

Evidence for the effectiveness of visual supports in helping children with disabilities access the mainstream primary school curriculum

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Removing barriers to learning for children with mild to moderate disabilities in mainstream primary classrooms calls for creative approaches that exploit the cognitive and sensory strengths of each child. Although their efficacy has not been fully explored, pictorial, symbolic and written supports are often used with the intention of helping children access the curriculum by reducing anxiety, confusion and memory limitations both at school and at home. This paper reports a qualitative study carried out in New Zealand, which designed, delivered and evaluated a coordinated home and school visual supports programme for 23 children with moderate special education needs aged between 5 years and 7 months and 11 years and 10 months. Interview and questionnaire feedback from parents, teachers and the children themselves suggests the visual supports reduced anxiety and frustration, provided structured reminders of tasks and equipment needed, and permitted greater involvement in home and classroom routines. They also suggested a positive impact on distractibility, task completion, classroom independence and perseverance. It is suggested that while the visual supports were helpful, the attention to the child's needs across contexts contributed importantly to the success of the programme. Directions for further research are outlined.

Introduction

Removing barriers to learning that come not from the challenges of the curriculum itself (although these may also exist), but from socio-emotional and organisational issues that limit access to the curriculum should be of the utmost importance if we are to promote the capabilities of young children in school. Many teachers will be familiar with children who are intellectually capable of accessing the curriculum content, but who present in classrooms as disorganised, anxious, withdrawn and/or challenging. Their identified levels of need mean they do not meet criteria for

educational supports such as teacher aides and specialist input, and they are at risk of being viewed negatively by general education teachers (Cameron and Cook, 2013).

The literature suggests that there may be a number of reasons for the poor performance of these children, including working memory (Alloway et al., 2009), motor planning (Gibbs, Appleton and Appleton, 2007), processing of auditory information (Dawes et al., 2008), self-regulation (Neuenschwander et al., 2012) and attention (Lauth, Heubeck and Mackowiak, 2006). If diagnosed, they are likely to have one or more of a cluster of disorders that at various times and under various diagnostic schedules have been called sensory processing disorders, Developmental Coordination Disorder (DCD), Auditory Processing Disorder (APD), dyspraxia, mild autism, Global Developmental Delay (GDD) and Attention Deficit Hyperactivity Disorder (ADHD).

Efforts to remove barriers to learning for children such as those described above (Cheminais, 2004) have frequently involved the use of visual schedules and pictorial and/or written supports to provide reminders of tasks and task components in a format that is both convenient and flexible. Their use has been predicated on the fact that visual information (whether in written language, symbols or pictures) is 'not evanescent but remain[s] permanently accessible as an externalised memory resource' (Perkins, 2007). Additionally, it has been suggested by Frey and Fisher that 'all visual information isn't equal. Pictures consistently trump text or oral presentations' through what has been termed the 'pictorial superiority effect (Stenberg, 2006) . . . [and] it is not just that pictures are easier to remember, they're significantly more likely to be stored and much more likely to be retrieved' (Frey and Fisher, 2010, p. 107). If the 'pictorial superiority effect' can be harnessed to assist children to improve their self-regulation, reduce distractibility, to persevere, to complete tasks and be more independent in the classroom, then such visual supports are predicted to be a valuable asset for any teacher working with mixed ability students (von Suchodoletz et al., 2009).

However, despite their popularity for a wide range of students and their theoretically predicted effectiveness, there are surprisingly few empirical studies of the use of visual schedules. A number of studies have explored the use of visual supports with children with Autism Spectrum Disorder (ASD) (e.g., Dettmer et al., 2000) or more broadly with students with a range of mild intellectual disabilities (e.g., Duttlinger et al., 2013). However, a review of the literature on visual activity schedules against criteria for evidence-based practice (Knight, Sartini and Spriggs, 2015) concluded that there is a need for more research into the impact of visual schedules for both academic and daily living activities for children with ASD. We argue that the same need holds true across the spectrum of developmental delays and challenges that impact on children's access to the school curriculum, and this paper is a contribution to that research.

