University "St. Kliment Ohridski" – Bitola
Faculty of Education – Bitola
ISSN: 1857- 8888
DOI: 10.20544/teacher.29.16

APPLICATION OF INTEGRATIVE TEACHING IN ADDRESSING NATURAL AND SOCIAL SCIENCE CONTENT IN LOWER GRADES OF PRIMARY SCHOOL

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Abstract

Modern education has introduced numerous teaching concepts that share a common denominator—changing the perspective on the child, thereby altering the ways in which new experiences are acquired. Critical thinking, independent identification of cause-and-effect relationships, and drawing conclusions, as well as improved knowledge transfer, thus become imperatives of all innovative models. Contemporary natural and social science education adheres to all the changes affecting modern teaching in general but also carries specific features, primarily its integrative nature. For this reason, integrative teaching appears to be one of the most suitable innovative learning models for this subject area. Therefore, the primary aim of this paper is to examine different aspects of integrative learning in natural and social science education and highlight its numerous advantages.

Keywords: Integrative teaching, natural and social sciences, primary school, modern education.

Introduction

Nearly three decades have passed since attempts were made to replace traditional teaching—where the teacher was the primary source of knowledge and students were passive recipients—with an approach that fundamentally changes the student's position. This change primarily pertains to the intellectual engagement of students, i.e., the activation of cognitive processes that facilitate active and independent knowledge acquisition. Numerous innovative concepts have emerged, all of which shift the perspective on the child and alter the ways in which new experiences are obtained. Contemporary teaching has become an umbrella term encompassing numerous innovations aimed at fostering critical thinking, independent identification of cause-and-effect relationships, and drawing conclusions, as well as better knowledge transfer. This new approach to teaching has also redefined the roles of teachers. Their function has shifted away from the traditional lecturer-examiner model. Teachers are now creators of various environments and situations that encourage independent knowledge acquisition by students. "In this dynamic teacher-student relationship, depending on the goal, all types of classroom interactions alternate: periods in which the teacher speaks and their activity is dominant, periods in which students speak and their activity prevails, periods of lively group discussions, or periods of quiet individual work under the teacher's supervision. From an external perspective, there might be little visible difference compared to a traditional lesson. However, the distinction is crucial—not only in the range and repertoire of activities and their alignment with the objectives and content of the subject but also in the fundamental assumption regarding how knowledge is acquired." (Pešikan, 2010, 174)

Contemporary Approaches to Teaching Natural and Social Sciences

Contemporary natural and social sciences education follows the same innovative trends observed in modern pedagogy. The involvement of students in the process of "creating"

knowledge is equally applicable to subjects such as Nature and Society or The World Around Us. However, it is essential to recognize the specificities that distinguish natural and social sciences from other subjects. The most notable characteristic is its integrative nature—the unification of content from history, biology, geography, physics, chemistry, and other disciplines into a single educational framework suitable for the developmental stage of primary school students.

This integrated approach naturally leads to the implementation of integrative teaching as a valuable innovative model for mastering natural and social sciences content. Consequently, curriculum topics are organized into teaching units, with thematic planning being the most common strategy, serving as a fundamental prerequisite for integrative learning.

A teacher's ability to recognize and consolidate various interdisciplinary content early in the school year is crucial for the successful application of integrative teaching. This method demands greater effort and preparation from educators, as they must systematically identify and connect content that can be logically integrated across different subjects. In essence, integrative teaching is not an educational novelty—it is a return to foundational logic, respecting child development principles. It requires students to actively engage in cognitive processes and apply knowledge practically across diverse fields.

A holistic approach is emphasized because the world surrounding children is a complex, interconnected system, requiring critical thinking and the identification of cause-and-effect relationships to fully comprehend natural and social phenomena.

"The term "integration" means the unification of certain parts into one whole and the interconnection of autonomous elements. Teaching, based on this approach, can be very stimulating for students. Content that is interconnected contributes to knowledge that is complete, valuable and usable. An integrative approach implies an active student as well as a teacher. It is not just about conveying facts, but much more about solving problems, asking questions and actively seeking answers from your environment." (Milanković Jovanov, J. et al, 2022: 174).

