

# FEUERSTEIN INSTRUMENT ENRICHMENT IN A SMALL RURAL NZ CLASSROOM/SCHOOL

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## ACKNOWLEDGEMENTS

In the first instance I must acknowledge Vicki Williams, Havelock School's Deputy Principal, who first drew my attention to the TVNZ *Sunday* programme of 11 August 2014 which talked of a new approach to dyslexia. In the time since, we have collaborated to explore further how our rural students might be the beneficiaries of exposure to FIE<sup>1</sup>.

Similarly, the Havelock School Board of Trustees must be acknowledged for supporting senior management with training and subsequently a pilot programme, and more recently also for my involvement in a sabbatical centred about Feuerstein.

This opportunity to study Feuerstein was of course made possible through the Ministry of Education. In a very different way, but crucially, I acknowledge our senior leadership team who managed so well in my absence.



## EXECUTIVE SUMMARY

The goal of Feuerstein Instrument Enrichment (FIE) is to facilitate autonomous and independent learning.

From television to classroom, describes succinctly the school's journey toward Feuerstein's Instrument Enrichment. This description naturally belies the reality of investigating, exploring, lobbying, funding, travelling, training, planning, measuring, implementing and learning that has taken place since that initial TVNZ screening in 2014.

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<sup>1</sup> Feuerstein Instrument Enrichment

Like any new enterprise there was optimistic interest but also caution. With the need being evident for some three years within and across a particular cohort, FIE was identified as a potential approach to support them, not just in one area but more universally with the key competency of *THINKING*. A strong international research base over some sixty years was strong justification that here was a more than a programme, indeed a whole pedagogy that could support normative students as well as those across the special needs spectrum – an inclusive approach delivered in a variety of modalities.

Initial training was completed by the class teacher (DP) in January 2015 and a pilot designed to deliver the initial *Basic* instruments. With RTLB, a regime was designed to help ascertain what effect might take place. Exposure commenced in April 2015 and data gathered very early on. No control was used as it was deemed unethical to exclude some students (and which ones) from engaging with such a potentially powerful programme. In terms of timetabling it was also problematic to try and exclude some students. Four 50 minute sessions per week ensued over the following seven months with data regathered in November.

Costs were met by the school so as not to generate any hardship or disbar any student from taking part due to hardship. While only \$35 per student, when added to normal beginning year costs, it may have forced some to stand on the side-lines. Inclusivity was an important tenant to uphold.

Suffice it to say that post data under the gaze of RTLB was collected and collated and evaluated. A two-page summary of the pilot was distributed to parents who had themselves given both their voice and their children's in what they had seen as evidence of positive change.

With significant positive change evident, especially amongst the boys, the pilot strongly pointed to wider implementation across other classes.

2016 saw the larger second pilot launched. Further training was undertaken in January and the programme delivered from Years 3 – 8 for 50 minutes on four days a week. More usual assessment data was gathered and again in early 2017.

Delivery continued using the *Basic* and *Standard* sets of instruments as planned through the first three terms. During Term 3 the principal attended the Feuerstein International Summer School (Shoresh) in Prague to train in the delivery of FIE-Tactile Kinesthetic – for partially sighted people and those with ADHD.

Term 4 was disrupted with a change in staffing and two classes combined with one mediator and one teacher-aiding. A number of issues arose that could not be easily resolved, underlining the fact that there comes a point when group FIE in a normative setting becomes unwieldy especially when not all class teachers are trained. Despite a less than desirable and stable delivery of FIE during 2016, for the first time the school achieved an overall mean of 88% of students achieving *At* or *Above* the National Standards.

Although an inquiry, rather than a purely empirical exercise, evidence from the pilots suggest significant shifts in what students bring to their learning beyond FIE and the classroom. To what degree this can be attributed purely to exposure to FIE rather than all the other curriculum that happens in a classroom, school and beyond is very hard to quantify. This can only be done using the *Learning Propensity Assessment Device*<sup>i</sup>. Although used on a one-to-one basis, it will be some time before group LPAD will be available beyond Israel. A web-based tool is under development but training will not be easy as initially it will be only on offer at the Shoresh (Milan July 2017).

As FIE is a complete pedagogy, substantial background has been included in this paper in order to give the reader an insight into its initially theoretical base (now supported through research and the new science of neuroplasticity). Cognitive functioning is enriched through an array of deliberate finely tuned, graduated (increasing complexity) and sequenced instruments. Thinking about thinking or metacognition, is both the task of learner and mediator. The task is the vehicle to provide the means to develop a particular cognitive function

leading to improved cognitive operation which can then be *bridged* into the real world and transferred to life beyond the here and now.

FIE is used across the world with diverse groups, special needs (behavioural, injured) normative populations and indigenous people with well documented success. Over eight hundred schools in New Zealand have some form of FIE operating and a growing number of parents who are seeing results in only weeks.

Work will continue to explore how best to embed this pedagogy into classroom practice determining how all students might be best exposed over the school year and their primary years to the advantages of enhanced thinking in order that their life chances are maximised... *learning for life*, able to become their own agent within and beyond the classroom – confident, connected, actively-engaged and life-long learners.

Confident	Connected	Actively Engaged	Life-long Learners
<ul style="list-style-type: none"> <li>• positive in their own identity</li> <li>• self-motivated</li> <li>• resourceful &amp; resilient</li> <li>• respectful &amp; reasonable</li> <li>• responsible &amp; reliable</li> </ul>	<ul style="list-style-type: none"> <li>• relate well to others</li> <li>• team player</li> <li>• effective ICT skills</li> <li>• connected to the environment, their communities &amp; globally</li> </ul>	<ul style="list-style-type: none"> <li>• participates &amp; contributes across a range of contexts</li> <li>• physically active</li> <li>• supports &amp; encourages others - is a big dolphin</li> </ul>	<ul style="list-style-type: none"> <li>• literate and numerate</li> <li>• critical and creative thinkers</li> <li>• independent learners</li> <li>• users &amp; creators of knowledge</li> <li>• informed decision makers</li> </ul>



## PURPOSE

From the earliest, interest was piqued as to how FIE might be used in our rural school particularly in relation to a cohort of students who had, from enrolment, shown showed minimal transference and limited strategies resulting in under performance. The intended consequence of using FIE was to enhance cognitive strategies and mitigate the apparent deficiencies impacting on students' wider curriculum. As mentioned above, this cohort of students in 2015, nearly all in Wakamarina<sup>2</sup>, presented an almost homogenous need. The purpose became very clearly;

1. To determine the efficacy of FIE in a rural New Zealand classroom and whether students' needs would be met. An inquiry would need to run alongside the initial Feuerstein Pilot during 2015 and second stage in 2016.

The second purpose particularly relating to the period of the sabbatical, was;

2. To attend the annual international summer school or *Shoresh* and then if time and resource allowed also take a brief look within and beyond New Zealand at Feuerstein work internationally.



## BACKGROUND

Although introduced to FIE via television, it did not take much effort to explore material available on the internet and discover the body of world-wide research of over 60 years and a connection with New Zealand as early as 1970. The seeds had been planted and plans were made.

