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Carpenter er førsteforfatter av artikkelen nedenfor. Den er tidligere publisert og re-publiseres nå med tillatelse fra forfatterne
Barry Carpenter kommer til Norge 31. mai og vil forelese blant annet om Complex Needs and Autism under jubileumskonferansen til Psykologi i Kommunen.

The Engagement for Learning Framework:
Connecting with learning and evidencing progress for children with autism spectrum conditions

The population of children with complex needs in our schools continues to increase, and children with Complex Learning Difficulties and Disabilities (CLDD) are presenting with new profiles of learning need that the teaching profession struggles to meet through existing teaching styles or curriculum frameworks. Figures from Blackburn et al. (2010) showed that between 2004 and 2009, numbers of families recognised as having a disabled child rose from 700,000 to 950,000, and that their increased numbers are due in part to medical advances and intergenerational poverty (Ramesh, 2010). During this same period, the total number of children with severe learning difficulties (SLD) increased by 5.1%, while the total number of those with profound and multiple learning difficulties (PMLD) rose by an average of 29.7% (National Statistics, 2004, 2009). Schools also note the changing pupil population in very practical ways.

Barry Carpenter *er honorary professor ved universitetene i Worcester, Limerick, Hamburg og Flinders, (Australia). Har over 30 års erfaring innen det spesialpedagogiske fagområdet og utgitt over 100 artikler. I de senere årene har han vært opptatt av at jenter med antatte autismespekter-forstyrrelser, blir oversett av faginstanser og ikke blir vurdert like grundig som gutter med de same symptomene. Han er dessuten opptatt av barn som har sammensatte behov; complex needs.*

One head teacher wrote:

Three years ago, we had up to seven children with gastrostomies – we now have 16. Just recently, we have enrolled two students with tracheostomies who need full time medical support. (Ferguson and Carpenter, 2010)

The brain functioning of this new generation of children is often very different to that which professionals have previously known (Goswami 2008a,b). As a result of teachers' petitioning for advice on how to support the educational needs of this group, the UK Government commissioned the CLDD Research Project (Carpenter et al. 2011, 2015) to investigate approaches to meet their teaching and learning needs. The Project – together with schools, specialist advisors and a multi-agency steering board – defined children and young people with CLDD as having:

…conditions that co-exist. These conditions overlap and interlock creating a complex profile. The co-occurring and compounding nature of complex learning difficulties requires a personalised learning pathway that recognises children and young people's unique and changing learning patterns. Children and young people with CLDD present with a range of issues and combination of layered needs; for example, mental health, relationship, behavioural, physical, medical, sensory, communication and cognitive. They need informed specific support and strategies which may include transdisciplinary input to engage effectively in the learning process and to participate actively in classroom activities and the wider community. Their attainments may be inconsistent, presenting an atypical or uneven profile. In the school setting, learners may be working at any educational level… (Carpenter et al., 2011, 2015)

In response to these children's needs, educators need to remodel pedagogy and generate teaching strategies that will embrace these children as learners. The Engagement for Learning Framework (described below) was therefore developed by the CLDD Research Project to support necessarily personalised approaches to teaching and learning.

COMPLEX NEEDS AND AUTISM

Baron-Cohen et al. (2009) estimated the prevalence of autism spectrum conditions (ASC) in the UK at one in 100 children. Some of these children present with CLDD. While we know much about educating children with ASC, there are lessons emerging from neuroscience (Carpenter and Egerton 2007; Ramachandran and Lindsay 2006) that demand detailed consideration. In the field of autism, through international work in the USA (Mesibov et al. 2004), Holland (Peeters 1997; Peeters and Gillberg 1999) and the UK (Blakemore and Frith 2005; Jordan and Powell 1995), neuroscientific research has generated revolutionary ideas about how to educate this rapidly expanding group of children effectively by mapping the connections between brain states and learning patterns. As Frith stated in the context of a Royal Society Science Policy Centre report (2011):

Education is concerned with enhancing learning, and neuroscience is concerned with understanding the mechanisms of learning. It seems only logical that the one should inform the other.

Similarly there are 'new autisms' being identified which give a different lens with which to view a child's needs profile: Pathological Demand Avoidance (PDA) is one such powerful example which demands critical review. Again, there are new implications for how schools manage the teaching and learning of children with this diagnosis (Christie et al. 2011). Adolescence compounds children's difficulties as mental health needs emerge – according to Dossetor et al. (2011) one in seven young people with autism spectrum conditions will experience at least one mental health issue. The challenge for teachers is how to translate all this information into effective classroom practice.

