

**HANDS-ON, HEADS-ON, AND HEARTS-ON IN TEACHING MATHEMATICS
TO CHILDREN WITH SPECIAL EDUCATION NEEDS,
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Abstract: *The Department of Education specifically all public schools in the country have a diverse and unusual task in a child's education. They are in charge of not only teaching the basic concepts of learning, but also letting children know how to behave in a social setting. Department of Education in the Philippines is highly concerned with producing learners whose full potentials are developed regardless of their capabilities, hence this research was conceived. Since the researchers are engaged personally to children with special education needs, the experimental analysis made to action. It opted to find ways on enhancing the number concept of children with special needs. In so doing, determining the effectiveness of hands-on, heads-on and hearts-on in teaching Mathematics for children with special education needs was conceptualized. The study was conducted with eight (8) pupils with varied exceptionalities or conditions as follows: Cerebral Palsy, Autism, Hearing Impairment and suspected learning disability confined in a Self-Contained classroom. A pre-test and post-test were employed in this study. 3 H's was employed in this study as experimental approach. The first H is called the "mental" (HEADS-ON) using images (pictures) to represent objects to count or solve a math problem. The "doing" (HANDS-ON) which involves physically manipulating objects is the second H. The final H is the "interest" (HEARTS-ON) also known as the "symbolic" which involves using only numbers and symbols to count or solve a math problem. The key finding was consistent with other research revealing that in order to achieve great knowledge and success in understanding, pupils or children with special education needs must engage in hands on, heads on and hearts on approach, particularly in learning Numeracy or Mathematics. These children needed heads on, hands on and hearts on to relate and retained to them the numbers being taught. It also observed that all throughout the study, children with Autism needed more motivation and patience as compare to the rest of the SEN participants. Implication of the study to these children help to enhance the Numeracy skills of the pupil-respondents.*

INTRODUCTION

Children in all walk of life whether children with special education needs have their right to an education appropriate to their needs: spiritual, moral, cognitive, emotional, imaginative, aesthetic, social and physical; therefore, bringing together the hand, head and heart of these children placed great demands and challenges to educational system. The Department of Education specifically all public schools in the country have a

diverse and unusual task in a child's education. They are in charge of not only teaching the basic concepts of learning, but also letting children know how to behave in a social setting. Children with special education needs received equal rights same as regular students when it comes to education. However, it's not really easy to make relevant things work out. Every progress has its difficulties like the problems encountered by educators when they are handling special classes. These problems are considered essential and important

though thinking it as small problem. Nevertheless, small problems need to be resolve so that it will not tend to become a bigger problem in the students. Lack of trainings and seminars means lack of knowledge and strategies in handling special classes. Department of Education in the Philippines is highly concerned with producing learners whose full potentials are developed regardless of their capabilities, hence, this research was conceived. Since the researchers are engaged personally to children with special education needs, the experimental analysis made to action. It opted to find ways on enhancing the number concept of children with special needs. In so doing, determining the effectiveness of hands on, heads on and hearts on in teaching Mathematics for children with special education needs was conceptualized.

Specifically, this study sought answers to the following questions:

- i. How may the level of Numeracy skills of the children/participants be described along:
 - a. Pre-test/Post-test of writing number symbols (1 to 10) and counting numbers consecutively
 - b. Pre-test/Post-test of relating number symbols (1 to 10) to actual objects
- ii. Is there a significant difference between the pre/post-test of the respondents after the intervention?
- iii. What is the implication of the study to the No Child Left Behind Act ?

Billig, 2003 stated that most people agree on what service-learning is (heads, hearts and hands), but it is still confused with community service. The research evidence is building around the set of outcomes that service-learning produces. However, the research show that K-12 school-based service-learning remains an enormously promising practice, especially if practice includes elements of high quality. The evidence that service-learning affects the heads, hearts and hands of our students is compelling enough to encourage all schools to try it.

The 21st century is –placing great demands on our students and educational system. To meet those demands, we recognize that educating the head, exclusive or the heart and hand, is no longer educational best practice. School leaders recruit students, parents and the community through the assessment and dialogue to achieve a school culture where each student is engaged intellectually (head), in healthy, safe and supported (heart) learning communities and challenged to demonstrate their learning (hand). The Whole Child model seeks to work with best practices to achieve engaging and challenging instruction, develop a school culture that promotes a healthy and safe climate for student learning and

leadership that involves faculty, students, parents and the community to maximize the supportive potential in school and provide for long-term student success with sustainable strategies. (Wangaard, etal. 2014)

Emerald Group Publishing Limited, 2008 emphasized that advancement of head, hands and heart as an organizing principle by which to integrate transdisciplinary study (head); practical skill sharing and development (hands); and translation of passion and values into behavior (heart); development of a cognitive landscape for understanding TSL as a unifying framework amongst related sustainability and transformative pedagogies that are inter/transdisciplinary, practical and or place based; creation of learning objectives, organized to evaluate a course or program’s embodiment of TSL (transformative sustainability learning).

The investigation conducted by Ates and Eryilmaz on the effectiveness of hands on mind on and hearts on in ninth grade students achievement and attitudes towards simple electric circuits found that hands on/mind on/hearts on activities were an effective means of increasing physics achievement about simple electric circuits. It concluded that the students in hands on laboratory instruction or activity based science curriculum had significantly higher scores compared to students using a traditional science curriculum.

Similarly the work of Stohr-Hunt 1996, Freedman, 1997, Turpin, 2000 reporting that learning through hands, heads and heart was more effective that learning in traditional method especially that actual activities took action.