From almost reception in 2011 it was increasingly obvious that the 2015 cohort in the middle of our three learning areas/classes (Yrs 2 – 4), would be needing a curriculum tailored more closely to anticipated needs. By

<sup>2</sup> *Wakamarina* - single cell learning area/classroom catering for students in Y4 (9), Y3 (14) and Y2 (7) - a further 7 Y2 pupils were in the *Kaituna* Learning Area Havelock School has named its learning spaces after local waterways running into the Marlborough Sounds and ultimately the world's oceans... *Kaituna* ~ (Yrs 1 - 2) the smallest; *Wakamarina* ~ (Yrs 2 - 4) still washing gold into its gravels; *Pelorus* ~ (Yrs 5 - 8) the largest debouching into the sound with the same name and from thence into the wider seas and oceans of the world. The school's students similarly since 1861, have indeed travelled the globe and made significant contributions beyond local shores - an aspiration held for its current pupils. In mid-2016 a fourth classroom was added *Kenepuru*, another significant waterway in the greater Pelorus Sound.

mid-2014 teachers were mooting a programme perhaps better suited to the needs of boys. Learning how to learn, how to think and to then apply across the wider curriculum, was a clear need for almost all.

Following a “Sunday” documentary on TV One (11 Aug 2014)<sup>3</sup> about a new approach to dyslexia learning featuring Barbara Arrowsmith and Anne Gaze (Reuven Feuerstein), a spark was struck and discussion ensued. Suffice it to say the professional staff and trustees worked to find out more and initial training was undertaken by Vicki Williams, (class teacher, SENCo, Reading Recovery teacher and DP) in September. After further deliberation, the Board of Trustees took a bold step and agreed to a pilot for Wakamarina in 2015 and Vicki attended another training module in January 2015. A budget was agreed from within the school’s operational funding so no student would miss out.



## INTRODUCTION TO FIE

Before reading further, some clear understanding of FIE and its genesis is fundamentally necessary. It cannot, nor should it, be oversimplified. The underlying theory is, in this 21<sup>st</sup> Century, being affirmed through recent developments and advances in the field of neuroscience.

The basic principle of the Feuerstein Method is that all of us - regardless of our age, disability or socio-economic background, have the ability to significantly improve our level of cognitive functioning and therefore, the way we learn.

***"Intelligence is not a static structure,  
but an open dynamic structure  
that can continue to develop throughout life."***

*Reuven Feuerstein<sup>4</sup>*

Instrumental Enrichment (IE) is the cognitive intervention program used individually and within the classroom. The IE programme is successfully used worldwide as the tool for the enhancement of learning potential and cognitive functioning of learners. IE, as a classroom curriculum, is aimed at enhancing students' cognitive functions necessary for academic learning and achievement, and ultimately their life chances.

- 3 000+ published and peer reviewed articles
- 60+ years of implementation/development
- Not-for-profit
- Implemented by multiple governments internationally
- 100 000 students in Europe delivered the programme daily
- 800+ New Zealand schools using FIE in varying contexts

By identifying and targeting specific cognitive weaknesses, we can intervene and strengthen the weak cognitive capacities that affect our learning. We can “re-design” our brains. [View *Sunday* news story - Feuerstein enters New Zealand<sup>3</sup>]

<sup>3</sup> <http://tvnz.co.nz/sunday-news/new-approach-dyslexia-learning-video-6052374> and also <http://www.nzfie.org/>

<sup>4</sup> **Reuven Feuerstein** (Hebrew: רֵאוּבֵן פּוֹיֶרְשְׁטֵיין; August 21, 1921 – April 29, 2014) was an Israeli clinical, developmental, and cognitive psychologist, known for his theory of intelligence which states “it is not ‘fixed’, but rather modifiable”. Feuerstein is recognized for his work in developing the theories and applied systems of: structural cognitive modifiability, mediated learning experience, cognitive map, deficient cognitive functions, learning propensity assessment device, instrumental enrichment programs, and shaping modifying environments. These interlocked practices provide educators with the skills and tools to systematically develop students’ cognitive functions and operations to build meta-cognition.

Feuerstein was the founder and director of the International Centre for the Enhancement of Learning Potential (ICELP) in Jerusalem, Israel. For more than 50 years, Feuerstein’s theories and applied systems have been implemented in both clinical and classroom settings internationally, with more than 80 countries applying his work. Feuerstein’s theory on the malleability of intelligence has led to more than 2,000 scientific research studies and countless case studies with various learning populations (See bibliography and publication on Feuerstein's work). ([Wikipedia](#))

## FEUERSTEIN METHOD IS

- Improving the way students learn, thereby increasing motivation and performance
- Increasing the IQ of their students
- Increasing the learning capacity of the learning-disabled and returning them to mainstream teaching
- Teaching the brain-injured to function without special education support
- Instead of measuring knowledge, the ability to learn is evaluated first - intelligence is not fixed but able to be increased.

For more than 60 years Feuerstein's theories and applied systems have been implemented in both clinical and classroom settings internationally, with more than 40 countries applying their work with 85 training institutions worldwide.

Designed over six decades and proven significantly effective in a school and clinical setting, FIE became available to teachers worldwide twenty years ago, with pivotal evidence in outcomes. This programme enables educators to increase the cognitive functioning of their students, facilitate the development of social emotional awareness and achieve significant outcomes and measurements in academic attainment.

The FIE program activates and/or corrects deficiencies in fundamental thinking skills and provide students with the concepts, language, skills and strategies necessary to function as independent learners; in short, 'learn how to learn' - with measurable outcomes in increased IQ and brain modifiability (development).

Howie notes in her 2015 paper in *Kairaranga* that recent work on the brain through brain imaging etc, has revealed that brain functioning is more modifiable than was previously thought. This has enhanced interest in the approaches to the teaching of thinking (Key Competency NZC, 2007) which have as their aims, the modification of brain functioning (neuroplasticity). Following his work with addressing the needs of children having difficulty in adjustment to schools in Israel following the Holocaust, Reuven Feuerstein a Romanian Jew, as early as the 1970's, could only theorise about the brain's structural cognitive modifiability, and how with active moderation, modify how an individual can learn and think, rather than a passive acceptance approach particularly where this saw intelligence as fixed. Of central importance is the role of the mediator supporting efficient independent cognitive functioning. Nowadays both the new science of neuroplasticity and the multitude of research articles on his IE programmes etc support Feuerstein's early belief and subsequent theory that *intelligence is not a static structure*.

Effects have been well documented that students continue to exhibit achievement gains long after the programme has ended unlike many other intervention programmes. After IE training students' potential continues to grow because, according to Feuerstein, there have been significant changes in their basic cognitive structures (new pathways and neuron development) that are prerequisites to learning and thinking (Theory of Structural Cognitive Modifiability).

Unbeknown to Havelock School at the time, the MovinCog Initiative (University of Auckland Centre for Brain Research) was just getting underway with its *Evidence-Based Remediation* programme which seeks to audit all programmes currently on the NZ market – Feuerstein's Instrument Enrichment being one of them. MovinCog's full Feuerstein Programme Audit is accessible here<sup>5</sup>.