ENGAGEMENT FOR LEARNING AND AUTISM

Attention, or engagement, is considered by Wolke (2013) to be the most important predictor of successful learning outcomes for a child, even above IQ. Many educators believe that 'the study of engagement has the potential to assist educators and therapists to maximise learning outcomes' (Keen 2009: 136) and have focused upon engagement as the foundation for effective learning in children with disabilities (Brooks 2010; Carpenter 2010a,b; Guralnick and Albertini 2006; Keen 2009; Mesibov et al. 2004; Ruble and Robson 2007). As Carpenter (2010a: 5) states:

> *Without [engagement], there is no deep learning, effective teaching, meaningful outcome, real attainment or quality progress.*

It is important to emphasise that engagement for learning is not about giving children what they like to keep them quiet, but about how educators can work with children to construct the learning readiness that has eluded them hitherto. For children with autism, engagement can be a specific concern. Bagatell (2012: 258), quoting Carnahan et al. (2009: 37), writes that while students with disabilities spend less time engaged with peers, adults and materials than students without disabilities:

> *…students with ASD are 'less available for learning, or less engaged, during academic instruction' than typically developing students and other children with disabilities.*

Steinbrenner and Watson (2015: 2393) note that engagement relates to the quality of education and predicts children's later skills; they conclude that 'measuring and understanding engagement is a necessary step in determining how to provide high quality, effective services for students with ASD'.

DEFINING ENGAGEMENT

Over 20 years ago, Newmann (1986: 242) observed that 'engagement is difficult to define operationally, but we know it when we see it, and we know when it is missing.' Early attempts to define engagement focused on 'time on task'. Later definitions recognised its emotional (Skinner and Belmont 1993: 572) and other multiple dimensions (Ridley et al., 2000; Kuh et al., 2008), expanding the concept to include the quality of the engagement invested by a learning child (Brooks, 2010). The CLDD Project definition, which emerged through numerous revision processes with a wide array of professionals and educators, seeks to emphasise process and quality rather than outcome and quantity, and recognises the crucial interaction between learner and learning environment (Brooks, 2010; Kuh, 2008):

> *Sustainable learning can occur only when there is meaningful engagement. The process of engagement is a journey which connects a child and their environment (including people, ideas, materials and concepts) to enable learning and achievement. (Carpenter et al., 2015: 22)*

This idea of a connection between a child and their environment acknowledges the dynamic relationship between learner and learning environment that requires adaptation from both the learner and the learning environment for a successful connection (see Figure 1).

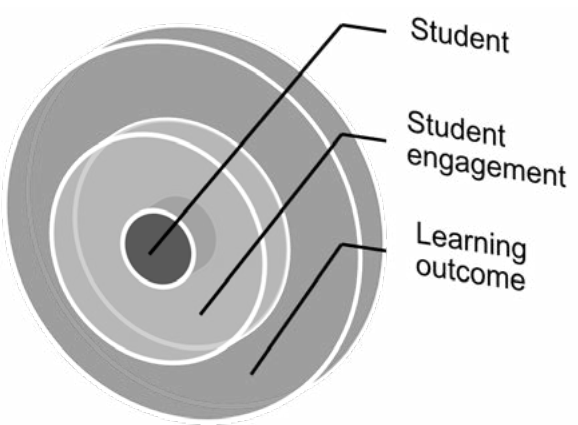


Figure 1. The relationship between engagement and learning (Carpenter et al., 2011, 2015)

Engagement may be understood as an 'umbrella' which covers a group of related ideas. To be able to direct children's engagement for lear-

ning, educators need to break engagement down into manageable components that allow them to focus on, engineer and develop different aspects of learning (Carpenter et al., 2011, 2015). Simpson et al. (2013: 1489) also recognise this, observing, 'Engaging individuals with ASD in learning programmes may require deliberate manipulation of materials, activities and the environment'.[1]

The Engagement Profile and Scale (Carpenter et al., 2011, 2015) – two of the suite of tools in the Engagement for Learning Framework[2] – therefore use seven 'indicators' of engagement for learning (see Figure 2 below). When educators commit to these indicators in facilitating and adjusting children's learning experiences, the outcomes can be transformative.

