

**BAR-ILAN UNIVERSITY**

**The Relationship among Type of Education,  
Creative Thinking and Social Competence of children:  
A Cost-Effectiveness Analysis for Homeschooling in Israel.**

Michal Unger Madar

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## **Abstract**

Homeschooling, also known as home education, is a method, in which children of various ages schooled at home, usually by their parents. There are two approaches to homeschooling. First, learning based on curiosity and intuitiveness. Second, structured and organized pedagogical learning (Ray, 2018; Murphy, 2012; Kula, 2018; Guterman & Neuman, 2016).

Figures on the numbers of elementary school and high school children who are homeschooled around the world and in Israel are as follows. Of the 48.8 million school-aged children in the United States (elementary and secondary school), two million are homeschooled (Ray, 2018). Thus, in the US school-aged children who are homeschooled constitute 0.05% of all schoolchildren enrolled in public education (NHERI, 2014; United States Census Bureau, 2010). In contrast, in Israel children who are homeschooled constitute only a miniscule percentage of those enrolled in public education. According to figures from the Israel Central Bureau of Statistics for 2016, 1.25 million students in the Jewish sector attend public elementary and secondary schools. Figures from the Ministry of Education for 2016 indicate that 908 Israeli children are homeschooled, representing 0.0008% of all children enrolled in Israeli public education settings. That is, the percentage of children in the US who are homeschooled is substantially greater than the percentage of Israeli children who are homeschooled (United States Census Bureau, 2010).

This study presents three equal material rights in education. The first is the right to education. Second, the right to choose the nature of education. Third, the right to equality in education. These rights stem from the right to liberty and dignity (Rabin & Or, 2012). Thus, parents have the right to choose their children's education by virtue of the right of a person of every age and class to make decisions about his or her life because of the right to autonomy. This right has been recognized as a constitutional right in the past, and therefore the parents' freedom to choose education also has constitutional status (Rabin, 2004, Rabin & Or, 2012).

In recent years educational perspectives have begun to change, leading to a new educational agenda focusing on creative thinking. Research studies show that creative thinking helps students develop critical thinking and serves as a means of solving

problems (Ritter& Mostert, 2017; Deming, 2017). This change is occurring in an era of globalization, in which knowledge and information are accessible to all and serve to develop human capital. Nurturing creative thinking helps students solve personal and social problems and adapt to new and unfamiliar situations (Stiglitz & Greenwald, 2014; Ritter& Mostert, 2017).

In addition to creative thinking, the development of social skills is also part of the new educational agenda. Social skills are defined as the skills that enable an individual to develop mutual relations with others in diverse situations and in ways acceptable to society and that benefit both the individual and others. Social skills are related to emotional intelligence (Monnier, 2015). There is conceptual confusion between the terms social intelligence and emotional intelligence and social skills. It is customary to explain that the concept is a collection of social interactions such as interactive skills, assertiveness, self-esteem, social ability, and interpersonal skills (Arnold, Kupersmidt, Vogerler-lee & Marshall, 2012). These concepts are used as synonyms and sometimes as a broad term for socialization skills, but these concepts are perceived as components of each other by defining social abilities and interacting effectively with others based on social skills (Monner, 2015; Bayer, Ditton & Wohlkinger, 2012).

In view of the growth of homeschooling in Israel and the major importance of creative thinking and social skills to individuals and to society, in this study we examine the relations between these abilities and the degree of success of teaching and learning program among homeschooled children in these areas. In recent years, researchers have become increasingly aware of an innovative model for measuring the cost effectiveness of educational programs. The current study examines the effectiveness of teaching and learning program in homeschooling based on the abovementioned measures. Cost-effectiveness analysis was chosen for two reasons. First, education demands a large allocation of resources and a high financial investment, and these expenses require careful examination. Second, in developed nations the budgetary investment in education is high on the list of national priorities. Hence this high financial investment must be examined in terms of improvement in educational achievements and desired content (Levin, McEwan, Belfield, Bowden, & Shand, 2018).

The model presents the cost and effectiveness calculations in the teaching and learning program of home schooling children in Israel. Because the cost-effectiveness model is not commonly used in Israel, the analysis required major adjustments so that it would be compatible with the government statistics, as detailed in the research tool. The model shows an improvement in effectiveness and growth in achievements requiring creative thinking and social skills, leading to the recommendation to invest in resources to facilitate in-depth and routine use of the cost-effectiveness model.

**The current study examines the relationship between the teaching and learning program in home education in relation to the indices of creative thinking and social skills, and between the comparison group the children of public education, in Israel.** The findings underwent statistical examination with respect to background variables such as gender, age, country of birth, parents' education, number of siblings and region of residence. Unlike other studies examining the ties between homeschooling and educational achievements from the perspective of parental choice of homeschooling or the viewpoint of homeschooling teachers, the current study focuses on the extent of creative thinking and social skills among homeschooled children as measured and examined using innovative and diverse research tools (Edri, 2010; Ben-David, 2014; Heller-Degani, 2007; Guterman & Neuman, 2017).

**The eight research hypotheses** are: The first hypothesis is that the background variables of the student, the parents and the environment will differ between the two types of education (homeschooling/public education). The second hypothesis is that the background variables of the student, the parents and the environment will differ in accordance with level of creative thinking. The third hypothesis is that the background variables of the student, the parents and the environment will differ in accordance with social skills. The fourth hypothesis is that differences will emerge in children's creative thinking depending on type of education. The fifth hypothesis is that differences will emerge in children's social skills depending on type of education. The sixth hypothesis is that when the background variables of the student, the parents and the environment are statistically controlled, differences will emerge in the children's level of creative thinking between the two types of education, in accordance with the two types of education or in favor of homeschooling. The seventh hypothesis is that when the background variables of the student, the parents and the environment are

statistically controlled, differences between the two types of education will emerge in the children's social skills such that the two types of education will be found similar or homeschooling will show an advantage. The eighth hypothesis is that differences will emerge in the cost-effectiveness ratios in measuring the teaching and learning program of the homeschooling with respect to measures of creative thinking and social skills such that the two types of education will be similar or that homeschooling will show an advantage.

