Title of the invention:

Simple Measurement Algorithms to Re-access Training and Learning Ability of Brain (SMARTLAB) for kids.

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Background

1 Child Early Learning Stage

As you can see from the table 1, the sensitive period of learning Language begins as early as from birth. Infants will be talked to very frequently and Phonics will be taught at age as young as 2 years so that your children will be able to read at very early age. The Writing Learning Foundation building is meant for Kids between ages 2 to 6, this is important and the purpose is tap on the child early development on their senses during their sensitive periods, and their subconscious memory.

Age	0	1	2	3	4	5	6
Learning Development Periods	Movement						
	Language						
		Small object					
		Toilet train					
			Order				
			Music				
			Grace and Courtesy				
			Senses				
				Writing			
				Reading			
					Spatial Relationship		
					Mathematics		

Table 1: Table describing the Sensitive Period of kid's development

This able relates to when to give the right training and excessive may lopsided developing of the brain. The notion that some of the kids are left-brained (logical, analytical) and some are right-brained (intuitive, creative) bias. Putting the right of amount of appropriate training and training will enhanced development of the brain.

SMARTLAB for kids is a Learning Development Program platform design for better planning and understanding of kids' learning diversification. This platform forms a basis of grouping different learning activities by its dominance of the brain bias; that is the left brain inclined development and the right brain inclined development. An algorithm is formulated and invented to capture the distribution of weightage impacting the segment of brain development by capturing different variable the nature of training development, gender, age, and learning frequency.

SMARTLAB for kids is a learning development program that primary cater for age of 18 months to 6 years old. All kids' development growth are in development of their logic

thinking, understanding concepts, facts, music, motor skills, memory etc. starting at different age.

The four stages of cognitive development that Piaget distinguished (Piaget, 1968) is important for kids development and forms a basis of the invention.

Sensorimotor (0-2 years of age) - children begin to use imitation, memory and thought. They begin to recognize that objects do not cease to exist when they are hidden from view. They move from reflex actions to goal-directed activity.

Preoperational (2-7 years) - Children gradually develop language and the ability to think in symbolic form. They are able to think operations through logically in one direction and they have difficulty seeing another person's point of view.

Concrete operational (7-11 years) - Children are able to solve concrete (hands-on) problems in logical fashion. They understand the laws of conservation and are able to classify and seriate. They also understand reversibility.

Formal operational (11-15 years of age) - Children are able to solve abstract problems in logical fashion. Their thinking becomes more scientific, they develop concerns about social issues and about identity. *Piaget, J. (1968) On the development of memory and identity. Barre, MA: Clark University Press with Barre Publishers.*

Where else the place where the learning is conducted plays an important component that affect kids learning development. *J. Valsiner (Ed.), Children development within culturally structured environments, Vol. 2, Social* co-construction and environmental guidance in development (pp. 28-65)

2 Concept Overview

By activating the power of learning development on both hemispheres of the brain (left and right), a child will be able to retain knowledge better and become proficient in any subject, especially math, language and motor skills. Most of the time, the child's right brain is often neglected, which is the creativity.

Current situation:

Parents and educator engage in:

1. Patchy learning environment. Many education centres market provide patchy learning program, without holistically preparing kids in their precious first 6 years of learning. It could be that parents enrolling kids up into various learning activities programs with knowing or unaware of the holistic development of the kids.
2. Have very little understanding of kids' growth and development.

Problem derived:

1. Without an effective catalog of learning progress development for kids.
2. No trace of kids' growth and learning development.

Social Impact:
To provide a platform for parents and educator to coordinate learning for the kids.
To derived application software for kids to learn, to monitor their growth and their learning development. The software application is cater for preschools and home learning. The advantage of having SMARTLAB for kids learning application are, (1) Mothers can guide their kids in home learning environment, (2) Not relying on specific individual teacher (3) Childcare centres delivering quality teaching.

The learning platform will gather the learning concept of left and right brain development.

