Bar-Ilan University

Scaffolding Pre-School Children With and Without Learning Disabilities and its' Impact on Understanding Scientific Phenomena and Developing Inquiry Skills

Rinat Ezer

Submitted in partial fulfillment of the requirements for the Master's Degree in the School of Education, Bar-Ilan University.

Ramat Gan, Israel 2015

Abstract

Children are born with natural curiosity that drives them to enthusiastically engage with all sorts of scientific activities. One of the goals of early childhood education is to encourage and even develop this natural curiosity.

The dominant quality that sets the ground for the child to engage in scientific contents is its inner motivation that drives him/her to engage in a certain activity for acquiring additional information, understating their surrounding and achieving the satisfaction from being active and inquiring.

Dealing with inquiry and discovery processes require high thinking capabilities from the child, even if it seems to be a spontaneous game-based process. Science teaching at kindergartens emphasizes the need of the child to know and understand natural phenomenon surrounding them and related to their world, when the activity should be held under conditions that nurture and foster scientific thinking capabilities. 'Scaffolding' is a metaphorical term used to explain the nature of the didactic interaction. When a grownup and a child work together on a common assignment, the contribution of the adult and the contribution of the child differ based on the child's capabilities. When the child exhibits certain capability that enables them to get involved in a certain activity, the adult 'builds' around them 'scaffoldings'. With significant assistance, the child's capability can be expressed. Such scaffoldings provide the necessary accessories for completing the task and without them it will not be completed.

The goal of this research was to identify the characteristics of the effect of the scaffoldings providing process over the performance of inquiry components, such as: asking questions, making presumptions, and inquiry exploration in young children with learning disability at a special education kindergarten – language and behavior delayed at preschool school children; in comparison to children without learning disabilities. Providing such scaffolding will be conducted during a four-stage scientific experiment. This experiment is a situation of an inquisitive nature arising curiosity, discovery, asking questions, observing and concluding with the children. For this experiment we phrased the following research questions:

1. How providing scaffolding effects the explanation of scientific phenomenon and the development on inquiry capabilities in special education preschool children with learning disabilities in comparison to children of mainstream education without learning disabilities?
2. What is the contribution of providing personal scaffolding in comparison to providing reciprocal/social scaffolding for explaining scientific phenomenon and the development of inquiry capabilities in special education preschool children with learning disabilities in comparison to children of mainstream education without learning disabilities?

For this research I have performed an observation and an individual interview.

Observation – this research tool enables to collect data on the natural behavior of the learner in authentic, didactic and social situations. The observation becomes a scientific tool when it serves a systematically phrased and planned inquisitive purpose and when it is documented in an organized and structured manner. Under this

research we held a joint observation, because the observer is also the researcher, taking part in the ongoing activity, initiating the interaction while documenting the process.

Individual Interview – the interview was a half-structured interview. At such interview, the core questions are pre-phrased, but the sequence of their presenting is not predetermined and there is room at the end of the interview to add questions based on the context, when sometimes the answers provided by the interviewee lead to spontaneous questions. The goal of the interview held as part of this research was to examine the understanding of the child of what happened during the experiment.

At this research, providing reciprocal/social scaffolding via the documentation of social activity over scientific phenomenon was examined, similar to the happening at the individual interview, when this time the children were divided into small groups of 3.

The research encompassed 30 preschool children from governmental classes, aged between 5-6 years old, fifteen from special education classes and fifteen from mainstream education preschool classes.

The Experiment Process

Part 1

Stage A: preliminary stage. Examined the child's curiosity and ability to individually and spontaneously inquire and discover; an observation that did not include the providing of scaffolding.

Stage B: the longer stage, in which an examination quite similar to the first stage took place, but this time the researcher provided the child with scaffolding and held a conversation with them, aiming to prolong the interactions chain with the child.

Stage C: this stage examined the children ability to internalize, i.e. in view of the scaffolding provided at the previous stage, can the children hold the experiment alone, make assumptions and think what can be done, ask questions and imply inquiry components.

Part 2

At the second part, 3 children were taken for group activity at a time. Different materials were laid on the table and the researcher observed the occurrence. The observer focused on specific topics: are the children helping each other, influencing each other? Convincing or directing each other?

The data processing during the interview and the observation was performed as a qualitative research of categories identification and content analyzation.

From the research results presented here it is evident that the scaffolding components such as:…… were found in higher frequency when provided to the special education children in comparison with the mainstream education children, except for the scaffolding that was related to the reminding category. Hence we can conclude that special education children need more scaffolding for the different categories.

The chapter detailing the responses of the children participating in the research shows higher ability to provide a scientific explanation among children without learning

disabilities, which expresses in evident capability to perform more advanced research activities, alongside a higher self-control capability.

The comparison between the group experiments in which providing of group scaffolding was examined, exhibits higher frequency of the scientific explanation and inquiry components explanations in mainstream education vs. special education. It seems that special education children don't optimally use the joint experience and don't take advantage of the opportunity to learn from each other during the experiment.

We can conclude that no significant difference was found between the responses of both groups -- special education children and mainstream education children -- for providing individual or social scaffolding.

Children with learning disabilities are more dependent on scaffolding provided by the experienced guide as a main source, assisting them in enhancing their ability to focus and persevere while performing the experiments. As above mentioned, both groups derived great benefit from the individual scaffolding provided, but the special education children required more scaffoldings.

In light of the results of this research, it is recommended to engage special education children with scientific education. We learn that this population can learn and benefit from scientific exploration and moreover – play an active part. The research also shows that special education children have the ability to inquire, make conclusions, ask questions, etc. in spite of the fact that fostering scientific thinking was neglected in special education preschool frameworks for many years. The implementation of this research will contribute to the implementation of the special education vision,

aspiring providing equal opportunity in the society, while adjusting to the needs of all children, not only the needs of the special education children, as it is today.

The research findings show that dealing with scientific content and inquiry skills and discovery need to exist while providing qualitative and ongoing scaffolding, personally and socially, for both research groups – special education and mainstream education children. Nevertheless, a sequel research for a prolonged period is required, examining the way to make the scaffolding more efficient, especially for children with learning disabilities.