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Dissertation title: *The impact of educational interactions using TOC tools (Theory of Constraints) on the development of selected competences of six-year-old children*

Doctoral dissertation prepared under the supervision of **profesor Ryszardy Cierzniewskiej**
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Abstract

Key words: competences of a six-year-old child, critical thinking, *Theory of Constraints*, TOC tools

Introduction

The contemporary world is subject to permanent and multidirectional transformation, which results in, among other things, changes in the living conditions and development of children. The existing discourse in this area presents a need for a new perspective on the process of facilitating educational conditions optimal for the development and learning of the child.

In this context, the deficit in pre-existing literature in the field regarding critical thinking, a key competency in the 21st century, points to the need to consider this category cognitively and scientifically valuable. It also emphasises the need to create an educational process conducive to the development of this skill, as well as supportive of the related communicative and socio-emotional competencies in children, all from an early age.

However, despite the postulates of many educators and psychologists, the issue of critical thinking research has not been sufficiently explored and rarely appears in Polish literature and research, especially in relation to pre-school children. Therefore, the scientific study described in the dissertation fills the existing gap in this area. It concerns educational interactions with six-year-old children using TOC tools (based on E. M. Goldratt's *Theory of Constraints*) in the context of constructivist theories on child development and learning (J. Piaget, L. S. Vygotsky and J. S. Bruner), which are innovative in this thematic area.

Subject, aim and research problem

The subject of research within the framework of this dissertation is the critical thinking competencies of six-year-old children as well as the communicative and social-emotional competences and the ways in which they change under the influence of an experimental factor, i.e. educational activities influenced by the use of TOC tools.

The main objective of the research undertaken is to define the relationship between educational interventions using TOC tools and critical thinking, communicative, socio-emotional competencies. The relationship relates to the impact of educational interactions using TOC tools on the levels of the studied competencies in six-year-old children, including determining whether an increase in the level of both communicative and socio-emotional competencies occurs as the level of critical thinking competence increases. The knowledge gained through scientific cognition can be useful both for both pedagogical theory and practice.

The main research question is: is there a relationship between the competencies of six-year-old children attending kindergarten and educational interactions using TOC tools?

Methods, techniques, research tools and study group

In order to verify the research questions indicated above, the project used the pedagogical experiment method.

In support of educational practice and the exploration discussed, a series of activities for six-year-old children who do not yet have literacy skills were conducted. During the activities, the children used TOC tools (*the logical branch, the cloud and the ambitious goal tree*) in a version adapted to their needs and abilities. A standardised psychological tool, the *Intelligence and Development Scale for Children aged 5-10 (IDS)*, and a pedagogical one, *School Readiness Scale (SRS)*, were used to assess the effectiveness of the relevant educational interventions. In addition, the diagnostic survey used original tools developed by the author for the study, those being the *Parent Survey Questionnaire, Teacher Survey Questionnaire, and Teacher Interview Questionnaire*.

This made it possible to gather the opinions of competent observers, who were parents and teachers, of the effectiveness of educational interventions with the use of an experimental factor on the development of the studied competences in six-year-old children. *Observations of children were also carried out using Child Observation Sheets in Task Situations developed by the author with the application of TOC tools (the logical branch, the cloud and the ambitious goal tree)*, which allowed the observation of the skills included in the relevant competencies in children while they participated in the organised activities.

This procedure was necessary due to the lack of standardised tools available to examine critical thinking competencies in preschool children.

Fifty six-year-old children from two pre-school institutions took part in the experiment. The control group (CG) consisted of 24 children (12 girls and 12 boys), while the training group (TG) consisted of 26 (11 girls and 15 boys).

Conclusions

As the results of the study show, following the influence of the educational interventions applied in the experiment with the use of TOC tools, there was an increase in the level of all the competencies studied (critical thinking, communicative competence, and social-emotional competence in six-year-old children). This was confirmed by a quantitative and qualitative analysis of the results obtained. It was found that there is a correlation between the development of the competences studied and the introduction of educational interventions using the TOC tools of *the logical branch*, *the cloud* and *the ambitious goal tree*.

The author's findings confirm that critical thinking competencies can already begin to be developed in six-year-old children. However, it is important to use an appropriately designed teaching process adapted to the needs and capabilities of children of this age.

The application of TOC tools (based on E. M. Goldratt's *Theory of Constraints*) and the assumptions in constructivist theories regarding child development and learning (J. Piaget, L. S. Vygotsky and J. S. Bruner) made it possible to facilitate the development of the studied competencies in children throughout the educational process.

The increase in children's competencies identified in the study and the recognition of some individual differences in this respect, which may be related to the individual pace of children's development and its socio-cultural context, indicates the need to individualise educational measures taken with children.

Furthermore, as the results of the dissertation show, both the gender of the children and the educational background of their parents can differentiate the level of studied competencies, which highlights, among other things, the importance of the socio-cultural context in children's development and learning.

The analysis of the literature and available research confirms that the classification of critical thinking competence as a key competence in the author's study is justified. Didactic stimulation of this activity creates conditions for the development of other competencies in children as well, which plays an important role in preparing children for their further education and coping with everyday life in the modern world.

The results obtained by the author correspond with the results of other researchers.