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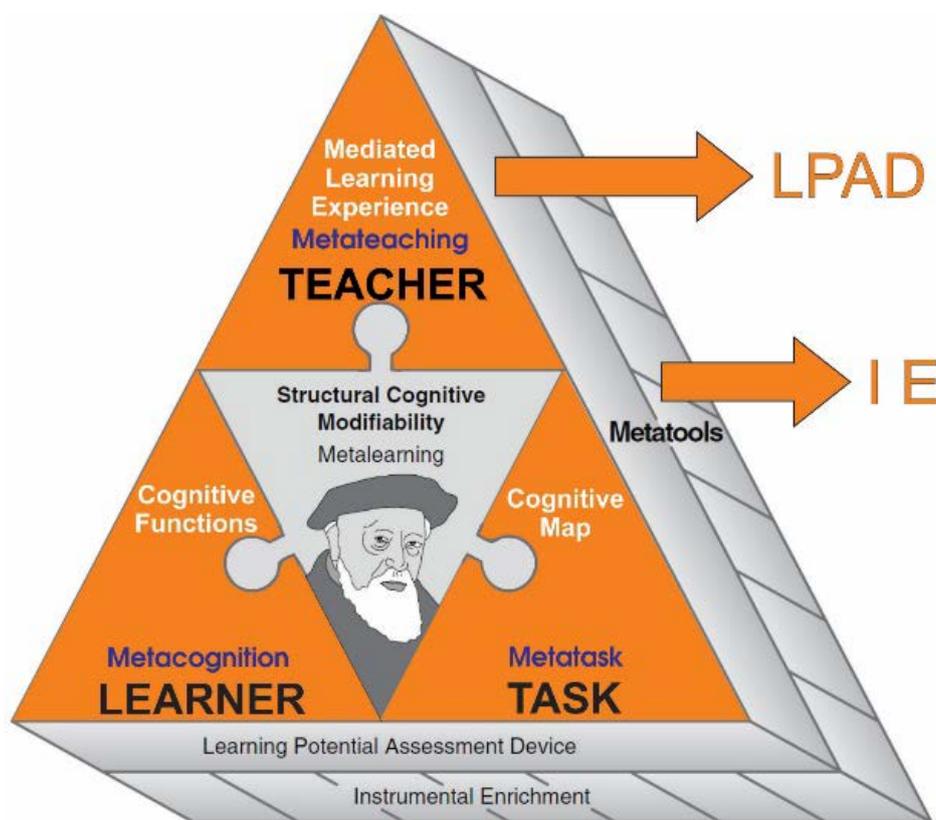
<sup>5</sup> <http://www.movincog.org/#!feuerstein-audit/g5yzk>

## FUNDAMENTALS

- The programme is delivered via multiple tasks identifying 14 written cognitive modules/instruments
- When delivered in schools ie full class, minimum 3 hours per week for normative students and 15+ hours for students with significant learning impairments
- Two years is the average time it takes for a student (normative or impaired?) to complete the programme and return to mainstream teaching, no longer needing learning support
- Normative program in a mainstream class three years

Central then is the belief of structural cognitive modifiability and the optimism which this engenders, for without it there is little hope and inevitably, the status quo remains. So, *Change is possible and desirable*.

There are 3 critical elements which comprise the learning interaction Feuerstein called the *mediated learning experience* or MLE. Through the MLE the learner develops efficient thinking skills (*cognitive functions*). Cognitive efficiency is enhanced by manipulating (moderating) the learning task which Feuerstein refers to as the *cognitive map*.



(Mandia Mentis M. D.-B., 2009)

The mediated interaction and changes in thinking relate to observing, analysing and adjusting the learning task using the cognitive map.

The *Learning Potential Assessment Device* (LPAD) requires specialist training and is generally used internationally for individual assessment of very complex learning needs and is not a requirement for use of the Instrumental Enrichment cognitive enhancement programme. There is a group LPAD alternative which can be used for exploring needs and informing intervention within the classroom context. However, this is not yet available outside Israel but the *Shoresh* of 2017 (Milan) will provide training for this for the first time.

## CRITERIA OF THE MEDIATED LEARNING EXPERIENCE (MLE)

The MLE is at the core of the FIE and of the twelve criteria identified by Feuerstein, the first three are necessary and sufficient for an interaction to be considered mediation.

### Intentionality

By offering a hand, the mediator invites the learner to engage with stimuli (intentionality). In reaching back, the learner's willingness to respond is communicated (reciprocity).

### Meaning

It is as if the mediator provides a key to understanding the significance of stimuli. The key, or the mediation of meaning, unlocks and interprets the cultural context in which the mediatee is situated.

*The mediator enriches the interaction between the child and the environment with ingredients that do not pertain to the immediate situation but belong to a world of meanings and intentions derived from generations of culturally transmitted attitudes, values, goals and means.* – Feuerstein, 1979

### Transcendence

Every single activity has in it the potential for transcendence. Transcendence is the bridge that connects related activities and ideas, and links immediate needs to ever expanding needs for the future.

*Education is what survives when what has been learned has been forgotten.*

– B. F. Skinner

## MAINSTREAM INSTRUMENTS

The FIE Basic programme has 11 different instruments (A4 paper format) and the Standard programme 14. Each instrument is designed to address a particular aspect of cognition. (Refael S Feuerstein, 2009)

Feuerstein Instrument Enrichment	
Basic Program (5 – 9 yrs)	Standard Program (8+ yrs)
Organisation of Dots - Basic	Organisation of Dots
Orientation in Space - Basic	Orientation in Space 1
From Unit to Group	Comparisons
Identifying Emotions	Analytic Perception
From Empathy to Action	Categorisations
Compare and Discover the Absurd	Illustrations
Tri-Channel Attentional Learning	Family Relations
Know and Identify	Temporal Relations
Think and Learn to Prevent Violence	Instructions
Learning to Ask Questions for Reading Comprehension	Orientation in Space 2
Compare and Discover the Absurd Illustrations	Numerical Progressions
	Transitive Relations
	Syllogisms
	Representational Stencil Design (Scaffolding)

Tactile instruments.



(Mandia Mentis M. D.-B., 2008)

There is no prescribed order of presentation of the instruments to the learner. This depends on an assessment of the developmental and functional needs of the learner/s and more general curricular objectives of the classroom in which the programme is to be integrated. The FIE-B and S can be applied as a part of the classroom curriculum for all students, related to the goals of cognitive development and enrichment, or as a prescribed intervention directed toward specific cognitive development goals for individual students (FIE-Tactile) or selected small groups.

### FIE TACTILE-KINESTHETIC

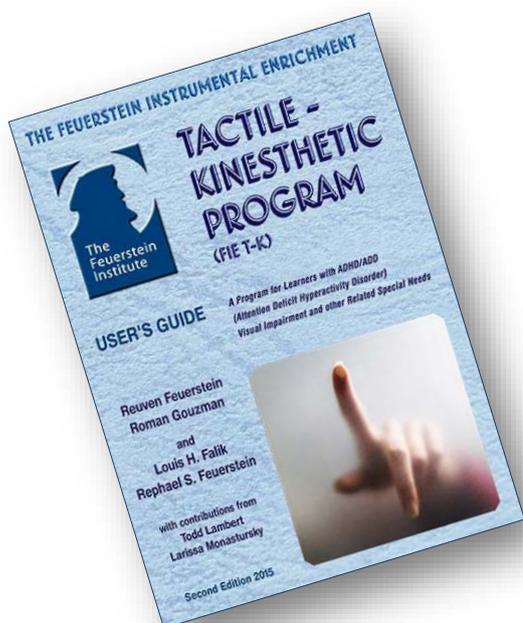
The second purpose of the sabbatical relates to specific training received in Prague during the 2016 International Summer School (*Shoresh*). The *FIE T-K* has been adapted by Feuerstein, Gouzman et al for use with a more specific target group.

