Gist Education and Learning Research Journal. ISSN 1692-5777.
No. 10, (January - June) 2015. pp. 113-127.

A Baseline Study of Strategies to Promote Critical Thinking in the Preschool Classroom[1]

Un Estudio de Base sobre Estrategias para la Promoción de Pensamiento Critico en las Aulas de Preescolar

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Abstract

The purpose of this study was to identify the different incidents of critical thinking in five preschool classrooms in one school, and the instructional strategies preschool teachers employed in the development of children's critical thinking. The participants in this study were five self-contained preschool teachers and their corresponding groups. The study explored teachers' beliefs in regards to the role of critical thinking in their classrooms. Data collection techniques included classroom observations, document analysis, and interviews with teachers. Two over-arching findings include: a) it is possible to observe and describe numerous instances in which critical thinking is paid attention to explicitly by teachers, and b) it is possible to observe a range of classroom interactions and techniques that explicitly develop these skills among preschoolers.

Keywords: Critical thinking, instructional strategies, classroom interactions, preschoolers, teachers' beliefs, development of thinking.

Resumen

El propósito de esta investigación fue identificar los diferentes aspectos del pensamiento crítico en cinco aulas de preescolar en un colegio, y las estrategias de instrucción usadas por los profesores en el desarrollo de este tipo de pensamiento en niños en edad preescolar. Los participantes de este

[1] Received: Dec. 15, 2014 / Accepted: April 16, 2015

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estudio fueron cinco profesoras de preescolar con sus respectivos grupos. Este estudio exploró las creencias de los profesores respecto al rol del pensamiento crítico en sus aulas. Las técnicas para la recolección de información incluyeron observaciones de clases, análisis de documentos institucionales y entrevistas con profesores. Se identificaron los siguientes resultados generales: (a) es posible observar y describir numerosos ejemplos en los que los profesores prestan especial atención al pensamiento crítico y (b) es posible observar una variedad de interacciones y técnicas de clase que explícitamente desarrollan las habilidades de pensamiento crítico en los niños de preescolar.

Palabras clave: Pensamiento crítico, estrategias de instrucción, interacciones del aula, niños preescolares, creencias de profesores, desarrollo de pensamiento.

Resumo

O propósito desta pesquisa foi identificar os diferentes aspectos do pensamento crítico em cinco salas de aula de pré-primária em um colégio, e as estratégias de instrução usadas pelos professores no desenvolvimento deste tipo de pensamento em crianças em idade de pré-primária. Os participantes deste estudo foram cinco professoras de pré-primária com seus respectivos grupos. Este estudo explorou as crenças dos professores com relação ao papel do pensamento crítico em suas salas de aula. As técnicas para a coleta de informação incluíram observações de classes, análise de documentos institucionais e entrevistas com professores. Identificaram-se os seguintes resultados gerais: (a) é possível observar e descrever numerosos exemplos nos que os professores prestam especial atenção ao pensamento crítico e (b) é possível observar uma variedade de interações e técnicas de aula que explicitamente desenvolvem as habilidades de pensamento crítico nas crianças de pré-primária.

Palavras chave: Pensamento crítico, estratégias de instrução, interações da sala de aula, crianças de pré-primária, crenças de professores, desenvolvimento de pensamento.

Introduction

Preschool age is a very important age among humans. In this period, young children are keenly interested in learning everything with a very exciting attitude. It is considered by many people that this age is when young children blossom and gain knowledge as never again in their lives. All areas, including motor, communicative, cognitive, affective and social aspects are rapidly developed in order to enable children to interact with and understand the world around them.

In terms of cognitive development, one of the most important skills to develop in preschoolers is the thinking process. Every new situation becomes an opportunity for young children to assimilate and accommodate information in order to create new conceptual structures on their own (Piaget, 1952). Thus, studying the way critical thinking demonstrated in preschoolers becomes an important issue the academic world should consider.