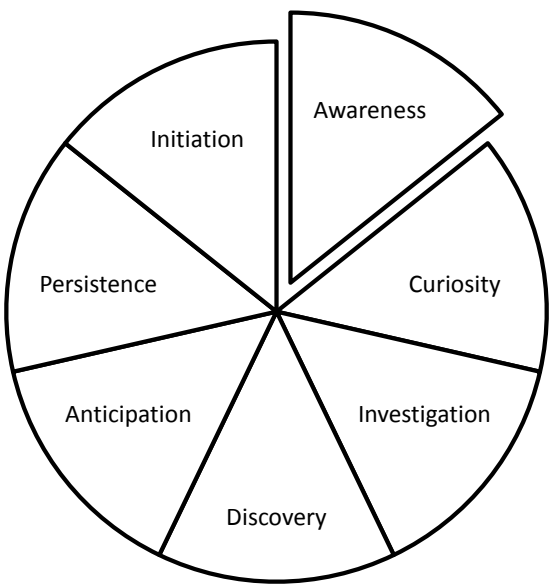


Figure 2. The seven indicators of engagement for learning

OUTCOMES FROM THE CLDD RESEARCH PROJECT

During the CLDD research project, a total of 95 educational settings, including students, educators and parents, took part in the development and trial of the Engagement for Learning Framework tools. This involved three phases between November 2009 and March 2011: Phase 1 during which the tools were developed and refined (12 special schools; 60 students and their parents); Phase 2 in which UK and international special schools trialled and fed back about resource effectiveness (65 schools; 130 students); and Phase 3 – a similar mainstream trial phase (16 schools and two early years settings – 34 students).

The CLDD research team sought to establish through the trial phases how well the Engagement for Learning Framework resources worked for educators in everyday practice; how the resources impacted on students' engagement in learning; and educators' perceptions of the professional impact of using the resources (cf. Carpenter et al., 2011).

The data collected using the Engagement Profile and Scale for individual students across all phases of the research suggested that the proportions of students showing an increase in engagement associated with Engagement for Learning Framework resource use were broadly similar: 81–85% (mean: 83%) students showed increased levels of engagement; 2–9% (mean: 5.3%) students showed neither increased nor decreased levels of engagement; 5.5–16% (mean: 11.6%) students showed decreased levels of engagement (Carpenter et al., 2011). This information relates to engagement score trends alone; however, the scores were supported by descriptive data which included the associated contextualising (e.g. aim, objective, strategies, environment, student mood, etc.), and observational information (e.g. what worked, what did not work and proposed next steps).

During semi-structured exit interviews, educators involved in the Phase 2 and 3 trials (post-development phases) shared their perceptions of the usefulness of the Engagement for Learning Framework resources as well as learning outcomes for their students. When asked to rate the usefulness of the Engagement Profile and Scale, 57 educators (76.7% of those responding) said the resources had been 'useful'

or 'very useful'; 17 (23%) described them as 'quite useful'; while one person (less than 1%) thought they had been of 'little' or 'no' use. Sixty-four (86.3%) of trial schools identified positive learning outcomes for their students from working with the CLDD Engagement for Learning resources.

Educators also made positive comments about the impact of using the Engagement for Learning Framework on their professional practice. Sixty-four (82% of those responding) described how it had caused them to reframe their practice in relation to learner awareness, professional reflection, understanding and focus. Sixty-one (77%) referred to specific areas of professional practice – most frequently: personalising learning; planning, target-setting and assessment; and student observations. When asked whether they would continue to use the Engagement for Learning resources after the CLDD Research Project ended, 73 educators (95%) said they would use them in some way, and of these 47 (69%) said they would use them as trialled. Twenty-four respondents (26%) said that their schools (including one mainstream secondary school) intended to roll out the Engagement for Learning Framework resources across the whole school as a result of their trial.

THE ENGAGEMENT PROFILE AND SCALE

The Engagement Profile and Scale together form a classroom observation and assessment resource that enable educators to shape child-centred, personalised learning pathways through:

- *Identifying children's engagement for learning behaviours during their highest-interest activity (Engagement Profile)*
- *Reflecting on and implementing strategies to increase children's sustained engagement and 'deep learning' in low interest activities (Cogill 2002; Hargreaves 2006; Hennessy et al. 2007) (Engagement Scale)*
- *Evidencing the impact of the resulting incremental adjustments to the children's learning environment (Engagement Scale)*
- *Scoring the children's current engagement for learning in the light of their own 'highest engagement' activities (Engagement Scale).*

Thus:
The Engagement Profile is used to describe a child's 'highest possible engagement for learning' behaviours during their 'most absorbing-interest' activity or activities; this may be in any environment (e.g. school, home, therapies, community activities, etc.)[3]

The Engagement Scale: allows assessment and documentation of a child's progress on a journey from minimal engagement in a priority learning activity to high engagement as a result of adjustments made.