The authors of the guide put it this way:

*Perhaps the most overarching objective of the FIE T-K programme for blind and visually impaired learners is to develop images and concepts in the absence of visual stimuli. In the programme the modality of “touch” (tactile, kinesthetic, haptic<sup>6</sup>) substitutes for visualisation and thus contributes to conceptual imaging.*

*In the case of the ADHD population, the overarching objective of the FIR T-K programme is to “slow down” the attention deficit learner and to transform him/her into a systematic explorer who plans activities and is aware of each stage of the learning process.*

*The programme uses specially designed instruments to give the learner tactile-kinesthetic information that is placed into a cognitive-developmental context through the application of mediational interventions.*



(Reuven Feuerstein, 2015)

The FIE T-K is a programme for learners with ADHD/ADD, visual impairment and other related special needs.

- Attention Deficit Hyperactivity Disorder (ADHD):
  - Inattention
  - Hyperactivity
  - Combination of two with or without impulsivity
- Blind/Visually impaired
- Dyslexia/Dyscalculia
- Sensory Deprived

The Tactile version of FIE uses special technology in the form of

- Micro-capsule paper – to emboss graphics (input solution)
- Magnet board and set of ferromagnetic tokens - for response (output solution)
- Raised-line drawing set<sup>7</sup> (input – output solution)
- Manipulative objects that offer specific forms of T-K experiences

<sup>6</sup> Haptic perception refers to small-scale global acquisition of information based on simultaneous, but proximal palm grasp perception (ie the entire object can be held in the hand and moving fingers over its surface) versus visual perception by sight, which is based on large-scale/superglobal and distant eyes experience.

<sup>7</sup> A specially designed board that allows the user to write or draw on a regular A4 sheet of paper and make the writing tactile by placing an A4 sheet of standard paper on the board, write with a standard pen, turn the paper over and feel whatever is drawn or written.

- Set of 3D objects (plastic fruit) for comparison with 2D symbolic representation
- Blindfolds and/or specially constructed box in which learner can manipulate objects without visual input

### Main Differences Between Tactile and Standard IE

Categories	Tactile IE	Standard IE
<b>Sense</b>	touch	sight
<b>Gathering information</b>	screening by units	simultaneous
<b>Distance</b>	close look	from a distance
<b>Perception</b>	episodic	gestalt <sup>8</sup>
<b>Process</b>	the process is visible	the process not visible

### Tactile Version of FIE – Special Design

The Tactile version of FIE is based on a special design – a set of tactile symbols (symbolic representation). The word *symbol* derives from the Greek word *symbolon*, meaning “token.” The sense of the word meaning, “something which stands for something else,” (Spenser’s *Faerie Queene* in 1590). Symbols have incredible energy as they simultaneously engage with pictorial and abstract meaning leading to visualisation.

**Concepts without images are blind...**  
**Images without concepts are empty...**  
***Symbols are the ultimate combination of both:***  
***images and concepts***



### The FIE Tactile Instruments

Since most of the IE instruments are based on visualisation, it would seem that they require sight. However, it is a mistake to think that visualisation is based solely on sight. In fact, it is based mostly on imagination and interpretation. Visualisation is the process of interpretation and imagination, and the source of a given input – eyes or fingertips – is quite irrelevant. We can see the external shape of an object, but not its meaning. In many cases we are not able to see very small or very large objects ie electrical current or ocean current. In the same way, letters spelling words and numerals spelling numbers have in themselves no meaning, and yet through visualisation hold meaning even in the abstract. Interestingly the visualisation of an (abstract) emotion might differ substantially for different people. We do not readily see “meaning.” Meaning is initially always hidden and needs mediation. An image, symbol, plan, map or diagram can help us to understand what happens inside or with an object - its meaning. We can do this by comparing a perceptual image, its artificial representation and the mental image stored in our mind. Enhancement of the brain’s library of mental images/concepts is one of the ultimate goals of the FIE T-K programme.

And so through specially devised FIE T-K instruments (A4 embossed sheets) relating to critical cognitive functions, Feuerstein, Gouzman, Falik and Feuerstein structured a framework particularly suited to the target groups. Note the respective *Orientation in Space* instruments appended to this paper – the standard example holds images and the tactile example holds symbols. Please note however, it would be a mistake to assume that the Tactile instruments are simply a version of the basic or standard instruments. While there is a synergy between them in terms of cognitive function, there are fewer instruments and respond particularly to the needs of the target groups.

<sup>8</sup> an organised whole that is perceived as more than the sum of its parts (Wikipedia)



### The Sense of Touch – The Penfield Homunculus

Many years ago neurologist Wilder Penfold created a figure intended to show graphically the respective neurological processing proportions used by the brain. The hands illustrate the importance of the sense of touch to learning and neurological processing - approximately half the entire cortex. The large mouth clearly also plays a very important part. The largest part of the cortex corresponds surprisingly to the palm. The tactile sense then features strongly in making meaning and is seriously underutilised.

Verbal misunderstanding is often cited as a cause of interpersonal problems. Words, because they can mean different things to different people, do not help us much in overcoming a communication problem. The tactile-kinesthetic approach would seem to have a particular advantage over just the verbal approach. We might say that in most cases *touch doesn't lie*.

*Tactile- kinesthetic cognition is a crucial part of the thinking process, but humans use it only at very early ages of life. Thus, it is not an overstatement to say, "The brain demands touch!"* (Reuven Feuerstein, 2015)

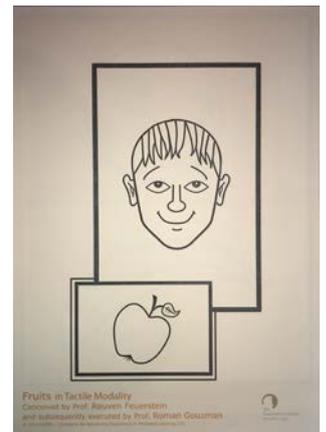
The Feuerstein Tactile - Kinesthetic Instruments		
Introductory	Core	Advanced
Fruit	Orientation in Space - Tactile	Illustrations
Facial Expressions	Comparisons - Tactile	Animals
Orientation in Space: magnetic story board	Analytic Perception	Transportation

### Intention and Challenge

To enable all children to achieve to their full potential and become life-long, independent learners through the advancement of LEARNING and THINKING SKILLS, beyond the limitations of background, cognitive level and age.

Modern Day Educational Challenges (Rabbi Rafi Feuerstein, 2014)

- Today's current knowledge is tomorrow's history
- Generation "Y" has information at its fingertips – the role of the teacher as conduit of information is obsolete
- Generation "Y" – a population of acquired ADD
- It is difficult to arouse interest in Generation "Y"
- The large proportion of learning difficulties stems from the fact that in the age of the smartphone, effort and process do not exist



The Feuerstein Method trains for the learning in the 21st Century by teaching systematic thinking and learning skills. Failure to do so creates students with "teaching difficulties" (not "learning difficulties"!)



