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Personal and Regulatory Resources in Achieving Educational and Professional Goals in the Digital Age

**CHILDREN WITH MENTAL DEVELOPMENTAL DELAY:
SELF-REGULATION DEVELOPMENT THROUGH EDUCATION**

Nataliya Viktorovna Babkina (a)*

*Corresponding author

(a) Institute of Special Education of Russian Academy of Education, Pogodinskaja str. 8/1, 119121 Moscow, Russia,
natali.babkina@mail.ru

Abstract

This article focuses on the current issue of psychological and educational support of children with mental developmental delay (DD) in today's educational environment. The study shows that the disorder-related character typical for children with mental DD plays a primary role in the underdevelopment of conscious self-regulation. The study validated the differentiated approach to revealing specific educational needs of children with mental DD in compliance with their type of mental development and their level of self-regulatory development by first grade. The design of longitudinal study on conscious self-regulation development in cognitive activity in children with mental DD through education is described here. Children aged 7-8 years were involved in the study (n = 87), including children with mental DD (n = 57) and children with typical development (n = 30). The article describes the area of specific work and intervention aimed at self-regulatory development in school children with mental DD and aimed at special educational conditions that facilitate capacities of children in terms of conscious self-regulation. The study provides the experiment results of self-regulation development in primary school pupils with mental DD that estimate the efficiency of the suggested approach. Resuming the study results, this type of intervention should be included in psychological and educational intervention programme for children with mental DD.

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1. Introduction

Owing to today's modernization trends in education for children with special needs, with robust development of inclusive education, researchers tend to study specific manifestation of dysontogenesis in terms of cognitive and learning activity in school children in order to flesh out and differentiate their special educational needs for habilitation / rehabilitation through learning. The most numerous group of children with special needs, who are educated basically in an inclusive community, consists of children with mental developmental delay (DD).

2. Problem Statement

The group of children with DD is characteristic of extreme heterogeneity conditioned by a significant variety of etiological factors causing this type of mental dysontogenesis (Lubovsky et al., 2016). Organic and/or functional disorders of the central nervous system, constitutional factors, chronic somatic diseases, disadvantaged early care and childhood living conditions, psychic and social deprivation may occur among the causes of DD. All the above make for a significant delay expression range – from conditions close to the age norms to the conditions requiring contradistinction from intellectual disability. For that reason, capacities of a child with DD and special conditions that would compensate for his/her developmental disorder will differ from case to case, which makes it crucial that psychological and learning support be based on differentiated approach.

Previous studies proved underdevelopment of conscious self-regulation of actions to play a primary role in the disorder-related character typical of children with mental DD (Babkina & Korobeynikov, 2019). The studies analysed and systematised specific manifestations of conscious self-regulation in primary school pupils with mental DD in terms of cognitive activity. The research defined and described levels of conscious self-regulation development (Babkina, 2019) and set an objective to reveal capacities of a child and conditions that can facilitate overcoming or minimising the disorder.

3. Research Questions

Learning conditions, psychological and teachers' support in schools play a significant role in development of personal resources and self-regulation skills in a child with mental DD. Therefore, the major research questions were:

- Can conscious self-regulation skills in primary school children with mental DD be improved?
- What conditions and environment should be provided in schools for self-regulation development in children with mental DD?

4. Purpose of the Study

The article exhibits the results of the longitudinal study on conscious self-regulation development in cognitive activity in primary school pupils with mental DD studying in an inclusive community.

5. Research Methods

Eighty-seven children aged 7–8 years were involved in the study, with 57 schoolchildren with mental DD (30 children – in experimental group (EG), 27 children – in control group (CG)) – and 30 schoolchildren with typical development – in typical development group (TDG).

The research was executed within a school year (September – May). The sample included pupils from 8 general Moscow schools (Russia). All of the children were first-graders, children with DD studied in these schools on inclusive terms. The study was approved by the Ethical Committee in Institute of Special Education of Russian Academy of Education.

The research includes the observational, skill-developing and control phases.

Self-regulation skills in children with mental DD (EG and CG) were researched as opposed to children with typical development (TDG) in observational and control phase of the study. Different self-regulation skills were researched, for instance, activity goal acceptance, activity program setting and adherence, developing a way of acting and following it, intermediate and final results control. Performance and self-regulation efficacy were the focus of the results review and were evaluated according to: reduced or improved performance, readiness for skill automaticity, self-regulation skills transfer to new circumstances. The review considered the influence of different types of help on how effective children could regulate their activity.