**The research method** involves quantitative analysis using seven regression models and one cost-effectiveness model: one logistic regression model, two multivariate regression models, two simple linear regression models, two hierarchical regression models and one cost-effectiveness model.

**The research tools** included two questionnaires and an analysis model. The first questionnaire, Test for Creative Thinking Drawing Production (TCT-DP), measures creative thinking. The second questionnaire, Social Skills Rating System (SSRS), measures social skills. The third tool is the Cost Effectiveness Analysis model measuring cost effectiveness in education. The validity and reliability of the TCT-DP creative thinking questionnaire were evaluated by a team of three judges from the field of the arts. The questionnaire's consistency was assessed by Cronbach's alpha, where  $\alpha=.83$ . The validity and reliability of the SSRS social skills questionnaire were assessed by the research literature. The internal consistency of the SSRS questionnaire in the current study was assessed by Cronbach's alpha, where  $\alpha=.85$ . The cost-effectiveness analysis model is not measured by statistical significance but rather by mathematical calculation and use of a software package.

**The research participants** included 549 children aged 8-12 and their parents. Of these, 269 were enrolled in public education and 280 were homeschooled. The research population was sampled identically according to the Ministry of Education districts: North, Haifa, Center, Tel Aviv, Jerusalem and South.

**The main research results** are as follows. Logistic regression analysis of the relations between students' background variables and type of education shows that the likelihood of homeschooling is higher among students whose parents have a higher degree education (more than 12 years of schooling) ( $OR=3.03$ ,  $\beta=0.01^{***}$ ). That is,

the chances that a child whose parents have more education will be homeschooled are three times greater than among his peers whose parents have a lower level of education (see Table 9).

Analysis of the relations between the background variables and level of creative thinking did not yield any statistically significant findings ( $R^2 = 1.5\%$ ,  $p > .05$ , see Table 10). Analysis of the relations between the background variables and the acquisition of social skills did not yield any statistically significant findings ( $R^2 = 2\%$ ,  $p > .05$ , see Table 11).

Simple regression analysis of the relations between type of education and creative thinking indicated that homeschooled children exhibited a higher level of creative thinking than their peers enrolled in public education ( $\beta = 0.43^{***}$ ), corroborating the research hypothesis (see Table 12).

Simple regression analysis of the relations between type of education and social skills indicated that homeschooled children exhibited greater social skills than their peers enrolled in public education ( $\beta = 0.38^{***}$ ), corroborating the research hypothesis (see Table 13).

Bidirectional hierarchical regression analysis of the relations between type of education and creative thinking while controlling for background variables indicated that student age ( $\beta = 0.79^*$ ) and homeschooling significantly predict level of creative thinking, corroborating the research hypothesis (see Table 14).

Bidirectional hierarchical regression analysis of the relations between type of education and social skills while controlling for background variables indicated that number of siblings ( $\beta = 0.78^*$ ) and homeschooling ( $\beta = 0.00^{***}$ ) significantly predict extent of social skills (see Table 15).

Cost-effectiveness analysis of the components of the homeschooling program for teaching and learning at home indicated that the cost is 323.7 ILS per student per year, compared to an annual cost of 14,918 ILS per student in elementary public education (see Table 16). Moreover, the average score for homeschooled children on the TCT-DP questionnaire assessing creative thinking is 32.67 ( $SD = 10.4$ ), compared to an average

score of 21.36 (SD=13.0) for children enrolled in public education (see Table 17). Furthermore, the average score for homeschooled children on the SSRS questionnaire assessing social skills is 70 (SD=7.6), compared to an average score of 62 (SD=9.5) for children enrolled in public education (see Table 18). It should be noted that the costs of teaching and learning program in home education were calculated for all participants (calculation of all components of the program: the costs of the facilities, services, equipment, and the cost of human capital), even though the learners are independent and do not necessarily study together or share any resources. These figures demonstrating that the effectiveness of homeschooling is greater than that of public education.

This research has both theoretical and practical contribution. From the **theoretical perspective**, this study shows that the effectiveness of homeschooling is greater than that of public education. Moreover, it indicates that children who are homeschooled exhibit better results on measures of creative thinking and higher levels of social skills. Moreover, to the best of our knowledge this study is the first to use the cost-effectiveness model to assess homeschooling in Israel.

From the practical contributions of the study are dual. The first is practical implications for decision-makers and policymakers on differential budgeting that will enable homeschooling children to receive a living stipend. Such support can enrich and facilitate activities such as visiting museums, visiting public institutions and more. Second, the use of cost-effectiveness model calculations does presents here for the first time and is a breakthrough as far as it known. This model explained in detail in the research tool sub-section, enables effective resource management, planning and calculation of educational programs in various fields. This model helps to move from a level of values in education to the economic level and vice versa, thereby helping policymakers at various levels (the Ministry of Education, but also school principals and supervisors in the local authorities) to manage their education budget in the best possible manner. Therefore, raising awareness among decision-makers and policy-makers regarding the use of the economic model "cost-effectiveness", will help to improve the programs taught in educational frameworks, and will enable an effective examination of their effectiveness in comparison to other programs. Due to the fact that home schooling presents optimal effectiveness over public education, it is recommended to examine the

tools and methods of learning which come from home education and adapt them to public education to enhance and improve teaching and learning.