

**GRAPHIC ORGANIZERS METHOD USED
IN THE SYSTEMATISATION AND RECAPITULATION
OF KNOWLEDGE IN GEOGRAPHY**

**METODA ORGANIZATORILOR GRAFICI UTILIZATĂ
ÎN SISTEMATIZAREA ȘI RECAPITULAREA CUNOȘTINȚELOR
LA GEOGRAFIE**

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10.52846/AUCSG.24.06

Abstract: This research analyses whether the use of an effective method/technique, as support in the educational process, can make pupils better understand the concepts learned in Geography classes and be more effective in practical tests. Thus, this research is based on the design and use of the method of graphic organizers in the teaching-learning-evaluation lessons, which allows the fixation and thorough consolidation of pupils' knowledge in the discipline of Geography, 7th grade. The research method used was the questionnaire, which was applied to an experimental sample (7th grade A) and a control sample (7th grade B), the pupils being from the countryside school in Dolj County, Romania. Statistical data were analyzed using SPSS Statistical Software (Statistical Package for the Social Sciences) and provided valuable insights in understanding the relationships between the studied variables and the research hypotheses. We consider this technique, being new, attractive and innovative in the Romanian education system, for the development of the spirit of observation in pupils, the increase of attention, imagination and memory, the amplification of investigative capacity, organization in thinking but also in deeds (creativity and thinking free).

Keywords: *SPSS, methods, graphic organizers, recapitulation, systematization, lesson.*

Cuvinte cheie: *SPSS, metode, organizatori grafici, recapitulare, sistematizare, lecție.*

1. INTRODUCTION

Graphic organizers are simply a graphic or geospatial representation of the theoretical notions taught by the professor during the teaching process; it is an instructional tool that helps students to structure information (received during the learning-teaching process).

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Graphic organizers are framing tools that use visual and spatial displays (Zakas et al., 2013), visual symbols to express thoughts and ideas (Ghanizadeh et al., 2020), which facilitate the understanding of a text by "*using lines, arrows and a spatial arrangement that describes the text's content, structure, and key conceptual relationships*" (Darch & Eaves, 1986, p. 310).

The proposed assessment method provides visual models that prepare teachers and students with tools, concepts and language in order to organize, understand and apply information in real life (Gallavan & Kottler, 2010). Graphic organizers help students sort out, identify the connections between theoretical and practical concepts, make sense of and manage information quickly and easily before, during, and after evaluating the information presented in class (Gallavan & Kottler, 2010).

Research has confirmed that studying graphic organizers method is more effective than studying a text, especially for correlated learning (Colliot & Jamet, 2018; Colliot & Jamet, 2020; Colliot & Jamet, 2021; Colliot et al., 2022).

We consider "The method of graphic organizers used in the systematization and recapitulation of knowledge in Geography" to be an important and current topic because graphic organizers, with applicability in studying a geographical phenomenon, regardless of the school cycle, have the following roles:

- They develop the students' practical skills;
- Stimulate constructive imagination, intuition;
- Develop the ability to model, read or practically exercise the theory of Geography lessons, thus stimulating scientific creativity;
- Influence the students' personality by making them more creative, more orderly;
- Develop the spirit of observation and attention;
- Sustain assimilation of knowledge of Geography by reconstructing notions around a key concept in those moments meant to fix and consolidate some notions by carrying out experiments;
- Create interdependencies between theoretical and practical notions;
- Develop thinking, imagination, analysis and comparison between geographical laboratory experiments etc.

The essential condition for a thorough/solid fixation and systematization of information, not only regarding the discipline of Geography, but also for any other field of activity, is that students should get in touch with the laboratory experiments and field practice (excursions), so to work concretely with these.

By rigorously elaborating the recapitulation and systematization lessons, by choosing the methods suitable to each learning situations, by introducing new and diversified techniques and methods (e.g. graphic organizers method) according to the level of students' knowledge, the learning of Geography can be made more efficient, the routine can be avoided and students' motivation to learn is stimulated.

Ioan Cerghit (1980) characterizes the method as follows: "*an effective way to organize and manage learning, a common way of proceeding, which brings together in a familiar whole the efforts of both teacher and student*".

The didactic method represents an essential element of the didactic technique and assumes certain characteristics (Tiron & Stanciu, 2019, p. 69):

- a. is selected by the teacher and implemented in the lesson with the help of the students;
- b. implies teacher-student collaboration, but also student-student;
- c. is used under various variants or combined procedures;
- d. allows the different organization of the instructional-educational process and the integration of teacher in different roles: animator, guide, evaluator, etc.

In the specialized literature, recapitulation and systematization lessons are classified in turn according to variable factors: *"level of students' knowledge, complexity of the knowledge to be acquired by the students, work strategies available to the teacher, educational means used, place of the lesson in the system"* (Ionescu & Radu, 1995, p. 237).

The lesson is defined and classified in the specialized literature in a wide variety of ways, from several points of view: from the organizational point of view, from the perspective of teacher's activity and the perspective of students' activity. Most classifications are made according to the general objective pursued. Each category of lesson has its own flexible structure, which allows the Geography teacher to adapt and diversify the lesson, depending on the variable factors encountered, thus creating several variants of each type of lesson.

The recapitulation and systematization lesson, in turn, has several variants, depending on the variable factors encountered, as shown by Ionescu (1982, p. 119) of which, we mention several examples that apply themselves well to the discipline of Geography at middle school/high school classes:

- ✓ introductory recapitulation lesson;
- ✓ lesson based on the plan drawn up by the teacher and presented to the students in the previous lesson;
- ✓ lesson based on the plan drawn up by the teacher together with the students;
- ✓ lessons based on recapitulation graphic organizers, practical activities, exercises, monographs, reports, classifications;
- ✓ the recapitulation-systematization lesson through scheduled training;
- ✓ recapitulatory lessons by means of the students elaborating problems, making visits to exhibitions and museums;
- ✓ "process" type lesson, case analysis;
- ✓ lesson based on projects;
- ✓ summary lesson at the end of the chapter, term or school year.

The methodology for developing these lessons for recapitulating and systematizing Geography knowledge in middle/high school is within reach of the teacher, thus having the opportunity to be as creative and innovative as possible, to find teaching-learning strategies as diverse and appropriate as possible to determine the progress of students by achieving the objectives pursued.

The starting point in organizing lessons for the recapitulation and systematization of Geography knowledge in secondary/high school education must

be the fact that Geography is one of the branches of natural sciences whose object of study is the Earth, its layers and the relationships between them, bringing together notions from the fields of geology, astronomy, biology, chemistry, etc. into a unified entirety.

Determining clearly the objectives of the recapitulation of knowledge in Geography and the objectives of this lesson is of great importance for the lesson to be effective and to achieve the expected results.

Thus, the Geography teacher must establish a clear and concrete structure of the recapitulations he intends to do, for the learning of units taught in the classroom. Recapitulation and systematization lessons in Geography have a relatively different structure compared to other types of lessons.

In organizing lessons for the recapitulation and systematization of knowledge in Geography, the teacher must start from the idea that this is not an ordinary lesson, for acquisition of knowledge, the subject previously taught is not reviewed, but the relationships and connections between concepts are highlighted, namely: (Earth-Geospheres-Man, people's living environment-behavior relations with the phenomena of reality).

"Very special attention should be given to the reactivation of the so-called anchor ideas and the intellectual skills involved in studying the new material, indispensable for the establishment of new cognitive structures, and the formation of more complex intellectual work skills, certain cognitive strategies" (Cerghit, 1983, p. 133-134).

Following the analysis of specialized literature, in modern and postmodern pedagogy, the teaching method represents the teacher's main tool for transmitting, fixing, recapitulating knowledge, forming special skills, competences and attitudes of students under his leadership or coordination, but also in an independent manner. The teaching methods are all the more effective when the teacher reduces his control, and the students' involvement is more active within the teaching-learning lessons.

The systematic study of Geography in secondary school, as shown by the school curriculum, contributes to the formation and development of the students' personality by aiming to:

- involvement in various activities of observation, experimentation and application, developing their ability to integrate new information and apply it in everyday situations;
- stimulating curiosity and interest in knowledge, in general, and for Geography, in particular;
- integrated approach to concepts, making connections with other natural sciences;
- development of positive attitudes towards oneself, towards others and towards the environment;
- stimulating the motivation for protection of nature and its valorization in the formation of appropriate ecological beliefs and competences for training students in environmental protection activities.

The systematization of knowledge implies the integrated delivery of information, granting their natural coordination and interconnections. Everything that is taught at a given time must be connected with what has been learned up to that point (Cucoş, 1998, p. 62).

2. DATA AND METHODS

The methodology used in this research involved the utilization of the Spearman correlation coefficient to assess the relationship between two variables: the observation of recapitulation and systematization moments in Geography and the perception of the usefulness of fixing and consolidating notions for effective learning. Additionally, we applied the chi-square coefficient to analyze the association between other nominal variables from the questionnaire.

To obtain the necessary data for analysis, we administered a questionnaire to the participants, where they were asked to respond to two questions regarding the observation of recapitulation and systematization moments in Geography and the perception of the usefulness of fixing and consolidating notions for effective learning. The participants were requested to evaluate these two variables using an ordinal scale and also answer nominal questions related to other aspects of recapitulation lessons.

