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INTERDISCIPLINARY INCOMPATIBILITY IN SECONDARY EDUCATION IN KOSOVO: AN ANALYSIS OF LANGUAGE AND COMMUNICATION, AND MATHEMATICS

Education is a fundamental social activity that is subject to ongoing reforms aimed at improving teaching and expanding learning opportunities. Traditional teaching models have been replaced by approaches that put the student at the center of the educational process. This study analyses the applicability of the New Curriculum in Kosovo's education system, with an emphasis on the cross-curricular links between the fields of Languages and Communication and Mathematics. The aim is to explore the impact of curricular changes on the didactic triangle—the balance among students, teachers, and teaching content. The research includes an analysis of relevant literature and a survey of teachers. The results indicate content overload, insufficient coordination between subjects, and a need for improved coordination among teachers to enhance the quality of teaching. These findings can serve as a basis for further research and improvement of educational planning.

Keywords: *curriculum, didactic triangle, cross-curricular connection, teaching content*

* Note: Students Muzemilj Ese, Veljid Hadžisin, Bersida Skenderi, Azra Odžini, and Majda Odžini from the Faculty of Education made invaluable contributions to this research by conducting fieldwork and collecting relevant data.

INTRODUCTION

Education, as the foundation for all other social activities, is subject to constant reforms and reorganizations, all aimed at providing a better educational environment and greater opportunities for learning and knowledge transfer. Many pedagogues and philosophers, even in earlier periods of history, have tried to change the traditional, monologue approach in teaching and move students from the position of a passive observer to that of an active participant in learning new scientific facts. This teaching principle remains one of the key principles that initiates educational reforms and curriculum changes, especially in developing countries.

Like any change, the alteration of the school curriculum in the Republic of Kosovo has faced resistance. This opposition, whether from conservative groups directly involved in the educational process or from individuals who are not directly engaged in education, such as parents and various community members, is a natural part of the reform process. Understanding and addressing these concerns is crucial for the successful implementation of any new curriculum.

In this research, we will try to clarify to what extent the teaching envisaged by the New Curriculum is appropriate for the appropriate age of students, how feasible it is in terms of the planned number of teaching hours, and how much curricular areas and subjects can distort each other due to the presumed excessiveness of the material or other possible reasons.

The research is limited to the III and IV level according to the International Standard for the Classification of Education ISCED 2, which includes lower secondary school (VI–IX grade), and to the curricular areas of Languages and Communication and Mathematics.

THEORETICAL FRAMEWORK

Intercurricular Areas and Subject Integration

Cross-curricular areas are an educational approach that emphasizes the integration of knowledge from different disciplines, enabling students to develop a broader understanding of the concepts and skills necessary for life. According to Fullan (2007), an integrated curriculum allows students to connect knowledge and develop critical thinking.

Different models of cross-curricular connectivity include thematic integration, project-based learning, and interdisciplinary approaches. The key to successful integration lies in joint planning among teachers to achieve cross-curricular goals (Bean, 1997).

The Role of Mathematics in Cross-Curricular Connection

Mathematics provides tools for problem solving, data analysis, and logical thinking, which are applicable in all other subjects. Skills developed in mathematics improve students' ability to make decisions and reason in everyday life (Fullan, 2007).

ANALYSIS OF THE CURRENT SITUATION

Language and Communication Curriculum Review

The language and communication curriculum at the second level of schooling includes the development of reading, writing, listening, and speaking skills. Its goal is to train students to think critically, express themselves clearly, and analyze information. However, there are challenges in its application due to the lack of coordination with other subjects Ministry of Education, Science and Technology, 2016).

Math Curriculum Review

The mathematics curriculum emphasizes the development of numerical thinking, geometric skills, and logical reasoning. According to Beane's (1997) research, there is a need for better integration of mathematical concepts with real-life problems and other subjects.

Examples of discrepancies between areas

One of the key problems in Kosovo's current education system is the inconsistency between language and mathematics curricula. For example, math assignments often require an understanding of complex language instructions that are not adapted to the student's language level, making them difficult to solve. Similar difficulties occur with language tasks that use mathematical expressions without adequate explanation.