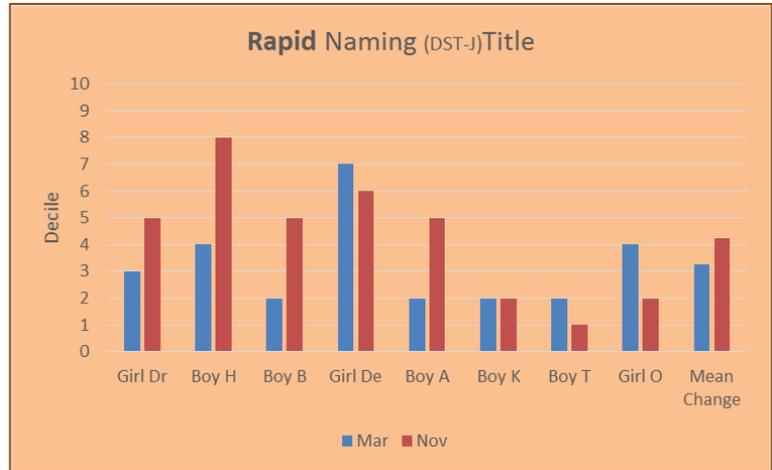
## METHODOLOGY

### PILOT I

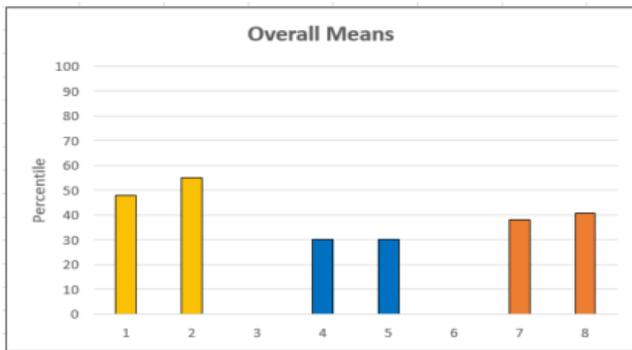
From early on it was increasingly obvious that the 2015 middle school might benefit from a curriculum tailored more closely to anticipated needs, in particular those of boys. However, learning how to learn, how to think and to then apply across the wider curriculum is a clear need for all students in the 21<sup>st</sup> Century – as our charter states and also the *NZ Curriculum 2007*. So for both ethical and practical reasons all pupils in *Wakamarina* were included in the pilot and at no cost. The BoT approved the cost from its Operations Budget. Like the professional staff, trustees and of course parents were/are very keen to find out the impact of this seven-month pilot albeit well short of a full two-year programme. A range of tools were administered by teachers and MoE Resource Teachers of Learning and Behaviour. The results to date we have summarised below with key comparison data sets. A full academic paper is being written alongside this pilot and the full results published by Dec 2016. In April ERO applauded the school's enterprise in exploring programmes that might help lift progress and achievement. Of the fourteen instruments in the full programme, *Wakamarina* has to date virtually completed

three – so relatively early days yet. Given the results and discussion at the board’s last meeting of 2015, it was resolved to extend and continue into 2016 with further training for staff so students moving to new learning areas may continue to reap the obvious benefit from the instruments. Some assessment tools involved whole of class, others random students and some specific students.

1. From the *Dyslexia Screening Test (J)* one of thirteen subtests... The Rapid Naming test measures the time it takes for the student to name a page of pictures and gives an indication of the students processing speed.



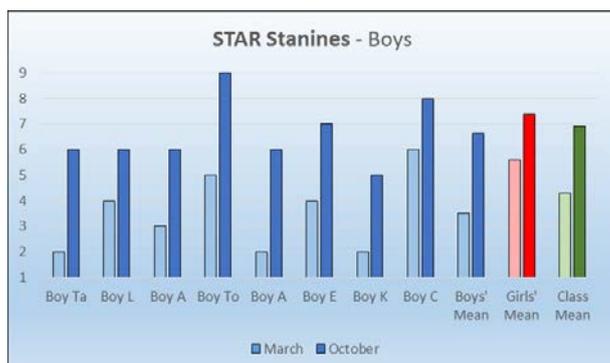
2. *Lucid Ability* is an adaptive computerised assessment program which assesses verbal and non-verbal reasoning skills in the age range 4 - 16 years. Key: Yellow – Verbal Reasoning, Blue – Non-verbal Reasoning, Orange – General Conceptual Ability



3. *Full Classroom Observation* - a formal recording focussing on student engagement undertaken by an independent practitioner. Data here is presented as a range. Boys clearly made up significant ground.



4. *Supplementary Test of Achievement in Reading (STAR)* used across NZ classrooms. Within this assessment tool it becomes much more apparent across both boys and girls that the change in stanines is significantly beyond expectations. A positive shift by a small number of students within a class of one stanine could be reasonably expected. In this class the mean positive shift was 2.6 with girls moving on average 1.8 stanines and boys a huge 3.1. No student moved down a stanine. These data reflect that boys seem to again, be the main beneficiaries of the FIE.

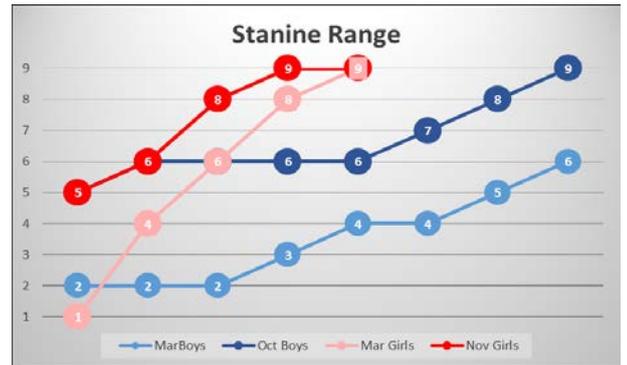


that the change in stanines is significantly beyond expectations. A positive shift by a small number of students within a class of one stanine could be reasonably expected. In this class the mean positive shift was 2.6 with girls moving on average 1.8 stanines and boys a huge 3.1. No student moved down a stanine. These data reflect that boys seem to again, be the main beneficiaries of the FIE.

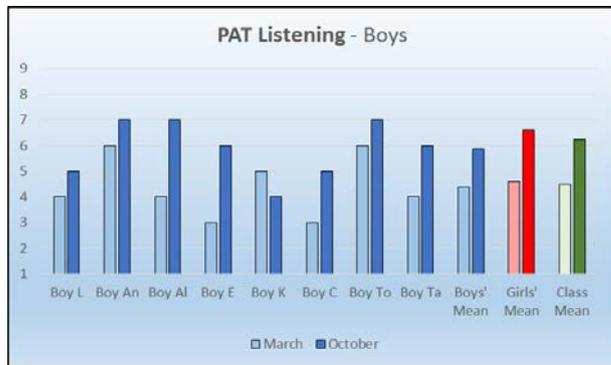
STAR makes it possible to objectively assess the targeted aspect of reading below.

