Charlotte Davies
Fit 2 Learn CIC

Barriers to learning: a practical investigation in how to analyse their root causes, monitor and overcome them using appropriate technologies.

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Objectives

- identifying a structure to profile a child's physiology for learning with visual screenshots and printouts that enable all stakeholders to share the underlying issues

- identifying key steps in changing a child's physiology which will impact upon a child's cognitive skills;

- provide the data to understand the precision with which it is necessary to work to impact upon cognitive skills.

- Provide an understanding of the limitations of the methods.

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Technology

Technology used is a means to an end to:

- Assess and monitor;

- To share information with stakeholders;

- To provide insight into sequence of processes;

- To quality control;

- To provide transparency and rigour;

- To scale the programme up.

Programme aims

- To create a programme that addresses developmental delay that is affordable, sustainable and accessible.

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Case Study – Autistic boy, difficult home background

Gross motor skills

Exercise	Observations December 2013	Observations April 2015
Angels in the snow	Unskilled, struggled with mid-line crossing	Skilled
Sit-ups	Satisfactory, but skewed leading with his right side	Skilled, good core strength
Skipping with opposing limbs	Unskilled both forwards and backwards	Skilled has now mastered moving forwards and backwards with opposing limbs
Throwing from hand to hand	Struggled with mid-line crossing and catching the ball.	Skilled can now throw a ball from hand to hand competently
9 peg board test	Satisfactory	Equally skilled with both hands

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Technology to log physical movement

- 1. An app with numbered descriptions – too slow; too much detail and too many factors to capture.

- 2. A Go-Pro camera – wide therefore distracting; attached to body therefore turns with body does not stay on subject.

- 3. A professional film maker – slow; intrusive

- 4. Sports coach software – currently investigating.

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Cognitive problem solving

Exercise	Observations December 2013	Observations April 2015
Pattern recognition	Used one hand, and tactile coping strategies to produce a correct solution. He struggled to work out where items were in relation to left and right sides	Used both hands, worked fairly systematically. Used his visual skills to observe and copy the pattern.
Visual memory skills	Could not access this task when first assessed.	Developing well, can confidently repeat complex patterns and detailed pictures from memory.
100 square board test	XXXX could not access this test when he was first assessed.	XXXX can now rotate images in his mind's eye if he is encouraged and reassured.

Technology to log cognitive skills

- Similar problem to gross motor skills. Looking for a wide range of variables:

- Body position; angle of head; position of eyes.

- Involuntary habits;

- Use of hands; one hand, both hands, finger control.

- Head movements;

- Method and efficiency for solving problem.