OBJECT OF RESEARCH

In this research, we will examine the impact of the Kosovo curriculum on the concept of the didactic triangle proposed by Young and Muller (2010), particularly in terms of its influence on teaching content. Emphasizing the importance of a particular factor in teaching is often indicated by phrases such as student-centered teaching, teacher-centered teaching, or material-centered

teaching, as per the Lexicographic Institute (2013-2025). If any of the elements of the didactic triangle are neglected and the balance between them is disturbed, the learning outcomes are significantly reduced. This concept is crucial in our research as it helps us understand the potential impact of the Kosovo curriculum on the teaching process and student learning.

Given that the New Curriculum in Kosovo was introduced relatively recently, it is unclear whether similar research has been conducted on this topic. This paper aims not only to provide objective results but also to stimulate further research, serve as a suitable basis for deeper study, or act as a catalyst for possible changes in the planning and implementation of teaching content that the curriculum envisages.

The research will be limited to schools where classes are taught in Bosnian, Albanian, and Turkish.

THE PROBLEM OF RESEARCH

In addition to the very inert acceptance of the new curriculum, which, for various subjective reasons, many teachers and educators considered an unnecessary burden, during the exchange of experiences among teachers, as well as among those who are in any way involved in the issue of education, not a small number of them think that the curricula resulting from the new curriculum in Kosovo are too extensive and that they are not sufficiently balanced and adapted to the age and cognitive capabilities of students. It is precisely such opinions that prompted us to explore this aspect of the curriculum, analyzing exactly how much the teaching content, as an equally important part of the didactic triangle, disturbs the balance of the didactic triangle itself. The teaching process, viewed as a whole, is characterized by multidisciplinarity and interdisciplinarity. There is consensus in the literature that multidisciplinarity involves examining the same problem from two or more perspectives without integrating them (Ash, 2019; Clark & Wallace, 2015; Klaassen, 2018; Razzaq, Townsend, & Pisapia, 2013). In this regard, multidisciplinarity is more akin to simple disciplinarity than to true interdisciplinarity (Clark & Wallace, 2015). Unlike multidisciplinary, interdisciplinarity implies the integration of existing disciplinary perspectives. Interdisciplinarity transcends the concept of a multidisciplinary approach by focusing on the integration of perspectives from various academic disciplines. Interdisciplinary research involves the integration of ideas, theories, and methodologies from various fields, yielding insights that provide innovative perspectives on complex issues (Klaassen, 2018). As emphasized by Lattuca, Voigt, and Fath (2004) and Razzaq, Townsend, and Pisapia (2013), this paradigm necessitates collaboration among educators across various subjects. It also requires

meticulous coordination of the planned content and a collective effort to enhance the appeal and engagement of instructional materials for students.

METHODOLOGY

Research

This study used a mixed-methods approach, combining theoretical analysis and quantitative research methods. The quantitative approach organized and analyzed teachers' responses to questionnaires. The qualitative approach, on the other hand, used open-ended interview questions to allow teachers to express their opinions on how the delivery of educational content could be improved to balance all elements of the educational triangle. According to Dzogovic and Bajram (2023), the qualitative approach enables researchers to delve deeper into real-life situations, resulting in a more comprehensive understanding of the phenomena under study.

Working methods

The data was collected through two primary methods:

Method of theoretical analysis: Consideration of available literature and e-resources dealing with the issue of organizing classes and implementing the curriculum, both in Kosovo and in the countries of the region.

Survey method: A standardized questionnaire has been created to cover key aspects of teaching practice and teachers' perceptions of the curricular areas of Languages and Communication and Mathematics. The questions are designed in such a way that a detailed analysis of the survey results can confirm or refute the validity of the set hypotheses. In selecting questions, it was crucial to include all potential, direct, and indirect factors that could affect the degree of realization of teaching content, the subject of this research.

Sample

The sample includes teachers from the subject area of Languages and Communication (Bosnian, Albanian, Turkish, and foreign languages), as well as mathematics teachers, who teach from 6th to 9th grade in lower secondary schools in the municipalities of Prizren and Dragas, teaching in Bosnian, Albanian, and Turkish. The total number of respondents is 126 teachers, of whom 98 teach subjects from the subject area of Languages and Communication, and 28 teach mathematics. The selection criteria include:

– Actively engaged in teaching, at least for the last five years,
– Work in schools belonging to different geographical areas (rural and urban environments).

