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Learning Struggles in Math and Their Behavior Manifestations among Children at Home

ABSTRACT: *Children need to be aware of their learning needs as well as how they can have these learning needs met. The facilitation of learning is incumbent on how learners would receive, process, and retain new and difficult information. Learning is influenced by a lot of factors. These factors include daily experiences, physical activities, love, and care that the child receives. The relevance of the study extends to the fact that the findings should serve as a spring board for proposing modifications or adjustments on teaching strategies in order to address learning struggles. This case study aimed to identify the learning struggles in Math and behavior manifestations of 6-year-old children at home. Data were gathered using checklist and interview. The specifics of four learning struggles in Math were the following: (1) Left-to-right visual skills/Math calculations /understanding of writing symbols; (2) Focusing on test; (3) Mental Math calculations; and (4) Controlling skills/hand and eye coordination skills. Learning struggles in Math can be manifested through various bodily movements and such were grouped into four areas, namely: head, arm-hand, shoulder-waist, and waist-foot. It is recommended to conduct further research on learning struggles in Math using a larger population of school children. Likewise, research in exploring interventions to address children's learning struggles in Math shall be conducted.*
KEY WORD*: Learning Struggles in Math; Behavior Manifestation; Children at Home; Children's Parents; Teachers.*

RINGKASAN*: "Berusaha Keras dalam Belajar Matematika dan Manifestasi Perilaku Anak-anak di Rumah". Anak-anak perlu menyadari kebutuhan belajar mereka serta bagaimana mereka dapat memenuhi kebutuhan belajar tersebut. Fasilitasi pembelajaran adalah kewajiban bagaimana siswa akan menerima, memproses, dan menyimpan informasi yang baru dan sulit. Belajar dipengaruhi oleh banyak faktor. Faktor-faktor ini termasuk pengalaman sehari-hari, aktivitas fisik, cinta, dan perhatian yang diterima anak. Relevansi penelitian meluas ke fakta bahwa temuan harus berfungsi sebagai titik awal untuk mengusulkan modifikasi atau penyesuaian pada strategi pengajaran dalam mengatasi usaha keras dalam belajar. Studi kasus ini bertujuan untuk mengidentifikasi usaha keras dalam belajar Matematika dan manifestasi perilaku anak-anak berusia 6 tahun di rumah. Data dikumpulkan menggunakan ceklis dan wawancara. Secara spesifik empat usaha keras dalam belajar Matematika adalah sebagai berikut: (1) Keterampilan visual kiri-ke-kanan/kalkulasi Matematika/pemahaman simbol tulisan; (2) Berfokus pada tes; (3) Perhitungan mental Matematika; dan (4) Kemampuan mengontrol/keterampilan koordinasi tangan dan mata. Usaha keras dalam belajar Matematika dapat dimanifestasikan melalui berbagai gerakan tubuh dan bisa dikelompokkan menjadi empat bidang, yaitu: kepala, tangan-lengan, bahu-pinggang, dan pinggang-kaki. Disarankan untuk melakukan penelitian lebih lanjut tentang usaha keras dalam belajar Matematika dengan menggunakan populasi anak sekolah yang lebih besar. Demikian juga, penelitian untuk mengeksplorasi intervensi dalam mengatasi usaha keras anak-anak belajar Matematika harus dilakukan.*
KATA KUNCI*: Usaha Keras Belajar Matematika; Manifestasi Perilaku; Anak-anak di Rumah; Orangtua Anak-anak; Guru.*

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INTRODUCTION

The case study hopes to introduce an idea that irritating behaviors of grade school children have various explanations. For some pupils, they may only need alternative activities to facilitate their learning experience. Children need to be aware of their learning needs as well as how they can have these learning needs met. The facilitation of learning is incumbent on how learners would receive, process, and retain new and difficult information. Learning is influenced by a lot of factors. These factors include daily experiences, physical activities, love, and care that the child receives (Brotherson, 2005; Goldstein, 2012; and WHO, 2012).

Environmental factors, therefore, can create a unique impact to each pupil as he/she learns. The relevance of the study extends to the fact that the findings should serve as a spring board for proposing modifications or adjustments on teaching strategies in order to address learning struggles (Fillmore & Snow, 2000; WHO, 2012; and da Luz, 2015).

Students, who struggle to learn, remain an issue among parents. It seems a child becomes appealing only, when he/she is performing well in academics. This stressful situation becomes more challenging, because the present era of new technology dictates the young generation, including those learners in the primary level, to get things done while seated. This could cause both health and learning problems (Carr, 2007; Fry, Ketteridge & Marshall eds., 2009; and Ozar, 2013).