Visagraph Eye Movement monitoring equipment
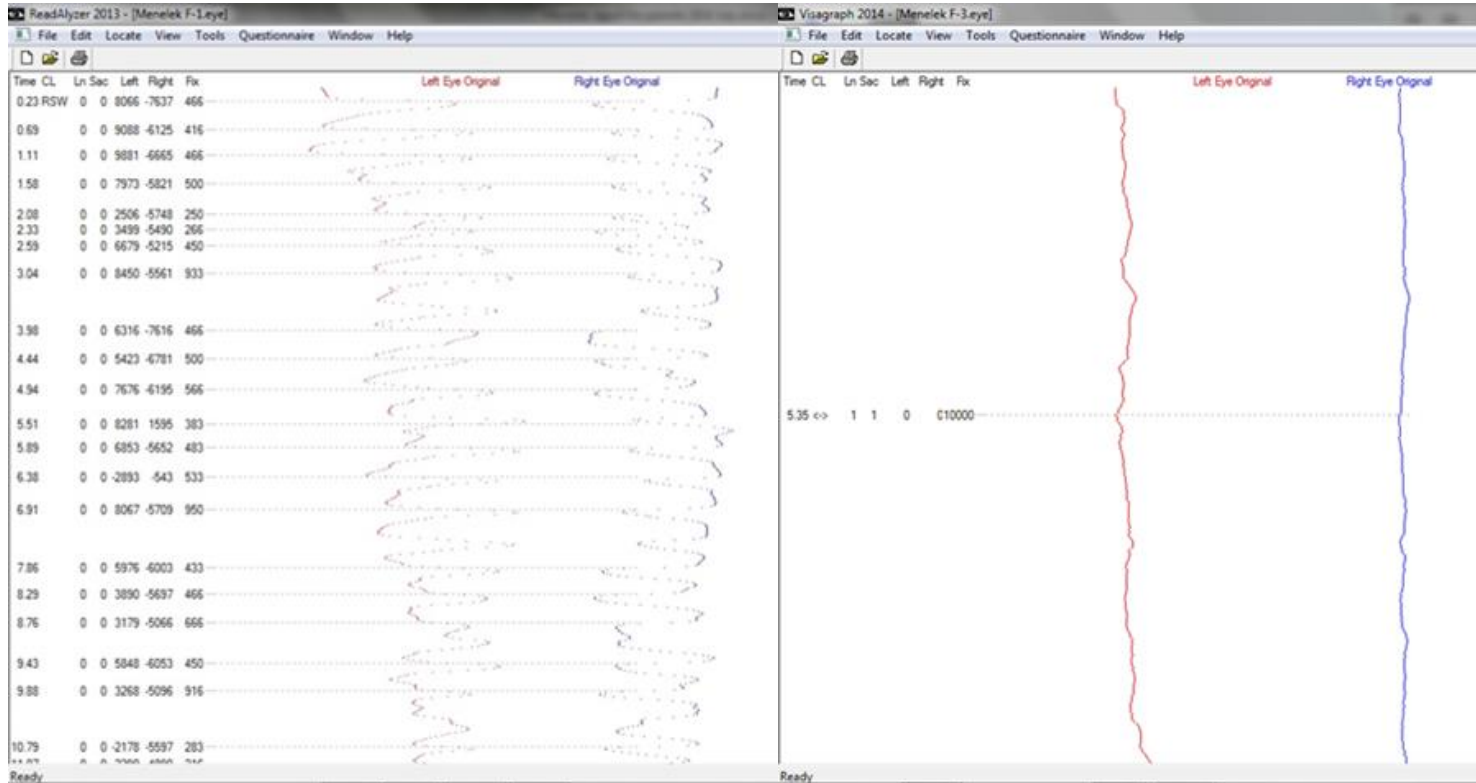
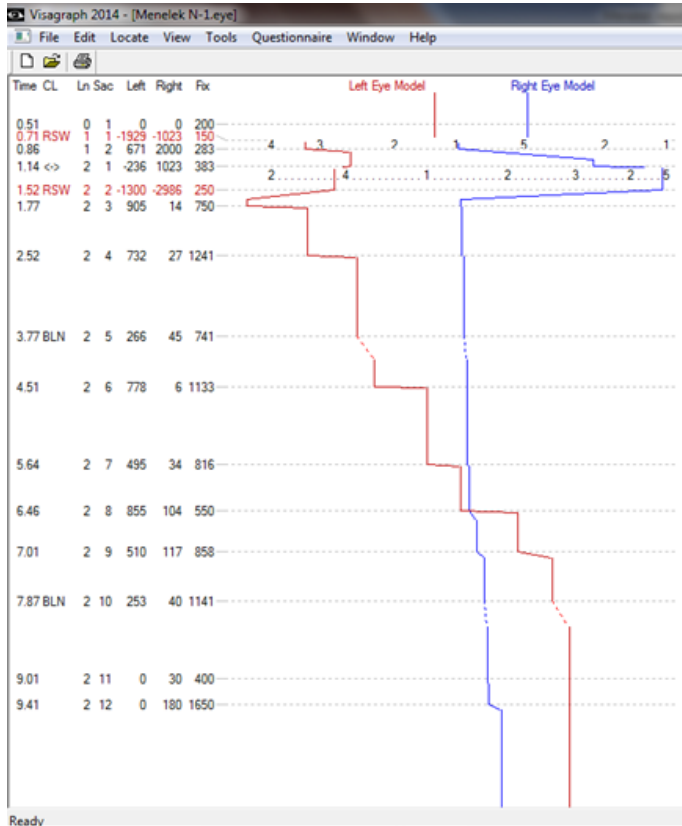December 2013