Data collection

To prove the hypotheses, we developed a structured questionnaire comprising 21 questions, most of which relate to the research goals and claims of the hypotheses. The questionnaire contains questions related to the teacher's information, professional qualifications, work methods, use of available IT resources, the school's operating environment, the implementation of planned teaching content, intercurricular cooperation, and other aspects of teachers' work.

Working procedure

Collecting consent from school principals and teachers to participate in the research.

Distribution of questionnaires via online platforms (Google Forms).

Collection and organization of data into a central database, and analysis using SPSS software.

Data analysis

Quantitative analysis: Data from the questionnaire were analyzed by descriptive statistical methods (mean values, correlation, and standard deviation) and comparative analysis.

RESEARCH RESULTS

Basic data on data subjects

A total of 126 teachers participated in the survey, consisting of 66 females and 60 males. Among them, 78 work in schools located in the Prizren municipality, while 48 are employed in schools in Dragas.

In terms of language instruction, 73 teachers teach in Bosnian, 35 in Albanian, and 18 in Turkish. The specific subjects taught are as follows: 31 teachers teach in Bosnian, 28 teach mathematics, 17 teach English, 8 teach German, 23 teach Albanian, and 19 teach Turkish.

According to the respondents' estimates, the average number of students per class is approximately 11.65.

Regarding professional qualifications, 95 teachers hold a four-year bachelor's degree, 22 have completed master's studies, six possess a three-year bachelor's degree, and three have a college degree. A total of 102 respondents hold a professional degree in education, while 24 have degrees in other fields. In terms of qualifications related to the subjects they teach, 114 teachers meet the necessary professional standards, whereas 12 do not.

The survey included 22 schools, distributed as follows: 12 schools were located in rural areas, nine schools were located in urban areas, and one school was located in a suburban area.

Testing hypotheses

In response to the question: Do you manage to implement all the planned teaching content during one school year, a total of 104 respondents answered negatively, while only 22 answered positively.

The respondents were asked to provide information on the approximate percentage of teaching units implemented during one school year. Only 19 respondents realize 100% of the planned content, 56 respondents recognize between 90 and 100% of the material, 31 respondents between 80 and 90%, 16 of them between 70 and 80% and four respondents realize between 60 to 70% of the planned teaching units.

The previous data support the central hypothesis H1, as the poor realization of teaching units distorts the didactic triangle in favor of the teaching content.

As reasons for poor realization, 42 respondents cited low interest of students, 26 respondents - too extensive material, 25 of them that students are burdened with other subjects, 13 respondents - lack of teaching aids, 12 respondents - lack of textbooks, and eight respondents cited too many administrative tasks in school.

The previous analysis results confirm the H3 hypothesis, as the excessive material and the fact that students are burdened with other subjects complement each other, together making up a frequency of 51 examinees.

This result supports the H3 hypothesis, which claims that excessive material is the reason for the poor realization of teaching content. However, equally important is the data obtained on 42 respondents who claim that the low interest of students is, in fact, the reason for the poor realization of the material.

When asked how they handle situations where there is not enough time to process the planned content during class, 108 respondents reported that they transfer the unprocessed content to the next class. In contrast, 13 respondents indicated that they assign the remaining material as homework. Additionally, five respondents did not answer the question.

Data also prove that unprocessed teaching units are continuously transferred from one lesson to another. At the same time, a small number of respondents take advantage of the opportunity for students to complete what was omitted in class independently. These data further confirm the central hypothesis of H1 that inconsistent teaching content disrupts the didactic triangle. To test hypotheses H2, H4, and H5, we conducted a linear regression analysis. The independent variables included the approximate average number of students each teacher instructs, the extent to which teachers utilize computer devices in their teaching, and the level of collaboration among teachers when planning content in the same subject area.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.435[a]	.189	.169	.912

a. Predictors: (Constant), How much the teacher cooperates within the professional team, Average number of students in the classes, How much does the teacher use IT devices in class

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.670	3	7.890	9.489	<.001[b]
	Residual	101.441	122	.831		
	Total	125.111	125			

a. Dependent Variable: Approximate percentege of realization of teaching units during the school year

b. Predictors: (Constant), How much the teacher cooperates within the professional team, Average number of students in the classes, How much does the teacher use IT devices in class