The project described here was conducted from 2009 to 2012 in Christchurch, New Zealand. It aimed to design, deliver and evaluate a visual supports programme for a sample of children in primary schools across the city. The programme was designed and delivered by a group of disability support agencies working together and was independently evaluated by a disability research institute from another city. The focus was the use of visual supports within the home to ensure children arrived at school calm and ready to learn, and within the classroom to support their access to the curriculum. The goal was to provide organisational supports that were aimed at enhancing children's abilities to engage with the activities of the classroom rather than providing visuals that taught the curriculum itself.

Participants

The participants in the project were a non-random sample of primary aged children in Christchurch, New Zealand. Children were referred to the project by one of the participating organisations on the basis of concerns raised by either a parent or a teacher that a child did not meet criteria for significant specialist support, but was nonetheless failing to keep up with his or her peers at school and was exhibiting signs of disorganisation, frustration and/or anxiety at home and/or at school. Twenty-six children were initially referred to the project over the course of its first 2 years, of which 23 remained with the project for a year or more. The data analysed here are from those 23 children: 4 girls and 19 boys, ranging in age from 5 years 7 months to 10 years old at entry into the project and between 7 years 8 months and 11 years 10 months at the finish.

Partly as a result of the Dyspraxia Support Group being one of the collaborating organisations, and partly because children with DCD/dyspraxia often do not have challenges of sufficient severity to trigger specific government support, most of the children had a diagnosis of DCD/dyspraxia, either alone or in combination with another diagnosis. Of the 23, 7 had a sole diagnosis of DCD/dyspraxia with a further 2 having a possible diagnosis; the remaining 14 had a diagno-

sis of ADHD, Specific Learning Disability (SLD), APD, GDD, dyslexia and anxiety, either alone ($n = 7$) or in combination with DCD/dyspraxia ($n = 7$). It is important to note that dyspraxia is currently (2015) used as a diagnostic category in New Zealand in a fashion broader than that covered by DCD or dyspraxia in the UK. Although a deficit in motor coordination is a necessary symptom, challenges in ideational planning, communication and social skills are often subsumed under the dyspraxia diagnosis in New Zealand rather than being identified as co-morbidities. This may change with the tighter definitions contained in DSM-5, but at time of writing the broader definition is in common use (see the following website <http://www.dyspraxia.org.nz>).

The children attended 22 different schools across the Christchurch area, and had between 1 and 3 different teachers over the life of the project. Schools in New Zealand are ranked by the socio-economic status of the surrounding catchment area on a decile system in which 1 is the most impoverished and 10 the most resourced. The schools attended by the children in the project ranged from decile 4 to 10. All of them had had some contact with specialist services prior to the project, and all had parents who were keen for their children to receive support.

The procedures described below were implemented by a team made up of a small group of individuals consisting of a consulting speech and language therapist (SLT) and occupational therapist (OT) (1–10 hours per week each), a project assistant and a small team of individuals trained as visual resource specialists (VRSs; approximately 35 hours per week combined). The VRSs were responsible for delivering the programme in consultation with the SLT and OT, and although they included individuals with a variety of backgrounds, the largest number of hours were provided by one individual with a Diploma of Teaching People with Disabilities. Oversight of the project as a whole was from a project co-ordinator (the first author) and a committee of representatives from the four agencies. The independent evaluation was carried out by the second author as a separate project under the auspices of a different organisation, and findings were not shared until after completion of the project.

The service delivery project received ethical approval from the Human Ethics Committee of the University of Canterbury and was funded by the Wayne Francis Charitable Trust. The evaluation project received ethical approval from the Regional Health and Disability Ethics Committee and was funded by the J R McKenzie Trust.

Procedures

Initial concerns about the children's home and school challenges were determined through structured interviews carried out by the VRS with the parents at home and the current teacher of the child at school. A project-created Parent Interview Protocol used an extensive series of questions covering the child's medical and developmental histories, their interests and behaviour, routines, response to

and performance at school, their diet and sleeping patterns, past services and their current concerns for their child. [All project materials (with the exception of the ABASII questionnaire: see below) are freely available from the first author and are contained in the final project report prepared for the funders.] The aim was to understand the child through the parent's eyes, to determine the likelihood that visual supports might be helpful and to allow the VRS to consult effectively with the SLT and OT. The Teacher Interview Protocol was shorter and less comprehensive, aimed at determining how the teacher perceived the student as a learner and class member, what extra support the child might already be receiving from the school and any concerns the teacher had about the student. Although it was clear that several of the children had significantly more challenges than could be addressed by visual supports alone, all the children accepted into the project were deemed by their teachers to be likely to profit from visual resources.