After data collection, we applied the Spearman correlation coefficient to calculate the degree of association between the observation of recapitulation and systematization moments and the perception of the usefulness of fixing and consolidating notions. Furthermore, we used the chi-square coefficient to evaluate the relationship between other nominal variables, such as preferences for organizing knowledge in Geography.

The choice of the Spearman and chi-square coefficients was based on the nature of our data, which can be evaluated both in an ordinal and nominal manner, and the fact that the relationship between variables is non-linear, requiring appropriate statistical analysis.

Interpreting the results of the correlation coefficients allowed us to analyze whether there is a significant correlation between the observation of recapitulation and systematization moments and the perception of the usefulness of fixing and consolidating notions, as well as the association between other nominal variables from the questionnaire.

By applying this methodology, we gained a better understanding of how the observation of recapitulation and systematization moments in Geography can influence the perception of the usefulness of fixing and consolidating notions for effective learning. The obtained results have enabled us to draw relevant conclusions regarding the importance of these aspects in the educational process of students in the field of Geography.

2.1. Location of applied research

In order to make the map of the location at national level and within Dolj County, of the Secondary School no. 1 Mârşani, found on the Main Street nr, 224, we used the ArcMap software (Fig. 1). Vector and raster data were downloaded for

free from <https://geo-spatial.org/>. The map also contains a photo (graphy) taken on the field. Secondary School No. 1 Mârșani is a rural school unit. It is located 43 km from Craiova and is found in a geographical area with a special history.

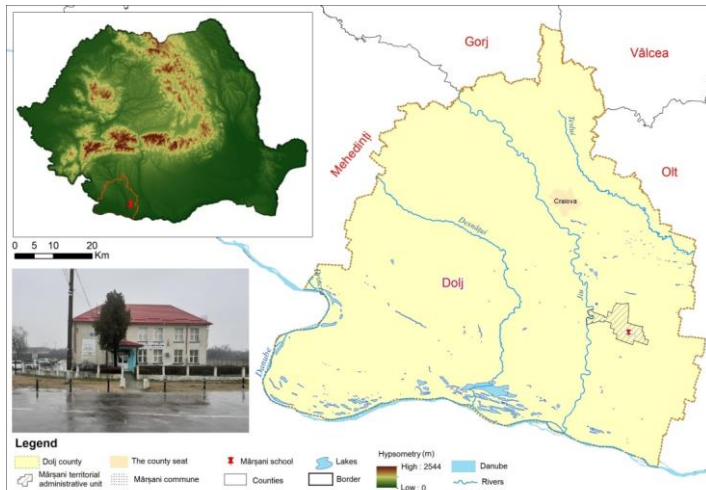


Fig. 1. Geographical location of the school at local and national level
(Source: authors' processing using ArcGIS 10.7)

The school unit is performant in terms of accessing and implementing school projects - "Second Chance" (2022) or projects with European funding ERASMUS – „Peace is not free” (2018-2020) „Maths is life” (2019-2021), „Happy schools for happy students” (2019-2021), „Sharing European treasure” (2019-2021), „Act for the environment” (2022-2024).

In the 2022-2023 school year, Secondary School No. 1 from Mârșani (Fig. 1), from Dolj County, has a total number of 316 students, of which: four kindergarten groups with 85 students (47 girls and 38 boys), seven primary school classes with 133 students (62 girls and 71 boys) and seven middle school classes with 98 students (44 girls and 54 boys).

2.2. Sample and research structure

The cognitive dimension explores how deeply and extensively a student constructs the arguments and ideas presented in front of the class, regarding a topic presented and proposed for discussion by the teacher (Jeon et al., 2022).

The formative didactic intervention took place during modules I and II of the current school year 2022-2023. The research was carried out after the teaching process afferent to module I and module II of didactic activity in the 2022-2023 school year.

2.3 Student sample

In order to follow the objectives and verify the formulated hypothesis, we included in the research a number of 32 students aged between 12-14 years who attended the secondary school cycle in the 2022-2023 school year.

Thirty-two high school students from Secondary School No. 1 Mârşani were included in the questionnaire. Students had the opportunity to answer the questions by choosing only one answer option. At the same time, all the students answered all the questions in the questionnaire, meaning that there were no errors in the quantitative data's interpretation.

The thirty-two children come from diverse social backgrounds, mostly with optimal educational conditions, namely: most of the children come from two-parent families, where the parents have jobs, almost all children have computers and internet connection at home, which offers the possibility of information and unlimited documentation, but there are also children with parents who have gone abroad, children with parents who have a poor financial situation and minimal educational training, but there are also children with good and very good living conditions.

The didactic research elaborated and carried out to verify the hypothesis consisted of a series of didactic activities in which the independent variables (graphic organizers) were introduced, for which the student sample was established.

In choosing the sample of students, we took into account the age at which we considered that it is possible to act through new methods/techniques that demonstrate the hypothesis of this didactic research, the possibilities of applying the independent variables and the students' level of knowledge.

2.4. Sample of participants

1. Experimental sample: Class VII A (Secondary School No. 1 Mârşani), made up of 16 students, physical and intellectual development level corresponding to their age, possessing skills corresponding to the framework and reference objectives set out in the school Geography curriculum;

2. Control sample: Class VII B (Secondary School No. 1 Mârşani), made up of 16 students, level of physical and intellectual development corresponding to the age, specific skills for the discipline of Geography at the curricular standards' level provided by the present school curriculum.

We consider the Geography lessons chosen for the didactic research to be relevant for the application of graphic organizers method/technique in order to demonstrate the research hypothesis. We believe that in the Geography lessons chosen for research, it is possible to apply the method/technique of designing graphic organizers, due to the diversity available in Geography, in the case of researching some aspects related to the geographical characterization of Asia and Africa.

In (Fig. 2), the learning unit is elaborated, the Geography topics that we selected for the didactic intervention that are part of the experimental and control sample for the 7th grades A, respectively B.

2.5. Research objectives

Main objective

If we establish and consolidate important notions in Geography lessons by means of graphic organizers, it is possible to increase and develop in students the spirit of observation, thinking and imagination. The notion of spirit of observation can be translated by looking for the definition of three words *spirit*, *observation*

and *imagination* which, according to the Romanian Language Explanatory Dictionary, are the following: *spirit* means thinking, judgment; *observation* means remark, acknowledgement, and *imagination* means the ability of students to create new representations or ideas based on perceptions, representations or ideas accumulated in previous lessons. Thus, by the spirit of observation, we mean the ability of students to notice quickly and consciously what is relevant and important in the lessons taught by the teacher.

Learning unit	Specific competencies	Content	Number of hours allotted	Week	Remarks/ Evaluation
Learning module 1					
Asia	1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4.	Earth - elements of human geography. Europe (recap) Geographical characterization Geographic position The relief: general characteristics, major units. Himalayan mountains Hydrography: general characteristics. Rivers and lakes Climatic differences. Monsoons Biogeographic contrasts Recap and evaluation	7	1-7	T0 (initial test) Oral assessment Self assessment/ peer T1 (sequential test)
Autumn holiday: 22.10.2022 – 30.10.2022					
Learning module 2					
Asia	1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4.	Elements of human diversity (ethnic, linguistic, cultural, religious diversity) Political map and large human agglomerations natural resources Economic activities. Regional economic contrasts Case studies: Geographical peculiarities of some states (optional). Asia in the contemporary world	5	8-12	Practical tests Oral evaluation
Africa	1.1, 1.2, 2.1, 2.2, 3.1, 4.1, 4.2.	Geographical characterization Geographical position – latitudinal symmetry The relief of Africa - general characteristics. African Rift Hydrography, climate and biogeography – general characteristics	3	13-15	Practical tests Oral evaluation
Winter holiday: 23.12.2022 – 08.01.2023					
Application of the questionnaire 10.01.2023					

Fig. 2. Planning study of Geography – 7th grade, class VII A/B (2022-2023)

Secondary objectives

- Increasing organizational actions and free thinking;
- Increasing the knowledge capacity;
- Development of attention and memory;
- Development of creativity and investigative capacity;
- Correlation of theoretical knowledge with cartographic support;
- Transposing numerical notions in the form of graphs.

3. RESULTS AND DISCUSSIONS

3.1. Quantitative data analysis

The present study aims to investigate students' perception of recapitulation and systematization moments within Geography lessons and how they contribute to the effective fixation and consolidation of knowledge. To achieve this objective,

we have developed a questionnaire comprising a series of questions regarding students' experiences with these specific moments of recapitulation and systematization, as well as their influence on learning and understanding important concepts in Geography.

The questionnaire includes inquiries about students' observations and participation in recapitulation and systematization moments, as well as their opinions on the usefulness of these moments for fixing and consolidating notions. Additionally, we explore methods of organizing knowledge in Geography, including the use of graphic representations, and their impact on the process of systematization.

Another essential aspect addressed in the questionnaire pertains to the strategies students employ to overcome potential obstacles encountered during the process of fixing and consolidating knowledge in Geography. Moreover, we investigate students' perceptions of the recapitulation plan provided by the teacher and the methods they use to prepare for assessments or tests following recapitulation and systematization lessons.

Alongside these aspects, we explore the presence of distinct recapitulation and systematization lessons in Geography and how they relate to students' preparation methods for these lessons. Furthermore, we take into account students' perceptions of obstacles encountered during systematization and fixation of knowledge, as well as their suggestions and opinions for improvements that can be made in recapitulation lessons.