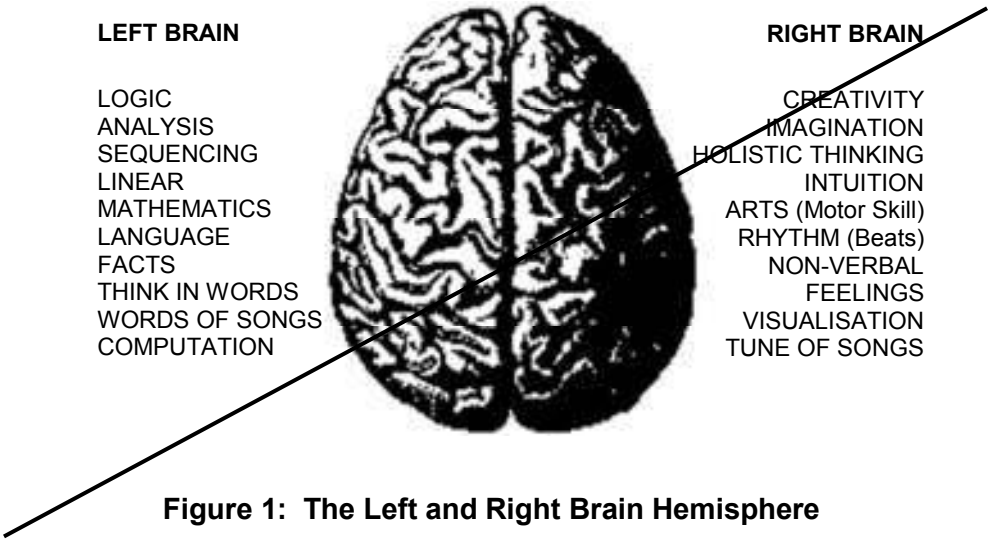

Figure 1: The Left and Right Brain Hemisphere

3 Development Brief

The Brief will give an overview of the development, its benefits and its limitation. The SMARTLAB for kids will provide a platform for parents and educator to work towards a balance extra curriculum.

3.1 Overview of Application leveraging on SMARTLAB for kids

There will be possibilities to design application platform to enable the following for future development:

1. Lesson suggestions based on age and gender
2. Area of emphasis learning base on Left Brain and Right Brain development focus
3. Evaluating standard of child in development,
4. Assessing the kids learning bais focus
5. Tracking of performance for kids

3.2 Overview of the SMARTLAB Application

Design an application platform to enable:

1. Lesson suggestions based on age and gender
2. Area of emphasis learning base on Left Brain and Right Brain development focus
3. Evaluating standard of child
4. Tracking of performance

3.3 Brain bias learning focus in child development

A kid's mindset contributes heavily to his or her overall educational outcomes. Kids who have a 'growth mindset' believe intelligence can be developed. They are more likely to do well than kids with a 'fixed mindset', who believe their ability is fixed while others may be able to achieve

So, is every kids capable of learning math? – The answer is more complex than a simple 'yes' or 'no'. But given the right environment, encouragement and method of teaching, children are able to build on their natural curiosity for learning, and develop skills and enjoyment in math, giving them greater potential for better outcomes in later life. *Emily Cairns, Every child is capable of learning math, August 2015, https://www.britishcouncil.org/voices-magazine/every-child-capable-learning-maths.* Even IBM has adopted the kids learning development from structure simple task to complicated development to understand the learning hemisphere of the children brain. (https://www.technologyreview.com/s/544376/this-ai-algorithm-learns-simple-tasks-as-fast-as-we-do/)

According to Romberg (Grouws, 1992), there is no general agreement on the definition of learning, how learning takes place and what constitutes reasonable evidence that learning has taken place. Some say it is observable changes in behavior, others that it means acquiring new knowledge and other say that it is the creating of disequilibrium.