The use of the Engagement for Learning Framework is described below within the case study from Hamilton School, Birmingham, a school for 83 children with an Autism Spectrum diagnosis. By focusing on a child's engagement for learning, instead of their disengaged, behaviours, educators and learners can celebrate their incremental progress towards a priority learning target. The resulting evidence can inform both parents and supporting professionals.

CASE STUDY

Hamilton School is an inner city Primary Special School. All 83 students have a diagnosis of autism, ranging across the spectrum in terms of levels of need and support. A priority for the school is for students to sustain engagement with learning, which contributes to their enjoyment of school and to achieving well in order to maximise their life chances.

The headteacher wanted to trial the Engagement for Learning Framework as a possible means for education staff to identify and remove barriers to learning for children, and record progress. Therefore he asked the Curriculum Lead Teacher to pilot the approach

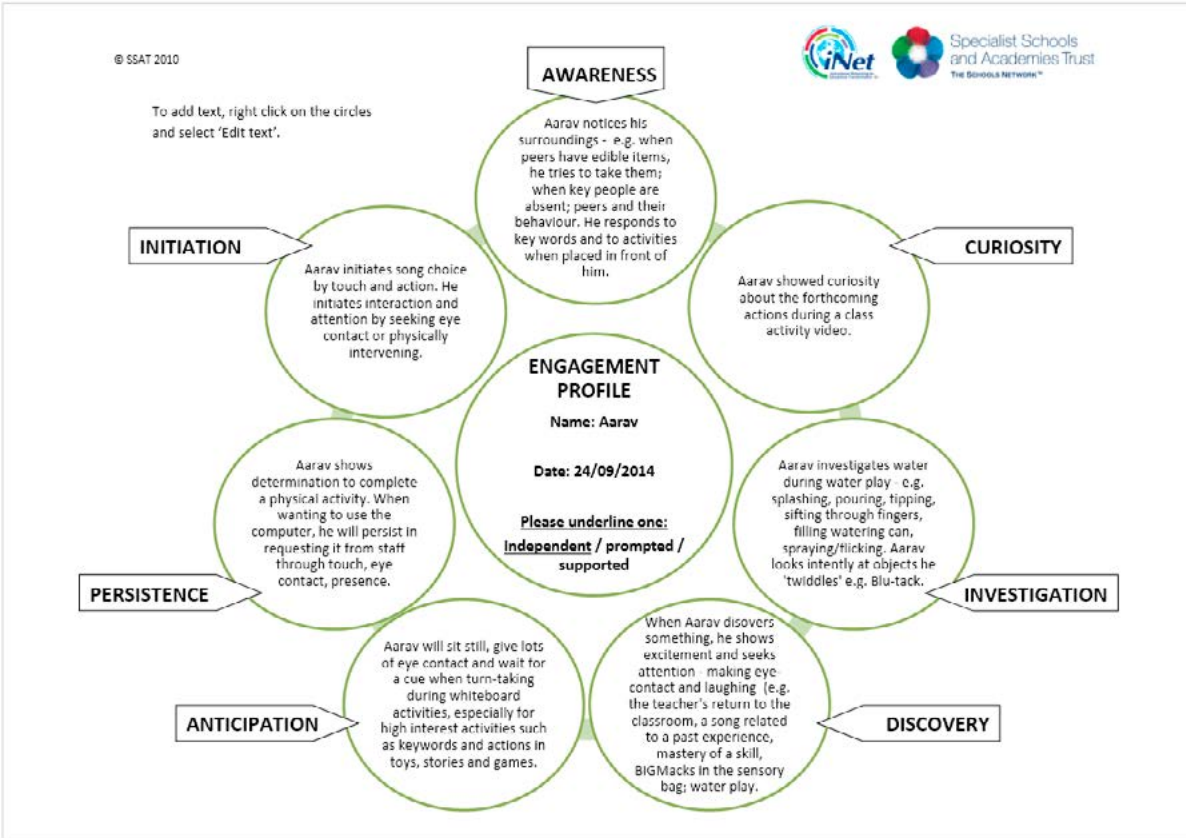


Figure 3. Aarav's Engagement Profile

initially with one child, whose case study is recorded below.