Through analyzing the obtained questionnaire results, our aim is to identify possible correlations and associations between the different investigated variables, providing a comprehensive perspective on students' perception of recapitulation and systematization moments in Geography and their impact on the learning process. These conclusions and observations may contribute to optimizing the methods and strategies used by teachers in the delivery and organization of recapitulation and systematization lessons in the field of Geography, thereby enhancing the efficiency and effectiveness of the learning process.

Following the formative didactic intervention, the experimental sample (Class VII A) had at their disposal during the two learning modules included the method of graphic organizers in all lessons, while the control sample (Class VII B) did not benefit entirely from this teaching-learning method; this is observed in the applied questionnaire as there are remarkable differences between the responses of these two classes.

By means of the questionnaire addressed to the students at the beginning of this didactic research, 13 questions were drawn up with reference to the recapitulation and systematization of Geography knowledge: how these recapitulations help students in fixing and consolidating notions, if they recognize graphic organizers as a learning method/technique, if they apply these techniques of graphic organization of information in learning lessons. In its final part, questions were administered on how students prepare for recapitulation in

Geography, how students perceive these recapitulations, the improvements that the teacher can make in recapitulation and systematization lessons in Geography.

Have you noticed moments dedicated to recapitulation and systematization of knowledge in Geography lessons?

This question aims to investigate whether the respondents have noticed specific moments in Geography lessons that are dedicated to the recapitulation and systematization of knowledge. By using this question, the goal is to obtain information about how teachers or educational institutions approach the recapitulation and systematization of the material taught in Geography lessons.

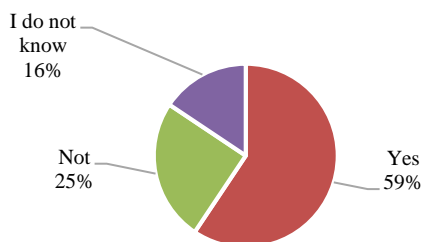


Fig. 3. Identification of the presence of recapitulation and systematization lessons in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

From the presented data, it can be observed that 19 participants have noticed moments dedicated to the recapitulation and systematization of knowledge in Geography lessons, while 8 participants have not noticed such moments, and 5 participants are unsure or do not know (Fig. 3). This indicates that the majority of participants have observed the moments of recapitulation and systematization, but there is also a significant number of participants who have not noticed them or are unsure about these aspects.

Do you think that fixing and consolidating notions is useful for effective learning?

This question aims to explore the perception and opinion of the respondents regarding the usefulness of fixing and consolidating notions for effective learning. By using this question, researchers seek to gather information about how much the respondents consider it important to review and reinforce the knowledge learned in the learning process.

It is an open-ended question, meaning that the respondents can provide varied and detailed responses. The answers may range from a positive perception, where respondents believe that fixing and consolidating notions are essential for effective learning, to a negative perception, where respondents may consider these aspects to be less important or believe that there are other more effective learning methods.

From the data presented, it can be observed that 17 participants consider fixing and consolidating notions to be highly useful for effective learning, while 4

participants find them useful. On the other hand, 5 participants perceive them to be of very little utility, and 6 participants find them slightly useful. These results indicate that the majority of participants see the benefits of fixing and consolidating notions in learning, but there is also a significant number who perceive these aspects to have a lesser or negligible utility (Fig. 4).

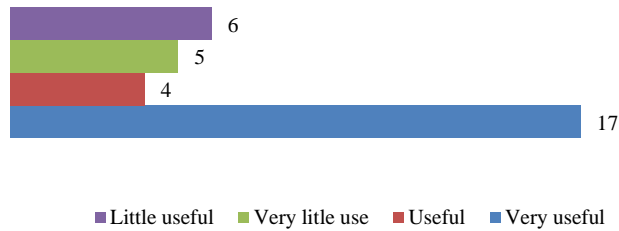


Fig. 4. Perception of the utility of fixing and consolidating notions for effective learning

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

Identify the methods that you think help you in organizing your knowledge in Geography?

This question aims to identify the methods that respondents consider effective in organizing knowledge in the field of Geography. The obtained responses can provide insights into preferred learning strategies and can contribute to the development of more efficient teaching and learning methods in the field of Geography.

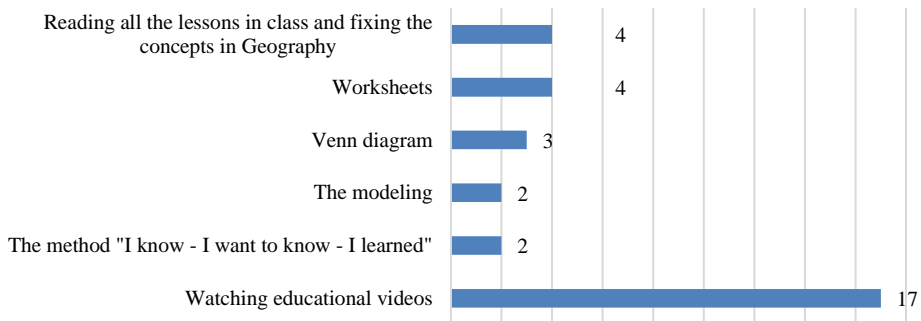


Fig. 5. Preferred methods of knowledge organization in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

From the data presented, it can be observed that participants have identified several methods that help them organize their knowledge in Geography. The most frequently mentioned methods are (Fig. 5):

Watching educational videos (17 participants)
 Using the 'I know - I want to know - I learned' method (2 participants)
 Using modeling (2 participants)
 Using Venn diagrams (3 participants)
 Using worksheets (4 participants)
 Reading all the lessons in class and consolidating concepts in Geography (4 participants).

These methods are perceived as useful in organizing knowledge and systematizing information in Geography by the research participants.

How do graphic representations help you to systematize in Geography?

This question explores how graphic representations (diagrams, graphs, charts, etc.) contribute to the process of knowledge systematization in Geography. The responses provided can highlight the impact of these visual methods on the understanding and memorization of geographical information.

According to the graph, the majority of participants (9 individuals) mentioned that graphic representations in Geography are interesting. Other reported benefits include easier memorization of concepts (8 individuals), highlighting the most important concepts (4 individuals), and better organization of ideas through the use of schemes (3 individuals). Additionally, a significant number of participants (6 individuals) indicated that these graphic representations help them prepare better for tests or exams. However, only 2 individuals mentioned that graphic representations offer methods different from the usual ones (Fig. 6).

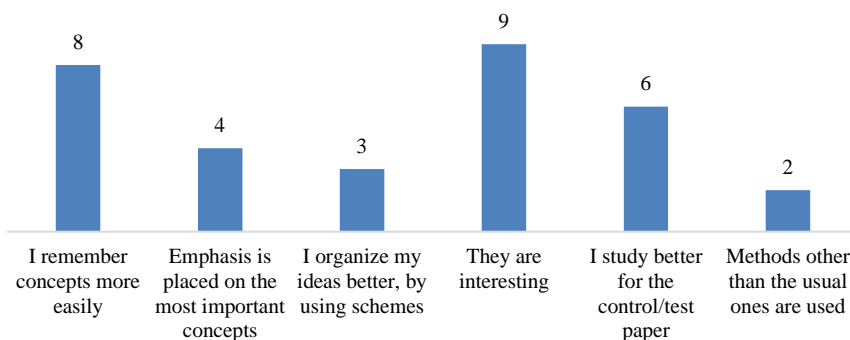


Fig. 6. Benefits of graphic representations in knowledge systematization in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

The results suggest that the use of graphic representations in Geography brings multiple benefits to students, such as increasing interest, more efficient memorization of information, and facilitating the organization and understanding of concepts. These findings support the idea that the method of using graphic representations can be an effective way to improve the process of knowledge systematization and learning in the field of Geography.

Do you think that organizing information graphically for recapitulation and systematization helps you understand important concepts in Geography?

This question explores the respondents' perception regarding the utility of organizing information graphically in the process of recapitulation and systematization in the field of Geography. The answers can provide insights into how effective graphic methods are in assimilating key concepts in Geography.

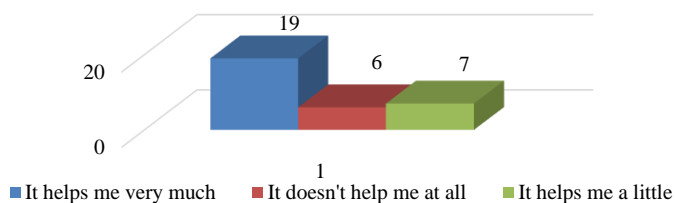


Fig. 7. Perception of the usefulness of graphic information organization for recapitulation and systematization in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

According to the survey results, the majority of participants (19 individuals) believe that organizing information graphically for recapitulation and systematization greatly helps them understand important concepts in Geography. However, there are also a few participants (6 individuals) who stated that this method does not help them at all in understanding the concepts. Additionally, a smaller number of individuals (7) mentioned that organizing information graphically provides them with little assistance in understanding the concepts (Fig. 7).

These findings indicate that the majority of participants perceive the use of graphic representations for recapitulation and systematization as beneficial for understanding key concepts in Geography.

However, it is essential to consider that there are individuals for whom this method may not work as effectively or has a lesser impact on their learning process. Overall, graphic representations appear to be a valuable tool for most students in the process of learning and comprehending geographical concepts.

What obstacles do you encounter while the moments of systematization and fixation of knowledge in Geography?