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	5.441	.370		14.708	<.001
	Average number of students in the classes	-.062	.014	-.408	-4.559	<.001
	How much does the teacher use IT devices in class	-.323	.121	-.250	-2.666	.009
	How much the teacher cooperates within the professional team	-.256	.114	-.212	-2.249	.026

a. Dependent Variable: Approximate percentege of realization of teaching units during the school year

From the previous tables, we can see that the P-value of the ANOVA test is less than 0.001, which indicates a high degree of statistical significance. The situation is similar to the statistical significance of the coefficients for each of the predictors that affect the dependent variable, and their P-value is less than 0.05, which, along with a low standard error coefficient in all three cases, further confirms the statements we made in the hypotheses, H2, H4, and H5.

To further confirm these hypotheses, we examined the percentage of realized teaching content in relation to the average number of students per class. We examined the value of Pearson's chi–square, as well as the correlations between Pearson's and Spearman's.

We observe that this type of analysis also confirms the H2 hypothesis, which states that in classes with a smaller number of students, a higher percentage of the planned teaching content is realized.

The P-value of the Chi-square test is less than 0.001. Combined with the findings from the regression analysis, this provides empirical support for hypothesis H2, confirming it with the data.

We repeated the same procedure with the H4 hypothesis to further confirm significance. We have conducted a crosstabulation of the percentage of realized teaching content and the extent to which teachers use IT devices in teaching.

Approximate percentege of realization of teaching units during the school year * Average number of students Crosstabulation

Count

		Average number of students						
		1-5	6-10	11-15	16-20	21-25	31-35	Total
Approximate percentege of realization of teaching units during the school year	60-70%	0	0	4	0	0	0	4
	70-80%	0	3	13	0	0	0	16
	80-90%	0	16	5	6	0	4	31
	90-100%	6	24	12	8	3	3	56
	100%	0	6	3	6	4	0	19
Total		6	49	37	20	7	7	126

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	72.628[a]	12	<.001
Likelihood Ratio	64.212	12	<.001
Linear-by-Linear Association	5.225	1	.022
N of Valid Cases	126		

a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is .03.

Symmetric Measures

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Interval by Interval	Pearson's R	-.204	.080	-2.326	.022[c]
Ordinal by Ordinal	Spearman Correlation	-.209	.082	-2.375	.019[c]
N of Valid Cases		126			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Based on the previous tables, the statistical significance of the Chi-square test, as well as the Spearman and Pearson correlations, is less than 0.05. These results corroborate the findings of the regression analysis, providing empirical support for hypothesis H4, which states that teachers who use IT devices in teaching achieve a higher proportion of planned teaching content.

The same procedure was subsequently applied to hypothesis H5, further confirming the results of the regression analysis.

How much does the teacher use IT devices in class * Approximate percentege of realization of teaching units during the school year Crosstabulation

Count

		Approximate percentege of realization of teaching units during the school year					
		60-70%	70-80%	80-90%	90-100%	100%	Total
How much does the teacher use IT devices in class	Regularly	0	0	10	9	8	27
	Sometimes	3	12	0	27	8	50
	Rarely	0	4	21	20	3	48
	I don't use at all	1	0	0	0	0	1
Total		4	16	31	56	19	126

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	72.628[a]	12	<.001
Likelihood Ratio	64.212	12	<.001
Linear-by-Linear Association	5.225	1	.022
N of Valid Cases	126		

a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is .03.

Symmetric Measures

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Interval by Interval	Pearson's R	-.204	.080	-2.326	.022[c]
Ordinal by Ordinal	Spearman Correlation	-.209	.082	-2.375	.019[c]
N of Valid Cases		126			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

The results of the Chi-square test and correlation analyses indicate statistical significance ($p < 0.05$), providing empirical support for the tested hypotheses concerning the factors influencing the achievement of planned teaching content.

H2: The proportion of planned teaching content decreases in classes with a larger number of students.

H3: Inadequate implementation of planned teaching content is a consequence of the pervasive use of teaching material.

H4: The integration of information technology in teaching enhances the achievement of planned teaching content.

H5: Collaboration among teachers within a curricular area contributes to greater achievement of teaching content.

Central Hypothesis H1: The didactic triangle is significantly imbalanced, with an overemphasis on teaching content.

