

A Study of Elementary Teachers' Changing Attitudes Towards Geometry Using the Interactive e-Learning Origametria Program for Teaching Geometry

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keywords: Origametria, attitudes, teachers.

Abstract

Introduction

The Origametria program for Grades K-6, recognized by the Israeli Ministry of Education for teaching geometry in elementary schools and kindergartens is being used in schools in many regions of the country. Many experienced teachers who have had an initial in-service training course have now taught this program for at least 2-3 years. These teachers, before using the Origametria environment have taught geometry over many years using text books where the Shape and Space dimension and the development of spatial sense are dominated by stereotyped techniques, most of which are out of the reach of many pupils at the particular developmental stage. The unique features of the Origametria program have been demonstrated at the 4th, 5th, and 6th OSME. In this study we are researching the changing attitudes of these experienced teachers as a key to influencing behaviour and skills of the teachers and their pupils after teaching the Origametria program for several years in 3-5 grade levels. Every year Grade 5 pupils in Israel are tested in Mathematics, the exam being prepared by the Ministry of Education. The results for questions in geometry have been generally unsatisfactory. In classes where the pupils have been learning geometry with the Origametria environment for several years it is stated by teachers that the results for the same exam held internally has shown increasing pupils' math motivation and achievement with the geometry questions of the exam.

Content

Ernest (1989) states that "official pressure for reforms in the teaching of mathematics overlooks a key factor: the psychological foundations of the practice of teaching mathematics including teacher's knowledge', attitudes and beliefs. Research on teaching and teacher education also under-emphasises this area which Shulman (1996) terms the 'missing program' in research on teacher cognitions." This paper will address this lack by proposing an analytic model of the different types of knowledge, attitudes and beliefs of experienced mathematics teachers' those having used the Origametria program for several years and those teachers who have taught geometry as it appears in most textbooks. Richardson (1996) mentions the understanding that "attitudes and beliefs are important concepts in understanding teachers' thought processes, classroom practices, change, and learning to teach." There is a vast number of studies relating to how attitudes affect teacher student interactions

The conceptual framework of this study sees attitudes as a subset of a group of constructs that name, define, and describe the structure and content of mental states that are thought to drive a person's actions. There are various definitions of attitude. Allport (1967) developed his definition: "a mental and neural state of readiness, organized through experience exerting directive or dynamic influence upon the individual's response to all objects and situations with which it is related". On the basis of this definition and similar definitions an attitude questionnaire was developed for our survey of changing attitudes of experienced teachers while using the Origametria program for several years and in Grade 3-5 school elementary classes. The questionnaire developed includes several Likert-type scales aimed at mirroring different aspects of elementary teachers' attitudes towards mathematics and specifically geometry, as well as questions which sought to gather information about the teachers' backgrounds.

Research Questions: The research questions are

- What are the attitudes of these teachers using the Origametria program towards selected challenges brought about by the introduction of this program for teaching geometry?
- What are the reasons for teachers' happiness or unhappiness with this newly introduced program after teaching for many years using other resources and lesson styles and plans?
- What role does teachers' biographical data play in determining teachers' attitudes?
- What are the factors that might account for changing attitudes?

In this study we will also relate to certain past conclusions that shifts in the teachers' attitudes towards the teaching of geometry are more likely to occur when after many years of teaching the subject at these class level when they were already committed to change. Also the shifts in teachers' attitudes are closely related to the sense of personal achievement derived by using this method.

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