

An Evaluation of the Thinking Maps Program in an Elementary School in Florida

by
Susan Marie Horrisberger

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Table of Contents

| | |
|--|----|
| Introduction..... | 3 |
| Statement of the Problem..... | 5 |
| Preliminary Literature Review..... | 6 |
| An Overview of Andragogy and Professional Development..... | 6 |
| Development of Higher-Order Thinking Skills..... | 6 |
| Thinking Maps | 7 |
| Purpose of the Project..... | 7 |
| Initial Research Questions | 8 |
| Methodology and Research Design | 8 |
| Anticipated Outcomes..... | 10 |
| References..... | 12 |

Introduction

Teaching students how to think is critical to their success in school and their future value as human capital capable of functioning productively in the workplace (Deming & Cracolice, 2004, Brooks, 2004). This process of teaching students how to think is not one that is familiar to many teachers, who have for years relied on memorization (Marshall, 2006). The Thinking Maps program consists of eight visual tools that students use to develop higher-order thinking skills. The maps give students ways to organize their thoughts, structure their thinking, and see their thinking. They provide students with a common visual language and allow them to be active participants in their learning (Holzman, 2005). Teachers receive training in how to introduce and teach Thinking Maps to their students. This training is in the form of professional development conducted either by an external trainer or an internal trainer.

The county in which the target school is located is the eighth largest school district in the state of Florida and the 37th largest in the nation. Of the 483,924 residents listed in the 2000 Census information, approximately 80% were Caucasian, 14% African-American, 10% Hispanic, and the remainder are American Indian and Asian. Close to 92,000 students attend one of the 152 school sites in the county. Of those sites, 106 are regular schools: elementary, middle, and secondary public schools. The rest are technical centers, alternative programs, adult schools, conversion charter, and charter schools. An additional three elementary schools will open in August of 2007 and growth projections of a 31.5 % increase in students by the year 2015 mean many more schools will be built (Crouse, 2007).

This public elementary school serves grades Pre-K through fifth. It is located on the urban fringe of a mid-size city in a rural community that is bisected by arterial highways leading

to nearby metropolitan communities. Median resident age is 41.9 years, median household income is \$28,247 per year (year 2000), and the median house value is \$51,700 (year 2000). Inexpensive housing has led to a substantial influx of new residents, many of whom commute to the metropolitan areas. The population of the city is currently estimated at over 50,000 and growing. Economic growth in the area has fluctuated as a result of changes in local industry, which is heavily dependent upon the phosphate industry and agricultural products. The industry has suffered reverses in production and agricultural production has moved further south because land has been developed for housing.

This school was originally built in 1907 as a high school. It underwent many changes and additions through the years, eventually evolving into an elementary school. The current student population is 530 students and consists of 61% Caucasian students, 23% Hispanic students, 13% African American students, and 3% other students. The socio-economic status of the student population ranges from very low to middle class. It is a Title One school with 78% of the students receiving free or reduced lunch.

The staff of Purcell consists of 38 teachers whose average classroom experience is 12 years. The ethnicity of the faculty is 81.6% Caucasian, 15.8% African American, and 2.6% Hispanic. There are more females than male staff members, the percentages being 86.8% to 13.2%. The current classroom teacher to student ratio is 18 to one. There are two administrators, a principal and an assistant principal.

The researcher was hired at the school in 2001 and remains on the staff at the target school as a resource teacher. Part of her current responsibilities includes analyzing all data pertaining to student academic achievement and growth. This affords the unique opportunity to

compare student data to evidence of program use in the classroom. In addition she has attended supplemental trainings in the use of Thinking Maps in the teaching of Math and Science and presented that training at an in-service for the target school.

Statement of Problem

Thinking Maps training was initially conducted in February 2002 by an external trainer for the whole teaching staff at the site school. Thinking Maps are visual tools designed to aid students in seeing their thinking leading to higher order thinking skills and are a research-based program proven to improve student learning. A follow-up session was conducted several months later. However, only 55% of the current staff was employed at the school and attended that original training. No further training was conducted and implementation of the thinking map program is now inconsistent across grade levels. Teachers attend one-size-fits-all professional development sessions continuously and most of what they learn never gets implemented in the classroom (Everett, Tichenor, & Heins, 2003). These sessions ignore basic andragogical theory about adult learning such as their self-concept, readiness and orientation to learn, past experiences, and an understanding of their need to know what is being presented (Knowles, Holton, III, & Swanson, 2005). The time, effort, and money invested in that training is wasted. In addition, the benefit to the students of excellent programs to deliver the curriculum in innovative ways is lost (Everett, Tichenor, & Heins, 2003). That is the case with the Thinking Maps program at this elementary school.