Despite the observations of various educators that traditional method of teaching where the teacher talks while the students take notes is becoming a thing of the past, that partiality of teachers with regard to paper and pencil activities; and, hence, most of the time require students to use their eyes and ears more often, is not as efficient as it once was in today's classroom, where diversity and differing styles are dominant (George, 2005; and Montrieux *et al*., 2015). Traditional forms of discipline, like sitting properly, following orders from teachers, and controlling body movement, due to limited space in the classroom are not enough measures to enable children to learn (Korpershoek *et al*., 2014; and Ocampo, Jr., 2015).

This explains why C. Koester & G. Dennison (2010) say that parents notice their children sitting stiffly, moving their eyes left and right, or moving their eyes up and away into the distance; surprisingly, some physical movements can be used to achieve bodily balance (*cf* Hannaford, 2005; Doidge, 2007; Koester & G. Dennison, 2010; and Ocampo, Jr., Varela & Ocampo, 2017). Likewise, since engaging in a physical activity has been shown to improve on-task behavior in the classroom (Mahar *et al*., 2006; and Goh *et al*., 2018), it was determined that the control intervention should also include physical activity.

On another perspective related to movement, learners who spend more time on physical education, regardless of their socio-economic status, exhibit a superior performance on academic subjects, such as Math and Reading (Felder & Brent, 2005; and Hillman, Erickson & Kramer, 2008). Albeit this, there are pupils who still have localized problems dealing with Math activities. It is but necessary that a study be conducted to identify pupils' learning struggles in Math. The result of this study can guide teachers, parents, or carers in mustering extensive understanding of the learners (Hillman, Erickson & Kramer, 2008; and Cooke, 2012).

According to Pam Schiller & Clarrisa Willis (2008), the matter of finding ways that will integrate compatible approaches to learning will help the child become more of an active learner. Learning outcome is evidently enhanced, when the teacher's approach is successfully aligned with learner's needs. The characteristics of the respondents at their present age can be matched by some specific movements (Schiller & Willis, 2008).

Though classroom teachers have frequently sought multiple ways to reach their struggling students, literature in teaching strategies has identified differentiation as a commonly used teaching strategy among effective teachers. It is an affirmation for a teacher, who is viewed as a facilitator of learning, to enable students to become independent learners (Beecher & Sweeny, 2008; and Lloyd *et al*., 2015).

Statement of the Problem. Specifically,

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the study attempted to answer the following questions: (1) What are the 6-year-old children's learning struggles in Math as reported by the following their parents and their teachers?; and (2) What are the behavior manifestations of learning struggles in Math among 6-year-old children as observed by their parents/carers during Math sessions at home?

Definition of Terms. To clarify the content of the words used in the study, the following terms are operationally defined:

Controlling skills/hand and eye coordination – the ability to form or construct shapes, figures, and numbers using manipulative materials/the ability to compute or solve, while looking at figures or problems simultaneously.

Focusing on test – the ability to apply some learned Mathematical ideas and concepts on a given question.

Academic inferiority – the child's failure to adjust when confronted with learning stimulations. The insufficient ability to absorb information or to express the corresponding reaction to different learning situations is measured by grades below 80 in Math subject.

Left-to-right visual skills/Math calculations/understanding and writing symbols – the ability to follow Mathematical processes and sequences, which start from the left/processes involving Mathematical operations with or without the aid of any calculating device/the ability to express understanding by using symbols for some Mathematical terms.

Mental Math calculations – the act of evaluating or solving Math problems (worded or not) without the use of any writing and calculating device.

Behavior manifestation – an unconscious response while an individual experiences learning struggles in Math; a composition of random head-to-foot movements which observers find as unfavorable and an irritating conduct. The behavior is manifested in at least five seconds.

METHODS

The subject children were composed of Three Grade I pupils. They had low grade in Math. This was used as the basis for identifying the children, who have learning struggles in the subject. The other reason for the selection of the participant-pupils was based on reports of their behaviors during the class in Math as observed by their teachers, or, at home as observed by their parents/carers (Rockoff & Speroni, 2010; Ho & Kane, 2013; and West *et al*., 2016).

Teachers were interviewed about their usual observations of their pupils during class hours, while the parents were interviewed about their observations of their children's study habits and behaviors at home in relation to learning struggles in Math. A checklist was used for data gathering through interview (Miles & Huberman, 1994; Cohen, Manion & Morrison, 2007; and Shek, Ng & Tsui, 2010).

