource	Explanation/Utilisation	Stakeholder
Good Practice Guide: Advice for employers on how best to support dyslexic learners	This is a distillation of the best international information on how best to support employees who are dyslexic	Employers
Good Practice Guide: Best practice for tutors to support dyslexic learners	A summary of best practice guidance for tutors, garnered from the project and from international information, to assist in providing the best possible service to dyslexic learners	Tutors
Tell-tale signs to recognise dyslexia	A guide for both learners themselves and all those who interact with them, sharing all the tell-tale signs of dyslexia, so that dyslexic people can be identified as quickly as possible and referred for screening and support	All
Sharing dyslexic learners' self-management tips and tricks	A guide for dyslexic learners and/or those who interact with them – to support dyslexic learners maximise their circumstances and their potential	All
Positive Dyslexia in Adults Information	An affirming statement of the positive elements of dyslexia; designed to assist the dyslexic learner, and employers, family and tutors who interact with them	All
Dyslexia support interventions matrix, detailing the what, why, how and for whom, of strategies and tools that support dyslexic people	A guide detailing the range of support interventions that assist dyslexic learners	All
DAST Training Guide and Information Sheet for DAST Screening Assessors	A guide, to assist staff of ITOs and tertiary education institutions, on how to administer the Pearson DAST	Organisations, learning support staff

Table 10. Dyslexia support resources

in the use of this technology, they would become more inclusive and effective teachers to the benefit of all learners. The contribution of the 'dyslexic voice' throughout the project advances the concept that people directly involved with the dyslexic learner – mentors, tutors, training advisors, family members, and employers – need to understand the difficulties and frustrations a dyslexic learner faces, in both an academic and workplace learning environment, in order to better support them.

Future plans

The project has spurred several changes in the project team members regarding the actions they intend to take in the future in increasing organisational awareness of dyslexia and their own involvement in supporting dyslexic learners. These are included as examples of different ways in which organisations may proceed. It is important to note that all participating organisations recognise the need to keep options for intervention selections open; there is no single tool or technology which once purchased, will work for all learners. As the wrap-around model evaluated and revised by the team throughout this project indicates, the learner is central. Identifying, supporting and empowering them to overcome barriers and embrace their dyslexia – at home, in class, and at work – is the key to success.

Whitireia New Zealand

"We will track our dyslexic learners to assess the support they receive and recommend that students ask Poutama (learning support) advisors to check their assignments prior to submission. We have had many changes in our organisation in the past few months and this project has enabled us to educate new members of staff about dyslexia. There is much greater awareness which we plan to continue building."

Capital Training Ltd.

"We are planning on training one tutor in every Centre to test students who may be dyslexic. Those tutors will then be responsible for diagnosing the student and supporting that student's tutor. In the future, our goal is to be known as a dyslexia-friendly organisation. At this stage we don't feel we can call ourselves dyslexia-friendly as we would have to be confident that everyone working with students is fully trained and equipped to assist students in this area."

ServiceIQ

"I hope slowly the organisation will be overall more aware and include dyslexia-friendly elements in such things as resources and ways of assessment. This will be a slow change as more people become aware of and are involved in situations that include supporting dyslexic learners. The organisation has agreed to purchase the DAST screening tool and develop a mentoring programme in 2018. I hope to train staff to screen and/or assist in

DAST screenings, and staff will need to be involved in helping to set up the mentoring programme. I will be encouraging the writers and assessors to learn more, so they can better include features that will assist dyslexic people in their learning."

The Skills Organisation

"We want to become a dyslexia-friendly organisation like Primary ITO and others and have put this into our business plan going forward into 2018. We have already created expectations with some providers about what they can do and what they want us to do, i.e. now they think we are responsible for all dyslexia assessment and are sending every possible learner in our direction for assessment and intervention. We seem to have created this expectation through the project."

Primary ITO

"Support for dyslexic learners is already a key part of the day to day operations at Primary ITO. We have dedicated staff who screen learners for dyslexia and have dedicated staff who complete the applications to Workbridge for the technological support. Regular information about dyslexia is provided on the ITO's intranet (our Kete) and staff will have further professional development on dyslexia at an upcoming national staff conference. Support for dyslexic learners is recognised as a point of difference here at Primary ITO."