Piaget suggested that when children do not understand or have difficulty with a certain concept, it is due to a too-rapid passage from the qualitative structure of the problem (by simple logical reasoning -e.g. a ball existing physically) to the quantitative or mathematical formulation (in the sense of differences, similarity, weight, number, etc.). Conditions that can help the child in his search for understanding according to Piaget are the use of active methods that permit the child to explore spontaneously and require that "new truths" be learned, rediscovered or at least reconstructed by the student not simply told to him (Piaget,1968). He pointed out that the role of the teacher is that of facilitator and organizer who creates situations and activities that present a problem to the student. The teacher must also provide counterexamples that lead children to reflect on and reconsider hasty solutions. Piaget argued that a student who achieves certain knowledge through free investigation and spontaneous effort will later be able to retain it. He will have acquired a methodology that serves him for the rest of his life and will stimulate his curiosity without risk of exhausting it.

Theories of mathematical learning and understanding **(http://ponce.inter.edu/cai/tesis/**lmrivera/cap2.htm)

A constructivist view of knowledge implies that knowledge is continuously created and reconstructed so that there can be no template for constructivist teaching (Peterson & Knapp, 1993). Since this point of view holds that learning involves student's constructing their own

knowledge, this leads to a redefinition of the teachers' role to one of facilitator. This also leads to teaching that emphasizes the importance of listening to and valuing students' perception, even when their understanding differs from conventional knowledge (Cochran, Barson & Davis, 1970).

4 The Description of Patent with claims

To patent the algorithm which used in evaluating and measuring the learning process of the two hemisphere of the brain.

The hemisphere of the brain is divided into 2 main variables; the Lambda (λ) and Rho (ρ). The learning area revolves the left and right brain is as follows:

LEFT BRAIN	**RIGHT BRAIN**
LOGIC	CREATIVITY
ANALYSIS	IMAGINATION
SEQUENCING	HOLISTIC THINKING
LINEAR	INTUITION
MATHEMATICS	ARTS (Motor Skill)
LANGUAGE	RHYTHM (Beats)
FACTS	NON-VERBAL
THINK IN WORDS	FEELINGS
WORDS OF SONGS	VISUALISATION
COMPUTATION	TUNE OF SONGS

The unit of measurement on each area of learning within the hemisphere is;

λ_1 = % x Weightage + …..+ % x Weightage OR

ρ_1 = % x Weightage + …..+ % x Weightage

Where,

λ_x represents each area of learning within the left brain hemisphere.

ρ_x represents each area of learning within the right brain hemisphere.

~~Where, λ_x represents each area of learning within the left brain hemisphere.~~
~~ρ_x represents each area of learning within the right brain hemisphere.~~

λ_1 = LOGIC
λ_2 = ANALYSIS
λ_3 = SEQUENCING
λ_4 = LINEAR
λ_5 = MATHEMATICS

λ_6 =ENGLISH LANGUAGE
λ_6 = CHINESE LANGUAGE
λ_7 = FACTS
λ_8 = THINK IN WORDS
λ_9 = WORDS OF SONGS
λ_{10} = COMPUTATION

The weightage of each learning area unit derived from their representation respective to the right hemisphere are as show below is obtained as a percentage of the summation from ρ_1 to ρ_{10} .

ρ_1 = CREATIVITY
ρ_2 = IMAGINATION
ρ_3 = HOLISTIC THINKING
ρ_4 = INTUITION
ρ_5 = ARTS (Motor Skill)
ρ_6 = RHYTHM (Beats)
ρ_7 = NON-VERBAL
ρ_8 = FEELINGS
λ_9 = VISUALISATION
λ_{10} = TUNE OF SONGS

SMARTLAB is the summation of the respective weightage of the left and right brain hemisphere

$\lambda = \sum (\lambda_1 \text{ to } \lambda_{10})$
$\rho = \sum (\rho_1 \text{ to } \rho_{10})$

The weightage of each learning area unit derived from their representation as show below is obtained as a percentage of the summation from λ_1 to λ_{10} .