This question investigates the difficulties and challenges faced by the respondents during the process of systematizing and consolidating geographical knowledge. The responses can help identify factors that may affect the effectiveness of these recapitulation moments and serve as a basis for improving teaching and learning strategies.

According to the responses received, the majority of participants (18 individuals) do not encounter obstacles during the moments of systematizing and consolidating geographical knowledge. However, a small number of respondents

(3) mentioned that they sometimes face difficulties due to the fact that the systematization materials are overly schematic (Fig. 8).

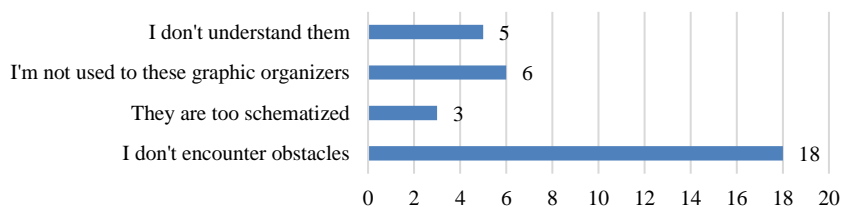


Fig. 8. Identification of obstacles encountered in Geography knowledge systematization and consolidation

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

Other obstacles mentioned by participants include not being accustomed to using graphic organizers (6 individuals) and not always understanding these organizers (5 individuals). These results suggest that, overall, most participants perform well during the moments of systematization and consolidation of geographical knowledge.

However, it is important to consider that there are some difficulties for a small number of students, particularly regarding the use and comprehension of graphic organizers. Adapting or diversifying the methods of systematization may contribute to overcoming these obstacles and facilitate the learning process for all students.

If you answered the previous question, how do you think you could overcome these obstacles in fixing and reinforcing

Through this question, the aim is to request respondents to provide potential solutions or strategies to overcome the obstacles identified in the process of fixing and consolidating geographical knowledge. The responses can offer valuable suggestions for optimizing the learning process.

According to the responses, students suggest various ways to overcome the obstacles encountered in fixing and consolidating geographical notions (Fig. 9). The most frequent suggestions include using colors to make graphic organizers more visual and appealing (15 participants) and making a greater effort to study these organizers more attentively and thoroughly (5 participants).

Other suggestions include modifying graphic organizers to better suit their individual needs and preferences, creating their own schemes (2 participants), and seeking help from the teacher when facing difficulties in understanding and using graphic organizers (10 participants).

These suggestions reflect students' desire to improve their skills in systematizing and consolidating geographical knowledge and to overcome any potential obstacles in this process. By implementing these suggestions, students can find more efficient and personalized ways of learning, which can enhance the consolidation and deepening of knowledge in a more effective and enjoyable manner.

Additionally, the involvement and support of the teacher can play a vital role in overcoming obstacles and enhancing the perception of the usefulness of graphic organizers in the learning process.

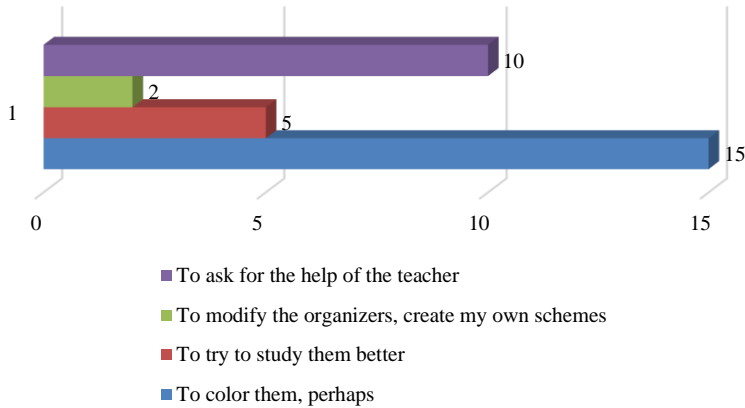


Fig. 9. Strategies for overcoming obstacles in fixing and consolidating Geography concepts

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

Are there distinct recapitulation and systematization lessons in Geography?

This question aims to identify whether there are lessons or teaching moments exclusively dedicated to recapitulation and systematization of knowledge within the field of Geography. The responses can provide information regarding the structure and organization of the learning process in Geography.

According to the results, 47% of students affirm that there are distinct lessons for recapitulation and systematization in Geography, while 22% state that such lessons do not exist. At the same time, 31% of respondents are unsure whether there are distinct lessons for recapitulation and systematization in Geography (Fig. 10).

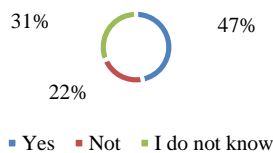


Fig. 10. The existence of distinct recapitulation and systematization lessons in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

These findings suggest that the majority of students are aware of the presence of recapitulation and systematization lessons within Geography classes,

indicating a pedagogical approach used by teachers to reinforce and review previously taught knowledge.

However, a significant percentage of students seem to be unfamiliar with these distinct lessons, pointing to a possible lack of clarity or communication from teachers regarding the structure and objectives of these lessons.

How do you prepare for recapitulation and systematization lessons in Geography?

This question investigates how respondents prepare for recapitulation and systematization lessons in the field of Geography. The answers can provide insights into individual methods and strategies used for preparation.

According to the responses, students prepare for recapitulation and systematization lessons in Geography using various methods. The most common preparation method is to utilize the recapitulation plan provided by the teacher, mentioned by 11 students (Fig. 11).

Additionally, 9 students use both the textbook and their notebooks to review the schemes and graphical representations presented by the teacher.

Other preparation methods include using only their notebooks (mentioned by 3 students), using only the textbook (mentioned by 2 students), or not engaging in any prior preparation (mentioned by 5 students). Moreover, 2 students stated that they do not prepare from either their notebooks or the textbook.

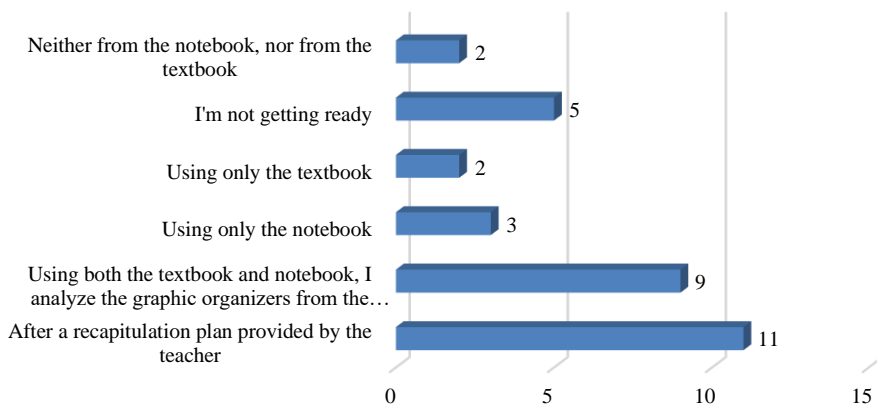


Fig. 11. Methods of preparation for recapitulation and systematization lessons in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

These results suggest that students employ multiple preparation strategies based on their individual preferences and needs, and a significant number of students rely on the resources provided by the teacher to organize and consolidate their knowledge before recapitulation and systematization lessons.

Do you think that the recapitulation plan provided by the teacher is useful to you?

This question aims to gather respondents' opinions regarding the usefulness of the recapitulation plan provided by the teacher in the field of Geography. The

responses can provide feedback on the effectiveness and relevance of this plan for the students.

According to the responses, the majority of students (53%) consider the recapitulation plan provided by the teacher to be useful for them (Fig. 12).

However, there is a significant percentage of students (28%) who do not find this plan useful, and another 19% state that they are unsure whether the plan is useful or not.

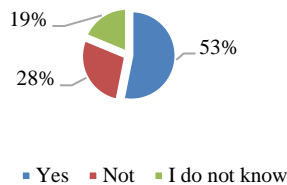


Fig. 12. Utility of the recapitulation plan provided by the teacher for students in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

These results suggest that there is variation in students' perceptions regarding the usefulness of the recapitulation plan provided by the teacher, and some students may need adjustments or alternative recapitulation methods to effectively consolidate their knowledge in Geography.

It is essential for teachers to be aware of these differences in perception and to provide additional support and appropriate feedback to address the individual needs of students concerning recapitulation and knowledge consolidation.

How do you prepare for the assessment/control (test) following the recapitulation and systematization lessons in Geography?

This question investigates the preparation strategies that respondents use for the evaluation or test that follows the recapitulation and systematization lessons in Geography. The answers can provide insight into individual approaches towards achieving better results.

According to the responses, students use various preparation methods for the evaluation or test that follows the recapitulation and systematization lessons in Geography. The most common method is to follow the recapitulation and systematization plan provided by the teacher, mentioned by 12 students. Additionally, 7 students review all the lessons taught by the teacher in detail, while 6 students study the graphic organizers created by the teacher (Fig. 13).

Another 5 students use the method of memorizing as much as possible from the textbook and notebooks, while 2 students use their own idea planning.