April 2015

Visagraph

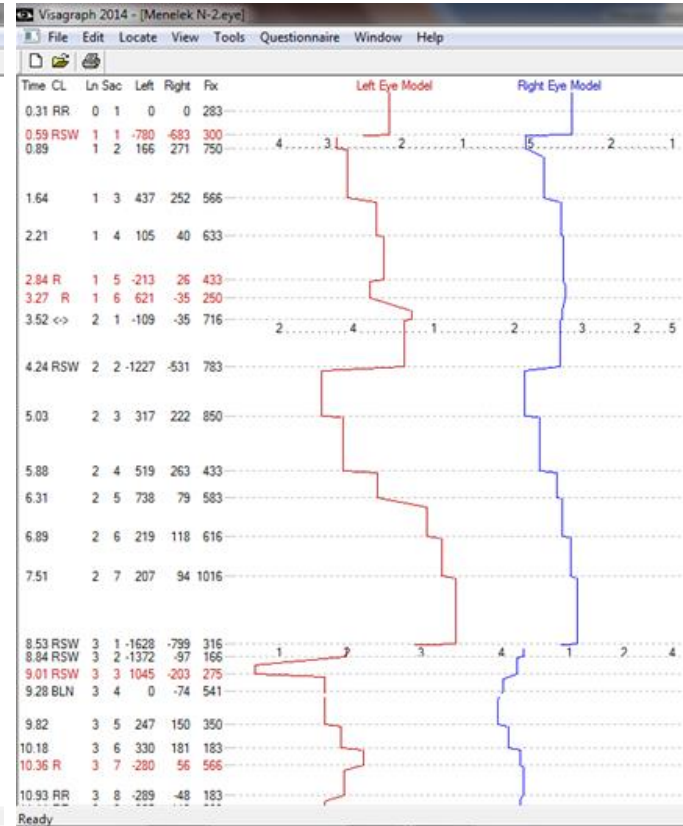Fit2 Learn

Small number text


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4......3..........2........1.........5..........2.......1
2.........4...........1.........2..........3.....2....5
1.........2..........3........4.........1......2......4
4.......1........5.........2.........5........4.......3
3.......2.........3.......4.......1.........2.........2
2.......1.......5.........4......2.........3....5
4.........2.........3.........1.........3.....1......1
4........3.........4.........2.....1......3.....2
5......1...........2.........1......4.......2......3
```

Reading small font numbers

December 2013

April 2015

Other underlying data

- a simulation of the eye movements whilst reading;

- Data on the eye movements against grade related norms i.e.

- Saccadic movements (forward movements)

- Regressions (backward movements)

- Fixations (focusing period)

- Reading rate wpm

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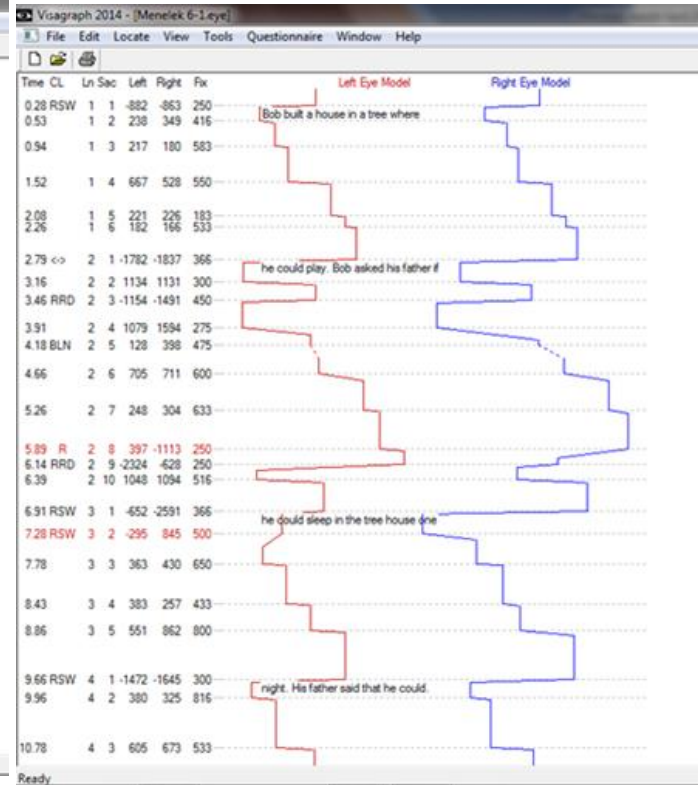# Simple text for reading assessment

o

