BECOMING A PART-WHOLE THINKER: THE NEW ZEALAND EARLY NUMERACY PROJECT

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This paper reports on data from the more than 33,000 students aged 5 to 8 years who took part in New Zealand's Early Numeracy Project in 2001. Children's strategies for solving addition and subtraction problems were assessed at the beginning and end of the project using a diagnostic interview based on the New Zealand Number Framework (Ministry of Education, 2001). One of the important progressions within the framework is the shift from reliance on counting strategies to the use of part-whole strategies, where numbers are partitioned into their component parts and recombined in ways which make the calculation easier (see Young-Loveridge, 2001, 2002). Of the 7988 students who began the project using a counting on strategy, approximately half went on to use part-whole strategies during the project (Part-wholers), while the remainder continued to use counting on (Counters). A comparison of the performance of Part-wholers and Counters on number knowledge tasks at the beginning of the project showed a slight advantage for Part-wholers on all tasks. There was a small difference in numeral identification (98% cf. 91%), slightly larger differences in knowledge of number sequence (forwards: 91% cf. 74%; backwards: 78% cf. 56%), but a sizeable difference in ability to count on by tens off the decade (i.e., 4, 14, 24, 34, 44, 54, 64, 74) (68% cf. 36%). By the end of the project, virtually all Part-wholers had completely mastered the number system to 100, including knowledge of numerals and of number sequence (forwards and backwards), as well as being able to use mental computation for addition and subtraction problems. Counters had made huge progress in counting on by tens but as yet were unable to use this knowledge to solve problems mentally. These findings have important implications for teachers wanting to provide their students with a strong foundation for mental computation, and suggest that learning to increment by tens may be very important for developing good number sense.

References

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