With the arrival of a new assistant principal who is a Thinking Maps trainer, training sessions were conducted as part of school in-service days for the current teaching staff. Training was conducted by grade level and all teachers were required to write a goal related to the use of

Thinking Maps in the classroom to be used as part of their evaluation plan for the year. Teachers are being highly encouraged to implement the training in the classroom and provide proof in the form of student work samples to receive their in-service points.

In order for organizations to learn there must be feedback (Kline & Saunders, 1998). This research project will evaluate the Thinking Maps program at the site school to see how effectively the program is in providing students with tools to become critical thinkers and to assess if the school is getting a return on its monetary and time investment in the program. A key evaluation will focus on determining if the Thinking Maps program is being implemented effectively in the target school and what changes or improvements are needed to ensure consistent, pervasive implementation. In addition, it will document teacher attitudes about the program and its perceived effectiveness in increasing students' higher-order thinking skills as one possible contributing factor to the program's level of effectiveness.

Preliminary Literature Review

This literature review is divided into three sections: a) an overview of adult learning theory and professional development; b) development of higher-order thinking skills; and c) a history of Thinking Maps.

An Overview of Andragogy and Professional Development

Knowles, Holton, III, and Swanson (2005) found that adult learning differs significantly from that of children in that learning differences between individuals become greater as they become older. Their research also found that adults need to be responsible for their own learning and must see the value and need for whatever it is they are being asked to learn. According to Kline and Saunders (1998, p. 23) “organizations learn through change in the culture.” In order for change to take place, the organization must change the attitude and behavior of its members. All members must become willing to learn, change, and adapt before the organization can become a learning organization (Marquardt, 2002).

Development of Higher-Order Thinking Skills

Perhaps most importantly in today's information age, thinking skills are viewed as crucial for educated persons to cope with a rapidly changing world. Many educators believe that specific knowledge will not be as important to tomorrow's workers and citizens as is the ability to learn and make sense of new information (Danielson, 2002). Marzano (2003) reported that in order to be effective teachers, teachers need specific strategies to design effective lessons and provide students with ways to organize the content delivered in those lessons. He found that students must be able to synthesize the knowledge presented to them in order to focus on the most important aspects of the lesson and extend their understanding.

Thinking Maps

Thinking Maps are the creation of Dr. David Hyerle who developed them as tools for his own students in 1988 (Designs For Learning, 2007). Research conducted by educators and administrators who have implemented Thinking Maps in schools and classrooms have shown impressive results in increasing student achievement and learning (Designs For Learning, 2007). Marzano and Pickering (2005) included two of Hyerle's Thinking Maps in their book on strategies to build student vocabulary. They found that using an organizer such as Hyerle's Thinking Maps helps students understand analogies. Thinking Maps fall under the umbrella of visual tools that include brainstorming webs, graphic organizers, and thinking-process maps.

Providing students with strategies and tools to organize their thoughts and manage their learning allows both the student and the teacher to differentiate instruction. Students need a variety of tools to use so that they can select what works best for them in each situation (Tomlinson, 2001). Organizers "help students learn the tools of thought and communication" that will help them be successful (Tomlinson, 2003, p. 52) "Effective teachers use proven research-based practices that are employed by thousands of other teachers" (Wong & Wong, 1998, p. 27).

Purpose of the Project

The purpose of this project is to evaluate the Thinking Maps program at an elementary school in Florida. The problem at this elementary school is that implementation of the Thinking Maps program is not consistent and pervasive. In January 2002 the administrators at the target school paid \$5,380 for Thinking Maps curriculum and contracted with an educational consulting and publishing company called Thinking Maps, Inc. to conduct a school-wide in-service training in Thinking Maps for its staff. The goal of that professional development, which cost \$3,000,

was to provide teachers with training in research-based strategies to increase student achievement by improving students' critical thinking skills. However, evidence of teacher acceptance and student ownership of these strategies is lacking.