Families and teachers were provided with general information about the possible value of visual supports, and they signed informed consent forms as well as agreements that the project could access information on children already held by the school or by other professionals. In addition, parents and teachers were asked to complete the Adaptive Behavior Assessment System (version II) questionnaire, known as the ABASII (Harrison, Oakland and Psychological Corporation, 2000) at the beginning of the project and where possible each year until completion of the project.

The ABASII is a psychometrically robust questionnaire designed to assess adaptive behaviour from multiple perspectives (Bagnato and Simeonsson, 2008; Richardson and Burns, 2005). Separate questionnaires for parents and teachers ask about children's functioning across nine areas: communication, community use (parent version only), functional academics, home living (for parents) or school living (for teachers), health and safety, leisure, self-care, self-direction and social development. The questions are strengths based, asking parents and teachers what the child can do rather than what they cannot do. They are also organised according to a developmental curriculum with later questions in each section more relevant to older children. The questionnaires were scored as required by the test creators to generate a General Adaptive Composite (GAC) score. A study-internal measure was also created from a subset of the questions selected by the project team from the ABAS, which could be expected to be impacted by visual supports and which matched as closely as possible the concerns identified by parents and teachers in the structured interviews. Details of this measure are given below.

The next step involved direct observation of the child at home and at school, followed by consultation between the VRS and the OT and SLT to determine the goals to be addressed and the particular visual supports to be intro-

duced. Once determined, the resources were created by the VRS, in most cases using Boardmaker® (Mayer-Johnson Company of Solano Beach: CA, USA) software and the Picture Communication Symbols© 1981–2001 (Mayer-Johnson Company of Solano Beach: CA, USA), and actively introduced to the child, family and classroom by the VRS. Sometimes visuals were introduced by simply talking with parents and teachers who then introduced them to the child. Usually, however, it involved meeting with the family, child and teacher, and negotiating where the visuals were to be placed (e.g., on the stove versus fridge at home; on the desk versus inside the desk at school) and how they were to be used. Both at home and at school, the VRS often observed for an extended period of time and modelled and coached the use of the visuals at the precise times they were needed. This might be followed after a span of days with another observation to see if the introduction had been successful or if any adjustments needed to be made.

Once the visuals were successfully introduced into the home and/or classroom, as determined by parent and teacher self-report and/or observation by the VRS, the VRS stayed in phone contact on an approximately monthly basis to ascertain if the visuals were still working, whether new ones were needed or whether visuals were no longer needed. When a new school year intervened or a child had a change of teacher, there was a re-engagement with the family, an introduction of the project to the new teacher, an attempt to ensure the visuals had been transferred to the new classroom, discussion of any new ones required (with input from the SLT and OT) and a systematic observation of the child in the classroom within 5 weeks of the transition.

At the end of the project, a final observation was carried out both at home and school, and an evaluation made of progress towards specific goals set for the child. In particular, the family, including the child, were asked 'Have the visuals implemented by the project addressed the concerns you identified at the beginning of the project?' (Those initial concerns were restated for the family.) At the close of the project, the family was provided with a final summary report on their child including suggestions for accessing ongoing support from other sources if appropriate and a letter from project personnel thanking them for their participation. With the family's permission, the report was also provided to the school.

All families who had children participating in the project were asked if they would be willing to take part in the second author's independent evaluation. Participation in the evaluation was not compulsory; children could continue to be part of the wider project even if their parents did not wish to be involved in the evaluation. Twenty of the 21 families who had a child (or children) involved in the project chose to contribute evaluation data, either through the completion of written questionnaires, or through face-to-face or telephone interviews. Eighteen parents returned an evaluation questionnaire during the preliminary stages of the project,

and 15 exit interviews were conducted via telephone at the end of the project. Several other families chose face-to-face interviews as the most appropriate and convenient way for them to take part in the evaluation. The evaluation team recognised the pressures that some families faced and were committed to being responsive to individual need by offering a range of participation strategies.