- decode high-frequency and familiar words
- make meaning of a range of sentences and longer texts
- draw on their vocabulary knowledge

Amidst a number of purposes for using STAR, it helps teachers to assess how much progress classes or year groups have made over time, and validate teacher judgements about their students' abilities relative to benchmarks. Given then the data collected in March and October in Wakamarina, there is little beyond the FIE that can explain the huge gain this data shows.



5. *Progressive Achievement Test - Listening Comprehension Years 3 - 10* used across NZ classrooms. These stanine data show a similar trend to the STAR results albeit a little more muted.



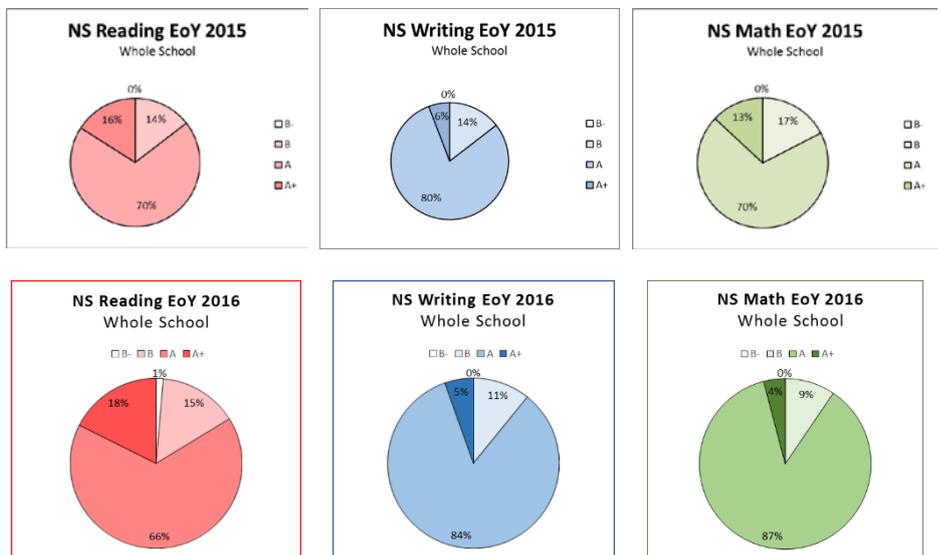
The assessments above show significant positive variance, variance that cannot be easily explained within the context of normative progress for pupils over a year let alone seven months. Something about thinking, engagement, application teaching and learning has been changed in *Wakamarina* during 2015. These results are "abnormal" in the positive. They suggest thinking about thinking and learning is now understood and practised at levels not evident before. Both students and parents have noted the impact be it at school or at home. While there is much more to explore, the school is excited about what has been achieved.



### PILOT II

FIE in a normative setting across Years 3 – 8 as a larger pilot got underway in 2016. In hindsight, a more robust initial data set would have been useful – thinking, as a core competency, should permeate across all areas of human endeavour and learning. Whilst observations by teachers, parent and the learners themselves are useful and help guide future work, they remain anecdotal. There are few, if any assessments to do with cognitive functioning, that classroom teachers are allowed to use without specialist administration. One that would have been useful would have been Raven's Progressive Matrices. Suffice it to say, the following summarises the work completed during 2016.

Little change is evident using the broad brush OTJ/NS data. The beginning of year (BoY) data was generated from the previous end of year (EoY) data as of course different standards apply as pupils move through the years. A true BoY data set would in fact look different in that the standard being used is for the end of the new year. Establishing this would have been very time



consuming and fairly arbitrary. Whilst establishing a different starting point, it would not have given a fair result. Using commensurate age/stage standards from EoY data was the fairest way to compare relative change.

After a year students overall, moved to their next commensurate age/stage standard in the same proportions as they had left the previous year. This is to some extent gratifying. Only in math did the proportions of those *Below* drop by 8%. Very small percentage changes indicate normal variations and to some degree, the slightly different make-up of the BoY and EoY cohort.

Although other more specific assessment tools may in future be used to check progress, it is within the wider context of numeracy, literacy and key competencies that accelerated progress would be expected and desired. Of course bridging new and enriched cognitive functioning to all areas of activity within and beyond the classroom is the goal.

Some discussion has followed in trying to determine why this result occurred. Looking back on 2016 there are some key factors which it is believed diminished the intended outcome of accelerated progress. Briefly these have been identified as;

- Whilst all three initial classes had trained mediators, one was not the home class teacher – diminished potential to have new learning permeate through the whole curriculum
- BoY class organisation changed from three to four classes causing some re-settlement – new teacher had no FIE training
- Building alterations forced classes at different times to “camp” in other spaces so work could be completed – further disruption to routines
- Changes to staffing ie relieving teacher for two terms with no FIE training
- Classes combined to try and have two mediators cover three classes – not successful despite best attempts
- Mediation across Basic and Standard instruments to all three classes less consistent than desired

All in all, a less than usual year and one that impacted particularly on the intended cognitive enrichment that was hoped for. The positive outcomes from Pilot I however remain a benchmark and work will continue to achieve similarly as FIE begins with a more stable platform in 2017. Following training in the Tactile FIE, one student worked with their mediator and made excellent progress which impacted positively back in the classroom and playground. Work has begun to develop a two or three-year framework as Basic (11 instruments) normally takes two years in a school setting to work through and Standard (14 instruments) estimated to take up to three years depending on exposure to previous instruments. Clearly all class teachers should be trained so that the benefits can permeate the whole curriculum and enriched cognitive functioning can become the norm and be well articulated so that metacognition becomes “just the way we think and do around here.”

## OVERSEAS

There is much interest and work being done across the world. Whilst intending to visit more, time allowed only one visit by the author and that was to the Feuerstein Centrum in Amsterdam. Although contracted to supply specialist services outside the mainstream, where clients/learners are brought onsite to a specialist facility, observing FIE in action, 1:1 in another tongue, reinforced how regardless of culture, the work of developing cognitive function is universal. There are also mainstream schools in the Netherlands beginning to explore how FIE can be used in normative settings. It was a privilege to observe, engage and interact with a variety of learners brought to the centre.

Contact, albeit briefly, was also made with those who had trained teachers involved in the [Evaluation of Scottish Borders Council's Feuerstein Partnership Project](#) (University of Strathclyde 2007). This research paper is able to be downloaded and reinforces much of the author's experience.



## IMPLICATIONS

Putting in place a school-wide FIE programme is not a short term exercise, nor one that can be hastened nor under resourced. Commitment by professional staff and trustees as well as trust and understanding by parents is absolutely paramount. Havelock School's journey has not been an even one with capacity and consistency difficult to maintain with a small core of trained mediators. The pedagogy for newer professional staff to the school is readily understood and supported. An overall curriculum statement and framework to design a programme potentially stretching from two to five years is still under development as the instruments provide a very rich and graduated sequence helping develop cognitive functioning.

Of many potential programmes, FIE is sustainable financially and professionally although this takes time to embed and make mainstream. The path Havelock School has thus far trodden, will likely take another two years to mature and will naturally rely on stable staffing – the smaller the staff, the greater the impact of turnover.



## RECOMMENDATIONS

In terms of self-diagnosed recommendations or *next steps* for Havelock School, the following come easily to mind.

