

## Chapter 14

# Investigating the Adult Learners' Experience when Solving Mathematical Word Problems

**Ellen Brook**

*Cuyahoga Community College, USA*

### **ABSTRACT**

*The purpose of the study was to describe the experiences adult learners have while solving mathematical word problems. The focus of the study was on how these adult students used prior mathematical knowledge and how their past experiences with mathematics influenced their solving of mathematics word problems. The study found that the attitudes, feelings and beliefs that adult students in the study hold toward mathematics and problem solving are an integral part of their mathematics learning experience. This study also reports on the particular pattern observed within the participants' attitude toward mathematics education during their schooling years beginning from elementary school till college. The adult students participated in the study lacked the necessary knowledge of such concepts as motion and concentration. Finally, the study found that even after learning the topic during the college class, the participants had difficulties with applying algebraic approaches to word problem solving.*

*Because learning transforms who we are and what we can do, it is an experience of identity. It is not just an accumulation of skills and information, but a process of becoming. (Wenger, 2004, p. 215)*

*The single most important reason to teach mathematics is that it is an ideal discipline for training students how to think. (Schoenfeld, 1982, p. 32)*

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## **INTRODUCTION**

### **Difficulties Experienced by Adults Learning Mathematics**

I would like to begin with providing some information on the studies in adult mathematics education. These studies found that the numeracy proficiency of 58.6% of U.S. adults was below level 3, the minimum level needed for managing today's working and living requirements (Statistic Canada and OECD, 2005). Furthermore, the quantitative literacy skills of 55% of U.S. adults are at a Basic or Below Basic level (NCES, 2006). The economic impact of having low numeracy skills has been reported by the Adult Literacy and Lifeskills Survey (ALL). U. S. adults performing at numeracy levels 1 and 2 (the lowest of five levels) are about three times more likely to receive social assistance payments from the state than those who score in levels 3, 4, or 5 (Statistics Canada and OECD, 2005). The Adult Literacy and Lifeskills Survey (OECD, 2005), examined adults numeracy skills in the context of daily life and work across seven countries, including the United State, and showed that those with low numeracy skill levels are more likely to be unemployed for six months longer than those at higher levels and three times more likely to receive social assistance payments. In 2009, passing rates on the GED mathematics exam were the lowest among the five academic subjects tests (American Council on Education, 2010).

Additionally, about 60 percent of community college students in the United States are referred to take developmental courses since these students are deemed insufficiently prepared to start college-level work (Attewell, Lavin, Domina, & Levey, 2006; Bailey, Jeong, & Cho, 2010). Mathematics classes in particular are a common roadblock for a large proportion of the community college student population (Achieving the Dream, 2006c). Approximately two of three community college students referred to a remedial mathematics sequence do not complete it (Bailey et al., 2010). According to a U.S. Department of Education study (Adelman, 2004), the three courses with the highest rates of failure and withdrawal in postsecondary education are developmental mathematics courses. About 50% of the thousands of individuals interviewed for the National Adult Literacy Survey, including numerous persons holding high school and college credentials, have major difficulties with quantitative literacy (Nesbit, 1996). This data reveals that the adult numeracy issue in the United States is severe, and its negative effects fall far beyond the classroom.

## **BACKGROUND**

### **The Importance and Necessity of Teaching Mathematics to Adult Learners**

I began working with adults in mathematics education a decade ago. During this time, as a teacher, I experienced both success and failure. My aspiration to help my adult students gain knowledge in mathematics and apply it in their lives influenced my decision to research adult mathematics education.

John Dewey began writing about the concept of adult education in 1916 (FitzSimons, 2001). Since that time, the quickly changing aspects of modern society, the more public existence led by individuals, and the increasing educational demands of employers have elevated the topic's significance. Educationally, adult learning is seen as a foundation of personal development and growth, a way of enhancing an individual's life. Economically, adult education is the way to become commercially competitive and to

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