Similarly to the evaluation approach taken with families, all teachers who were identified as having had a role in implementing visual supports for children involved in the project were invited to take part. Gathering evaluation data was more difficult to achieve, however, because of frequent changes in classroom staffing, resulting in a situation where not all teachers who were currently using the visual supports with a particular child had knowledge of the project over time. In total, nine classroom teachers and one special education needs co-ordinator provided evaluation data through face-to-face interviews, telephone interviews or in written form in response to a brief questionnaire.

Evaluation data were analysed thematically, informed by the general inductive analysis method, which was specifically developed for use in evaluation contexts (Thomas, 2006).

Results

Initial concerns

Impressions of children's overall levels of functioning can be derived from the ABASII questionnaires completed by parents and teachers. The mothers and fathers and the teacher of 21 of the 23 children completed the ABAS at entry into the project, allowing comparison between children on the global summary GAC scores. (ABAS qualitative categories are given in parentheses.) Mothers' GAC scores ranged from 44 ('extremely low') to 87 ('below average') [mean 70.82; standard deviation (SD) 11.504]; fathers from 50 ('extremely low') to 88 ('below average') (mean 69.37; SD 11.112); and teachers from 48 ('extremely low') to 116 ('above average') (mean 75.00; SD 17.004). These scores confirm that, as a group, the children who participated required support in their daily lives both at home and at school.

A comparison of different scorers of individual children suggests a lack of common understanding of the children among the adults in their lives. The ABASII has an SD of 15, so any scores more than 15 points apart on the GAC between scorers was regarded as significant. Of the 21 children, 48% (n = 10) received significantly different GAC scores from mothers and teachers.

However, despite the differing views on the degree of functional delay, the specific concerns identified in the semi-structured interviews with parents and teachers revealed a consistency of concerns between home and school; and these were backed up by the direct observations of the VRSS.

The most common concern identified by both parents and teachers was the children's inability to carry out a routine or a task either at home or at school, without repeated prompting. ('Without structure he is constantly asking questions'.) Many parents and teachers commented that the children had difficulties with following verbal instructions, particularly ones that involved multiple steps, which is presumably why they needed the repeated prompting. ('Multiple step routines are difficult'.) Not surprisingly, given the challenges to actually performing a task independently, a very common concern expressed was children's inability to organise and manage the equipment and belongings needed for those tasks or for other tasks during their day. Distractibility and difficulty sustaining attention (particularly in a noisy classroom) were often mentioned with a perhaps inevitable impact on their ability to complete a task within an expected time frame, presumably leading to more prompting from adults. ('She has difficulty completing a task within a time frame'. 'She gives up easily'.) Difficulty with actually starting a task and shifting from one task to another were also identified as common challenges ('Spontaneity throws him', 'he wouldn't know what to do without (structure and routine)').

In addition to attention issues, some teachers identified slow processing as a reason for the poor task performance resulting in more time being needed for a task. They also identified challenges with fine-motor control that slowed completion of tasks involving writing.

The negative impact of their challenges on the children themselves is reflected in the not infrequent reference to children's anxiety, frustration, difficulties with peer relationships and poor self-esteem, with some parents saying their children have difficulty with feeling the pressure of having to perform at school. The following descriptions of the children's behavioural responses to these pressures are typical: 'Acts stupidly and misbehaves'; 'yelling, hitting people or things, physical displays of aggression and tantrums'; 'repeats requests loudly, runs away and hides'; 'looks angry, grimaces, hides to control or regulate emotion'; 'Physically tenses up, bottles things up at school and brings it home'.

Visuals for goals – goals for visuals

The goals set for each child reflected the challenges each child was understood to face. Although some of these goals were very particular to individual children (e.g., the taking of medications on schedule, having a checklist for activities during a holiday programme, remembering to put their glasses on), the vast majority were common across all, or almost all, the children.

The most common goal was to predict and follow through on daily living routines and activities independently. These routines most typically included getting up and dressed, getting breakfast, packing their bag, doing homework, doing chores and completing bedtime routines. For many

children, there was a need for a reminder about tasks not only on a daily basis, but also on a weekly basis. This was particularly true of children whose separated parents shared custody and who needed to be reminded who would pick them up from school each day, which house they were going to and what they needed to have with them for each place. Independent toileting was also a goal both at home and at school for several of the children.