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Appendices

Appendix A: DAST training guide + information sheet for DAST screening assessors

Introduction

The Pearson DAST (Dyslexia Adult Screening Test) is a dyslexia screening tool that can be used to identify the presence of dyslexia. There are other screening tools that can be used, including the Lucid LADs Plus and the Dyslexia Quick Screen Tool. Both the Lucid LADS Plus and the Quick Screen are computer-based screening tools. The Pearson DAST is a face-to-face screening tool that takes around 50 minutes to administer and a further 10 minutes to analyse the results.

For this research project a dyslexia screening – as opposed to a full diagnosis or assessment – was used for logistical, economic and practical reasons. A full diagnosis is very expensive and the people capable of conducting such a comprehensive assessment are largely limited to the major metropolitan areas.

The Pearson DAST is designed to be administered by experienced educators who have some knowledge about learning differences, tests and assessments and the normal processes of moderation and norm referencing. It is not necessary to be an educational psychologist or trained SPELD assessor to administer the DAST. It is strongly recommended that anybody aspiring to administer the DAST should take a few hours to rehearse and ensure that they are confident and able to complete the screening in a professional manner.

Object of the exercise:

As far as possible the goal is to eliminate other factors that might have caused literacy and or numeracy difficulties, such as – hearing problems, eyesight problems, general health problems, a history of not having regular school attendance, or genuine low intellect.

Process guide:

Step	What to do	Why
1	Learners are referred to the screener. Often because of low LNAAT scores but may be referred from other sources.	
2	Initial interview. This is before the formal screening. This provides time and opportunity to gather background information, such as family details, schooling, health. Learners are asked to read a passage of text with familiar words in it.	This provides a lot of basic information about the learner. Reading a passage provides important information about the subject. Missing out the little words and mispronouncing bigger words provides valuable information.
3	Complete the tasks as outlined in the DAST instruction booklet. We omit question 3.	Question 3 involves blindfolding the subject and pushing them with a measured amount of pressure. We do not do this task because it is considered personally invasive, and because we were advised not to by practitioners in the United Kingdom – who also omit it.
4	Process the subject's responses as per the process outlined in the template answer sheet.	It is very important to follow the process to the letter.
5	Use the appropriate norm reference card to make a judgement about the result.	There are 7 different norm referenced groups to compare your subject's results with. This step is important because it compares your subject's results to a large sample of similar people.
6	By comparing your subject's results with a norm referenced group, you can make a decision about the degree that your subject shows dyslexic tendencies. The rating has five levels (strong, moderate, mild, zero, or definitely not dyslexic).	It is important to choose the correct reference group.
7	For the final calculation – divide by 10 – as opposed to 11.	Because one of the questions has been omitted.
8	Once you have completed this you will have a score.	The score gives you the decision about the subject's dyslexia
9	Scores of 0.5 to 0.95 indicate no Dyslexia. Any score of 1.0 or more indicates dyslexia. The greater the score above 1.0, the greater the dyslexia.	Subjects can score up to 2.0 or above. That would indicate severe dyslexia.
10	Complete the little graph on the template answer sheet.	The graph is very important, in that it groups the results in a way that can be used to make informed comments about the learner's challenges and relative skills.

Appendix B: Data collection process map

A. Learners

Process	Document/Resource	Activity
Option 1: The learner reads and signs consent form BEFORE completing the DAST **Option 2:** A learner who has already completed the DAST (previous to NPF project commencing) and has been diagnosed as dyslexic can be asked if they wish to participate in the project *(A learner may be referred to the team member by a training adviser, a mentor or a tutor as potentially dyslexic. These learners can potentially be participants)*	Learner Consent Form	**Option 1:** Learner is well aware that they are agreeing in principle to participating in the project – they will engage in the project on the proviso that they are tested as dyslexic **Option 2:** Some learners may have already been diagnosed as dyslexic from a DAST conducted prior to the NPF project. These learners could be approached to participate in the NPF project
Learner completes the DAST *(Option 1 scenario)*	› Information Sheet for DAST Assessors › DAST Training Guide	The DAST will be carried out by either the team member or the project leader/co-leader If the project leader or co-leader is assisting with conducting the DAST, the team member is expected to attend/participate in this assessment session It has been agreed that the project leader and co-leader (Primary ITO) will assist with conducting the DAST for learners in Skills Organisation and ServiceIQ. Whitireia and Capital Training will conduct the DAST with their identified learners
If DAST confirms an 'at-risk' result, the learner is asked again if they are still interested in participating in the project	› Participants Spreadsheet › DAST Results	**Participant Spreadsheet** filled in with all required learner details, including inputting DAST results
If DAST results confirm that the learner does not have dyslexia, they are thanked for participating but will not be engaged in the project		If the assessor (team member) is not sure whether the learner still needs support in some area/s, discuss with the project leader and/or co-leader Important: although not diagnosed as dyslexic, the learner may require support for other learning needs. The team member refers them to other support systems/people, for example: Mentors, Learning Support team/Dept within the organisation
Project team member conducts first interview with the Learner	› Learner Interview Schedule – First Interview › Suite of Support Interventions Sheet › Participant Spreadsheet	If the DAST has been conducted by the project leader or co-leader, it is still the role of the project team member to conduct the first interview (and track the learner through the one-year trial period plus conduct the interviews at the 3- and 6-month points) At the conclusion of the interview, discuss with the learner what dyslexia support intervention or interventions they are willing to trial over the one-year period. The learner also has copy of **Suite of Support Interventions**; use this to help identify what will be trialled **Participant Spreadsheet** filled in confirming interview date and support interventions to be trialled
Interview transcripts are sent to the lead researcher immediately following the interview with the learner	Interview transcript	