Aarav (not his real name), an eight-year-old student with autism, had very low engagement with all aspects of learning and class activity. He was easily distracted, struggled with gross and fine motor skills, and had sensory issues, including audio hypersensitivity.

Following training in using the Engagement Profile and Scale, Aarav's teacher and occupational therapist began to explore collaboratively Aarav's learning styles and what engaged him, using the Engagement Profile and Scale to record this. In identifying Aarav's most highly engaged behaviours for the Engagement Profile (see Figure 3), they discovered Aarav enjoyed 1:1 interaction with adults, particularly when singing nursery rhymes, and had an interest in 'twiddling' objects. A subsequent occupational therapy assessment revealed that Aarav had a low arousal levels, poor core stability, and that he used twiddling to self-regulate and motivate himself.

The low engagement activity that the teacher and occupational therapist identified for improvement was independent working. Aarav found it difficult to engage in independent learning without multiple staff prompts due to his low arousal and distractibility. The teacher and occupational therapist therefore considered a range of related interventions to increase Aarav's ability to focus on learning activities during independent learning.
The teacher and occupational therapist decided upon an initial intervention period of nine weeks. Following baseline measurements, which established Aarav's pre-intervention levels of engagement, the interventions were introduced over that period and outcomes regularly

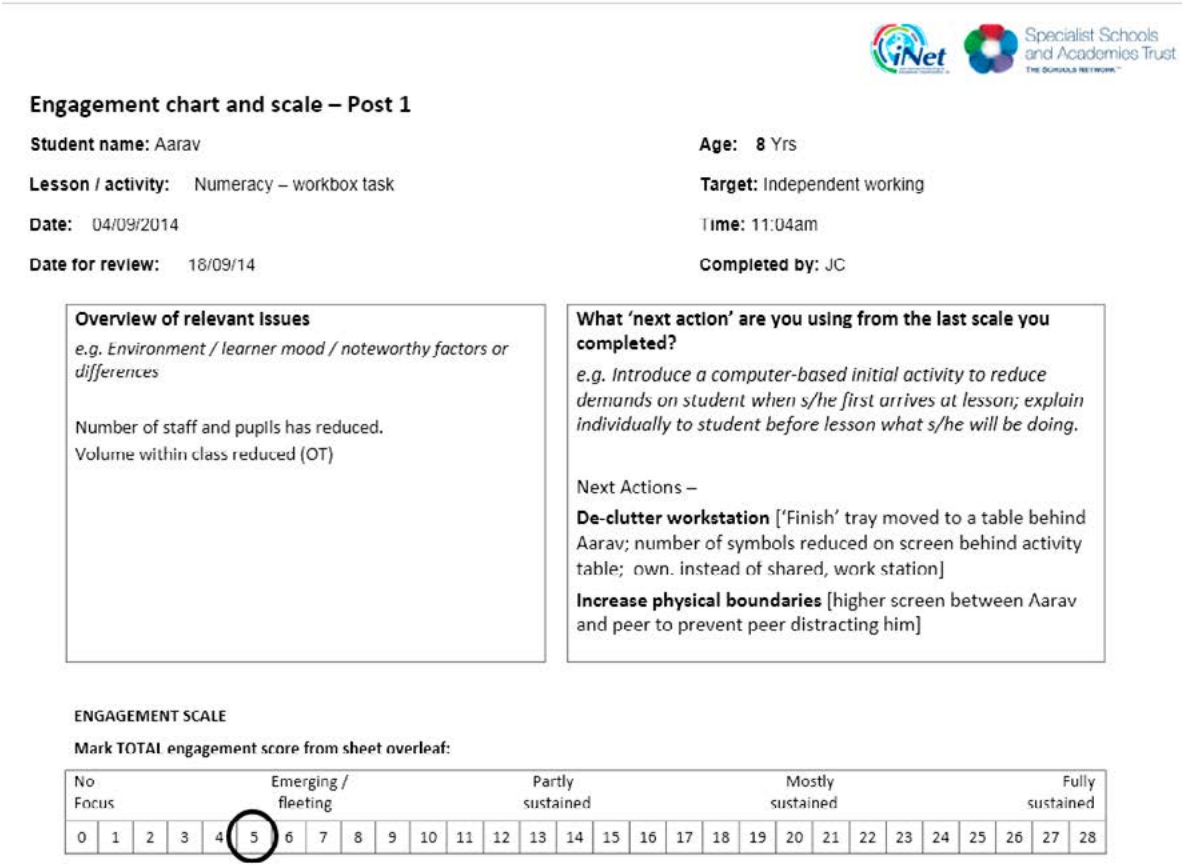
documented using the Engagement Scale. (See Figure 4a and 4b for an example of one of seven observations using the Engagement Scale.) The interventions implemented to increase Aarav's were inspired by his Engagement Profile, including introducing a piece of 'Blu-Tack' for him to manipulate between tasks, and providing 'as needed' opportunities for Aarav to join staff in a short 1:1 'wake-up shake-up' activities between tasks. Other interventions related to evidence-based knowledge of what works for many children with ASC; for example, structured teaching elements of the TEACCH approach (Mesibov et al, 2004).