Almost all the children also had goals related to following the sequence of activities and routines at school, including having the right equipment on hand and used for each task. Several also had overt goals about abiding by the social rules of the classroom such as being aware of their feelings of frustration, asking for help but not asking for too much help, and following expectations about the use of their voices and bodies. The net effect was that although there might be some variation in the way appropriate visuals were presented, they were largely similar from one child to another.

The visuals appropriate for these goals were selected from Boardmaker®, printed and laminated and presented to the child in ways that were appropriate for the age of the child, the context of the goal and the child's preferences for their placement in their environment. Some children used a whole sheet with several different images that they ticked off with a marker pen as they were completed (getting dressed, breakfast, brushing teeth, etc.). These were placed, as appropriate, at home (e.g., on the fridge) or at school, either on the child's desk or, in some cases, where all the children in the classroom could access and consult them for routine tasks. Other children had their images individually laminated and attached by Velcro® (Velcro USA Inc., Manchester, NH: USA) to a backboard with a pocket into which the image could be placed as each task was completed. Some visuals were made into a ring-bound set of up to a dozen individual images that could be attached to a belt or a backpack.

At the end of the project, although some parents and teachers identified that their children continued to need help with organisational independence, the feedback from parents, teachers and the children themselves to the VRSs suggested the visuals had a positive impact on children's home and school lives.

Qualitative Feedback

Almost all the families (21 of 23) reported increased independence in morning and evening routines, and two of these also reported that the child had been able to take on extra responsibilities at home because of the visual supports. Parents said things like: 'I don't have to prompt [child] as much anymore and he is much more independent'; 'Now that [child] is more independent, I can introduce more tasks such as chores into his routine'; 'I've got a little boy who can get up every day and get organised for school'; 'He felt

more empowered to be part of, instead of having things done to him he was part of being more independent and growing up, you know'.

Other comments centred on the reduction of the anxiety that parents felt contributed to their child's difficulties with organisation at home and at school. For example, '[Child] is definitely less anxious, generally more easy-going and happy . . . It has absolutely been worth having [child] on the project, it has been positive and anything that could have lessened his anxiety is worthwhile'. And from another parent: 'He felt less anxious and more confident about his day . . . keeping his self-esteem intact as we can is probably the most important thing that we can do. Because if he feels good he'll give anything a go'.

In some cases, families were so impressed with the power of visual supports that they went beyond the parameters of the project to use them more widely at home: visuals 'are probably the most relevant, useful and widely used of all the tools we have to support [child]. They have such a wide and endless range of applications across all areas of his routine, self-confidence and self-management. We have embraced them as a family and they are now very much part of our day to day life'.

Some parents were, however, also realistic about their child's ability to sustain the gains they made and about how, for some children, there are 'good days' and 'bad days'. One parent said: 'On a bad day you can refer back to them. I think that worked really well and I think that the weekly layout, given the kind of blended family we've got . . . it really helped all of us'. On the other hand, another parent saw clearly sustained improvements for her child: 'It's really made an impact and a step up for him. Like I can't imagine where he would be now you know, without having those extra skills'.

For their part, the teachers of more than half the children reported they were better able to follow the classroom routines and/or were more independent in class. Their comments included 'The independence . . . just say if I was busy with something else for the moment . . . he was able to get on with things . . . I think it gave him a sense of security too' and 'Improved home-school links, some consistency between home and school, [child] able to follow class routines more independently'. And the reduction of anxiety was also mentioned: 'Now he is starting to speak and not be so anxious', as was the ability to manage equipment better. Some expressed a desire to have easier access to the visuals: 'What I would love to see is . . . a bank of visuals . . . knowing they are available . . . you know, country-wide'.

Particularly powerful was the feedback from the children themselves. Although verbal report data were not gathered from the children at the beginning of the project, at the end of the project, they were invited to provide their view of the

visuals. Their comments suggested that they had understood the point of them: '[Visuals] are also good because they are really great at showing what we are doing each day, so I know what to do each day. It helps because if I forget I can always go to the fridge and look'; 'When I had the pictures at home and I kept looking at them and they reminded me and got stuck in my head'; and 'They do help me to remember what task I need to be doing and which ones I still need to do'. Moreover, the children clearly relished the independence they felt the visuals gave them: 'I don't have to ask Mum all the time, I can just look at the board and see what I need to do next'; 'Have helped me to remember what to do in the morning and at night time . . . they remind me . . . the pictures on the drawers help me to find stuff . . . the visuals in the class are really good at showing me what we are doing in class'; 'I do not have to ask for help so much'; and 'Visuals are great. They tell us what to do so we can just do it and go there and Mummy doesn't need to nag'. Some said they had outgrown some or all of them ('I am not using the visuals at home anymore. I don't need them because I know what to do'), and overall their comments suggested the children enjoyed using them: '[They] 'get in your mind'; '[They are] 'cool to use'; 'I like to use the visuals'.