Jill likes to play with the animals on her farm. The cow she likes the most is all black. One day she took that cow some milk. Two other cows wanted the milk, too. The other cows bumped her down. She called to her mother for help. Her father saw her and ran to help. Now Jill stays away from the cows.
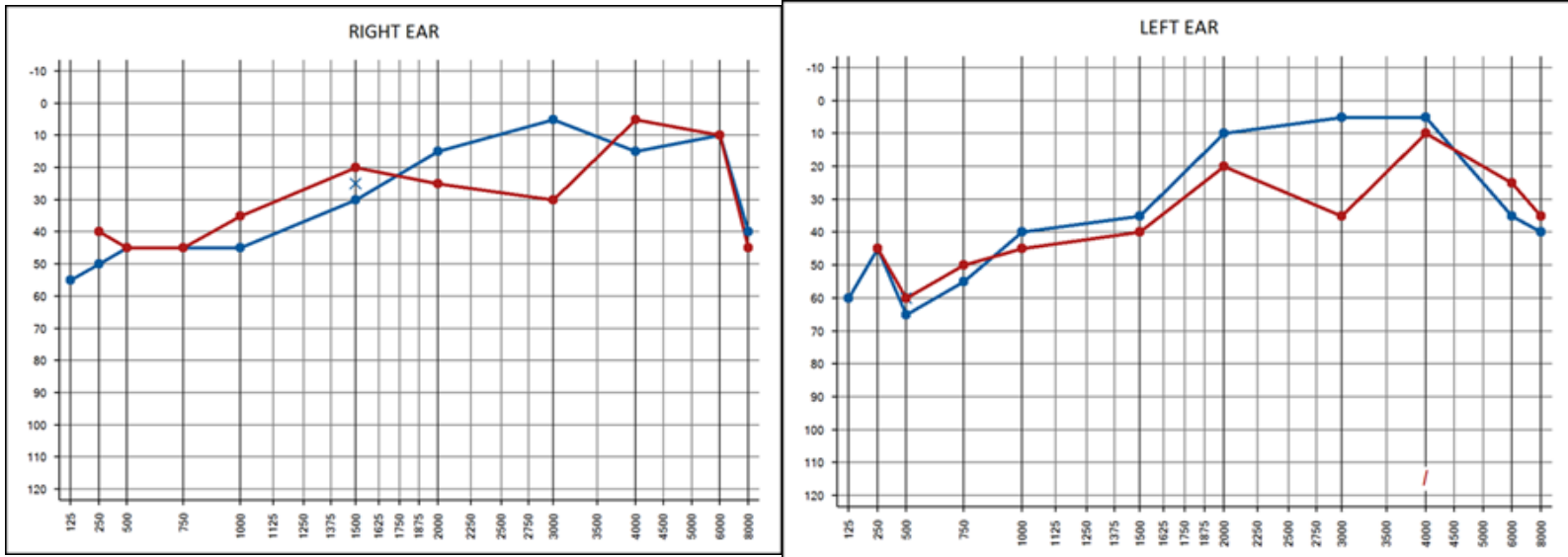
1

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Reading text
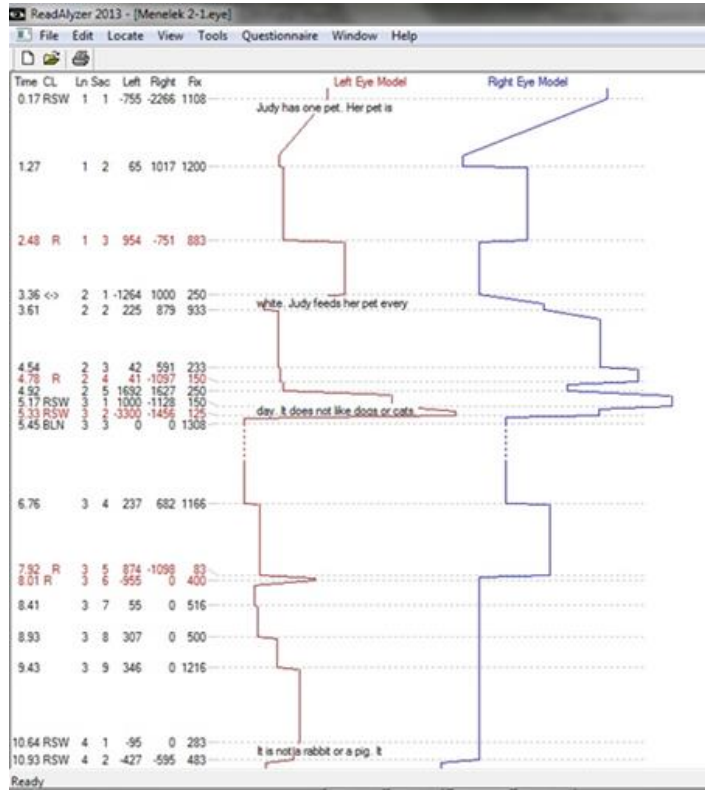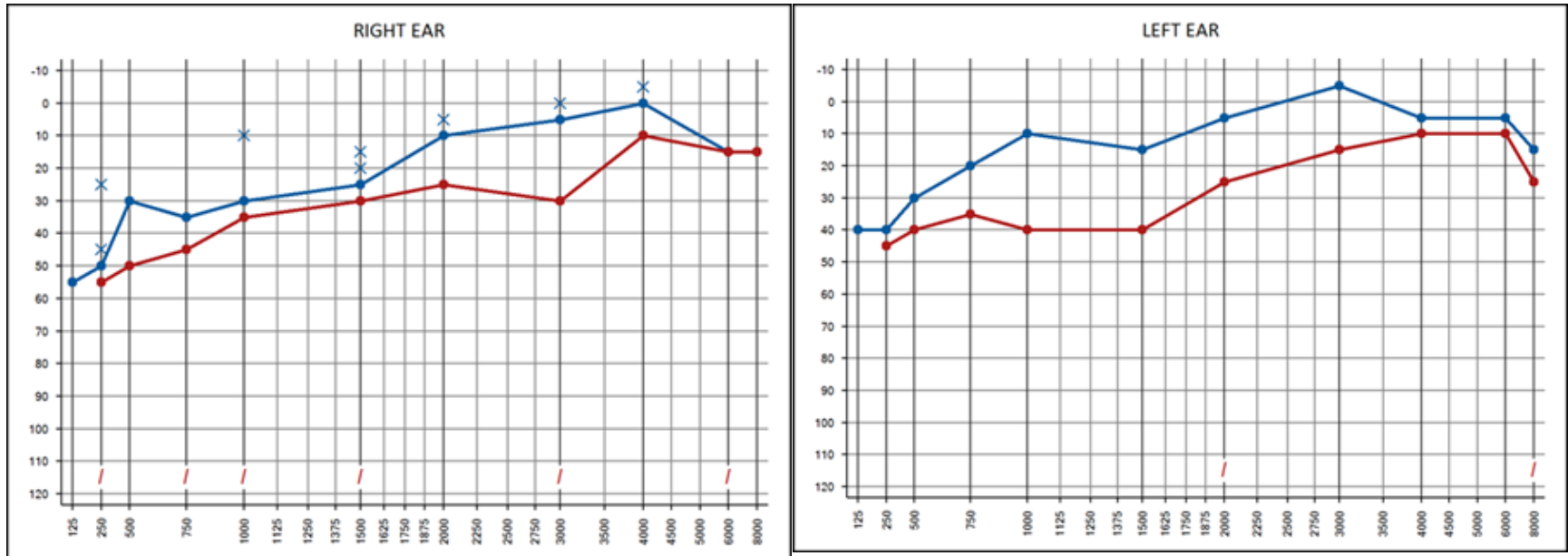

December 2013

April 2015

Tomatis sound processing

September 2014

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Tomatis cont'd

April 2015

Tomatis Technology

- Currently available:
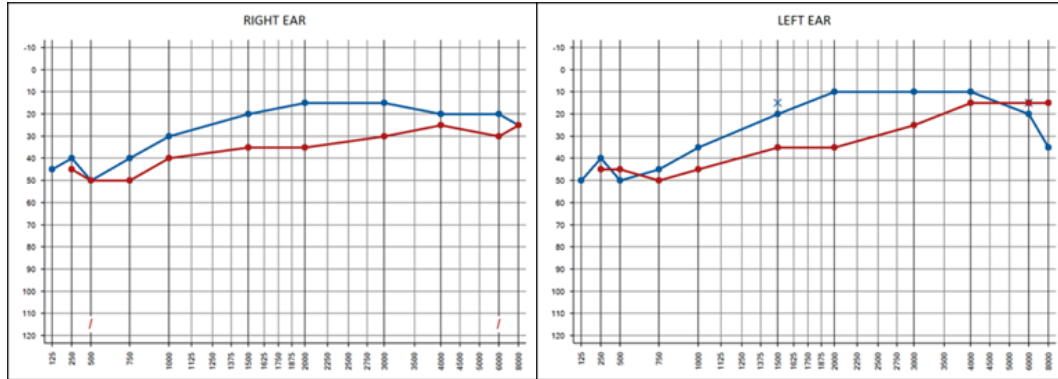- Solisten headsets

Forbrain
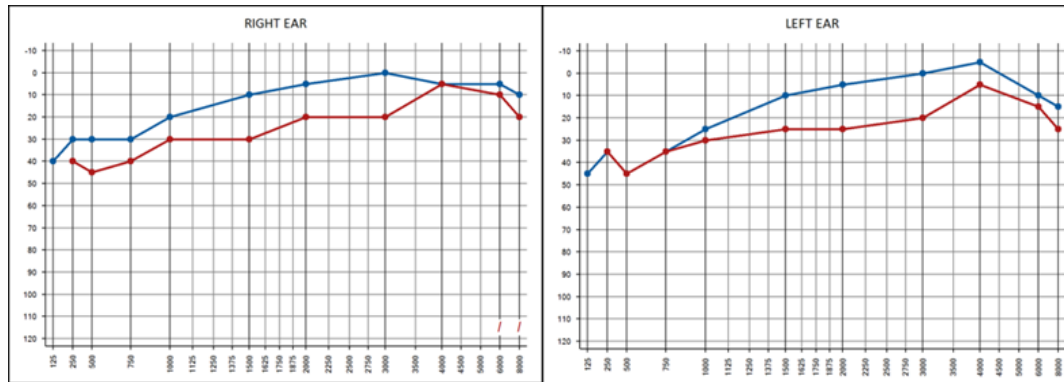
Sound processing screening

- .

Tomatis equipment

- Cost vs. data & evidence for parents, teachers, OFSTED etc

- Monitoring children's actual changes and knowing what is happening

- Age from which it is possible to gather reliable data.

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Forbrain technology