There has been a fair amount of discussion about the importance of promoting critical thinking in students; however, there is little evidence and few studies that focus on the way young children demonstrate critical thinking. Most of the studies reviewed for this article are focused on adult acquisition of critical thinking skills. This research studied the practices of critical thinking development through incidents observed in five preschool classrooms of a school, the different thinking strategies employed by children, and the teachers' roles in the development of this kind of thinking. The process of collecting and anayzing data went guided by the following research questions:

1) What incidents of critical thinking are possible to observe in preschool classrooms?

2) What instructional strategies do teachers employ in order to develop preschoolers' critical thinking skills?

3) What are teachers' beliefs about the role of critical thinking in preschool classrooms?

Findings indicate that it is possible to observe and describe numerous instances in which critical thinking is paid attention to explicitly by teachers, and that it is also possible to see a range of classroom interactions and techniques that explicitly develop these skills among preschoolers.

Literature Review

Definitions of Critical Thinking

Critical thinking is known as a basic competence of the 21st century. This skill is acquired in a life-long process and is developed starting in infancy. This ability comes from an inner capacity of structuring cognitive structures that include high levels of complexity (Piaget, 1952). Further, the mental capacity for higher-level thinking continues to develop across the life span (Piaget, 1952).

Critical thinking has been defined in many ways; for some authors it refers to the ability to interpret, analyze and evaluate ideas and arguments (Facione, 2011). According to Glesser (As cited in Fisher, 2011), this kind of thinking refers to the attitudes to consider a problem in different, thoughtful ways within an experience. Some others define critical thinking as reasonable and reflective thinking, the act of thinking about thinking, thinking moved by reasons, and the development of metacognitive understandings, among others (Kuhn, 1999).

Different theorists have posited the importance of promoting critical thinking in the learning process and how students can learn in more thoughtful ways. Some of these theorists have related the development of critical thinking with the term *active experience*. Dewey and Kolb are the most representative authors that proposed the idea of giving value to experience opose learning. Dewey (1933) claimed that the quality of thinking is directly related to the experiences a person has. He defined experience as the act of living and having constant interactions between individuals and the environment (Dewey, 1933). He called the relationship between subjects and their worlds *transaction*. One of the main points in Dewey's theory is that experience leads to an inquiring process, which promotes critical thinking in the student and consequently, thoughtful actions. This transaction is also called the "learning by doing" approach (Dewey, 1933).

Glaster argues that critical thinking refers to the attitude of being inclined to think about the ways to face problems (as cited in Fisher, 2011). This thinking process implies knowledge of methods of logical inquiry and reasoning. Ennis defines critical thinking as the reasonable and reflective thinking focused on deciding what to believe or do (as cited in Fisher, 2011, pg.4). Considering the array of scholars who have been included above, for this study was considered that critical thinking is a process that implies reasoning and reflecting thoughtfully.

Scriven (as cited in Fisher, 2011) mentions an important element that can show the level of critical thinking developed. It has to do with

the language of reasoning. Some language expressions may alert the ways in which one is thinking. When someone uses words such as "since" and "because", there is an indication of reasoning. Evidence, opinions, proofs, supports and fallacy are some language expressions that show higher understanding and development of critical thinking (Fisher, 2011).

Bailin, Case, Coombs & Daniels (1999) explain it this way:

> Critical thinking is done with the purpose of making up one's mind about what to believe or do. It must be described in terms of adequately accomplishing certain intellectual tasks. This kind of thinking allows the fulfillment of standards of adequacy and accuracy in one's thinking. Thinking catalogued as critical thinking must be done with a purpose whether it is to answer questions, make a decision, solve a problem, resolve an issue, devize a plan or carry out a project. (p. 273)

Based on Dewey's studies, Kolb came up with a notion of learning that focuses on transformable experiences as a source of knowledge (as cited in Elkjaer, 2009). He talked about the experiential learning cycle in which experience is transformed. This cycle shows the transformation of experience into a real, significant and thoughtful learning experience. The innovation in Kolb's proposal is in the different learning styles that arise throughout the transformation of experience (Elkjaer, 2009).

Recent research on young children has focused its attention on how these learners may develop critical thinking and how different approaches in learning may lead to better outcomes.