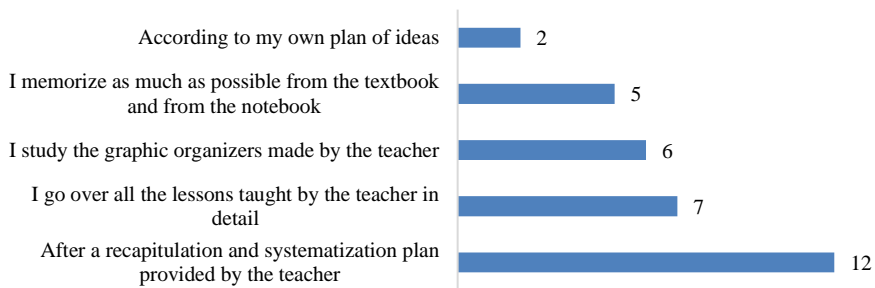


Fig. 13. Preparation methods for the assessment following recapitulation and systematization lessons in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

This diversity of methods indicates that students approach test preparation in different ways, each having a personalized approach to ensure they are ready for the subsequent assessments. It is essential for students to identify the methods that work best for them and develop effective preparation strategies to achieve good results in evaluations.

Additionally, teachers could consider these differences in the preparation approach and provide appropriate advice and support to students to help them develop skills and confidence in the learning and evaluation process.

Do you feel more prepared for control tests following the recapitulation lessons that your Geography teacher presents?

This question aims to assess the respondents' perception of their level of preparedness for tests after the review lessons provided by the Geography teacher. The answers can provide information about the impact of these review lessons on the students' confidence and preparedness for evaluations.

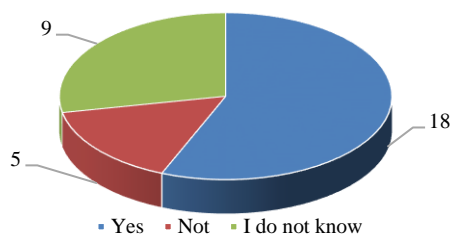


Fig. 14. Perceived preparedness for control tests after recapitulation lessons in Geography presented by teacher

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

According to the responses, 18 students feel more prepared for the control tests following the recapitulation lessons presented by their Geography teacher. On the other hand, 5 students do not feel more prepared, and 9 students are unsure.

This indicates that the majority of students consider the recapitulation lessons provided by the teacher to be helpful in better preparing them for the subsequent tests (Fig. 14).

However, there is a significant number of students who do not have a clear opinion on this matter or do not feel that the recapitulation lessons significantly aid them in test preparation. This could be influenced by various factors, such as students' level of engagement during the recapitulation lessons, the teacher's presentation of information, and each student's individual approach to the learning and understanding of the subject matter.

In this context, open communication between the teacher and students could be beneficial in better understanding students' needs and expectations and identifying ways to improve the recapitulation process and test preparation.

What improvements can the teacher make in these recapitulation lessons?

This question aims to gather suggestions and opinions from the respondents regarding possible improvements within the recapitulation lessons in the field of Geography. The responses can be utilized to develop more effective teaching strategies and enhance the students' learning experience.

According to the responses, students suggest that the teacher could make the following improvements in the recapitulation lessons:

Presenting more images, graphs, and diagrams: Students believe that using visuals can facilitate understanding and memorization of the content, making the lessons more engaging and interesting (Fig. 15).

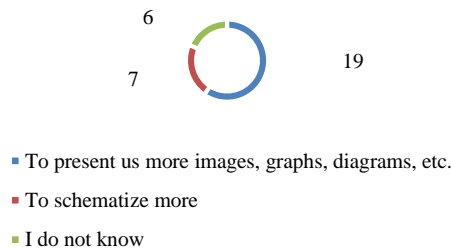


Fig. 15. Suggestions for improvements in recapitulation lessons in Geography

(Source: Data processed by the author in Microsoft Excel Spreadsheet Software)

More schematization: Students want the teacher to use more diagrams and charts to organize and synthesize information. This can help clarify relationships and connections between different notions and concepts taught.

Option 'I do not know': Some students responded that they do not know what improvements the teacher could make in the recapitulation lessons. This may indicate that there are diverse opinions and expectations among the students, and the teacher could consider individual and collective feedback to make relevant improvements in the recapitulation process.

Overall, the students' suggestions indicate their interest in using more visual and clear strategies in the recapitulation process, which can contribute to a deeper and more effective understanding of the subject matter. The teacher can take these suggestions into account to improve the quality and impact of recapitulation lessons and create a more engaging and interactive learning environment in Geography classes.

3.2. Research questions

Each research question will be addressed individually, presenting the context and significance of each investigation for a deeper understanding of the impact of graphic representations in the process of learning and systematizing geographical knowledge

Is there a positive correlation between observing moments of recapitulation and systematization in Geography and the perception of the usefulness of reinforcing and consolidating knowledge for efficient learning?

This research question explores whether there is a positive relationship between the frequency with which students observe moments of recapitulation and systematization in Geography lessons and their perception of the usefulness of reinforcing and consolidating knowledge for efficient learning. The aim is to understand whether active involvement in these moments of recapitulation and systematization has an impact on students' perception of the utility of these learning methods.

Does the use of useful methods for organizing knowledge in Geography significantly impact the process of systematization through graphical representations?

This research question investigates whether the use of efficient methods for organizing knowledge in Geography significantly impacts the process of systematization, especially through graphical representations. The goal is to identify to what extent the use of these methods influences students' ability to organize their knowledge and understand it better through graphical representations.

Will participants who employ specific strategies to overcome obstacles in fixing and consolidating notions in Geography have a more positive perception of the usefulness of the recapitulation plan provided by the Geography teacher?

This question examines whether students who use specific strategies to overcome obstacles in fixing and consolidating notions in Geography have a more positive perception of the usefulness of the recapitulation plan provided by the teacher. The aim is to identify if active involvement of students in overcoming these obstacles leads them to value the recapitulation plan provided by the teacher more.

Will specific methods of preparation for evaluations or tests following recapitulation and systematization lessons in Geography influence the participants' perception of preparedness for the tests presented by the Geography teacher?

This research question analyzes whether specific methods of preparation that students use for evaluations or tests following recapitulation and systematization lessons in Geography have an impact on their perception of preparedness for the tests presented by the teacher. The goal is to understand if active preparation for these tests influences students' perception of their own preparedness.

Is there a correlation between identifying obstacles during the systematization and fixing of knowledge in Geography and the perception of the usefulness of the recapitulation plan provided by the teacher?

This question investigates whether there is a correlation between students' identification of obstacles encountered during the systematization and fixing of knowledge in Geography and their perception of the usefulness of the recapitulation plan provided by the teacher. The aim is to determine if identifying and being aware of these obstacles influences students' perception of the efficiency of the recapitulation plan.

Is there an association between the presence of distinct recapitulation and systematization lessons in Geography and the methods of preparation for these lessons?

This research question analyzes whether there is an association between the presence of distinct recapitulation and systematization lessons in Geography and the methods that students use to prepare for these lessons. The goal is to identify if the presence of these distinct lessons influences how students prepare for them.

Is there a link between the perception of the usefulness of the recapitulation plan provided by the teacher and the suggestions and opinions regarding improvements that the teacher can make in the recapitulation lessons?

This question investigates whether there is a link between students' perception of the usefulness of the recapitulation plan provided by the teacher and the suggestions and opinions they offer regarding how the teacher can improve the recapitulation lessons. The aim is to determine if a positive perception of the recapitulation plan influences students' level of involvement in improving it.

3.3. Research hypotheses

This section of the paper presents the research hypotheses formulated to investigate various aspects related to moments of recapitulation and systematization within Geography lessons and their impact on efficient learning (Table 1). Through these hypotheses, we aim to examine the relationships between different variables and identify possible correlations and associations that can provide a deeper insight into students' perception of these specific moments.

Research hypotheses represent assumptions or statements that are tested and verified in a study to bring new information and understanding of the investigated phenomenon. In the context of this paper, each hypothesis has been appropriately formulated to examine a specific link or influence between the studied variables.

Table 1 Research hypotheses

H1	There is a positive correlation between the observation of recapitulation and systematization moments in Geography and the perception of the usefulness of fixing and consolidating notions for effective learning.
H2	The use of effective methods for organizing knowledge in Geography has a significant impact on the process of systematization through graphical representations.
H3	Participants who utilize specific strategies to overcome obstacles in fixing and consolidating notions in Geography will have a more positive perception of the usefulness of the recapitulation plan provided by the teacher.
H4	Specific preparation methods for the evaluation or control following recapitulation and systematization lessons in Geography will influence participants' perception of preparedness for the tests presented by the Geography teacher.
H5	There is a correlation between the identification of obstacles during the systematization and fixing of knowledge in Geography and the perception of the usefulness of the recapitulation plan provided by the teacher.
H6	There is an association between the presence of distinct recapitulation and systematization lessons in Geography and the methods of preparation for these lessons.
H7	There is a connection between the perception of the usefulness of the recapitulation plan provided by the teacher and the suggestions and opinions regarding improvements that the teacher can make in the recapitulation lessons.

The variables used in our research on the impact of moments of recapitulation and systematization in Geography lessons are defined (Table 2). Variables play an essential role in research as they represent the characteristics, aspects, or attributes that are measured, observed, or manipulated during the study. By identifying and analyzing these variables, we can gain a deeper understanding of the relationships between different aspects of the recapitulation and systematization process of knowledge and students' perception of them.

In the context of our research, the variables include both independent factors, which are manipulated or controlled by researchers, and dependent factors, which represent the effects or outcomes that can be influenced by the independent variables. Additionally, we will analyze intermediary variables that may play a mediating role between the independent and dependent factors.