- Wall charts also online for off-site reference by learners and parents – showing the three phases of cognition in *kid's speak*
- Material to help support learners and their mediators (parents and teachers) what prompts to help with processes as opposed to content
- Learner journal for reflections and associated material ie WORD WALL – school generated
- Modular school-wide framework/statement – likely timing across five years of *Basic* and *Standard* instruments but with flexibility to respond to need/s
- Staff FIE training built into school PLD programme
- Mediators to plan, journal and reflect their experience with instruments – ie OneNote or digital set up – shared space
- Work with parent community to widen their understanding of FIE and support them in their role as mediators
- Modify the school's mid and end of year reporting format to reflect interaction with instruments and growth in cognitive function
- Provide FIE curriculum leader with a unit and non-contact time to support collegial mediators

For schools looking at supporting their learners, particularly in thinking, start with some readings, locate and visit some schools who have made a start, perhaps train an individual and use within a special needs context initially. Don't expect to move quickly, this pedagogy is huge and it will take teachers some considerable time to embed into their daily practice and likewise their learners, but the rewards will travel with them.

Stated succinctly, *Worth a look!*



## CONCLUSIONS

The work is not over. FIE has really only just started to become *the norm* in parlance and expectation. In hindsight Havelock School would have benefitted from further advice re pre and post data. This evidence however is growing within the New Zealand context but will not, in the author's opinion, be fully useful until

the group LPAD is launched internationally via the 2017 Shores in Milan – specific training is required. Only then will more closely targeted and aligned instruments be able to show specifically the change in cognitive development which up till now are only reflected in the more usual assessment tools found in schools. Some work is underway to gather more uniformly and routinely, New Zealand data. Given the experience to date, teachers, learners and parents are recognising the growth in thinking of those exposed to FIE. To become embedded in mainstream practice, there has to be deliberate intention, resourcing and long term commitment – any programme in the mainstream in schools, can be diminished by the *busyness* of school life. Dedicating a specific part of the timetable (week/day) is crucial, especially in the early years of introduction.

The following may help from the voices of the learners themselves...

- M *When I'm doing my work outside of Feuerstein I try to be more accurate.*  
B *I like the hard ones because it challenges me.*  
H *I'd like it to be harder. I listen and follow instructions more clearly now.*  
A *It helps me make smart choices like being systematic when I do stuff.*  
O *It's making my brain think harder than anything else I do at school.*  
E *I like it because it makes my brain think harder, so I don't give up as quick.*  
R *I'm no longer impulsive when I'm doing other stuff.*



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Further useful links may be found on the author's school website here...

<http://www.havelock.school.nz/learning-areas/special-programmes-events>

Note Diagrams redrawn by the author based on Mentis et al.

## FURTHER NOTES

### SHORESH ~ PRAGUE 2016

While the Feuerstein Institute is based in Jerusalem, its summer school is nowadays hosted in a different European city as the suburb of Shores and indeed others areas within Israel, have for many years been too dangerous. Each summer the professors, trainers and researchers set up a variety of courses at various levels in order to advance the institute's mission and Reuven Feuerstein's vision.



About 300 attended the fortnight summer school, based in a Soviet era hotel west of Prague Castle. Courses ran concurrently from 08:30 through to 17:30 each day. One other kiwi attended in one of the LPAD trainers' courses. My tactile group comprised 20 educators from across the globe and included mainstream educators, special needs specialists, psychologists in private practice, teachers, system leaders and interestingly the institute's CEO who visited Auckland in November 2016.<sup>9</sup>

Evenings provided opportunities for further seminars and workshops sharing practice from around the world. I contributed by sharing Havelock's experience to date as there are few schools internationally working FIE across whole school mainstream populations.

### MISSION

The Feuerstein Institute is an international education, treatment and research centre with a twofold mission:

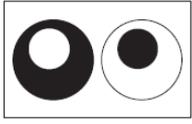
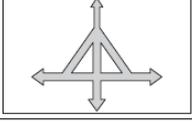
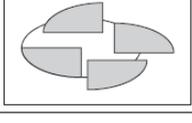
- To help schools worldwide prepare their students for the dynamic and ever-changing world
- To help children and adults overcome cognitive, emotional, psychological and social disabilities and claim their rightful place in society

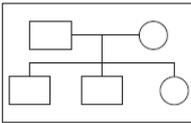
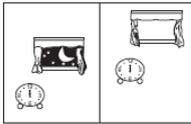
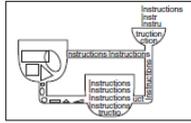
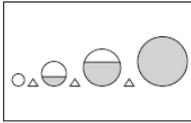
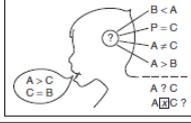
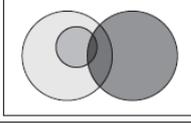
It is accomplished through the Feuerstein Method, a unique educational system that uses mediation and specialised instruments to enhance learning potential. Clients gain the knowledge and tools to reach beyond their manifest abilities and achieve more than they have ever dreamed.

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<sup>9</sup> [Radiolive's Duncan Garner talks with Chaim Guggenheim](#)

# THINKING SKILLS AND FEUERSTEIN'S INSTRUMENTS

Thinking Skill	Feuerstein's Instrument
<b>Organization</b> Chapter 1 covers Feuerstein's instrument of ORGANIZATION OF DOTS, which involves creating order out of discrete and unconnected items by linking, structuring, and connecting items.	
<b>Comparisons</b> Chapter 2 covers Feuerstein's instrument of COMPARISON, which involves finding similarities and differences between items according to relevant and appropriate criteria.	
<b>Categorization</b> Chapter 3 covers Feuerstein's instrument of CATEGORIZATION, which involves grouping elements according to appropriate principals and placing items into particular classes or groups.	
<b>Relational Orientation in Space</b> Chapter 4 covers Feuerstein's instrument of ORIENTATION IN SPACE I, which involves understanding that one's relative position in space depends on an internal reference system—the direction that one is facing.	
<b>Cardinal Orientation in Space</b> Chapter 5 covers Feuerstein's instrument of ORIENTATION IN SPACE II, which uses the cardinal points of the compass—North, South, East, and West—as the reference system to orient oneself in space.	
<b>Analysis and Synthesis</b> Chapter 6 covers Feuerstein's instrument of ANALYTIC PERCEPTION, which involves the skill of breaking a whole into its parts and putting the parts together to make a whole.	
<b>Problem Solving</b> Chapter 7 covers Feuerstein's instrument of ILLUSTRATIONS, which involves identifying that something has gone wrong (disequilibrium), analyzing why it has gone wrong, and finding solutions to make it right (restoring equilibrium to a system).	