The Role of Instructional Strategies, Questions, Play and Curiosity

Instructional strategies. Some studies conducted in different preschool contexts have shown the effectiveness of applying different instructional strategies in order to foster critical thinking in young children. In a project carried out by Collier, Guenther & Veerman (2002), it was shown that using the following strategies strongly affected in a positive way the development of higher level of thinking, in which students were able to question and construct what was learned. The strategies included journaling, problem-based learning, questioning techniques, computer programs, graphic organizers, story mapping, quiet game, pneumonic device, KWLH chart, among others. These instructional strategies also allowed the students to better understand the concepts taught in class and in addition helped them organize their thoughts and ideas in a visual way, promoting well-structured thinking.

The use of predictable routines was another instructional element analyzed (Collier et al., 2002). It was clear how the environment became a safe, calm and pleasant atmosphere that easily promoted learning because of the use of predictable routines. Scheau (2012) also mentions that instructional strategies in developing critical thinking can be more effective in students if the teacher creates a favorable environment in class for thinking, where students are allowed to formulate questions, share opinions, collaborate and communicate with each other.

Questions. A research project carried out in Turkey with a group of preschoolers analyzed how children's questions play an important role in the development of higher thinking (Şahhüseyinoğlu, 2010). The researcher noticed that children's questions were connected to their areas of interest or curiosity. They were able to make assumptions through questioning about the topic selected

Play and curiosity. According to Şahhüseyinoğlu's (2010) research, it was found that children experience curiosity and wondering about every new setting and environment they encounter. In this study, researchers observed that young children started asking their teacher questions about the items they saw as they entered the classroom. In the same study, the researchers also noticed that children could reach conclusions and share ideas by playing games and participating in role-plays.

Student Development

Personal development. Some recent studies have shown that children can develop personality characteristics according to the learning approach they experience in school. Scheau (2012) observed that teachers perceived critical thinking to be helpful in developing students' personalities. The group of teachers in this study believed that critical thinking develops a personal development plan, in which primary and elementary students set their own learning goals based on their interests.

Behavior and motivation. Since young children are always stimulated to learn and question their world, it is considered that they have a high level of motivation in their learning process. For Şahhüseyinoğlu (2010), stimulating curiosity is effective in supporting the academic motivation and continuity. When children feel they can control and study what they are interested in, they feel like independent learners that are able question what is shown and learned. This causes a high level of motivation in their process of education; when children feel in control of their learning they may be more likely to remain

engaged for longer periods of time which might lead to higher levels of thinking.

Accountability and timing. Some studies have shown that preschool students may make gains in acquiring accountability and pacing skills through learning by inquiring. Bell (2010) found that preschool children learn to be self-reliant when they plan and organize their ideas. Bell showed that the use of graphic organizers and thinking strategies such as brainstorming helped the students to better understand procedures to develop a specific investigation task and self-monitor their progress in learning.

Social skills. Studies about developing critical thinking skills in preschool contexts have revealed that students develop certain social skills since they build knowledge with others. In a study by Şahhüseyinoğlu (2010), the results demonstrated how sharing tasks and setting group goals benefit a collaborative learning environment and subsequently better interactional skills. Children were able to develop communication, collaboration and negotiation skills through the intervention.

Cognitive skills. Two different studies focused on the development of critical thinking through the use of different strategies and didactics. Collier et al. (2002) found that after the application of the research activities, students showed a higher development of critical thinking skills, including recall, describing, problem solving, prediction and estimation. Scheau (2012) concluded that critical thinking methods increase student's imagination, co-operation (teamwork), communication, active behavior and immediate application of theory.

Fostering Critical Thinking and Teacher Education

There was a negative aspect found in the studies reviewed, which had to do with poor quality and/or insufficient amounts of teacher training teachers aimed at fostering students' critical thinking. Studies conducted by Collier et al. (2002) and Rahman, Yasin, & Yassin, (2011) report that teachers do not have an interest in or have little knowledge of how to develop students' critical thinking, or why it is important. According to these authors, teachers lack training in teaching critical thinking skills as well as evaluating them. This is because there are few tools or accessible materials.

Even though most of the research studies reviewed above include findings about the gains and benefits young children may experience when having an instruction that fosters critical thinking, there is still

the need of more research and information on how to observe and foster crtical thinking among preschoolers.