Usual methods of school readiness test were applied to carry out the research: the «Dotting test», the «Toulouse–Pieron Attention test» and the «Visual Pattern Test» (Babkina & Korobeynikov, 2019). In order to activate the full potential of self-regulation capacities in pupils and to make the task-performing conditions as close to real school life as possible, all the tests were executed individually, not in groups. There were separate groups that consisted either of children with DD or children with typical development. The number of children who were simultaneously performing tasks was 5 ± 1 , which allowed the experimenter to accurately monitor each child and record all his/her actions in a protocol.

In addition, the children were subjects of psychological observation when in classes. That, together with parent and teacher questionnaire, was aimed to record whether the children were able to activate and use learned self-regulation skills in and out of classes.

A comprehensive intervention program for conscious self-regulation development was designed to conduct the skill-developing experiment phase. The program was based on differentiated approach to revealing psychological and pedagogical conditions for development of self-regulation skills in cognitive and learning activity in children with mental DD. The program design was backed up by the theoretical Russian and global data on self-regulation development within ontogenesis, its function and structure and its relationship to cognitive and learning activity (Baumeister et al., 2019; Gagne & Nwadinobi, 2018; Gawrilow et al., 2011; Konopkin, 1980; Morosanova, 2012; Morosanova et al., 2015; 2018; Schwarz & Gawrilow, 2019; Sheeran & Webb, 2016; Wirth et al., 2015; Vygotsky, 1991). The program was designed also recognising the most characteristic features of conscious self-regulation in cognitive and learning activity in children with mental DD and their self-regulatory capacities – revealed through the experiment (Babkina, 2016; 2019; Babkina & Korobeynikov, 2019).

6. Findings

In control phase of the experiment the following was explored:

- children's conscious regulation of their actions, influence of different conditions on their performance and efficacy of self-regulation (dotting test);
- children's mental programming and control of their actions, adherence to instructions, feature-specific attention allocation, and different types of adult support and their impact on the performance (Toulouse–Pieron attention test);
- an ability to task-perform following a template, to set and to adhere to an activity program, to determine and keep the way of performing the actions, to assess the process and the results of the activity, to correct their own mistakes (visual pattern test).

Based on the experimental resulting data (Babkina & Korobeynikov, 2019), we designed an intervention comprehensive programme that can help to effectively activate and implement potential skills and capacities of schoolers with DD when it comes to development of their self-regulatory sphere.

The programme includes:

- methodological recommendations on organising group and individual classes with a psychologist according to the level of a child's self-regulation development in cognitive activity;
- recommendations for teachers on tailoring an individual and differentiated approach to schoolers;
- recommendations for parents.

The psychologist worked with children with DD on developing their self-regulation skills in cognitive activity. It was performed towards different directions, all related to building the exact set of skills:

- to set and to adhere to an activity goal;
- to determine and keep the way of performing the actions;
- to implement self-regulation during all the stages of actions' performing;
- to make verbal reports on the process and the results of an activity;
- to assess the process and the results of the activity.

The focus (of intervention) was kept on awakening of activity consciousness, of what led to good or bad results and building self-belief.

The sessions with a psychologist within the programme included a preparatory part and the next three core steps. The steps had different work focus, degree of child's self-independence during task performing and different types of support for the children.

There was a certain pattern of adult-child interaction aimed at child's learning and performing actions within the programme.

1. Performing actions together step-by-step, following a template and adult's cueing. At this point, mental actions-planning and actions-controlling (checking up) were provided by a psychologist.
2. Performing actions together step-by-step, following a template. Here, actions-planning and actions-controlling (checking up) were shared among a child and psychologist. Children followed up on the programme and checked up on the results due to psychologist support.

3. Performing actions together, following a template, shifting from step-by-step way of following up on the programme to a more integrated one. At this stage, the relevance of psychologist's support in actions-planning reduced.
4. Performing actions independently following up on learned and interiorized programme with checking up with the template whenever difficulties occur. A child executed his/her actions and checked up on them independently. The psychologist monitored whether the child checked up with the template or not when difficulties occurred and reminded him/her to do so when needed.
5. Performing actions independently and following up on learned and interiorized programme with transferring it to new tasks. The transferring was controlled by an adult.

The psychologist chose the correct level of tasks and working pace to start from (according to how many repetitions children needed to do correctly same-type tasks or how long it took for a schooler to move on to a more difficult task).