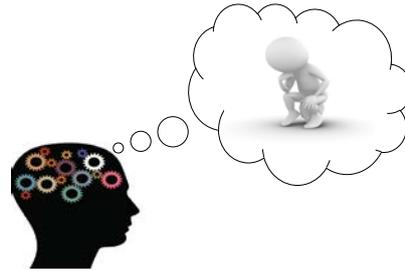
Thinking Skill	Feuerstein's Instrument
<b>Relationships</b> Chapter 8 covers Feuerstein's instrument of FAMILY RELATIONS, which focuses on inferring, understanding, and explaining the connection between two or more people or groups and their involvement with each other.	
<b>Temporal Concepts</b> Chapter 9 covers Feuerstein's instrument of TEMPORAL RELATIONS, which involves having an understanding of the concept of time.	
<b>Instructions</b> Chapter 10 covers Feuerstein's instrument of INSTRUCTIONS, which relate to the two reciprocal processes of encoding (giving) and decoding (receiving) information.	
<b>Progressions</b> Chapter 11 covers Feuerstein's instrument of NUMERICAL PROGRESSIONS, which focuses on identifying rules that govern the repeated patterns that occur between events.	
<b>Transitive Relations</b> Chapter 12 covers Feuerstein's instrument of TRANSITIVE RELATIONS, which focuses on transferring information from two pairs of items to a third pair.	
<b>Syllogisms</b> Chapter 13 covers Feuerstein's instrument of SYLLOGISMS, which focuses on syllogistic reasoning, where from two given premises that have a common middle term, a third premise—called the conclusion—is deduced.	
<b>Scaffolding</b> Chapter 14 covers Feuerstein's instrument of REPRESENTATIONAL STENCIL DESIGN, which focuses on the cognitive operations involved in mentally reconstructing an event or outcome by looking at the end product.	

Source: Adapted from Feuerstein, R., & Jensen, M. (1980). Instrumental enrichment: Theoretical basis, goals and instruments. *Educational Forum* 44(4), 401-423.



Reuven Feuerstein

# STRATEGIES FOR OVERCOMING DEFICIENT COGNITIVE FUNCTIONS



## Collecting the Senses

- explore, locate, collect, sift, clarify, sort, relate, connect, collate, plan

## The Thinking Factory

- process, define, select, remember, translate, compare, reason, summarise

## Showing Others

- focused, calm, engaged, connected, lucid, related, precise, logical, considered

### INPUT

### ELABORATION

### OUTPUT

#### 1 Perception - know what to do

Focus and perceive - the more data that goes in via our senses, the more info we have to use

#### 1 Definition of Problem - what do we have to do here?

Define the problem - what am I to do - problem, what problem

#### 1 Communication Modalities - well focussed and oriented output

Consider another point of view - ability to communicate well-elaborated responses

#### 2 Exploration of Learning Situation - making a plan

Systematically search - systematically approach new objects or information

#### 2 Select for Relevant Clues - select the key bits

Search for relevant cues - what is relevant to the problem - what is not

#### 2 Precision and Accuracy - I can do this, give me a moment

Do it right - take your time - say it or complete it with accuracy and precision

#### 3 Receptive Verbal Tools & Concepts - correct language/words

Use labels - without a name for something, we can't think or talk about it

#### 3 Spontaneous Comparative Behaviour - ability to compare

Spontaneous need to compare - seeking similarities and differences

#### 3 Data Output - makes sense, planned, organised

Well-developed self-regulation - ability to avoid trial and error responses - don't ever, ever give up

#### 4 Understanding of Spatial Concepts - position in space

Know where you are in space - right, left, front, back are critical concepts

#### 4 Broad Mental Field - hold onto an idea - remembering

Recall and use several pieces of information - working memory

#### 4 Expressive Verbal Tools - wide vocab used

Give a thoughtfully worded response - communicate my answer clearly with just the right words

#### 5 Understanding of Temporal Concept - time; past present future

Be aware of time - how much, how old, how often, sequence of events (chronology)

#### 5 Understand Reality - integrate different aspects of reality

Understand cause/effect - implications

#### 5 Virtual Relationships - from real to virtual

Can see relationships that aren't obvious - four dots can be a square, two people cousins

#### 6 Conservation of Constancies - shape static, different position/orientation

Decide what characteristics stay constant even when changes happen - what needs to stay the same for an object to retain its identity

#### 6 Logical Evidence - give a reason

Does this make sense - need for and ability to pursue logical evidence

#### 6 Visual Transporting - source to mind to output/media

Ability to copy accurately from board or other source - able to carry an image accurately in one's mind and move/manipulate it to another place

#### 7 Data Gathering - get it accurate

Collect precise and accurate data - the right stuff to get the right answer

#### 7 Abstract Thinking - do it in your head

Moving away from the concrete - visualising

#### 7 Behaviour - show self-control

Ability to restrain impulsive or acting-out behaviour - I think before I speak out - controlling impulsivity

#### 8 Consider Multiple Sources of Info - think about all the elements

Use more than one source of information - keeping two ideas in mind at the same time, assists in comparing and higher order thinking

#### 8 Inferential - Hypothetical Thinking - if this... then that

Use "iffy" thinking - if this is true then what else must be true

#### 9 Strategies for Hypothesis Testing - test out a theory

Test the hypothesis - how can I see if this is true

#### 10 Spontaneous Summative Behaviour - think about the world in numbers

Summing up - see the big picture - what is the main idea - how many things are there

#### 11 Planning Behaviour - make a plan

Make a plan - think forward - state the steps and the reasons

#### 12 Elaboration of Cognitive Categories - tell me more, make it whole

Relationships - links information into meaningful and comprehensible whole by organising, ordering, summing, comparing

Adapted from the following source material:-  
2015 *Soaring Minds, Inc*  
1980 Reuven Feuerstein *Instrumental Enrichment*  
2014 International Workshop *Teaching Diagrams*  
2008 Mentis et al *Mediated Learning* (2<sup>nd</sup> Ed)  
2017 Singer & Berenholtz *FIE Standard 2 Workshop*

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<sup>i</sup> **The Learning Propensity Assessment Device (LPAD)** is a series of activities used to determine how an individual learns. The test allows for the evaluators to observe and record how the examinee learns by deciphering which methods of teaching they best respond to, and how much observed learning is retained as they are presented with new and more challenging tasks. In scoring this exam, our evaluators are presented with a clear picture of how the examinee thinks and learns, and the most effective way to tap into their latent learning potential.

The LPAD battery consists of several instruments; the evaluator has the freedom to choose as many of them as the examinee responds to. As they respond, the evaluator gains information which helps them to develop theories about the examinee's needs and functions, and uses this insight in selecting and analyzing their performance in subsequent instruments. As such, the amount of time required for assessment and the number and range of instruments may vary a great deal.

The LPAD is different from traditional educational and psychological evaluations in that we determine the examinee's potential not from scores or single responses, but from observations of repeated responses to tasks, and from utilizing mediation to teach the examinee how to solve problems and correctly respond.

The LPAD not only measures potential, but also provides perspective on the best methods of intervention for the examinee's learning ability to grow. The LPAD instruments include all of the important forms of information processing - verbal, pictorial, numerical, figural, symbolic and graphic. How an examinee combines them tell us much about their individual style of learning.

<http://www.icelp.info/feuerstein-method/assessment-lpad.aspx>

<sup>ii</sup> **Raven's Progressive Matrices** (often referred to simply as **Raven's Matrices**) or **RPM** is a nonverbal group test typically used in educational settings. It is usually a 60-item test used in measuring abstract reasoning and regarded as a non-verbal estimate of fluid intelligence. It is the most common and popular test administered to groups ranging from 5-year-olds to the elderly.

[https://en.wikipedia.org/wiki/Raven's\\_Progressive\\_Matrices](https://en.wikipedia.org/wiki/Raven's_Progressive_Matrices)