STEM Education and Integrative Learning

In broader pedagogical discourse, STEM education is frequently highlighted as a crucial strategy in modern teaching methodologies. However, its foundation relies on integrative learning principles, focusing on specific domains—science, technology, engineering, and mathematics. Many of these subjects align directly with natural and social sciences, particularly in lower primary education, where students develop fundamental scientific reasoning. „Real-world teaching and learning assume that everyday situations familiar to students can be explored and appropriate responses can be provided through STEM concepts." (Petrovski, 2023: 62) Many global and regional studies support the effectiveness of integrative teaching, demonstrating its numerous advantages in knowledge retention, critical thinking development, and interdisciplinary problem-solving. The following section highlights key findings from educational research supporting these claims.

Research on Integrative Teaching

Numerous studies, both global and regional, emphasize the benefits of integrative teaching for improving knowledge acquisition, fostering interdisciplinary connections, and enhancing student engagement. Below are summaries of several key research findings.

Cekić-Jovanović & Milanović (2020): This study examined the impact of integrating Physical Education with Natural and Social Sciences on primary students' knowledge retention. Conducted using an experimental method, the research involved 128 fourth-grade students, divided into an experimental group and a control group. Results demonstrated a statistically significant difference in knowledge retention and application between the two groups, particularly at the second and third levels of Bloom's taxonomy (knowledge reproduction and practical application). The experimental group, taught using an integrative approach, exhibited higher knowledge quality, better problem-solving abilities, and stronger critical thinking skills compared to the control group. "Students in the experimental group, who learned natural science content through the integrative approach combining Physical Education and Natural and Social Sciences, demonstrated better knowledge retention and problem-solving skills. They were more successful in recalling facts, engaging in critical thinking, applying knowledge practically, and solving divergent problems compared to the control group." (Cekić-Jovanović & Milanović, 2020: 83)

Petrić (2024): This study analyzed teaching curricula for grades one through four in Serbia, specifically examining Natural and Social Sciences and English Language subjects. The research aimed to identify common content areas related to natural phenomena, which could be approached through an integrative teaching method. Findings indicated that topics such as living beings, basic survival needs, emotions, meteorological weather, and seasonal changes demonstrate high integration potential, enabling connections between biology, ecology, and scientific principles while aligning with children's real-life experiences. "The fields of natural sciences that showed integrative potential in our teaching curricula were: living organisms, basic life needs, fundamental emotions, meteorological conditions, and seasonal changes. These topics have a strong integrative potential, allowing students to connect various aspects of learning—natural phenomena, biology, ecology, and basic scientific principles. Moreover, they align with children's everyday experiences, making them highly relatable and understandable." (Petrić, 2024: 106-107)

Nahon-Crystal, Russo-Netzer & Segev (2024): This research explored the effects of integrating literature with natural sciences to increase student interest and develop scientific skills. The study utilized an experimental model, conducting six active integrative workshops, encouraging students to engage in experiments, scientific modeling, and critical discussions. Results showed that, following the experimental program, students expressed stronger positive attitudes toward natural sciences and demonstrated higher self-efficacy in scientific problem-solving. A statistically significant correlation was observed between improved scientific abilities and positive perceptions of science education.

Methodology of Research

The primary goal of this study was to determine the extent to which primary school teachers apply integrative approaches in teaching natural and social sciences. Based on this central objective, the following specific tasks were defined:

1. Identify the most frequently used teaching methods in natural and social science instruction.
2. Determine whether younger teachers are more likely to apply integrative teaching methods.

Sample Population: The research sample consisted of 46 primary school teachers from four schools in Vranje, Serbia. The sample included:

- 10 male participants
- 36 female participants

Distribution based on teaching experience:

- 10 teachers with less than 10 years of experience
- 20 teachers with 11 to 20 years of experience
- 16 teachers with more than 20 years of experience

Table 1: Teaching Experience of Surveyed Teachers

Years of Experience	Number of Participants
Up to 10 years	10
11-20 years	20
Over 20 years	16

Research Methodology: The methodology applied in this study was selected based on the nature of the problem, the subject, goals, and tasks of the research, as well as the established hypotheses. The study employed a descriptive research method to assess teachers' attitudes toward instructional strategies in natural and social sciences.

The data collection technique used in the study was a survey, with a questionnaire developed for primary school teachers. This questionnaire was not standardized, but was designed to gather qualitative insights into teaching practices.