λ_1 = LOGIC
λ_2 = ANALYSIS
λ_3 = SEQUENCING
λ_4 = LINEAR
λ_5 = MATHEMATICS
λ_6 = LANGUAGE
λ_6 = LANGUAGE
λ_7 = FACTS
λ_8 = THINK IN WORDS
λ_9 = WORDS OF SONGS
λ_{10} = COMPUTATION

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Example to determine λ_x , using λ_1 as an illustration.

Component	**Age**	**Learning Component**	**Environment**	**Learning Frequency**
Representing Variable	0-2	λ_1 ; LOGIC	Home	25 mins session
Development Weightage (1 to 3)	1	1	3	2
*Percentage of impact %	100%	10%	30%	40%
	100% - Developing Age 20% - very early / late 60% - a little early/ late	Of the overall left brain variable	100% - dedicated learning environment 70% - some dedicated learning environment 50% - fairly acceptable learning 20% - noisy or unsuitable learning environment	100% - 3 times a week 70% - 2 times a week 50% - once a week 20% - twice a month 10% - anything more than a month

λ_1 = % x Weightage + …..+ % x Weightage

190 as such λ_1 = 1 * 100% + 1 * 10% + 3 * 30% + 2 * 40% = 1 + 0.1 + 0.09 + 0.08 = 1.27

Other weightage of learning is derived from the above formulation. The summation of all learning weightage within the hemisphere will sum up to 100%.

$\lambda = \sum (\lambda_1 \text{ to } \lambda_{10})$ = in ideal case is 100%

195 The weightage of each learning area unit derived from their representation respective to the left hemisphere are as show below is obtained as a percentage of the summation from λ_1 to λ_{10} .

In an ideal case, the constituting weightage in the area of learning for left brain is as follows:

	Formula of $\lambda_{1..10}$	unit	%
λ_1 = LOGIC	2+0.1+0.9+0.8	3.8	10%
λ_2 = ANALYSIS	1+0.1+0.9+0.8	2.8	10%
λ_3 = SEQUENCING	2+0.1+0.9+0.8	3.8	10%
λ_4 = LINEAR	2+0.1+0.9+0.8	3.8	10%
λ_5 = MATHEMATICS	2+0.1+0.9+0.8	3.8	10%
λ_6 = LANGUAGE	2+0.1+0.9+0.8	3.8	10%
λ_6 = LANGUAGE	2+0.1+0.9+0.8	3.8	10%
λ_7 = FACTS	2+0.1+0.9+0.8	3.8	10%
λ_8 = THINK IN WORDS	2+0.1+0.9+0.8	3.8	10%
λ_9 = WORDS OF SONGS	2+0.1+0.9+0.8	3.8	10%
λ_{10} = COMPUTATION	2+0.1+0.9+0.8	3.8	10%
	Total	38	100%

4.1 Benefits

Purpose

To produce an algorithms for future adoption of measurement in accessing the extensive training focus. With this algorithms, parents and educated will not over train kids with in certain area of focus and forgotten the holistic development of kids, giving kids a more balance training.

4.2 Limitations

Parents and educators have to manually and consciously enter the correct amount of training in each area of focus as describe in figure 1.

4.3 Title of the invention

Simple Measurement Algorithms to Re-access Training and Learning Ability of Brain (SMARTLAB) for kids.

4.4 Brief Description of the Drawing (Inventive specification)

The diagram of the invention is filed as Diagrams in the submitted documents

5 Filing Justification

5.1 NEW

The Simple Measurement Algorithms to Re-access Training and Learning Ability of Brain (SMARTLAB) for kids is new as it is not found in the market. The highlight of the algorithm may be available in simple average but this algorithm uniquely enters an input of Age, environment and learning frequency. The new invention of the algorithms is unique with the essence of external factors which may varies, that is the Age, Environment, and Learning Frequency as variable as input into the equation to derive the weightage of the learning bias. The overall percentage will determine whether the kid is in left or right brain bias training.