B. Employers

Activity	Document/Resource	Activity
Employer reads and signs consent form	› Employer Consent Form › Participant Spreadsheet › Employer Information Sheet on Dyslexia and how to support learners in the workplace	**Participant Spreadsheet** filled in with all required employer details Explain to the employer how the learner will be trialling support interventions which may/will be workplace-related, i.e. influence on-the-job learning and task engagement
Project team member conducts first interview with the employer	› Employer Interview Schedule – First Interview › Participant Spreadsheet	**Participant Spreadsheet** filled in confirming interview date
Interview transcripts sent to lead researcher immediately following interview with the employer	Interview transcript	

C. Tutors

Activity	Document/Resource	Activity
Tutor reads and signs consent form	› Tutor Consent Form › Participant Spreadsheet	**Participant Spreadsheet** filled in with all required tutor details Explain to the tutor how the learner will be trialling support interventions which may/will be classroom-related, i.e. influence their learning in the class setting
Lead researcher contacts tutors to set up dates and times for the classroom observations and interviews	› Tutor Interview Schedule › Classroom Observation Template › Participant Spreadsheet	**Participant Spreadsheet** filled in (by lead researcher) confirming observation and interview date

Appendix C:
Learner support intervention trialling: Tracking sheet

(Support Strategy = Dyslexia support intervention selected by the learner at the First Interview)

1	Why did you choose this particular support strategy?	
2	How did you find getting started with using the support strategy?	
3	What difference is the support strategy making in your learning? i. In the classroom? ii. At work? iii. At home?	
4	How is the support strategy helping you to manage and/or learn new tasks at work?	
5	How is the support strategy helping you to manage the learning requirements in the classroom environment?	
6	Are there any challenges with using the support strategy? If so: i. What challenges are you experiencing? ii. How are you trying to manage these challenges?	
7	In addition to the support strategy you chose to trial in this project, what else is supporting you in your learning (for example, family members, mentor, training adviser)? i. In the classroom? ii. At work? iii. At home?	

Appendix D: Learner interview schedules

LEARNER FIRST INTERVIEW SCHEDULE

1. Have you been assessed before for dyslexia? YES / NO

   If YES:

   a. Did you get any assistance after being assessed? YES / NO

   b. What sort of help did you get?

   c. How did this screening assist you in understanding how you learn?

   d. You have been given some information about dyslexia. How has this information been helpful for you?

2. What things do you find really difficult to do (in the workplace; at home; in the classroom)?

3. When you have to learn something new, what do you do?

4. If that doesn't work, then what do you do?

5. Is this the best way to help you learn in class? (in relation to question 4 above)

   If YES, why is it the best way?

   If NO, why not? What would be better?

LEARNING ENVIRONMENT/CLASSROOM

6. What does your tutor do to support your learning?

7. What could your tutor do more of or differently to support your learning?

8. Please describe learning and teaching activities that are happening in your class that help you learn.

9. How are you finding the assessments (for you to demonstrate what you have learned)?

LEARNING TECHNOLOGIES

10. Have you tried any learning technologies to assist you in your learning? (for example – software, Smartpen, phones, iPad). If so, which ones?

11. What difference have these technologies made in your learning?

    i. In the classroom?

    ii. At home?

    iii. At work?

LEARNING AT WORK

12. What do you usually do if you need to know something or you need to fix something (for example, equipment, machinery) at work?

