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Solving Math Problems

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Abstract—This research paper discusses the development of simple math concepts that are useful today. It highlights the essential developments, such as memory, sequential ordering, and cognition, for students in solving math problems at school. It further highlights the reasons why persons find difficulty in solving written math problem .

1 Introduction

Various researches show that the least favorite subject at school is maths. Students claim that unlike other disciplines, arithmetic requires a lot of attention and commitment to get high scores. Parents who did not perform well on the subject display little concern for the subject instead of encouraging their children. As a result, arithmetic continues to be the least achieved subject in most countries and fewer people major in the mathematics (Wilson, 1993). One can trace the aspect of math solving being difficult to the various levels of development of the simple math concepts at schools.

2. The Development of Simple Math Concepts We Use Today

The level of development of mathematical concepts varies depending on the age of a person. Every idea engraved in the mind of the child at the different stages acts an important part in the next stage. For instance, a kindergarten child's ability to count numbers from 1-20 enable them to identify numbers that are greater than others (Baroody, 1987). They can also relate to objects that are smaller than others are and thus display them in an ascending or descending sequence .Those with a high proficiency of counting the numbers experience less difficulty in counting from 1-100. Increased exposure to numbers helps in improvement of cognitive skills, which are important in handling simple arithmetic operations including multiplication, division, addition and subtraction.

From research, the necessary skills required in the development of the mathematical concepts include memory, temporal sequential ordering, attention, and higher-order cognition. It is through memory that students can recall the rules necessary in solving a problem. The developed sequential ordering skill enables one to embrace the multi-step problem-solving techniques. Through spatial ordering, students can recognize the various mathematical symbols that aid in problem-solving. Higher-order cognitive, on the other hand, aids in the review of alternative methods of problem-solving (Schoenfeld, 1992). Thus, the students can give adequate reasoning to their answers and apply the acquired skills in solving other arithmetic problems (WGBH Educational Foundation, 2002).

3. Why People Find It Hard Solving Math Problems on Paper

While the primary purpose of learning maths at school is to equip oneself with problem-solving skills applicable both at school and in real life, students only focus on getting the right answer (Schoenfeld, 1992). There is limited effort to embrace the acceptable rules, which limit inventiveness. For example, when students are asked to calculate 15+15, they would have to add 5 to 5, and then carry 1, which they would add to the two 1s. If a student, who knew that 16+16=32, added 16 to 16 then subtracted 2, then the method is credited as wrong. While the problem could have been considered solved in real life, in an exam situation, the student could be wrong due to the use of the wrong solving technique (Wilson, 1993). It would be more appropriate for teachers to be flexible in the assessment of the right answer and method so as to improve the performance of students. Relying only on the methods provided by the course limits creativity, and thus students find it more complicated to apply the acquired skills in problems that incorporate real life situations.

Another reason people may fail to tackle math problems on paper is their inability to employ the necessary skills. Problem solving requires one to incorporate more than one level of development in simple mathematics concepts. For instance, a student may need computing: "if one child has two eyes, how many eyes do 62 children have? One of the essential factors is the ability to recognize a sequence. In this case, the pattern is that one child has two eyes. By use of the factual memory, a child would have to recall the multiplication tables. While doing the operation, the student would have to use the active memory to be mentally engaged (WGBH Educational Foundation, 2002). For instance, the learner could start by calculating 60*2=120; and 2*2=4. Then there would be the addition of the products. Thus, if the neurodevelopment of the child did not take place effectively, then the child would face difficulty in providing the correct solution. For example, failure to remember the multiplication tables would result in the addition of every child's eyes. The process has a high risk of error (Baroody, 1987).

Inability to understand math language and low cognitive skills results to low performance in math subject. The understanding of the arithmetic terms is confined to the ability of the teacher to issue clear instructed and giving adequate aid in getting the textbook explanations. Limited vocabulary, even

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though the child has memorized mathematical rules, results to failure. For example, when dealing with questions concerning addition, a student has to know the meaning of the terms combine, add, and plus (WGBH Educational Foundation, 2002). If the concept is not clear to the learner , he or she may use the reduction or multiplication sign. High cognitive skills also help in appropriate screening and discrimination against the information not necessary in a problem. For example, a teacher may ask a student to calculate the number of wheels of cars if red cars have four wheels while bicycles have two wheels. Lack of paying attention to details would result in a student calculating the number of wheels of both the bicycles and the cars. It is, therefore, important that tutors embrace strategies in maximizing the student's attention, cognitive skills, and their knowledge of math vocabulary (Wilson, 1993)

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