Methodology

Research Design

This study followed the principles of qualitative and naturalistic research to describe and analyze the different aspects about critical thinking in preschoolers. The purpose was to provide a baseline that describes and analyzes the forms in which critical thinking is presented in the preschool classrooms. The study also focused on investigating the view of the teachers about the importance of critical thinking for preschoolers. Three data collection instruments were selected: classroom observation, documents analysis and interviews. The variables taken into account for these techinques were the following: a) the presence of critical thinking in students, b) the incidence of teacher's instruction in the development of critical thinking and the presence of pedagogical strategies that promote critical thinking skills, and c) teachers' beliefs as to the importance of developing critical thinking in preschoolers.

Context

The setting for this research was a private Catholic English immersion school serving an affluent community in Bogotá, Colombia. This research was held in the preschool department. The preschool program serves children from kindergarten to first grade. They receive instruction in both English and Spanish.

The preschool curriculum has been changed along the years, but recently there has been a special interest in fostering 21st century skills. Thus, an interdisciplinary preschool group of teachers from the school was formed to develop and lead those transformations in the current preschool curriculum. This interdisciplinary teaching team has worked on developing a new sense of early childhood education, reviewing and restating concepts such as child development, the concept of childhood, dimensions of development, and promotion of thinking. One of the members of this team was the leader of this research.

Participants

Children. The participants in the study were 98 children between six, seven and eigth years old at the preschool level. The students were

enrolled in five different classes at three levels (kindergarten, transition, a year in the Colombian system between kindergarten and first grade, and first grade). Their mother tongue is Spanish. In this group, there are also some children with curricular accommodations.

Teachers. The participants were selected at random and comprised a group of five bilingual preschool teachers (out of 90 teachers in the school). All of the teachers hold undergraduate degrees in education, psychology, music or administration. Approximately 25% of the participants hold advanced degrees. The age of the teachers ranges from 22 to 45 years old. The participants' teaching experience ranges between one and 15 years with an average of seven years. The participant teachers were told about purpose of the study and informed consent was obtained.

Data Collection Instruments

Observation was used in order to collect information regarding the presence of critical thinking in preschoolers, and the frequency in which this form of thinking happens in classroom interaction and the incidence of teachers in promoting critical thinking. It was non-participant, which means that the observer did not have any contact or talk with the observed group. The observation was recorded in field notes. Transcripts were then coded based on critical thinking indicators mentioned above. There were a total of five classes observed. Each class was observed once for a length of 55 minutes.

The second technique was document analysis. Documents regarding teachers, students and school role were analyzed in order to find evidence of the real situations and issues that help describing the form critical thinking is promoted and seen at preschool level. The documents reviewed included the following: one lesson plan for each teacher, school long range plans by subjects (English and Mathematics), four students' notebooks and folders for each class, school cognitive objectives, and the preschool area project. For the third technique, teachers participated in a semi-structured interview with the five participant teachers. The teachers' awareness about critical thinking and its implementation in their classes were analyzed. This interview questions focused on four key aspects that included behavior, feelings/ perception, experience and training. The interviews were carried out with each teacher separetely and the length was about 25 minutes. Some sample questions include:

- *What tells you that a child/student understands something you teach?*

- *Do you accept when a child refutes with arguments what you say or explain?*
- *How do you know they are learning what you teach?*
- *Do you think you students show their thinking in the classroom? How?*

Data Analysis and Interpretation

A first coding exercise was implemented in which different categories were created that were common across the three data sources. Each classroom observation was transcribed and analyzed for recurring themes. The categories that emerged were the following: language of thinking, teachers and student´s interactions, use of resources and environment, type and accuracyof tasks, and behavior as indicators of thinking. The school documents were also analyzed for recurring themes. These themes were grouped into the following categories: indicators of critical thinking, classroom interaction that promoted critical thinking, materials and environmental accomodations that promote thinking, and teacher strategies that promote critical thinking. Teachers' interviews were also analyzed using content analysis to identify recurring themes. These themes were divided into the same categories listed above.