Engagement was scored by completing one Engagement Scale (see Figure 4) for each observation date – carried out live and/or supported with video. Each Engagement Indicator was scored between '0' (no engagement) and '4' represented by Engagement Profile descriptions of highest engagement behaviours for Aarav's favourite activities, giving a maximum possible score of 28 across the seven Indicators. (This is why Engagement Profile 'most engaged behaviour' descriptions should include contributions from parents and other professionals working with the student.) Behaviour descriptors for interim scores (1–3) were pre-agreed between observers to give inter-rater reliability. Knowledge of the student's most highly engaged behaviours enabled educators to have realistic high expectations of what is possible for the student. (Obsessive and compulsive behaviours are usually excluded as they do not represent engagement for learning.)

The descriptive observations in the Engagement Scale's 'What happened' column supported the scores given; while the 'Next actions' suggested possible adaptations to the activity intended either to further increase the student's engagement or, if engagement was already high, to increase the challenge or complexity of the activity. Typically only one or two adaptations are taken forward before the next observation. This allows the observers to ascertain which adaptations have the greatest impact on the student's engagement, and therefore which can be used more widely across the student's curriculum. As can be seen from Table 1, six adaptations were made between 4.9.14 and 18.9.14, due to the need to increase the student's learning engagement quickly and practical constraints. In an ideal world, this would also be a period of more frequent observations made after every one or two adaptations. Adaptations which appeared to increase engagement are subsequently retained, whereas any with no or minimal impact would have been discarded, with the Engagement Scale observations supplying the evidence for this. For pupils with profound and multiple learning difficulties, changes may need to be made slowly and to be in place for an extended time before any impact on engagement is apparent.)

At the end of the nine-week intervention period Aarav's observations were analysed (see Tables 1 and 2, and Figure 5). For observed differences in engagement to be valid, it is important to maximise consistency of the learning experience (e.g. environment, content and delivery) as far as possible aside from documented changes. Page 1 of the Engagement Scale prompts staff to note any significant changes to mood, medication, environment, etc., that are likely to impact on engagement so this can be taken into consideration during analysis. As Aarav was working at a developmentally low level (low 'P' levels), skills and presentation of numeracy and literacy activities were similar and consistent. At higher curriculum levels, learning experiences are very different, and students engage differently with different topics, and therefore the subject area would need to be consistent.

By the end of the 9-week engagement intervention, supported by the Engagement Profile and Scale, Aarav had increased his attainment by two 'P levels' in some of his Maths and English work. His confidence improved socially as well as academically. In contrast with his previous apathy, he began to initiate interaction



Engagement chart and scale – Post 1

Student name: Aarav **Age:** 8 Yrs

Lesson / activity: Numeracy – workbox task **Target:** Independent working

Date: 04/09/2014 **Time:** 11:04am

Date for review: 18/09/14 **Completed by:** JC

Overview of relevant issues

e.g. Environment / learner mood / noteworthy factors or differences

Number of staff and pupils has reduced.
Volume within class reduced (OT)

What 'next action' are you using from the last scale you completed?

e.g. Introduce a computer-based initial activity to reduce demands on student when s/he first arrives at lesson; explain individually to student before lesson what s/he will be doing.

Next Actions –

De-clutter workstation ['Finish' tray moved to a table behind Aarav; number of symbols reduced on screen behind activity table; own, instead of shared, work station]

Increase physical boundaries [higher screen between Aarav and peer to prevent peer distracting him]

ENGAGEMENT SCALE

Mark TOTAL engagement score from sheet overleaf:

No Focus				Emerging / fleeting							Partly sustained							Mostly sustained										Fully sustained	
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

Figure 4a. Aarav's Engagement Scale (page 1) – intervention week 1

with a range of adults and take more interest in his peers. He was also transitioning around school independently whereas previously he had relied on a 'buddy' to guide him.