How much the teacher cooperates within the professional team * Approximate percentege of realization of teaching units during the school year Crosstabulation

Count

		Approximate percentege of realization of teaching units during the school year					
		60-70%	70-80%	80-90%	90-100%	100%	Total
How much the teacher cooperates within the professional team	Regulary	0	10	10	20	16	56
	Sometimes	3	2	15	23	3	46
	Rarely	0	4	6	10	0	20
	I'm not cooperating	1	0	0	3	0	4
Total		4	16	31	56	19	126

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	33.413[a]	12	<.001
Likelihood Ratio	36.621	12	<.001
Linear-by-Linear Association	3.963	1	.047
N of Valid Cases	126		

a. 11 cells (55.0%) have expected count less than 5. The minimum expected count is .13.

Symmetric Measures

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Interval by Interval	Pearson's R	-.178	.089	-2.015	.046[c]
Ordinal by Ordinal	Spearman Correlation	-.188	.088	-2.130	.035[c]
N of Valid Cases		126			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

The statistical significance of the HI-square and correlation in this case is less than 0.05; thus, we accept hypothesis H5, which claims that teachers who cooperate within a professional team have a higher percentage of realizing the planned content, as confirmed. Overall, the analysis shows that collaborative practices among teachers, combined with the use of suitable teaching resources, have a positive impact on the practical implementation of planned instructional content. Simultaneously, structural factors such as class size and the scope of teaching material remain critical determinants. These findings provide empirical support for targeted pedagogical strategies designed to optimize teaching effectiveness across various instructional contexts.

In response to the question. What do you think could improve the material processing percentage during a school year? The respondents provided answers that we will quote verbatim:

Good preparation of materials using all available means.

- The activity of parents. Frequent parent-teacher meetings.
- It is necessary to continuously monitor contemporary trends in technology that can contribute to the improvement of the teaching process..
- More practice.
- IT more.
- Homework assignments.
- To increase the number of English lessons.

- Continuous work of students.
- Collaborating with colleagues.
- Theoretical with practical learning.
- Gaining competence.
- Cooperation, student-teacher.
- Prepare annual, monthly, and weekly plans.
- Teachers' attention focused on the class and students is an indicator that a healthy educational path has been set.
- Cooperation between teachers, less activity in administrative tasks.
- Priority given to important lessons in review classes.
- More extra classes.
- Student discipline.
- Textbooks with supporting literature (grammar, workbooks, spelling).
- Better cooperation with parents.

CONCLUSION

All the results and indicators that emerged from this paper indicate the need for harmonization of all areas and subjects within the Kosovo curriculum. Cross-curricular connection is of key importance for planning teaching content because it significantly reduces the time allocated for implementing the planned teaching units, which is the result of cooperation and harmonization of teaching topics. The role of each teacher, all actors, and institutions involved in the teaching process is equally important, and good results can be achieved within a compact education system in which continuous cooperation and coordination of activities take place.

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INTERDISCIPLINARNA NEKOMPATIBILNOST U SREDNJEM OBRAZOVANJU NA KOSOVU: ANALIZA JEZIKA I KOMUNIKACIJE, I MATEMATIKE

Obrazovanje je temeljna društvena aktivnost koja je podložna stalnim reformama usmjerenim na poboljšanje nastave i povećanje mogućnosti učenja. Tradicionalni modeli nastave zamijenjeni su pristupima koji učenika stavljaju u središte obrazovnog procesa. Ova studija analizira primjenjivost *Novog kurikuluma* u obrazovnom sistemu Kosova, s posebnim naglaskom na međupredmetne veze između područja jezika i komunikacije te matematike. Cilj je istražiti utjecaj kurikularnih promjena na didaktički trokut - ravnotežu između učenika, nastavnika i nastavnog sadržaja. Istraživanje uključuje pregled relevantne literature i anketu među nastavnicima. Rezultati ukazuju na preopterećenost sadržajem, nedovoljnu koordinaciju između predmeta i potrebu za boljom saradnjom nastavnika kako bi se poboljšala kvaliteta nastave. Ovi nalazi mogu poslužiti kao osnova za dalja istraživanja i i poboljšanje obrazovnog planiranja.

Ključne riječi: *kurikulum, didaktički trougao, međupredmetna povezanost, nastavni sadržaj*