The role of the VRS

Feedback from almost all of the families indicated a very high level of satisfaction with the support offered by their VRS. They praised the VRS's approach to learning about the child, family and school, helpfulness, and availability (particularly at times of transition between teachers and/or schools). One parent expressed her delight at the amount of input her child was encouraged to give in the design of the visual resources and considered that was key to their success.

Several of the teachers also felt very well supported by the VRS, praising her knowledge and skills and the role she

played in the children's homes. One teacher suggested that the success of the project was the result of the work with the families and 'getting a bit of order and sequence going at home' and, above all, having the time to 'sit and listen to families that need to talk'. Another teacher said: 'I most valued the link between home and school really . . . a valuable link . . . she's been a good support for the families and a good listening ear and maybe a good bridge between home and school'.

ABASII questionnaire data

A final view on the outcomes of the project can be gleaned from a subset of questions on the ABASII questionnaire. Questions were selected that most closely reflected the mothers' and teachers' concerns identified through the interview data. Table 1 shows the questions extracted from the ABASII.

For each question, the mother or teacher had indicated a score from 0 to 3 in completing the full ABAS. 0 = 'is not able'; 1 = 'never or almost never when needed'; 2 = 'sometimes when needed'; and 3 = 'always or almost always when needed'. Possible total scores extracted from the parent form were, therefore, 27 and for the teacher, 33. At the beginning of the project, the mother ratings ranged from 5 to 23 out of a possible 27. The teacher ratings ranged from 12–33 out of a possible 33. The mother and teacher scores were fairly weakly correlated [$r(22) = .344, P < .05$], possibly suggesting a lack of common understanding of the children.

A comparison between the scores for each of the 23 children at entry into the project and 1 year later shows that three of the children were rated lower by one raw score point after a year in the project by their mothers, and a further 6 children were rated only one raw score point higher. These children might be regarded as staying stable in terms of this measure over time. The remaining 14

Table 1: A subset of questions from the ABASII Parent and Teacher Questionnaires

Parent	Teacher
Pays attention during family discussions for as long as needed	Pays attention during classroom discussions for as long as needed
Listens closely the at least 5 minutes when people talk	Listens closely for at least 5 minutes when the teacher talks
<i>No parent equivalent</i>	Follows teacher's verbal instructions when undertaking tasks or activities, for example, a classroom project or a new game
Reads and follows a daily classroom or work schedule	Reads and follows a daily classroom schedule
<i>No parent equivalent</i>	Reads and follows instructions for classroom projects or activities
Follows the rules in games and other fun activities	Follows the rules in games and other classroom activities
Works on one home or school activity for at least 15 minutes	Works on one school activity for at least 15 minutes
Completes routine household tasks in a reasonable amount of time	Completes routine classroom tasks within a reasonable amount of time
Stops a fun activity, without complaints, when told that time is up	Stops a fun activity without complaints when told that time is up
Works independently and asks for help only when necessary	Works independently and asks for help only when necessary
Keeps working on hard tasks without becoming discouraged or quitting	Keeps working on hard classroom assignments without becoming discouraged or quitting

children were reported to have made gains ranging from 2 to 9 points, and as a group ($n = 23$) the positive changes over time were significant on a paired samples t -test for repeated measures, $t(22) = 4.94$, $P < .000$.

The data from the teachers is less consistent as they were different observers at the beginning and end of the year, and the teachers of three of the children did not return one or both of the questionnaires, leaving a smaller sample for whom change over time could be calculated ($n = 20$). The teachers rated 7 of the 20 children as functioning lower at time 2 than time 1, apparently losing between 1 and 8 points (less than half a SD nonetheless). The remaining children were viewed as gaining between 1 and 13 points. There was considerable variability, therefore, and although as a group there were no statistically significant positive changes in the children in the eyes of the teachers as evaluated by this measure, the positive qualitative comments provided to the independent evaluator suggest further research is needed.