13. How do you help yourself learn new tasks on the job?

14. Do you have any special 'tricks' you have learned that help you manage the work tasks? If so, please describe them.

15. Does your employer help you learn new tasks on the job? If so, what does he/she do?

16. Describe what works best for you to learn at work

LEARNING AT HOME

17. How do you learn best at home?

18. What do you need to learn best at home? (for example – does anyone assist you? Do you use technology to assist you?)

19. What else do you think you need to do to support your success?

20. Would it be useful for you to have a support person assist you to complete your assessments? YES / NO

    If YES, how could they assist you?

GENERAL

21. Are there things on the job, at home or in the classroom that really frustrate you or that you find very difficult? What are these?

22. Are there things that you find easy to do? What are these?

LEARNER INTERVIEW SCHEDULE: 3 & 6 MONTHS

This informal interview is to get your feedback on how you are finding the support tool you decided to trial in the project. For example, how useful the tool has been so far in helping you learn, whether you are still using the tool or if you have decided to trial a different support tool.

Support tool/s being trialled:

1. What do you really like about the tool?

2. Is there anything you don't like about the tool?

3. Have you needed any help with using the support tool so far?

4. If yes, what sort of help did you get?

5. How is the support tool helping you in the classroom?

6. How is the support tool helping you in the workplace?

7. How is the support tool helping you at home?

8. What difference has the support tool made in your learning overall so far?

9. Would you use this tool in the future?

10. Is there anything else you would like to try out?

Appendix E: Employer interview schedules

EMPLOYER INTERVIEW QUESTIONS

1. What, if anything, do you know about dyslexia?
2. What information have you been given to assist you to work with dyslexic learners?
3. What do you think it takes to work effectively with employees who are dyslexic?
4. Describe what you think are the main challenges for learners with dyslexia in the workplace setting?
5. What have you found to be the main areas of support needed for learners with dyslexia in your workplace?
6. What strategies have you found helpful in supporting learners with dyslexia to make the most of their strengths in their work role?
7. Does your team offer support for employees with dyslexia in your workplace? If so, what support do they provide?
8. What adjustments have you made to support dyslexic learners with managing work tasks, especially tasks that relate to them completing their qualification?
9. How many learners with dyslexia have you supported in completing their qualification in your workplace?
10. What do you think are important considerations for supporting learners with dyslexia in the workplace?
11. What qualities and skills do you believe make an effective employer working with dyslexic learners in your industry?

Appendix F: Tutor interview schedules

TUTOR INTERVIEW QUESTIONS

BECOMING A TERTIARY TUTOR

1. Why did you choose to become a tutor?
2. What do you enjoy about it?
3. What things pose challenges for you?

PRIOR TUTOR TRAINING AND SUPPORT WORKING WITH DYSLEXIC LEARNERS

4. What information have you been given about learner learning differences?
5. Have you had any specific training in teaching learners with dyslexia? If so what?
6. If yes, how has this tutor training been in helping you with your teaching, especially learners with dyslexia?
7. What other support or training have you received that helps you teach learners with dyslexia?
8. How confident are you in dealing with learners with dyslexia?

PERCEPTIONS ABOUT YOUR CURRENT TEACHING WITH LEARNERS WITH DYSLEXIA

9. What do you think makes an effective tutor for learners with dyslexia?
10. Have you discovered any strategies that work particularly well with dyslexic learners? If so, what are they?

OWN TEACHING PRACTICE

11. How do you get to know your learners at the start of their study?
12. How do you know if your teaching is effective?
13. What are you doing in the classroom to support learners with dyslexia with their learning? *(For example, how do you ensure that the learning is relevant and connected to individual learner's experience, background and culture?)*

PROFESSIONAL DEVELOPMENT

14. What kind of professional development do you find effective to assist you in your teaching? *(For example, formal, informal, whole day, small but frequent workshops, other)*
15. What professional development would be useful for you in teaching learners with dyslexia?

EFFECTIVE LEARNING ENVIRONMENT

16. What changes do you think could be made to improve the learning outcomes for learners with dyslexia? *formal, informal, whole day, small but frequent workshops, other)*

SUPPORT

17. What support is available to your learners who have extra pastoral care needs?
18. What support is available to you to assist you in implementing improvements in your teaching?

SUMMARY

19. Any other comments?

Nā āheitanga ā-mātauranga,
ko angitū ā-ākonga
Building educational capability
for learner success

Ako
AOTEAROA