Survey Instrument: The questionnaire contained eight questions:

- The formal section required participants to provide information on their qualifications and years of experience.
- The main section contained direct questions, asking teachers to respond by selecting from pre-defined answers.
- Participants were also given the option to share additional comments and suggestions related to the study.

Statistical Processing of Data:

Collected data was statistically analyzed using SPSS ver. 25.0 (Statistical Package for the Social Sciences) for Windows. The responses to each survey question were presented in tables, displaying statistical results

Research Results

Table 2: Suitability of Natural and Social Sciences for the Application of Modern Teaching Strategies

Response	**Observed N**	**Expected N**	**Residual**
Not at all	6	15.3	-9.3
Somewhat	24	15.3	8.7
Completely	16	15.3	1.3
Total	**46**		

Table 3: Traditional Teaching Achieves Educational Objectives

Response	Observed N	Expected N	Residual
Not at all	6	15.3	-9.3
Somewhat	24	15.3	8.7
Completely	16	15.3	1.3
Total	**46**		

Table 4: Modern Teaching of Natural and Social Sciences Provides Additional Opportunities

Response	Observed N	Expected N	Residual
No	10	15.3	-5.3
Somewhat	18	15.3	2.7
Yes	18	15.3	2.7
Total	**46**		

Table 5: Teaching Strategies Used in Natural and Social Science Instruction

Strategy	Observed N	Expected N	Residual
Problem-based	18	15.3	2.7
Exemplar-based	18	15.3	2.7
Integrative	10	15.3	-5.3
Total	**46**		

Table 6: Application of Integrative Teaching

Response	Observed N	Expected N	Residual
No	32	23	9
Yes	14	23	-9
Total	**46**		

Table 7: Does Integrative Teaching Place Additional Burden on Teachers?

Response	Observed N	Expected N	Residual
No	2	23	-21
Yes	44	23	21
Total	**46**		

Table 8: Are Teachers Familiar with the Advantages of Integrative Teaching?

Response	Observed N	Expected N	Residual
No	26	23	3
Yes	20	23	-3
Total	**46**		

To further examine the correlation between **teachers' years of experience** and **their stance on integrative teaching**, the **chi-square test** was applied. Below are the statistical results:

Table 9: Correlation Between Teachers' Experience and Their Teaching Preferences

Survey Aspect	Chi-Square (χ^2)	Degrees of Freedom (df)	Asymptotic Significance
Suitability of Natural and Social Sciences for Modern Teaching Strategies	7.348	1	0.007
Traditional Teaching Achieves Educational Objectives	5.304	2	0.070
Modern Teaching Provides Additional Opportunities	7.304	1	0.070
Preferred Teaching Strategy	1.391	2	0.499
Application of Integrative Teaching	3.922	1	0.061
Burden of Integrative Teaching	19.174	1	0.000
Familiarity with Integrative Teaching Benefits	0.391	1	0.532

Conclusion

Based on the results obtained from the chi-square test, the following key findings can be observed:

1. No statistically significant correlation exists between teachers' years of experience and their stance on the suitability of natural and social sciences for innovative teaching models.
2. A statistically significant correlation was found between teachers' experience and their perspective on traditional teaching achieving educational objectives—younger teachers hold more negative views toward traditional approaches.
3. No significant correlation was observed between teachers' experience and their views on additional opportunities provided by modern natural and social sciences teaching.
4. No correlation was found between teachers' experience and their preferred teaching strategies in natural and social sciences instruction.
5. A statistically significant correlation (at the 0.05 level) was observed between teachers' experience and their application of integrative teaching—younger teachers demonstrate a higher likelihood of using integrative teaching models.
6. A highly significant correlation ($\chi^2 = 19.174$) was found between teachers' years of experience and their perception of the additional burden imposed by integrative teaching—teachers with more experience perceive integrative teaching as an added challenge.
7. No significant correlation was observed between teachers' experience and their familiarity with the benefits of integrative teaching.

The primary research hypothesis was partially confirmed, revealing that only 21.74% of surveyed teachers actively implement integrative teaching in natural and social sciences instruction. Additionally, the sub-hypothesis was confirmed, showing a statistically significant correlation between teachers' years of experience and their use of modern teaching methods—younger teachers, who recently completed their formal education, demonstrate greater familiarity with integrative teaching and apply it more frequently.

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