RESULTS AND DISCUSSION

As reflected in table 1, on learning struggles in Math, all the parents reported that their children have difficulties focusing on test. There were parents who divulged that their children have another struggle either in mental Math calculations or left-to-right visual skills/understanding and writing symbols/Math calculations (Olson, 2018; interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; interview with Respondent C, 2/10/2017).

Child A's parent was puzzled by the behavior of her son during the latter's studies at home. He would bite his pencil and the mother could not offer or suggest any remedy except to utter admonishing remarks. The muscles on his jaw could have been tensed and probably needed a massage to give him some sort of relaxation (Hornbeak, 2007; and interview with Respondent A, 2/10/2017). It was such a distraction prompting him to address the uncomfortable feeling on his jaw instead of giving attention to his learning task (*cf* Pfeiffer, 1998; Hornbeak, 2007; and interview with Respondent A, 2/10/2017). See table 1.

The parent of Child B felt confused by the behaviors of the son. She assumed that her child was delayed, when it comes to normal learning abilities. She even suspected that the delay could have been associated with her age, 45 years old, the period when she

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Table 1:
Children's Learning Struggles in Math as Reported by Their Parents/Carers and Teachers

Parent's Report	Child	Teacher's Report
- Focusing on Test.	A	- Mental Math Calculations. - Left-to-Right Visual Skills/Understanding and Writing Symbols/ Math Calculations.
- Focusing on Test. - Mental Math Calculations.	B	- Controlling Skills/Hand and Eye Coordination. - Left-to-Right Visual Skills/Math Calculations /Understanding and Writing Symbols.
- Focusing on Test. - Left-to-Right Visual Skills/Math Calculations/Understanding and Writing Symbols.	C	- Left-to-Right Visual Skills/Math Calculations /Understanding and Writing Symbols. - Focusing on Test. - Mental Math Calculations. - Controlling Skills/Hand and Eye Coordination.

was pregnant with the son. The mother resorted to hiring tutors and depended on some professionals whom she thought could use appropriate strategies just to meet the academic needs of the son (Dubland, 2015; and interview with Respondent B, 2/10/2017).

Some tutors came to the point of recommending that the child be sent to other tutorial schools, which the mother followed. She went to the extent of sending the child to an exclusive and expensive tutorial school, believing that it could bring about significant impact on the learning activities of the child. After several weeks, she said the child had minor improvement. She was constrained to believe that her child was not interested to learn since he kept on playing with anything he could hold or touch (*cf* Carr, 2007; MacBeath, 2007; and interview with Respondent B, 2/10/2017). In this context, the Respondent C, for example, further said as following here:

> When there were signs, he was supposed to think, he would spend a lot of time looking around even when he was at home. The child may be experiencing feelings of insecurity at this point. He must have felt the danger of not giving a response that would match the learning requirements of the situation. His senses might have received the information but there seemed to be a problem of how this information had to be processed. On this account, the child would appear disinterested in his studies (interview with Respondent C, 2/10/2017).

In fact, the mother found it hard to control her temper and, therefore, would end up scolding her child. As a result, at times, the child would simply slouch on the chair. P. Formosa (2009) has an important input in this regard. The information received by one's skin, muscles, and movements is integrated with visual and auditory information (Formosa, 2009). This helps him to know and understand where he is in space, comprehend data and participate in learning and in social situations. If he struggles with sensory integration, the task becomes very difficult and this hampers him from achieving success (Formosa, 2009; and interview with Respondent C, 2/10/2017).

It could be an indication that the child felt shame or that he was just struggling to learn. There was also a thought that the child had a unique condition, because he was not accustomed to looking eye to eye, when he relates or communicates to others. The mothers said that, just like any other kid, their children always wanted to receive a reward after working on a particular activity. He/she has talents for handling tools like screw drivers and pliers. He/she is good in manipulating computer hardware and has a lot of views about his/her future (interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; interview with Respondent C, 2/10/2017).