Based upon the successful outcome of this pilot for Aarav, and existing evidence from the CLDD research project (Carpenter et al., 2011, 2015), the school have widened the pilot to include three further children for support and invested in whole-staff training in use of the Engagement for Learning Framework. The school has found that the Engagement Profile and Scale training is stimulating staff to think actively about what 'engagement for learning' means for their pupils. Most classes have found that the Framework helps them think creatively about how to adapt activities and incorporate pupils' interests to motivate and engage them with learning.

CONCLUSION

According to Lawlor (2009: 74, in Bagatell, 2012: 259), 'The concept of engagement has tremendous face validity, but is remarkably understudied and undertheorized'. Part of this may be due to the necessarily qualitative approaches. For example, although many studies attempt to quantify observations through measuring eye-gaze behaviour or apparent time on task, this does not always capture engagement for learning, particularly for children on the autistic spectrum. Autistic students, while appearing largely unengaged in learning (e.g. averted gaze, engaged in repetitive movements), may in fact be absorbing information (Bagatell, 2012). As Bagatell goes on to comment, this 'highlights the tension between the observable and the experienced aspects of engagement, and challenges occupational therapists, educators, and others to consider alternative ways that

Engagement Indicators	Score (0–4)	What happened? What happened / what didn't happen and why?	Possible next actions to increase engagement What will I do next time and why? How will I make the activity more appealing (see Inquiry Framework)?
Awareness	0	Aware of adult – change of position – seeks eye contact Change of position, looks around, and stands up to look over partition. NB Awareness not linked to focus activity.	Look above Aarav to reduce eye contact. Still requires a structured jig to increase awareness of activity – for clarity
Curiosity	1	Gets up to look over partition at peers and class display. Change of amount of symbols on partition. Looks at own photo	Still requires a structured jig to increase awareness of activity – for clarity
Investigation	0		Provide high motivation task
Discovery	0		Provide high motivation task and over-the-top praise
Anticipation	1	Task completed, looked at "finish" symbol presented. Aarav waited for prompter from staff.	Provide visual prompt on a work system
Initiation	2	Put work into finished tray (after initial prompts)	Provide visual prompt on a work system
Persistence	1	Less distracted, completing tasks slightly quicker Still shuffling, wiggling feet, waving arms. Twiddles resources Arousal low	Provide a 'wiggle cushion' or a 'twiddle' object (Blu-Tack?) in-between tasks? (Consult OT)
Total score	5	NB NOW CIRCLE TOTAL SCORE ON SCALE (previous page)	

Key for scoring	0	1	2	3	4
	No focus	Low and minimal levels – emerging / fleeting	Partly sustained	Mostly sustained	Fully sustained

Figure 4a. Aarav's Engagement Scale (page 2) – intervention week 1

people engage in everyday occupations' (2012: 263). This is one reason why, when considering engagement for learning, the combined value of qualitative judgements and observations, from people who have an in-depth knowledge and understanding of the student and how they learn, should not be under-estimated.

'Engagement' is generally treated in the research literature as a single concept, albeit multiply defined and quantified. This was true of the 125 academic and professional practice papers discovered through an initial literature search with a title focus on engagement and autism. However, it is only when the concept is analysed and broken down – into the Engagement Indicators within the Engagement Framework for Learning, for example – that it is possible for educators and other professionals to systematically address its constituent aspects through adaptions to environment, presentation and teaching approaches that will enhance children's connection with a learning activity. For example, knowing from their Engagement Profile what a student is most interested in, an educator may embed within the learning activity some element that excites their curiosity, which in turn leads to investigation and discovery.

Footnotes

1. Both Simpson et al. (2013) and McCurdy and Cole (2014) list a range of interventions associated with proven learning outcomes for children with ASC, and in the UK, best practice is summarized in the Autism Education Trust's What is Good Practice in Autism Education? (Charman et al., 2011).