The algorithms will still need human intervention to input of the type of training and its frequency. The input should be keep tract on a monthly basis,

5.2 Benefits and Usefulness

As have describe in the background. The left and right bias brain development allows the children to develop holistically and retain the maximum knowledge and skills learnt. Starting training may not be good, while starting the kids the right training at the appropriate age will benefits the kids extensively.

With this algorithm, Parents and Educator can re-access the amount of training being put kids in any particular development category of the brain. This development could possible lead to proper planning of their tuition, skills development and other enrichment programs.

With this algorithm, a benchmark can be form as the best appropriate enrichment development for kids

With this algorithm, Parents and Educators can gauge how the enrichment can affected the overall development of kids, and hence select the appropriate training and enrichment classes.

5.3 Industrial Applicability

The development of Simple Measurement Algorithms to Re-access Training and Learning Ability of Brain (SMARTLAB) for kids can be used in preschool to primary school for accessing appropriate enrichment. Many young parents struggle to make young children excel in certain learning, skills development or training, but forgotten the overall development for kids. Learning centre can also adopt a bench mark before recommending sensible and reasonably acceptable enrichment modules for kids.

~~5.4 Claims~~

~~1. A learning measuring algorithms for re-accessing young children enrichment programs which comprises~~

a. A simple measuring algorithm with the weightage percentage being focus on Age, Environment, and Learning frequency.

- The "Age" variable will determine the appropriate age for all specific enrichment and skills training program
  - i. 100% - Developing Age
  - ii. 20% - very early / late
  - iii. 60% - a little early/ late

- The "Environment" variable will determine the appropriate surrounding impacting the learning
  - i. 100% - dedicated learning environment
  - ii. 70% - some dedicated learning environment
  - iii. 50% - fairly acceptable learning
  - iv. 20% - noisy or unsuitable learning environment

- The "Learning Frequency" variable will determine the extensive of specific category of the brain training given to the young children
  - i. 100% - 3 times a week
  - ii. 70% - 2 times a week
  - iii. 50% - once a week
  - iv. 20% - twice a month
  - v. 10% - anything more than a month

b. A weightage equation to the calculate the variable

The unit of measurement on each area of learning within the hemisphere is;

λ_1 = % x Weightage + …..+ % x Weightage OR

ρ_1 = % x Weightage + …..+ % x Weightage

where,

λ_x represents each area of learning within the left brain hemisphere.

ρ_x represents each area of learning within the right brain hemisphere.

c. Summation of the "λ" which measure the left brain hemisphere and "ρ" which measure the right brain hemisphere. There are 10 learning category segments in both the left and right brain hemisphere. As such the summation of all learning weightage within the hemisphere will sum up to 100%.

Left brain hemisphere (λ); (1) LOGIC, (2) ANALYSIS, (3) SEQUENCING, (4) LINEAR, (5) MATHEMATICS, (6) LANGUAGE, (7) FACTS, (8) THINK IN WORDS, (9) WORDS OF SONGS, (10) COMPUTATION

Right brain hemisphere (ρ); (1) CREATIVITY, (2) IMAGINATION, (3) HOLISTIC THINKING, (4) INTUITION, (5) ARTS (Motor Skill), (6) RHYTHM (Beats), (7) NON-VERBAL, (8) FEELINGS, (9) VISUALISATION, (10) TUNE OF SONGS