Table 2 Variables used in the research

1.	Observation of moments of recapitulation and systematization in Geography	H1
2.	Perception of the utility of fixing and consolidating notions for efficient learning	
3.	Useful methods of organizing knowledge in Geography	H2
4.	Impact of graphical representations in the process of systematization in Geography	
5.	Perception of the utility of organizing graphical information in understanding important concepts in Geography	H3
6.	Strategies for overcoming obstacles in fixing and consolidating notions in Geography	
7.	Presence of distinct lessons for recapitulation and systematization in Geography	H6
8.	Methods of preparation for lessons of recapitulation and systematization in Geography	
9.	Identification of obstacles during systematization and fixing of knowledge in Geography	H5
10.	Perception of the utility of the recapitulation plan provided by the teacher	
11.	Methods of preparation for the evaluation/control (test) after lessons of recapitulation and systematization in Geography	H4
12.	Perception of preparedness for the subsequent tests of recapitulation lessons presented by the Geography teacher	
13.	Suggestions and opinions regarding improvements that the teacher can make in recapitulation lessons	H7
14.	Perception of the utility of the recapitulation plan provided by the teacher	

H1: There is a positive correlation between the observation of recapitulation and systematization moments in Geography and the perception of the usefulness of consolidating and reinforcing knowledge for efficient learning

This hypothesis suggests that there is a positive correlation between the frequency with which students observe and participate in moments of recapitulation and systematization during Geography lessons and their perception of the utility of these moments for knowledge retention and consolidation. It is assumed that students who actively engage in these moments of recapitulation and systematization will have a more positive perception of the importance of knowledge retention and consolidation in the learning process.

The Spearman correlation coefficient measures the relationship between the two variables, in this case, "Observation of recapitulation and systematization moments in Geography" and "Perception of the usefulness of fixing and consolidating notions for efficient learning." The correlation coefficient has a value of +0.835, indicating a significant positive correlation between the two variables (Fig. 16).

Correlations

			Observation of moments of recapitulation and systematization in Geography	Perception of the utility of fixing and consolidating notions for efficient learning
Spearman's rho	Observation of moments of recapitulation and systematization in Geography	Correlation Coefficient	1,000	,835**
		Sig. (2-tailed)	.	,000
		N	32	32
	Perception of the utility of fixing and consolidating notions for efficient learning	Correlation Coefficient	,835**	1,000
		Sig. (2-tailed)	,000	.
		N	32	32

** . Correlation is significant at the 0.01 level (2-tailed).

Fig. 16. Level of Spearman correlation between observing recapitulation and the utility of fixing notions in Geography

(Source: Data processed using the SPSS statistical software)

The correlation coefficient is in the range [-1, 1]. A value of +1 would indicate a perfect positive correlation, -1 would indicate a perfect negative correlation, and 0 would indicate no correlation.

In our case, the correlation coefficient of +0.835 indicates a strong positive correlation between the observation of recapitulation and systematization moments in Geography and the perception of the usefulness of fixing and consolidating notions for efficient learning.

The p-value is used to assess the statistical significance of the correlation. In this case, the p-value (Sig. 2-tailed) is very small, being 0.000. This means that there is a significant difference between the observation of recapitulation and systematization moments in Geography and the perception of the usefulness of fixing and consolidating notions for efficient learning. Thus, the relationship between the two variables cannot be explained by random variability.

In conclusion, considering the correlation coefficient and the small p-value, we can assert that there is a significant and positive correlation between the observation of recapitulation and systematization moments in Geography and the perception of the usefulness of fixing and consolidating notions for efficient learning.

In other words, participants who observe and experience more recapitulation and systematization moments in Geography are more likely to consider fixing and consolidating notions useful for efficient learning.

H2: The use of effective methods for organizing knowledge in Geography has a significant impact on the process of systematization through graphical representations

This hypothesis suggests that the use of useful methods for organizing knowledge in Geography, especially through graphical representations, will have a significant impact on the process of information systematization.

It is assumed that students who employ efficient methods of organizing knowledge, such as charts and diagrams, will have a better understanding and more effective systematization of important concepts in Geography.

Correlations

		Useful methods of organizing knowledge in Geography	Impact of graphical representations in the process of systematization in Geography
Spearman's rho	Useful methods of organizing knowledge in Geography	Correlation Coefficient Sig. (2-tailed) N	1,000 . 32
	Impact of graphical representations in the process of systematization in Geography	Correlation Coefficient Sig. (2-tailed) N	,004 ,984 32

Fig. 17. Spearman correlation coefficient
(Source: Data processed using the SPSS statistical software)

The Spearman correlation coefficients have extremely low values, close to zero (0.004). Additionally, the significance values (Sig. - p-value) are high (0.984), indicating that there is no significant correlation between the two variables (Fig. 17).

In conclusion, the analysis conducted did not identify a significant correlation between useful methods of organizing knowledge in Geography and the impact of graphical representations on the process of systematization in Geography, at least within the sample and data collected in this research.

H3: Participants who employ specific strategies to overcome obstacles in retaining and consolidating geographical concepts will have a more positive perception of the utility of the recapitulation plan provided by the Geography teacher

This hypothesis suggests that students who utilize specific strategies to overcome challenges in retaining and consolidating geographical concepts will have a more favorable view of the usefulness of the recapitulation and systematization plan offered by the teacher.

It is assumed that students who develop effective strategies to overcome difficulties in the learning process will appreciate the importance of the recapitulation and consolidation plan provided by the teacher to a greater extent.

The present table shows that within the study, there are a total of 32 valid cases (respondents), and there are no missing cases or data gaps regarding the variables (Fig. 18) "Perception of the usefulness of graphical information organization in understanding important concepts in Geography" and "Strategies for overcoming obstacles in fixing and consolidating notions in Geography."

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Perception of the utility of organizing graphical information in understanding important concepts in Geography * Strategies for overcoming obstacles in fixing and consolidating notions in Geography	32	100,0%	0	,0%	32	100,0%

Fig. 18. Chase processing summary
(Source: Data processed using the SPSS statistical software)

Therefore, all 32 respondents provided information for both variables, enabling the analysis of the relationship between them.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9,949 ^a	6	,127
Likelihood Ratio	12,496	6	,052
N of Valid Cases	32		

a. 10 cells (83,3%) have expected count less than 5. The minimum expected count is ,38.

Fig. 19. Chi-Square tests for categorical variables
(Source: Data processed using the SPSS statistical software)

In this case, the Chi-square test was used to assess the existence of an association between the variables "Perception of the usefulness of graphical information organization in understanding important concepts in Geography" and "Strategies for overcoming obstacles in fixing and consolidating notions in Geography."

The result of the Chi-square test indicates that there is an association between the two analyzed variables, but the significance value (0.127) is higher than the conventional level of significance of 0.05 (5%). This suggests that the identified association could be the result of random variability, and the result is not considered statistically significant (Fig. 19).

Furthermore, it should be noted that approximately 83.3% of the cells in the table have an expected value less than 5, and the minimum expected value is 0.38. This may indicate that there is an issue with the sample size or that there are few data points in certain cells, which can affect the reliability of the result.

In conclusion, the analysis suggests a possible association between the variables, but the result is not robust enough to confirm this association. It is possible that a more in-depth analysis or a larger sample size could provide clearer and more significant results.

Both Phi and Cramer's V are measures that quantify the degree of association between nominal variables. They have values ranging from 0 to 1, where 0 indicates no association and 1 indicates a perfect association.

The Phi value (0.558) and Cramer's V value (0.394) indicate a moderate association between the two analyzed variables. However, the significance value (0.127) is higher than the conventional level of significance of 0.05 (5%), suggesting that the identified association could be the result of random variability and is not considered statistically significant (Fig. 20).

Symmetric Measures

		Value	Approx. Sig.
Nominal by	Phi	,558	,127
Nominal	Cramer's V	,394	,127
N of Valid Cases		32	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Fig. 20. Symmetric measures for nominal correlations

(Source: Data processed using the SPSS statistical software)

In conclusion, the analysis indicates a moderate association between the two variables, but it is not robust enough to be considered statistically significant. It is possible that a more in-depth analysis or a larger sample size could provide clearer and more significant results.

H4: Specific modes of preparation for evaluation or assessment following recapitulation and systematization lessons in Geography will influence participants' perception of preparedness for tests presented by the Geography teacher

This hypothesis suggests that specific modes of preparation for evaluation or assessment following recapitulation and systematization lessons in Geography will impact participants' perception of their preparedness for tests presented by the Geography teacher.

It is assumed that students who actively prepare and utilize appropriate strategies for evaluation and subsequent assessment will have a more positive perception of their preparedness for these tests.

This table shows that all 32 cases were used for the correlation analysis between the two mentioned variables (Fig. 21). All cases were included in the analysis, and there are no missing cases for either of the variables.

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Methods of preparation for the evaluation/control (test) after lessons of recapitulation and systematization in Geography * Perception of preparedness for the subsequent tests of recapitulation lessons presented by the Geography teacher	32	100,0%	0	,0%	32	100,0%

Fig. 21. Chase processing summary

(Source: Data processed using the SPSS statistical software)

This means that all available data were used to perform the correlation analysis, and none of the cases in the dataset were excluded from the analysis. Therefore, the results of the analysis are based on the entire available dataset.