2. Other Engagement for Learning Framework resources include (Carpenter et al., 2011,

	Baseline session dates	Intervention session dates					
Interventions	27.6.14	10.7.14	16.7.14	4.9.14	18.9.14	22.10.14	13.11.14
None (baseline)	✓	→	→				
Declutter workstation				✓	→	→	→
Increase physical boundaries				✓	→	→	→
Reduce verbal and physical prompts; provide visual prompts				✓	→	→	→
Task taught first outside work station					✓	→	→
Introduced more visual clarity to task (e.g. jig)					✓	→	→
Move 'finished' tray to a better position					✓	→	→
Introduce twiddle (Blu-Tack) between tasks					✓	→	→
Wake-up shake-up activity when arousal dips					✓	→	→
Aarav to have individual work station					✓	→	→
Put completed task in finished tray						✓	→
Task on inclined board as appropriate							✓
Task intentionally incorporates motivating aspects							✓

Table 1. Dates of interventions introduced with the intention of supporting Aarav's engagement for learning between 27.6.14 and 13.11.14

Activity (Independent working)	**Date**	**Baseline**	**Interventions**
Numeracy - workbox activities	27.6.14	5	
Numeracy - workbox activities	10.7.14	1	
Numeracy - workbox activities	16.7.14	4	
Numeracy - workbox activities (fastenings)	4.9.14		5
Literacy - workbox activities	18.9.14		20
Literacy - workbox activities	22.10.14		18
Numeracy - workbox activities	13.11.14		26

Table 2: Engagement scores achieved for baseline and intervention sessions using the Engagement Profile and Scale

2015): the Engagement Ladder, which helps educators to identify a priority learning focus for children with CLDD; the Inquiry Framework for Learning – a framework of starter questions towards learning solutions in 12 areas including communication, emotional well-being, motor skills, etc.; a series of 10 CLDD Briefing Packs on conditions which commonly co-exist in children with CLDD giving information on effective educational strategies

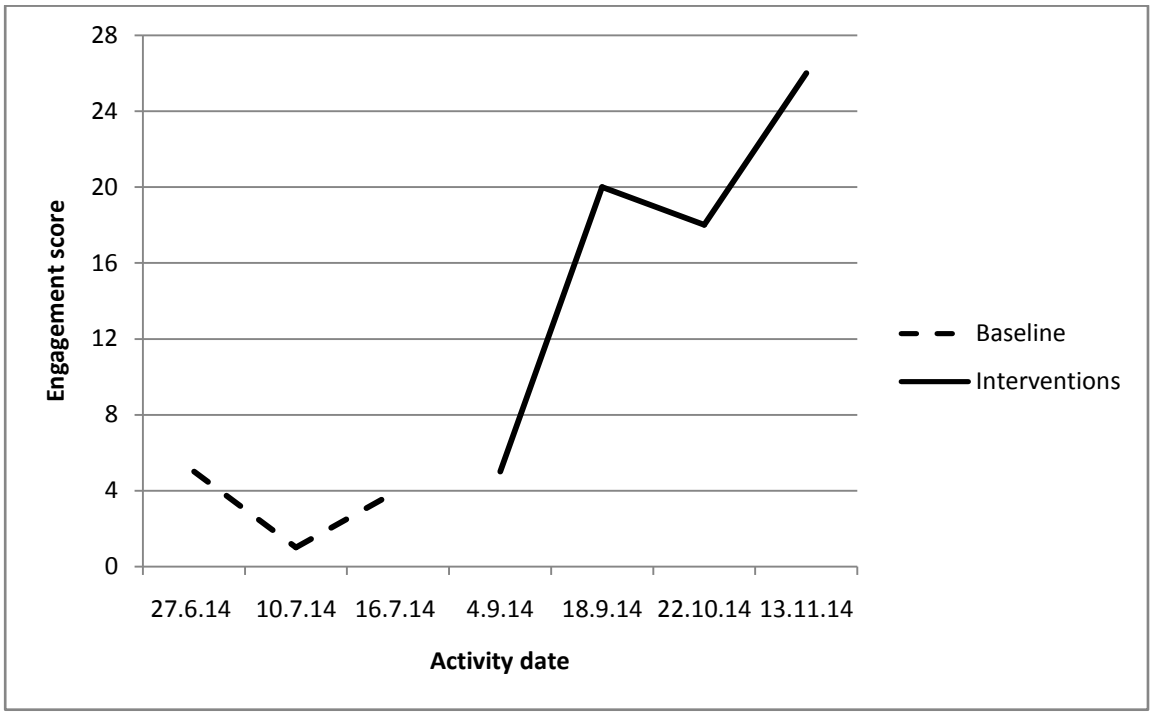


Figure 5. A graphic presentation of Aarav's engagement scores during independent work tasks in which '28' is the maximum possible engagement score.

3. When children's 'most absorbing interest' is detrimentally obsessional. or socially inappropriate, educators should select an alternative highest interest activity.

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