The teacher, however, said that the children or three pupils had struggles in Left-to-Right Visual Skills/Understanding and Writing Symbols/Math Calculations. According to her, Child B showed signs that he can do several tasks if he wanted to (interview with Respondent D, 5/10/2017). This was supported by the parent, and, she surmised that the

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Table 2:
Number of Children Who Manifested Behaviors and Behavior Manifestation During Learning Struggles in Math for Left-to-Right Visual Skills/Math Calculations/Understanding and Writing Symbols as Observed by Their Parents

Number of Children Who Manifested the Behavior According to Parents	Behavior Manifestation
	Head:
**	1. Bites lower lip
*	2. Closes eyes
*	3. Eats candy/chocolate
***	4. Looks around
*	5. Looks back upside down
*	6. Moves eyeballs up and down or vice versa
**	7. Yawns
	Arm-Hand:
*	1. Bites fingers/thumb
*	2. Draws something
**	3. Moves the chair
**	4. Plays pencil
*	5. Plays toy cars
*	6. Puts hand on the head
**	7. Uses fingers for reading
	Waist-Feet:
*	Places foot on chair

Note: Each asterisk represents each child, who manifested the behavior.

detailed orientation in studying Math simply did not appeal to his son. Child C, on the other hand, seemed to have a lot of learning struggles in Math. He was able to finish Grade I, but, was advised to transfer to another school the following year (*cf* Formosa, 2009; Gan, 2014; and interview with Respondent C, 2/10/2017).

As shown in table 2, parents claimed that during this activity, their children would tend to exhibit behaviors, such as biting the lower lip, eating candy or chocolate, and yawning (interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; interview with Respondent C, 2/10/2017). These were never noticed by the researchers, but, in their opinion, the children were feeling some stiffness along their face that needs a soft touch or massage. Feeling that they needed to address it, they appeared uninterested in their studies from the perspective of the parents (Krashen, 2002; and Gan, 2014).

On the arm-hand area, it was observed that the child would unnecessarily enjoy manipulating objects and school paraphernalia like toys, electric fans, and the like. The focus for learning seemed redirected to play and this case usually created feelings of discouragement on the parent. If ever the issue is concerned with the child's brain, M. Levine (2002) shares that the concept of individual differences extend to physiological and psychological issues. Learning hinges not only on intelligence, but also on readiness and preference to benefit from learning. There could be truth to this as the parent reported that her son was not an underachiever at all (*cf* Levine, 2002; Vey, 2005; and Neal, 2014).

The child was good in computation provided it was about money. Interestingly, the child kept telling his parents that he wanted to manage his own business someday. However, when being supervised while working on assignment, he would not want repetitions in discussing the lesson. In this context, P. Formosa (2009) viewed that self-regulation may be one of the possible problems that children with sensory processing disorder may encounter. The brain often receives the information in a disorganized manner. It may come into the brain too strongly or too weakly (Formosa, 2009).

The data that come too strongly into the brain produce a survival response, while data

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Table 3:
Number of Children Who Manifested Behaviors and Behavior Manifestation in Math for Focusing on Test as Observed by Their Parents

Number of Children Who Manifested the Behavior According to Parents	Behavior Manifestation
	Head:
**	1. Bites pencil
**	2. Looks around
	Arm-Hand:
*	1. Draws figures on test paper
*	2. Plays with pencil
*	3. Reads with fingers pointing
*	4. Touches the chin
	Shoulder-Wais:
**	1. Lies down
*	2. Slouches on the chai
	Waist-Feet:
*	1. Rocks the chair
*	2. Sits at inclined chair

Note: Each asterisk represents each child, who manifested the behavior.

Table 4:
Number of Children Who Manifested Behaviors and Behavior Manifestation in Math for Mental Math Calculations as Observed by Their Parents

Number of Children Who Manifested the Behavior According to Parents	Behavior Manifestation
	Head:
*	1. Rotates head
*	2. Yawns
	Arm-Hand:
*	1. Looks from left to right
*	2. Places hand at chin
*	3. Reaches toes

Note: Each asterisk represents each child, who manifested the behavior.

that come too weakly provide insufficient information. The other parent complained that when studying, her son who would tend to look around, look back upside down, and move his eyeballs up and down. This could be the struggle related to P. Formosa (2009)'s view. There were times the child felt unsafe on the account that he could not provide accurate response to information received by his senses (Formosa, 2009; and interview with Respondent A, 2/10/2017).

As shown in table 3, the parents reported that their children exhibited common behaviors like biting a pencil, looking around, and lying down. In relation to the Focusing on Test, and relative to the Head region, parents became intolerant when they saw their children trying to rest their chins on top of the table. They did not want to see their kids exhibiting this behavior, because they looked dull. There were instances when children were caught staring at the ceiling, yawning, or just looking around. Parents felt that their children were only wasting precious time, when they were supposed to think of answers and to finish the test (*cf* Ocampo, Jr., 2015; interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; interview with Respondent C, 2/10/2017).