METHODOLOGY

Sergia Soriano Integrated School was the locale of the study wherein only eight (8) children were confined in a self-contained classroom, therefor all served as participants. There were three (3) Autism, one (1) cerebral palsy, one (1) suspected learning disability (Dyslexia) and three (3) hearing impairment. Pre test and post test were employed in this study alongside the approach under experimental mode (3H). The principal instrument used in this study was a test which was prepared by the researchers in consultation with education program supervisor in-charge with special program in education and the Chief in curriculum and implementation division. The internal reliability of the test was calculated by using Cronbach Alpha. 3 H’s was employed in this study as experimental approach. The first H is called the “mental” (HEADS-ON) using images (pictures) to represent objects to count or solve a math problem. The “doing” (HANDS-ON) which involves physically manipulating objects is the second H. The final H is the “interest” (HEARTS-ON) also known as the “symbolic” which involves using only numbers and symbols to count or solve a math

problem. Each conditions underwent written test and it was administered individually to take note of the observed behavior and responses. The mother tongue of the children was used to explain the instruction of the said test as well as in the administration of oral examination. The parents/guardians were also present during the administration of the said test.

DATA ANALYSIS

This study was intended for the teachers who handled children with special education needs. The study found out that heads on, hands on and hearts on was an effective means of teaching mathematics to children with special needs, be it with conditions like Intellectual disability, autism, hearing impairment, suspected learning disability (dyslexia) or cerebral palsy. It also viewed that rote counting was evident to all fifteen (15) children. These children needed heads on, hands on and hearts on to relate and retained to them the numbers being taught. It also observed that all through out the study, children with Autism needed more motivation and patience as compare to the rest of the SEN participants. There was significant increase in the results of the posttest after using the approach in teaching Numeracy to children under study. As a whole, the heads on, hands on and hearts on was found to be effective in teaching Numeracy.

In comparing the results of this research with those of previous ones, this study supports the findings of : (Stohr-Hunt, 1996; Turpin, 2000; Billig, 2003; Acosta, 2005) that much can be done to improve teaching through Hands on, Heads on and Hearts on approach. In the study conducted by Stohr-Hunt (1996) evaluated the effect of frequency of hands-on activities

(daily, once a week, once a month, never) on eight grade students' science achievement. Results of his study indicated that students who experienced hands-on activities frequently (everyday or once a week) had significantly higher scores of science achievement than those students who experienced hands-on science infrequently (once a month, less than once a month, or never). The said findings were then similar to this study in the sense that when the application of the actual objects or realias employed, better results came out; Higher retention grew to the children's mind.

In the light of the conclusions drawn, the following recommendations are suggested:

- i. Teachers handling children with special needs should observe ingenuity and resourcefulness in providing challenging activities to cultivate the learner's potential to explore and enjoy Heads on, Hands on and Hearts on in Mathematics instructions.
- ii. Teachers should be encouraged to take up advanced professional studies, attend relevant in-service trainings, seminars and workshops to upgrade their instructional competencies in the learning area.
- iii. School administrators should equip their schools with adequate instructional materials and equipment suited for children with special education needs.
- iv. Home-School relations must be established through frequent short assignments on Numeracy to involve parents/guardians.
- v. A parallel study or research be undertaken to validate the findings of this study.

Figures, Tables and Equation

Age of Pupil respondents			
CONDITION	AGE RANGE	MALE	FEMALE
Autism	5 – 11 years old	3	0
Hearing Impairment HI	7 – 11 years old	2	1
Suspected Learning Disability (Dyslexia)	15 years old	1	0
Cerebral Palsy CP	13 yrs. old	1	0
Total		7	1

Pre/Post Test Results in Writing Number Symbols 1 – 10

No. Symbol	(f)	(%)	No. Symbol	Pupils with Correct Response	(%)
1	3	37.50	1	6	75.00
2	3	37.50	2	6	75.00
3	2	25.00	3	5	62.50
4	2	25.00	4	4	50.00
5	2	25.00	5	7	87.50
6	1	12.50	6	6	75.00
7	2	25.00	7	4	50.00
8	2	25.00	8	6	75.00
9	1	12.50	9	4	50.00
10	2	25.00	10	5	62.50

Pre/Post Test on Counting Objects Consecutively 1 – 10

Counting 1-10 Consecutively	(f)	(%)	Counting 1-10 Consecutively	(F)	(%)
1	5	62.50	1	7	87.50
2	5	62.50	2	7	87.50
3	3	37.50	3	7	87.50
4	3	37.50	4	6	75.00
5	3	37.50	5	7	87.50
6	2	25.00	6	5	62.50
7	1	12.50	7	4	50.00
8	1	12.50	8	4	50.00
9	1	12.50	9	4	50.00
10	1	12.50	10	5	62.50

Test on Relating Number Symbols with Realias

Relating Number of Symbols with Actual Objects	(f)	(%)
1	7	87.50
2	6	75.00
3	6	75.00
4	6	75.00
5	7	87.50
6	5	62.50
7	5	62.50
8	5	62.50
9	5	62.50
10	5	62.50

Significant Differences of Pre and Post test

Variables		Mean	Standard Deviation	T	p-value	α	interpretation
Writing Numbers	Pre	4.01	0.670	0.508	0.008	0.05	Significant
	Post	3.98	0.606				
Counting Numbers Consecutively	Pre	4.28	0.46	0.01	0.003	0.05	Significant
	Post	3.73	0.32				

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