

INNOVATIVE APPROACHES TO THE DEVELOPMENT OF LOGICAL THINKING OF STUDENTS IN GRADES 5-9 OF SPECIALIZED SCHOOLS

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<https://doi.org/10.5281/zenodo.8185564>

Abstract. *This article explores innovative approaches to developing logical thinking skills in students in grades 5-9 of specialized schools. Innovative approaches to developing logical thinking skills are necessary to help students excel in these subjects. Besides, in this article highlights several innovative approaches and provides examples of how each approach can be effectively incorporated into the curriculum of specialized schools.*

Keywords: *innovative approaches, logical thinking, specialized schools, technology-based tools, project-based learning, collaborative learning, problem-solving, decision-making, STEM.*

Logical thinking is an essential skill that is necessary for success in academic and professional life. It allows individuals to analyze complex information, identify patterns, make decisions, and solve problems effectively. Developing logical thinking skills is particularly crucial for students in grades 5-9 of specialized schools, where students are expected to excel in science, technology, engineering, and mathematics (STEM) subjects. To achieve this, innovative approaches to the development of logical thinking are necessary.

One innovative approach to developing logical thinking skills is through the use of technology. There are many technology-based tools and programs that can help students enhance their logical thinking skills. For example, online games and puzzles can help students practice critical thinking, problem-solving, and analytical skills in a fun and engaging way. Similarly, educational software and applications can provide interactive learning experiences that promote logical thinking and reasoning.

Another approach to developing logical thinking skills is through project-based learning. This approach involves students working on real-world projects that require critical thinking, problem-solving, and decision-making skills. Projects can be designed to incorporate various STEM subjects, such as robotics, engineering, and computer programming. By engaging in hands-on activities and collaborating with peers, students can develop their logical thinking skills and apply them in practical situations.

The use of inquiry-based learning is another innovative approach to developing logical thinking skills. This approach involves students asking questions, conducting research, and analyzing data to construct knowledge and solve problems. Inquiry-based learning encourages students to think critically, make connections between concepts, and communicate their ideas effectively. It is an effective way to develop logical thinking skills because it involves students actively engaging in the learning process and taking ownership of their learning.

Collaborative learning is also an effective approach to developing logical thinking skills. This approach involves students working in groups to solve problems, share ideas, and support each other's learning. Collaborative learning promotes critical thinking, communication, and teamwork skills, which are essential for developing logical thinking abilities.

In addition to these there is Project-based learning (PBL). It is an effective approach to developing critical thinking, problem-solving, and decision-making skills in students. It involves students working on real-world projects that require them to apply their knowledge and skills in practical situations. Here are some ways specialized schools can effectively incorporate PBL into their curriculum:

1. *Define Learning Outcomes:* Specialized schools should define clear learning outcomes for each project. These outcomes should align with the curriculum, and they should be specific, measurable, and achievable. By defining clear learning outcomes, teachers can ensure that students are learning the necessary skills and knowledge.

2. *Select Appropriate Projects:* Specialized schools should select projects that align with the curriculum and the learning outcomes. Projects should be relevant and engaging for students. They should provide opportunities for students to apply their knowledge and skills in practical situations. Teachers can consult with subject matter experts, industry professionals, and community organizations to identify appropriate projects.

3. *Provide Guidance and Support:* Specialized schools should provide guidance and support to students throughout the project. Teachers should provide clear instructions, resources, and feedback to help students complete the project successfully. Teachers can also provide coaching and mentoring to help students develop their skills and knowledge.

4. *Encourage Collaboration:* Specialized schools should encourage collaboration among students. PBL is an effective approach to developing teamwork and communication skills. Teachers can assign group projects to help students learn how to work collaboratively. They can also provide opportunities for students to provide feedback to each other.

5. *Evaluate Learning:* Specialized schools should evaluate student learning at the end of each project. Teachers should use rubrics or other evaluation tools to assess student performance. They should provide feedback to students on their strengths and areas for improvement. Evaluation is essential for ensuring that students are meeting the learning outcomes.

6. *Integrate Technology:* Specialized schools can integrate technology into PBL to make it more engaging and relevant for students. Students can use technology to research, design, and present their projects. They can also use technology to collaborate with each other and communicate their ideas.

It means that project-based learning is an effective approach to developing critical thinking, problem-solving, and decision-making skills in students. By incorporating PBL into their curriculum, specialized schools can help students develop the skills and knowledge they need to succeed in academic and professional life.

In conclusion, innovative approaches to the development of logical thinking skills are essential for students in grades 5-9 of specialized schools. The use of technology, project-based learning, inquiry-based learning, and collaborative learning are effective methods for developing logical thinking skills. By incorporating these approaches into the curriculum, specialized schools can help students excel in STEM subjects, develop critical thinking abilities, and prepare for success in academic and professional life.

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