Results

After collecting and analyzing data from the three sources, it was found that it is possible to observe and describe numerous instances in which teachers pay explicit attention to critical thinking. It was also possible to observe a range of classroom interactions and techniques that explicitly develop these skills in preschoolers. Finally, teachers reported a generally positive and enthusiastic attitude towards the development of critical thinking in their classrooms, willingly participated in training, and desire more training on the subject.

Classroom Interaction that Promotes Critical Thinking

One of the classroom interaction patterns found was the use of *thinking language* by children and teachers. Both teachers and students used a wide variety of expressions and vocabulary that have been shown to lead to the development of critical thinking. It was found that students' questions were highly concentrated in the "what" and "because" forms. For teachers, the thinking language seen in students is based on the level of questioning they show. For teachers, students' questions are determinant indicators of thinking and understanding.

There is a relationship between the degree of teacher questioning and evidence of students' thinking and understanding.

Class Methodology and Skills Development

Another pattern observed in the classroom observation notes, interview transcripts and document analysis has to do with the class methodology implemented for developing critical thinking in students. All five classes and planners analyzed showed a logical and sequential order that chronicled the goal of helping students develop thinking. The planners recorded methodologies that were used in the three main skill areas: fine motor (including coordination and visual perceptual skills), communicative and thinking. These planners belong to the five participant teachers and were created on their own.

During the interviews, teachers stated that there is no predominance of any one of these skills and that they try to develop each one with the same depth. However, when analyzing the data, it a predominance of certain skills was found, according to the age and level of the children, as seen in the following figures:

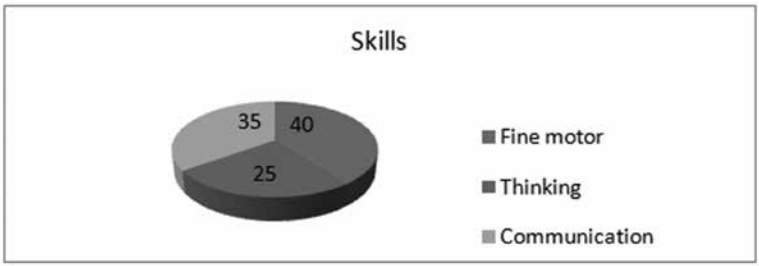

Figure 1. Skills focus in Kinder per teachers' planners

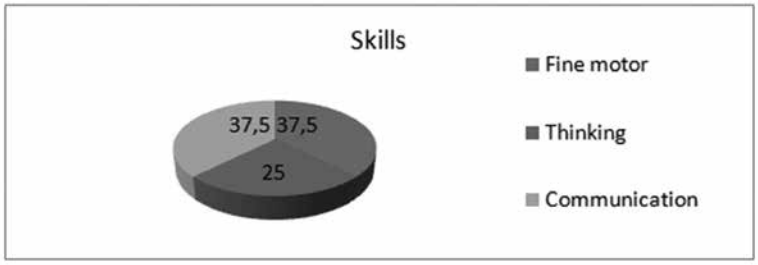

Figure 2. Skills focus in Transition per teachers' planners

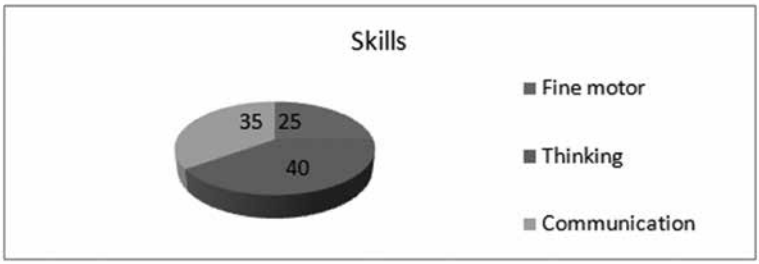

Figure 3. Skills focus in First grade per teachers' planners

The data illustrate a tendency to focus the class work on the three skills mainly promoted in preschool: fine motor, thinking and communication skills. For the kindergarten grade, more attention is focused on the development of fine motor skills. For the transition level, the attention is focused on the development of communicative skills. In the case of first grade, the attention is mainly focused in the development of thinking skills. These results were reached by counting the number of activities children had on each skill.