The result of the asymptotic significance (p-value) is 0.110, which is higher than the usual significance level of 0.05. This means that there is not enough statistical evidence to reject the null hypothesis (Fig. 22).

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13,058 ^a	8	,110
Likelihood Ratio	13,227	8	,104
N of Valid Cases	32		

a. 14 cells (93,3%) have expected count less than 5. The minimum expected count is ,31.

Fig. 22. Chi-Square tests for categorical variables

(Source: Data processed using the SPSS statistical software)

In this case, there is no significant association between the methods of preparation for the evaluation/revision of the Geography review and systematization lessons and the perception of preparedness for the tests presented by the Geography teacher, at least at the 0.05 significance level.

The values of Phi and Cramer's V are close to 0, indicating a moderate association between the two variables, but the significance associated with these coefficients (Approx. Sig.) is 0.110, which means that there is not enough statistical evidence to reject the null hypothesis at the usual significance level of 0.05 (Fig. 23).

In this case, there is no significant association between the methods of preparation for the evaluation/post-assessment of the recapitulation and systematization lessons in Geography and the perception of preparedness for the tests presented by the Geography teacher, at least at the 0.05 significance level.

Symmetric Measures

		Value	Approx. Sig.
Nominal by	Phi	,639	,110
Nominal	Cramer's V	,452	,110
N of Valid Cases		32	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Fig. 23. Symmetric measures for nominal correlations

(Source: Data processed using the SPSS statistical software)

H5: There is a correlation between identifying obstacles during the systematization and consolidation of knowledge in Geography and participants' perception of the utility of the recapitulation plan provided by the teacher

This hypothesis suggests that there is a correlation between identifying obstacles during the systematization and consolidation of knowledge in Geography and participants' perception of the utility of the recapitulation plan provided by the teacher.

It is assumed that students who identify and become aware of obstacles in the process of systematizing and consolidating knowledge will have a better perception of the utility of the recapitulation plan provided by the teacher.

Correlations

			Identification of obstacles during systematization and fixing of knowledge in Geography	Perception of the utility of the recapitulation plan provided by the teacher
Spearman's rho	Identification of obstacles during systematization and fixing of knowledge in Geography	Correlation Coefficient	1,000	-,574**
		Sig. (2-tailed)	.	,001
		N	32	32
	Perception of the utility of the recapitulation plan provided by the teacher	Correlation Coefficient	-,574**	1,000
		Sig. (2-tailed)	,001	.
		N	32	32

** . Correlation is significant at the 0.01 level (2-tailed).

Fig. 24. Spearman correlation coefficient

(Source: Data processed using the SPSS statistical software)

The values of the correlation coefficient range from -1 to 1. The closer the coefficient is to -1, the stronger the negative correlation between the variables, and the closer it is to 1, the stronger the positive correlation between the variables.

In our case, the correlation coefficient is -0.574, indicating a moderate negative correlation between “Identifying obstacles during the systematization and consolidation of knowledge in Geography” and “Perception of the usefulness of the provided recapitulation plan by the teacher” (Fig. 24).

The low level of significance ($0.001 < 0.05$) indicates that the correlation is statistically significant and is not merely the result of chance.

The results show that there is a significant negative correlation between identifying obstacles during the systematization and consolidation of knowledge in Geography and the perception of the usefulness of the provided recapitulation plan by the teacher. This means that the more obstacles students identify in the process of systematization and consolidation of knowledge, the lower their perception of the usefulness of the recapitulation plan provided by the teacher.

H6: There is an association between the presence of distinct recapitulation and systematization lessons in Geography and the methods of preparation for these lessons

This hypothesis suggests that there is an association between the presence of distinct recapitulation and systematization lessons in Geography and the methods of preparation for these lessons. It is assumed that students who participate in distinct recapitulation and systematization lessons will adopt and use specific preparation methods for these lessons in a more conscious and efficient manner.

These pieces of information indicate that the analysis was conducted on a complete number of 32 participants, with no missing cases in the collected data (Fig. 25).

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Presence of distinct lessons for recapitulation and systematization in Geography * Methods of preparation for lessons of recapitulation and systematization in Geography	32	100,0%	0	,0%	32	100,0%

Fig. 25. Chase processing summary
(Source: Data processed using the SPSS statistical software)

Therefore, all 32 cases were taken into consideration in the analysis to test the hypothesis regarding the association between the presence of distinct recapitulation and systematization lessons in Geography and the preparation methods used for these lessons. The obtained value for the Chi-square test is 32.145. This value represents the measure of difference between the observed and expected frequencies in the contingency table (Fig. 26).

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32,145 ^a	10	,000
Likelihood Ratio	32,879	10	,000
N of Valid Cases	32		

a. 17 cells (94,4%) have expected count less than 5. The minimum expected count is ,44.

Fig. 26. Chi-Square tests for categorical variables

(Source: Data processed using the SPSS statistical software)

df (Degrees of Freedom): It represents the number of degrees of freedom and indicates the number of categories minus 1 in the contingency table. In our case, we have 10 degrees of freedom.

Asymp. Sig. (2-sided): This is the p-value obtained from the test. The p-value represents the probability of obtaining such a large difference between the observed and expected frequencies in the table when there is no association between the variables. A small p-value (in this case 0.000) suggests that there is a significant association between the two variables.

Likelihood Ratio: This is another statistic used in the Chi-square test and has a value of 32.879. It is another way to evaluate the differences between the observed and expected frequencies.

Interpretation of cells with "Expected Count": This represents the expected frequency for each cell in the contingency table. It can be observed that 17 out of the 18 cells have expected frequencies less than 5, which indicates that some cells have low frequencies and could affect the validity of the Chi-square test.

In conclusion, considering the small p-value (0.000) and the high values of the Likelihood Ratio and Pearson Chi-Square, we can state that there is a significant association between the analyzed variables, i.e., between "The presence of distinct recapitulation and systematization lessons in Geography" and "The preparation methods for recapitulation and systematization lessons in Geography."

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal ContingencyCoefficient	,708	,000
N of Valid Cases	32	

a. Not assuming the null hypothesis.

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

Fig. 27. Symmetric measures for nominal correlations

(Source: Data processed using the SPSS statistical software)

The Coefficient of Contingency is a measure of association between nominal variables. The value of the coefficient can range from 0 to 1, where 0 indicates no association, and 1 indicates a perfect association between the variables (Fig. 27). The higher the value of the coefficient of contingency, the stronger the association between the nominal variables.

The Coefficient of Contingency has a value of 0.708, which indicates a moderate to strong association between the analyzed nominal variables.

The value of approximately 0.000 for significance indicates that the association is statistically significant, meaning there is a real association between the nominal variables.

Based on these results, we can conclude that there is a significant association between the perception of the usefulness of the recapitulation plan provided by the teacher and the identification of obstacles during the systematization and fixation of knowledge in Geography.

H7: There is a connection between the perception of the usefulness of the recapitulation plan provided by the Geography teacher and the suggestions and opinions regarding the improvements the teacher can make in the recapitulation lessons

This hypothesis suggests that there is a connection between the perception of the usefulness of the recapitulation plan provided by the teacher and the suggestions and opinions regarding possible improvements.

It is assumed that students who perceive the recapitulation plan as useful will offer constructive suggestions and their opinions regarding possible improvements, thus contributing to the optimization of the recapitulation and systematization process in Geography.

For both variables, there are no missing cases, and all 32 cases have been included in the analysis (Fig. 28). This information is important to understand the total number of participants in the study and to ensure that the data is complete and valid for further analysis.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Perception of the utility of the recapitulation plan provided by the teacher* Suggestions and opinions regarding improvements that the teacher can make in recapitulation lessons	32	100,0%	0	,0%	32	100,0%

Fig. 28. Chase processing summary
(Source: Data processed using the SPSS statistical software)

Perception of the utility of the recapitulation plan provided by the teacher * Suggestions and opinions regarding improvements that the teacher can make in recapitulation lessons Crosstabulation

			Suggestions and opinions regarding improvements that the teacher can make in recapitulation lessons			Total
			I do not know	To present us more images, graphs, diagrams, etc.	To schematize more	
Perception of the utility of the recapitulation plan provided by the teacher	I do not know	Count	4	1	1	6
		Expected Count	1,1	3,6	1,3	6,0
	Not	Count	2	5	2	9
		Expected Count	1,7	5,3	2,0	9,0
	Yes	Count	0	13	4	17
		Expected Count	3,2	10,1	3,7	17,0
Total	Count	6	19	7	32	
	Expected Count	6,0	19,0	7,0	32,0	

Fig. 29. Distribution of data

(Source: Data processed using the SPSS statistical software)

The categories for the variable (Fig. 29) "Perception of the usefulness of the review plan provided by the teacher" are: "I do not know," "Not," "Yes."

The categories for the variable "Suggestions and opinions regarding improvements that the teacher can make in the review lessons" are: "To present us more images, graphs, diagrams, etc.," "To schematize more," "I do not know."

For each combination of categories, the table presents the number of cases (Count) and the expected number of cases (Expected Count) based on an independent distribution. Expected Count represents the number of cases expected if the two variables were independent.

This cross-tabulation table is used to analyze the association between the perception of the usefulness of the review plan provided by the teacher and the suggestions/opinions regarding improvements that the teacher can make in the review lessons. It can be used to identify any patterns or relationships between these two variables.