Initial Research Questions

In order for the Thinking Maps program to be implemented consistently and pervasively in the target school, teachers must own the strategies and speak the language. Students imitate what they see used in the classroom, therefore, it must become second nature for teachers to use Thinking Maps automatically in their daily instruction. Students imitate what they see modeled for them. Thus the following research questions will be addressed in this study:

1. Are Thinking Maps being implemented effectively on a school-wide basis in terms of reaching students as intended and delivering activities?
2. What are the most appropriate methods to ensure continued effectiveness of the program in terms of training and support for teachers so that they automatically use Thinking Maps in their instruction?
3. What are the most appropriate methods to ensure continued effectiveness of the program so that students automatically use Thinking Maps inside and outside of the classroom?

Methodology and Research Design

The methodology for this research project will use formative evaluation to help strengthen or improve the Thinking Maps program by examining the delivery of the program, the quality of its implementation, and the assessment of the organizational context, personnel, procedures, and inputs. The Logic Model and Evaluation research design will be used to evaluate the program. This will include a needs assessment to determine the potential barriers to the

program facilitators (teachers). The Logic Model evaluation will also incorporate process evaluation to determine (a) how the Thinking Maps program is implemented, (b) the fidelity of the implementation (monitoring how the program is performing), (c) if the activities are delivered as intended (auditing the program to make sure it is following required implementation guidelines), (d) if the participants are being reached as intended, (e) identifying defects in the procedural design or in the implementation of the program, (f) what are the participant reactions to the program, and (g) what is the most appropriate method to ensure continued effectiveness of the program. Outcome Evaluation will be done to determine (a) to what extent are desired changes occurring, (b) if the program is making a difference, and (c) what seems to work and not work? From this evaluation the writer will provide information about what is actually occurring in the program, and this feedback will be used to make formative evaluation decisions about how to modify or improve the program and/or its implementation.

The focus of this study is to determine the factors that lead to school-wide implementation of a program delivered in professional development training. A formal evaluation will be conducted using “systematic procedures and formally collected evidence” (Fitzpatrick, Sanders, & Worthen, 2004, p. 8). Evaluative methodology will be used to determine the extent to which the Thinking Maps program has been implemented in the target school and what strategies need to be used to increase teacher and student participation in the program. Evaluation will begin with a thorough research of the amount and extent of training provided for the staff during all phases of professional development for Thinking Maps. Cross-training provided in related programs and through other sources will also be explored and evaluated. Additional research topics will include adult learning theory, visual tools, and

research-based strategies to increase higher-order thinking skills.

The second step will consist of developing and conducting a needs assessment to determine teachers' attitudes, skill level, and comfort level with Thinking Maps. The survey will consist of several parts. The first will address such demographic data as gender, years of experience teaching, and highest degree obtained. The next part will request information related to extent of professional development with the program, perceptions about the training, and perceived extent of classroom implementation. Finally, the survey will gather teacher attitudes about the program, its effectiveness in increasing higher-order thinking skills in students, and effectiveness of the professional development and follow-up support provided.

An analysis of responses will be made to determine the current training levels for all staff and whether further training needs to be conducted. Data will also be analyzed related to years of teaching experience and teacher willingness to engage in implementation of new teaching strategies. Finally, the responses will provide a basis for determining the need for and amount of follow-up support necessary to increase implementation of the Thinking Maps program.

The third step of this evaluation will be to conduct a school-wide inventory of Thinking Maps. Classroom observations will be conducted to document the extent to which teachers are using Thinking Maps in daily instruction. In addition, student work will be observed to document student use of Thinking Maps. Finally, administrators will be observed to determine if they are modeling the strategies they expect to see implemented in the school.

The final step in the evaluation will be to analyze all data and prepare a report for the administration documenting the consistency and pervasiveness of the implementation of the Thinking Maps program. The researcher will also make recommendations on training and

follow-up support to improve the program.

Anticipated Outcomes

One anticipated outcome of this study is that teachers who are correctly implementing the Thinking Maps program will serve as facilitators in follow-up training sessions as needed. It is also anticipated that increased knowledge about researched-based visual tools will result in further use of such tools in the classroom to improve students' higher-order thinking skills. A final anticipated outcome of this study is increasing the body of knowledge on Thinking Maps professional development that may serve as a model for other schools in the district.

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