Thinking Processes throughout the Lessons

It was also found that there are several processes and thinking operations planned and applied for every class or activity implemented by the teacher. The following are the main processes planned and developed by the group of teachers along the observation period: exemplification, comparison, explanation, retelling, naming, identifying, projecting/introjecting, observing, comparing, memorization, attention, concentration, and perception. At least four to five of these processes are listed for each activity planned. Teachers stated that they take into account these processes based on what is set in the cognitive curriculum of the school. It was evident that some of these processes are strongly developed during certain moments.

Accurate Task Performance in the Development of Critical Thinking

Class tasks are one important part in the daily school lives of preschoolers. It was found that young children face many different types of activities that help them in the development of skills and habits. The way children perform when solving the assigned task is

an indicator that tells teachers about the understanding of the students. Teachers interviewed stated that the more accurate the task is done, the better understanding is reflected. This is what teachers think works and what they believe is needed to support critical thinking skils.

Another aspect found in this area has to be with the types of activities children carry out; depending on the purpose of the activity, critical thinking skills can be developed. Preschoolers were exposed to different types of tasks, the most common being the following: handwriting tasks, video analysis, problem solving routines, ordering of events, identification of cause and effect relationships, stating facts, mistakes finding, and class discussions.

Teachers' Training and Use of Resources

It was found that the all of the five participant teachers had taken a training course offered by the school called Conceptual Pedagogy. In general, teachers think that this course has helped them in understanding students' cognitive development. They argued that there are positive aspects of the training, but they also admit that it is not useful for all levels, ages or subjects. Teachers also mentioned that they had not received any further cognitive training and that they would like to receive more training in the field of critical thinking.

The use of concrete materials and other aids in order to help students' understanding of the topic was another aspect found. Teachers said that they try to use as much concrete and real material as possible. Some of the resources frequently use by teachers are auditory, visual, concrete, kinetic (manipulative), and graphic materials. They found these important for the age because they observe more motivation in children when they use this kind of material.

Resources and environmental arranges have strong presence in the activities planned by the teachers; however, it is not evident that these kind of resources are specially designed to help children developing critical thinking skills. It seems it is done more by chance than for real purpose in the development of thinking.

Conclusions

This study sought to identify the incidents of critical thinking in five preschool classrooms in one school. Documentation on the different instructional strategies preschool teachers employed in the development of critical thinking in preschoolers were identified, as well as teachers' beliefs in regards to the role of critical thinking in their classrooms.

There are classroom interactions that were predominant and may lead to the development of critical thinking. These included the language of thinking and the promotion of curiosity, questioning, discussion and reflection during class time. Teacher practice in the preschool classes is centered on the development of certain activities and skills that are pre-determined by the teacher. It was believed by teachers that should more predominance be placed on the development of activities in which skills are the core, specifically thinking skills, there will be more possibilities for students' to develop critical thinking.

Thinking processes are a component that need to be included into teachers' planners and class delivery. When teachers focus their lesson planning on the development of specific thinking process, they are more likely to extend the possibilities of developing critical thinking in their students. Transference and application of what is learned, the level of participation in class, inferences and problem solution were also believed to indicate degree of critical thinking. The presence of these indicators may also contribute to raising the level of the development of critical thinking. Class environment also plays an important role in the development of critical thinking skills in students. Teachers who have a more clear purpose of promoting thinking and reflection in the students apply more environmental modifications and use many more resources before and during the lesson.

In terms of limitations of this study, since the data analysis was based only on the interaction with teachers, reading of documents and observation of classes, there was a limitation in terms of the role of children in this process. It was not possible to talk to the participant children and inquire about their perception towards the issue of critical thinking. It was not also possible to evaluate the level of critical thinking acquired by these children in the moment the research was held.

This research showed a different perspectives of the development of critical thinking in preschoolers and opens the opportunity of researching different aspects, but especially in terms of diagnostic tools to determine the level of critical thinking development in preschoolers as well as teachers believes in supporting children`s critical thinking.

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