January 2015

April 2015

What we wished we had logged..

- 1. Feet and ankles

- 2. Rhythm

- 3. Hands and manual fine motor skills

- Rationale: logging the journey, showing teacher and child progress, justifying time taken.

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Challenge to sift and simplify

- What does the average class teacher need to know to ensure that all children can access all areas of the curriculum?

- What data should signal that a child needs more focused attention than whole class activities?

- At which stage does a child need professional intervention?

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Long-term developments

- Need to monitor children as they progress through their school years to see how and why they block in different subject and skill areas.

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Results

- 1. Technology is work in progress; partly seeing what we can take from elsewhere; working out what needs to be re-engineered; for some parts writing software from scratch.

- 2. The Fit 2 Learn Programme: Everyone has to go on the same developmental journey, if taken in small steps day by day then everyone can keep making progress.

Detail of results

Gross Motor skills (maximum av. score of 5)

School A   Before average score per pupil 1.05

After average score per pupil   4.07

School B   Before average score per pupil 1.65

After average score per pupil   4.05

School C   Before average score per pupil 1.9

After average score per pupil   4.8

Vision data

School	Fixation Duration Before (After)	Reading Rate WPM Before (After)	Saccadic Differences>17ms Before (After)	Questions correct x/10 Before (After)
A	0.48 (0.47)	105.4 (147.6)	18 (14.1)	7.43 (8.4)
B	0.39 (0.34)	107 (144)	56 (27)	7.7 (9)
C	0.35 (0.31)	137 (181.5)	7.4 (3.5)	7.3 (9.2)

Cognitive Skills

School A before average score per pupil 0.81

after average score per pupil   5.26

School B before average score per pupil 1.3

after average score per pupil   5.7

School C before average score per pupil 0.83

after average score per pupil   5.25

Contact Details

Charlotte Davies

Director

Fit 2 Learn CIC

www.fit-2-learn.com

Charlotte.davies@fit-2-learn.com