With reference to the Arm-Hand region, there were children who would always scratch their head and stretch their arms upward. This could be an attempt to stay alert, while accomplishing a seat work or homework. They also read with fingers pointing at words, probably wanting to get and understand every detail of the test. Some of them played with their pencils, which could be an act to find

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Table 5:
Number of Children Who Manifested Behaviors and Behavior Manifestation
in Math for Controlling Skills/Hand and Eye Coordination as Observed by Their Parents

Number of Children Who Manifested the Behavior According to Parents	Behavior Manifestation
*	*(Standing)* *Head:* Looks around
*	*Arm-Hand:* Points pencil to the word
*	*(Sitting):* Plays pencil
*	*Waist-Feet:* Stomps feet

Note: Each asterisk represents each child who manifested the behavior.

time for the correct answers. While searching for answers, these children would draw figures on the test paper, hopefully finding time to relax in the midst of such demanding activity (Dennison & Dennison, 1994; and Ocampo, Jr., 2015).

Parents did not see the behaviors that would facilitate children's focus on test taking. Relative to the Shoulder-Waist region, parents would not agree seeing their children lying down on the floor or the bed, when they were in the testing activity. Some kids, on the other hand, preferred to rest their feet on the chair. Parents, at this juncture, would reprimand their kids with the threat of applying an unfavorable discipline, physical punishment (*cf* Ocampo, Jr., 2015; Avila, 2016; interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; and interview with Respondent C, 2/10/2017).

As may be seen in table 4, the parents reported that when assisting their children with their Math assignments, they were bothered on seeing them rotate the heads, yawning, and looking from left to right. For them, these are the usual behaviors which suggest that children refuse to participate. They thought that these children were suffering from excessive exhaustion, probably sleepy, or were pretending to be in the thinking mode. Parents could have also been tired themselves as they can assign labels for their children with ease and candidness. Since children are sent to school, it is expected that these learners, at very young age, would always know and recall whatever teachers have given them during class hours (*cf* Benson, 2011; Hull, 2016; interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; and interview with Respondent C, 2/10/2017).

According to P. Formosa (2009), many children who struggle with sensory dysfunctions in sensory integration do not receive adequate sensory information from their bodies, and their body awareness is limited. They may suffer from lack of coordination or find difficulty engaging in things that are related to their movements (*cf* Dennison & Dennison, 1994; Formosa, 2009; and Lee, 2013).

Table 5 shows one parent, who was bothered with her child, who tended to look around in a manner that required his hand and eye coordination and controlling skills during activities. This child was the one reported to have advanced skills in handling tools and manipulating computer hardware. Despite this report, she remained impatient in understanding the child's habit of looking around when being supervised in his studies. The parent may need plenty of time to understand that her child's behavior may be a manifestation of curiosity. If the child would receive full support and encouragement in doing what he is capable of doing, through constant practice and the provision of guidance from the parent, the child may develop his confidence. This may also develop his interest and ability to stay working once given a task (*cf* Hannaford, 2010; IMNRC, 2015; and interview with Respondent B, 2/10/2017).

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The parents also experienced irksome moments, when they saw their children pointing a pencil to a word, playing the pencil, or stomping the feet. This could be another behavior to which parents would not easily accede even if behaviors, in one way or another, help the children in enhancing brain functioning, learning, faster acquisition, and better retention (Hannaford, 2005 and 2010; interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; and interview with Respondent C, 2/10/2017). The behaviors that were divulged by parents as irritating are closely related to possible attempts of the children to perform a cross-lateral activity (Nash, 2009; Hannaford, 2010; interview with Respondent A, 2/10/2017; interview with Respondent B, 2/10/2017; and interview with Respondent C, 2/10/2017).

CONCLUSION

Focusing on Test and Left-to-Right Visual Skills/Understanding and Writing Symbols/ Math Calculations are the common learning struggles in Math of 6-year-old children. Learning struggles in Math can be manifested through various bodily movements.

The recommendations are to conduct further research on learning struggles in Math using a larger population of school children; and to explore interventions to address children's learning struggles in Math.[1]

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[1] ***Statement:*** This is to certify that the manuscript is an original work by us based on research. We have duly acknowledged the work(s) of others we used in writing this article/manuscript. We have duly cited all such work(s) in the text as well in the list of the References, and that we have presented within quotes all the original sentences and phrases, etc. taken from the sources, which we have consulted in writing this article/manuscript. We, further, declare that the paper has not been previously published, is not currently submitted for reviews to any other journal/magazine or periodicals, and will not be submitted elsewhere.

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