~~Note:~~

~~In an ideal situation, whereby~~

300 ~~$\lambda = \sum (\lambda_1$ to $\lambda_{10}) =$ in ideal case is 100%~~
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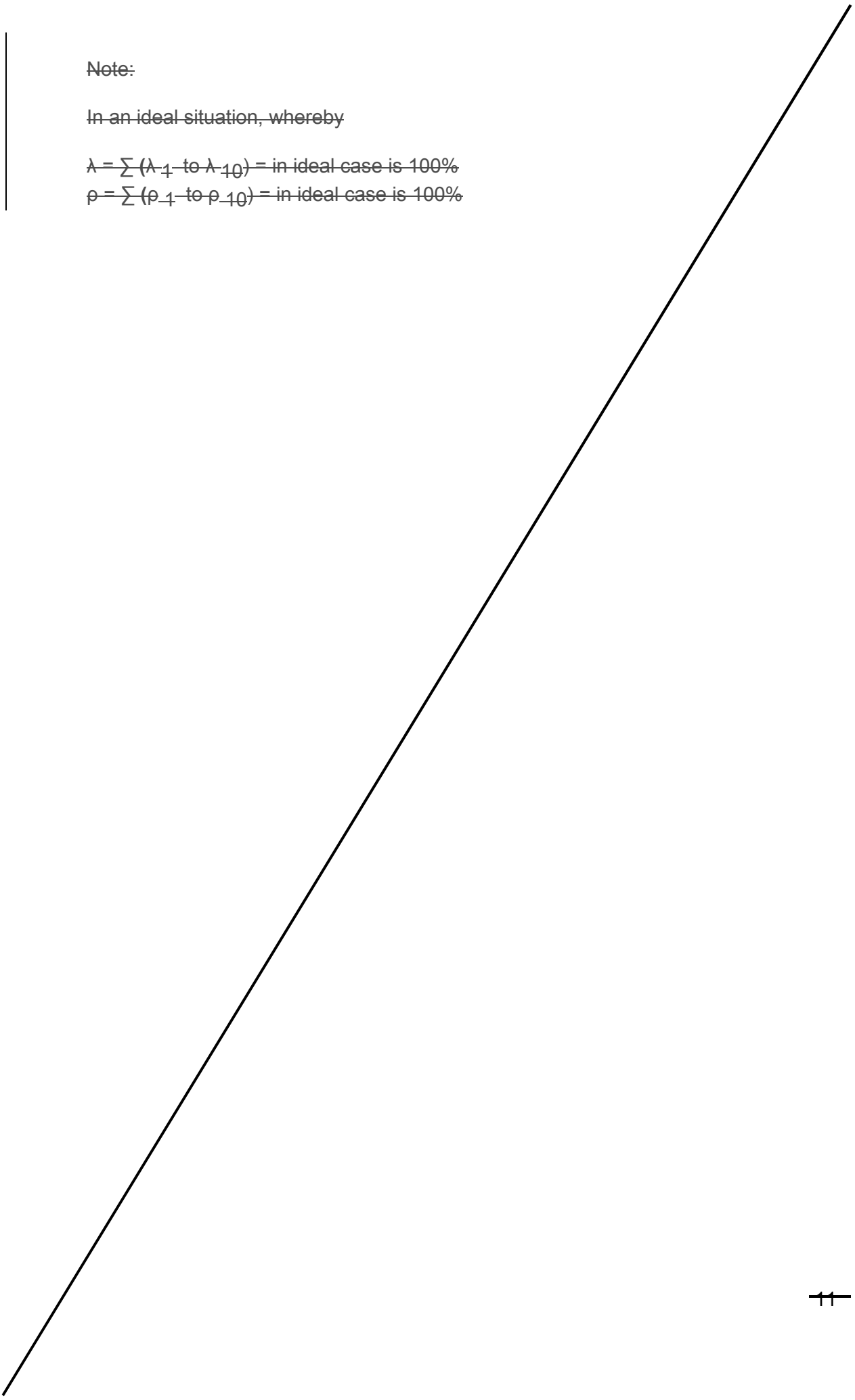

Simple Measurement Algorithms to Re-access Training and Learning Ability of Brain (SMARTLAB) for kids.

Claims

1.1 Title of the invention

The Title of the invention: Simple Measurement Algorithms to Re-access Training and Learning Ability of Brain (SMARTLAB) for kids

1.2 Field

The present invention of SMARTLAB for kids relates to simple measurement algorithms to re-access training and learning ability of brain for the kids. The brain is divided into two hemispheres, having the left brain being logical thinking inclined and the right brain being the creativity learning inclined. By understanding the kids' learning ability and their strength in learning, appropriate training can be given to the kids at very a young age (from 18 months onwards). The objective is to give kids a well-balanced learning development of the brain.