Discussion

A range of variables can impact the outcomes of a qualitative study such as this, which, by design, includes no control group and was limited to a small number of students by practical considerations. These variables include inherent variability between children (particularly degrees and types of special education needs); the fact that children for whom visual supports were likely to be effective were chosen for participation; the fact that the parents requested help for their children and so were likely to see positive benefit from their involvement; the fact that the children may have improved in the areas we documented over time without intervention; and the fact that teachers came with both positive and negative attitudes towards visuals from their training/experience. Although the responses to the questions on the ABASII are largely consistent with the verbal feedback from study participants, the issue of the lack of consistency in how parents and teachers view children deserves further study in order to understand whether some children did in fact regress or fail to make progress. Assuming the test retest validity of the ABASII, it is important to understand why the children were viewed so differently by different observers. A detailed analysis of how each child was viewed takes us beyond the goals of this paper.

While acknowledging these challenges to the study, we suggest that the data reveal largely (but not exclusively) enthusiastic embracing of visual supports by the children and their parents and positive impacts on participation in classroom learning and in home routines. Not all children progressed, or progressed as much in accessing the curriculum with the support of visuals as others. As already indicated, some of the children had greater learning needs than could be remediated by something as simple as visual supports, and together with the differing perceptions of children already noted are likely to be the main cause.

Parents were very positive about the role of the VRS (discussing the project with the family, taking the time to work out the routines that needed support, including the children themselves in the decision-making and brokering the relationship with the school for visuals to be used there). Indeed, it may, in some cases at least, have been the facilitated linkage of home and school that led to the reduction of anxiety and concomitant improved learning behaviour rather than the visual supports per se. The current project is not able to disentangle the impact of the focussed attention on the child, the family and the school that was the result of the role of the VRS from the direct impact of the visual supports themselves. Clearly, it would be important to explore whether the same kinds of results could be achieved through implementing visual supports without the role of the VRS as described here, or, alternatively, through a home to school visiting programme that simply has as its goal to help parents and teachers connect more meaningfully over each child's needs.

There also remains work to be done understanding the reticence of some teachers towards visual supports. We found it hard to ensure that all teachers were equally briefed about the project, particularly during a time in the history of Christchurch (during and immediately after the devastating earthquakes) when teachers were under more than usual stress in their work and home environments. Getting schools and teachers on board was not always easy, and we acknowledge that there was an inherent challenge in asking a non-teacher (the VRS) to request a teacher to change their pedagogical approach; and in some cases we were not able (even with the intercession of the SLT and OT) to convince the teacher of the value of what we were trying to do. Comments from teachers such as 'The student in question did not often use the resources without being told to do so' and 'Sometimes at school, I have tried not to nag her when she forgets, as this defeats the whole purpose of trying to get her to remember to use the resources in the first place' suggests we had not succeeded in convincing them that the (often extended) investment of time and energy needed to get the visuals incorporated into a busy daily classroom life was worthwhile. Unfortunately, a few comments from teachers seem to place the blame on the child not only for not using the visuals, but also for their overall behaviour: 'At school he is not keen on using visuals at all. Didn't want them on his desk didn't want them individualised for him . . . he doesn't like to be different and he doesn't like to be told what do to and he wants to make up his own mind anyway'. In cases like this, it would be worth looking for ways to encourage teachers to use visuals for all children in their classroom so that children who need to rely on them do not feel marginalised. Certainly, the few teachers we observed who had done so and who were positive about the home-school links were most positive about the outcomes of the project. In light of the project's experience, using a VRS who is embedded in a specific school community might work better than someone coming in from an external agency (as in this project).

Overall, the impact of the visual supports was seen as positive by the children and their families and something with a sustainable impact. As one parent put it: ‘It’s still successful, yes still paying off . . . I really do feel that it benefitted him for the long term and now we probably can, even if we come across certain obstacles we could probably look at doing something ourselves visually to help him along the way as he gets older, from home’. And for those teachers who embraced the goals of the project, it also had a lasting impact: ‘For me, it has been really worthwhile. We didn’t have that visual timetable before but the project has made us focus . . . it’s just a simple thing to do and it’s actually been really beneficial’.

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