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Abstract:

The current study aimed at exploring the effect of using learning - based brain theory in teaching mathematics on the development of mathematical communication and mental computation skills for primary school students . The researcher prepared brain dominance questionnaire and teacher booklet for teaching the two units of addition and subtraction to "99999" for third grade primary students , first year, according to learning – based brain theory . The researcher also prepared a mathematical communication test and mental computation test . The study sample included 63 primary students from Fayoum governorate . It consists of two classes , includes 30 pupils as an experimental group , the other included 33 pupils represent the control group. The researcher administered the brain dominance questionnaire to define the pattern of brain dominance of the two groups (Right or Left or Integrative pattern) . Also, the researcher administered the study tools to gain pre-data, then taught the units for the experimental group according to learning-based brain theory while teaching the

control group according to traditional methods . Finally, the researcher administered the tools to gain post data.

The study results revealed that the experimental group performed better than the control one in the post administration of mathematical communication test and mental computation test in every skill, and in the test as a whole . In addition , teaching according to learning-based brain theory made the students of a specific brain pattern of the experimental group perform better in mathematical communication and mental computation skills more than the control group . The study also revealed that there is no difference between the integrative pattern students of the experimental and control group . Moreover , there is no significant difference between the mean ranks of scores of the experimental students of the dominant pattern (Right or Left or Integrative) in the post administration of the test of mathematical communication test and mental computation test . This was because the activities and the teaching strategies of the program that helped to develop mathematical communication and mental computation for the 3 groups equally . The results revealed also that there is a positive correlation , significant at 0.01 , between the experimental group scores in the post administration of both mathematical communication test and mental computation test . The study recommended training teachers to activate the two patterns of brain (Right-Left) and using some of teaching styles that help the learner to use mathematics language and mental computation .

Key Words : Learning – Based Brain Theory ,
Mathematical Communication , Mental Computation