1.3 Background Brief

Traditionally parents determine the type and intensity of enrichment lessons given to kids may be based on what the parents observed themselves, or recommended by friends. Parents very often over emphasising one enrichment type than other.

The problem is that without recognising the amount of emphasis in the area of emphasis required by the kids, kids will not be holistically developed. Kids may be frustrated in their learning, and parents becoming more over exerting kids pressure in the wrong areas.

The present invention will help young parents in the developing of kids holistically. Parents become more aware of the kids development and forms their own guide in considering a benchmarking ruler in the kids' enrichment classes and their development.

This invention relates to having the appropriate training intensity and excessive of it may be lopsided in the kids' brain development. The notion that some of us are borne left-brained (logical, analytical) bias and some are right-brained (intuitive, creative) bias, by putting the right of amount of appropriate training will provide a balanced environment for brain development.

SMARTLAB for kids is a Learning Development Program platform design for better planning and understanding of children learning diversification. This platform forms a basis of learning activities group by the dominance of the brain; that is the left brain and the right brain. An algorithm is formulated to capture the distribution of weightage impacting the segment of brain development.

SMARTLAB for kids is a learning development program that primary cater for age of 18 months to 6 years old. All kids' development growth of their logic thinking, understanding concepts, facts, music, motor skills, memory etc. starts at different age.

SMARTLAB for kids produce an algorithm for future adoption of measurement in accessing the extensive training focus. With this algorithms, parents and educator will not overly train

kids within certain area of focus and forgotten the holistic development of kids. Kids need to be given a balance development.

1.4 Claims

1. A learning measurement algorithms for re-accessing young children enrichment programs which comprises
   a. A simple measuring algorithm with the weightage percentage being focus on Age, Environment, and Learning frequency.
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        iii. 50% - fairly acceptable learning
        iv. 20% - noisy or unsuitable learning environment

      - The "Learning Frequency" variable will determine the extensive of specific category of the brain training given to the young children

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      ρ_1 = % x Weightage + …..+ % x Weightage

      where,

      λ_x represents each area of learning within the left brain hemisphere.

      ρ_x represents each area of learning within the right brain hemisphere.

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both the left and right brain hemisphere. As such the summation of all learning weightage within the hemisphere will sum up to 100%.

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Right brain hemisphere (ρ); (1) CREATIVITY, (2) IMAGINATION, (3) HOLISTIC THINKING, (4) INTUITION, (5) ARTS (Motor Skill), (6) RHYTHM (Beats), (7) NON-VERBAL, (8) FEELINGS, (9) VISUALISATION, (10) TUNE OF SONGS

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The algorithms will still need human intervention to input of the type of training and its frequency. The input should be keep tract on a monthly basis,

2.2 Benefits and Usefulness

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With this algorithm, Parents and Educator can re-access the amount of training development emplacing consciously in any particular development category of the brain bias development.

This new invention development could possible lead to proper planning of the kids' tuition, skills development and other enrichment programs.

With this new invention, a benchmark can be form as the best appropriate balanced enrichment development for kids

With this algorithm, Parents and Educators can gauge how the enrichment can affected the overall development of kids, and hence select the appropriate training and enrichment classes.

2.3 Industrial Applicability

The development of Simple Measurement Algorithms to Re-access Training and Learning Ability of Brain (SMARTLAB) for kids can be used in preschool to primary school for accessing appropriate enrichment. Many young parents struggle to make young kids excel in certain learning, skills development or training development, but forgotten the overall development for kids. The New invention can be useful to learning centre, who can also adopt as a benchmark before recommending sensible and reasonably acceptable enrichment modules for kids.

2.4 Limitations

Parents and educators have to manually and consciously enter the correct amount of training in each area of focus.