The primary way how to develop conscious self-regulation of cognitive activity should be help in organising external (practical) guideline-based actions for children to do first and then gradually transferring them into their own mental plan of actions – plan of self-regulation. The intervention classes programme allowed to evolve prerequisites for child's action plan and controlling. It also allowed to be flexible and make change in order to increase child's self-discipline and working capacity keeping in mind that each of them is unique. The methodical approach is backed up by Vygotskiy's statement on the zone of proximal development and the key role of an adult in a child's psychological development.

Within an individual intervention program, each child of the experimental group took 50 classes during a school year.

At the end of the school year, the control experiment was executed in order to evaluate the efficacy of provided psychological and educational conditions. All the first-graders with typical development (TDG, 30 children), all the children with mental DD from experimental group (EG, 30 children) and from control group (EG, 27 children) were subjects in the control experiment. The dotting test, Toulouse–Pieron attention test and visual pattern test are the practical methods used in the study in both, control and observational experiments. The results of task-performing are compared in the table 1.

Table 1. Task-performing by children with mental DD and by their peers with typical development: The results to compare.

Children	Level	The dotting test		Toulouse–Pieron attention test		Visual pattern test	
		Control experiment	Observational experiment	Control Experiment	Observational experiment	Control Experiment	Observational experiment
Children with typical development	1 lev.	32 %	68 %	35 %	62 %	30 %	55 %
	2 lev.	51 %	32 %	54 %	38 %	51 %	45 %
	3 lev.	17 %	0 %	11 %	0 %	19 %	0 %
	4 lev.	0 %	0 %	0 %	0 %	0 %	0 %
Children with mental DD (experimental group)	1 lev.	0 %	39 %	0 %	33 %	0 %	30 %
	2 lev.	8 %	51 %	32 %	54 %	10 %	40 %
	3 lev.	63 %	10 %	43 %	12 %	65 %	30 %
	4 lev.	29 %	0 %	25 %	1 %	25 %	0 %
Children with mental DD (control group)	1 lev.	0 %	8 %	0 %	10 %	0 %	15 %
	2 lev.	9 %	20 %	29 %	51 %	12 %	35 %
	3 lev.	68 %	65 %	49 %	31 %	64 %	43 %
	4 lev.	23 %	7 %	22 %	8 %	24 %	2 %

According to the results of the control experiment, the children from experimental group proved ($p < 0.05$; the p -value is given by student's t -test distribution) to have upgraded all the studied features of task-performing. Owing to that, they significantly caught up with their peers with typical development.

First-graders with mental DD spend a while in group classes before they could put their efforts together to choose ways to perform and to sequentially follow them, to check intermediate and final results and correct mistakes. Significant improvement in results was reached by adding some changes to the diagnostic screening protocol and providing external help in activity management (going through instructions again and simplifying them, emotional support and switching from group to individual learning etc.).

Conscious self-regulation of cognitive activity in the first-graders with DD explored through the study explains the issues brought up by teachers: school skills learning difficulties, discipline problems, peers issues, which all leads to overall poor school adaptation. The executed research revealed the level of actual and proximal development of conscious self-regulation in children with DD.

The study proves that children with DD have special educational needs to meet in terms of conscious self-regulation development. The comprehensive intervention program was designed to that aim. Moreover, aside from special psychological classes, the program included special educational environment created to let children activate and use the learned self-regulation skills in order to deal with learning and routine tasks: to organise their activities by themselves, to realise difficulties on their way, to ask for adult's support and to make use of it, to implement learned skills and knowledge in everyday life.

7. Conclusion

The provided conditions effectively facilitated the activation of capacities for self-regulation development in schoolchildren with mental DD. The teachers noted the new need in these children to appear – now they wanted to success at task-performing and to improve their skills, with each time. The children were not afraid of mistakes anymore, they became much more active in social activities, anxiety and unreasonable fears reduced. Relationships with their peers improved.

According to the results, not only can self-regulation skills be developed but it is also a must for a teamwork by a psychologist, a teacher and parents within an intervention program. Moreover, it can and should be set as an objective in a goal-focused activity for a child with mental DD too.

Support in building leaning environment – according to developmental level of a child with DD and to his/her individual case along with special intervention measures towards conscious self-regulation skills development and activating child's own efforts in that direction, all the above should be provided as psychological and learning conditions that would help to develop conscious self-regulation in children with mental DD.

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