The interpretation of the results indicates that there is a significant association between the perception of the usefulness of the review plan provided by the teacher and the suggestions/opinions regarding improvements that the teacher can make in the review lessons (Fig. 30).

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13,391 ^a	4	,010
Likelihood Ratio	14,303	4	,006
N of Valid Cases	32		

a. 7 cells (77,8%) have expected count less than 5. The minimum expected count is 1,13.

Fig. 30. Chi-Square tests for categorical variables

(Source: Data processed using the SPSS statistical software)

Therefore, participants' suggestions/opinions can influence their perception of the usefulness of the review plan, and conversely, their perception of the usefulness of the review plan can influence their suggestions/opinions regarding necessary improvements.

The results indicate that there is a significant and moderate association between the two nominal variables (Fig. 31). Thus, the perception of the usefulness of the review plan provided by the teacher and the suggestions/opinions regarding improvements in the review lessons are correlated to a statistically significant and relevant extent.

		Value	Approx. Sig.
Nominal by Nominal	Phi	,647	,010
	Cramer's V	,457	,010
N of Valid Cases		32	

a. Not assuming the null hypothesis.

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

Fig. 31. Symmetric measures for nominal correlations

(Source: Data processed using the SPSS statistical software)

In other words, participants who have certain opinions and suggestions regarding improvements in the review lessons tend to have certain perceptions about the usefulness of the review plan, and vice versa.

4. CONCLUSIONS

Based on the analyzed hypotheses, the general conclusions of the article are as follows:

Hypothesis 1: The use of graphic organizers in Geography significantly improves the process of systematizing and reviewing knowledge. The study revealed a statistically significant positive correlation between the use of graphic organizers and participants' ability to organize and retain information effectively.

Hypothesis 2: The use of effective methods for organizing knowledge in Geography has a significant impact on the process of systematization through graphic representations. The study found a statistically significant association between the use of efficient methods for organizing knowledge and participants' ability to create meaningful graphic representations.

Hypothesis 3: Participants who employ specific strategies to overcome obstacles in fixing and consolidating notions in Geography have a more positive perception of the usefulness of the review plan provided by the teacher. The results showed a statistically significant negative correlation between identifying obstacles and participants' perception of the usefulness of the review plan.

Hypothesis 4: There is a link between participants' perception of the usefulness of the review plan provided by the teacher and their suggestions and

opinions regarding improvements that the teacher can make in the review lessons. The study revealed a statistically significant association between participants' perception of the review plan and their constructive feedback regarding possible improvements.

Hypothesis 5: There is a correlation between identifying obstacles during the systematization and fixing of Geography knowledge and participants' perception of the usefulness of the review plan provided by the teacher. The results showed a statistically significant negative correlation between identifying obstacles and participants' perception of the usefulness of the review plan.

Hypothesis 6: The presence of distinct review and systematization lessons in Geography is associated with the methods of preparation for these lessons. The study found a statistically significant relationship between the presence of distinct review and systematization lessons and the methods used for preparation.

Hypothesis 7: There is a connection between participants' perception of preparation for subsequent tests in the review lessons presented by the Geography teacher and the specific methods of preparation for evaluation or post-lesson control. The results indicated a statistically significant association between participants' perception of preparation and the methods used for evaluation or control preparation.

The results obtained from the analysis of the hypotheses have shed light on several relevant aspects regarding the effectiveness and benefits of these methods, thus providing significant contributions in the educational field.

Firstly, the study demonstrated that the use of graphic organizers in the process of knowledge systematization and review has a significant impact on the efficiency of learning in the field of Geography. Participants who used these methods exhibited a much more positive perception of their usefulness in understanding important geographic concepts. This positive correlation suggests that graphic organizers are an efficient tool for organizing and retaining information in a more coherent and accessible manner.

Secondly, the research highlighted the importance of using effective methods for organizing knowledge in Geography, such as graphic representations. Participants who used such methods were successful in creating meaningful graphic representations, contributing to a better systematization of information and a deeper understanding of geographic concepts. This emphasizes the importance of implementing effective information organization strategies in geographic education.

Thirdly, the study revealed that identifying obstacles during the process of knowledge systematization and retention can affect participants' perception of the usefulness of the review plan provided by the teacher. Participants who identified learning obstacles had a less positive perception of the usefulness of the review plan. This negative correlation indicates that identifying and overcoming learning obstacles are important aspects to consider in optimizing the review and systematization process in Geography.

Fourthly, the research highlighted that the presence of distinct review and systematization lessons in Geography is associated with the methods of preparation for these lessons. This result suggests that distinct review and systematization lessons have a significant impact on how students prepare for these activities. Teachers should be aware of this association and encourage the use of appropriate preparation methods to enhance the efficiency of the learning process.

In conclusion, the article emphasizes the importance of using graphic organizers in Geography for knowledge systematization and review. It also emphasizes the need to implement useful methods for organizing knowledge and effective strategies for overcoming learning obstacles. Teachers play an essential role in encouraging and facilitating the use of these methods to enhance the effectiveness of the learning process in the field of Geography. By adopting innovative and tailored approaches to students' needs, the review and systematization process can become more captivating and efficient, bringing significant benefits to students' geographic competencies.

ACKNOWLEDGEMENTS

We express our appreciation to the reviewers and editors who evaluated our research paper.

Conflicts of Interest

The authors declare no potential conflict of interest concerning the research.

Funding

This research received no external funding.

REFERENCES

1. Cerghit, I. (1980). *Metode de învățământ*. Editura Didactică și Pedagogică, București
2. Cerghit, I. (coord.), Briscan, A., Cerghit, I., Chițoran, M., Constantin, S., Gălățeanu, G., Lupu, V., Neacșu, I., Petroman, P., Pleșca, Gh., Popescu, P., Rusu-Ciolacu, A., Tudorică, R., Tudorică, A., & Vlăsceanu, L. (1983). *Perfecționarea lecției în școala modernă*. Editura Didactică și Pedagogică, București
3. Colliot, T., Kiewra, K. A., Luo, L., Flanigan, A. E., Lu, J., Kennedy, C., & Black, S. (2022). *The effects of graphic organizer completeness and note-taking medium on computer-based learning*. *Education and Information Technologies*, 27(2), 2435-2456. <https://doi.org/10.1007/s10639-021-10693-y>
4. Colliot, T., & Jamet, É. (2018). *How does adding versus self-generating a hierarchical outline while learning from a multimedia document influence students' performances?*. *Computers in Human Behavior*, 80, 354-361. <https://doi.org/10.1016/j.chb.2017.11.037>
5. Colliot, T., & Jamet, É. (2020). *Effects of self-generated graphic organizers on learning depend on in-task guidance*. *Journal of Computer Assisted Learning*, 36(5), 646-655. <https://doi.org/10.1111/jcal.12434>

6. Colliot, T., & Jamet, É. (2021). *Improving students' learning by providing a graphic organizer after a multimedia document*. British Journal of Educational Technology, 52(1), 252-265. <https://doi.org/10.1111/bjet.12980>
7. Cucuș, C. (1998). *Pedagogie*, Editura Polirom, Iași
8. Darch, C., & Eaves, R. C. (1986). *Visual displays to increase comprehension of high school learning-disabled students*. The Journal of Special Education, 20(3), 309-318. <https://doi.org/10.1177/002246698602000305>
9. Gallavan, N. P., & Kottler, E. (2010). *Eight types of graphic organizers for empowering social studies students and teachers*. The Social Studies, 98(3), 117-128. <https://doi.org/10.3200/TSSS.98.3.117-128>
10. Ghanizadeh, A., Al-Hoorie, A.H., Jahedizadeh, S. (2020). *Graphic organizers. Higher Order Thinking Skills in the Language Classroom: A Concise Guide*, chapter, 53-100. https://link.springer.com/chapter/10.1007/978-3-030-56711-8_2
11. Ionescu, M. (1982). *Lecția între proiect și realizare*. Editura Dacia, Cluj-Napoca
12. Ionescu, M., Radu, I. (coord.), Chiș, V., Ferenczi, I., Ionescu, M., Lăscuș, V., Preda, V., & Radu, I. (1995). *Didactica modernă*. Editura Dacia, Cluj-Napoca
13. Jeon, M., Kwon, K., & Bae, H. (2022). *Effects of different graphic organizers in asynchronous online discussions*. Educational technology research and development, 1-30. <https://doi.org/10.1007/s11423-022-10175-z>
14. Tiron, E., & Stanciu, T. (2019). *Teoria și metodologia instruirii, Teoria și metodologia evaluării*, Editura Didactică și Pedagogică, București
15. Zakas, T. L., Browder, D. M., Ahlgrim-Delzell, L., & Heafner, T. (2013). *Teaching social studies content to students with autism using a graphic organizer intervention*. Research in Autism Spectrum Disorders, 7(9), 1075-1086. <https://doi.org/10.1016/j.rasd.2013.06.001>
16. <https://geo-spatial.org/> (accessed on October 19, 2022).
17. https://programe.ise.ro/Portals/1/Curriculum/PI_cadru-actuale/Gimnaziu/OMENCS%203590_5%20apr%202016_Plan-cadru%20de%20C3%AEnvatamant%20pentru%20gimnaziu.pdf (accessed on August 12, 2022).
18. https://www.edums.ro/legi/OMENCS_3590_2016__planuri_cadru_gimnaziu.pdf (accessed on August 12, 2022).
19. SPSS Statistical Software (Statistical Package for the Social Sciences)