



SWOT ANALYSIS AS A TOOL FOR INVESTIGATING STUDENTS' ANALYTICAL AND CRITICAL THINKING AND ARGUMENTATION IN GEOGRAPHY

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ABSTRACT

The aim of this study is to analyze the level of development of students' analytical, critical, and evaluative thinking in the context of conducting a SWOT analysis in geography and to investigate the extent to which the use of a tabular support influences their performance. A total of 101 tenth-grade students participated in the research and were assigned to two experimental groups: GE1 (N = 51) and GE2 (N = 50). Each student was asked to select one county and, based on the tables and texts, to perform a SWOT analysis of the population in that county. Students in GE1 were given a table in which they were required to present, in written form, two strengths and two weaknesses of the population, as well as two opportunities and two threats (the latter referring to external factors). A SWOT-based assessment task was administered and evaluated using a scoring rubric. The results of this study indicate a low level of development of students' analytical, critical, and evaluative thinking in the context of a SWOT analysis task. Most students experienced significant difficulties, particularly in argumentation, highlighting the need for systematic cognitive training. Although the use of tabular support facilitated response organization to some extent, it did not lead to significant differences in overall performance, suggesting that the development of higher-order thinking cannot be achieved through isolated interventions but requires coherent and sustained instructional efforts throughout geography education. Overall, the study underscores the importance of explicitly integrating critical thinking activities into geography teaching, as well as adopting an instructional approach centered on guidance, reflection, and argumentation.

Keywords: *geographical thinking, demographic data, high school education, competence, relational thinking*

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INTRODUCTION

SWOT analysis is grounded in analytical thinking, considered a higher-order cognitive thinking skill (Anderson & Krathwohl, 2001). Analysis is an essential operation of thinking through which a construct of information – an “whole” – is mentally decomposed into its components, revealing its internal structure (Golu, 2007), establishing the properties of both the whole and its components (Zlate, 1999), as well as the interactions among components (Golu, 2007). Sensory analysis is performed on concrete materials, while abstract analysis is carried out at the level of thinking, on “mental objects” (Zlate, 1999). Analysis involves reference to certain criteria, a standard, an abstract mental model, or a physical model (Golu, 2007), and therefore implies comparison. It proceeds from complex to simple, from effect to cause, and from general to particular (Romanian Academy, 2009, 2010).

Analysis targets three subcategories – elements, relationships, and organizational principles (Krathwohl, 2002) – and three categories of cognitive processes – differentiating, organizing, and



attributing (Anderson & Krathwohl, 2001; Krathwohl, 2002). In some studies, analysis is described as a competence (Dulamă, 2009, 2010; Perdana & Rosana, 2019) aimed at examining aspects of reality such as landscapes (Ilovan et al., 2019; Rus et al., 2019; Rus et al., 2020), cities (Ilovan et al., 2018), or the content of visual representations, such as photographs (Antal et al., 2020; Magdaş et al., 2018), maps (Dulamă, 2014; Dulamă & Ilovan, 2016), and diagrams (Osaci-Costache et al., 2013).

In geography, SWOT analysis is used to identify the strengths and weaknesses of a space, as well as external factors or influences, namely opportunities and threats (Dulamă, 2008). Strengths have a positive character, while weaknesses have a negative one, whereas opportunities represent factors or conditions with potential beneficial impact, and threats may have a negative impact (Vincze, 2000). Cîineanu (2026) emphasizes that analysis requires the use of prior knowledge that underpins reasoning and that, through critical thinking, essential characteristics are identified.

SWOT analysis requires the use of critical thinking, that is, the accurate evaluation of statements: understanding the meaning of statements; assessing ambiguity in reasoning, the credibility of observations, the justification of conclusions, the adequacy of definitions, and contradictions; judging deduction, clarity of statements, the application of principles, problem identification, and assumptions (Ennis, 1962). In geography education research, there is no uniformity in the conceptualization of critical thinking; therefore, challenges arise in its development, measurement, and transfer (Bendl & Marada, 2021). This diversity is reflected in the existence of multiple perspectives and models of critical thinking (Facione, 2011; Fisher, 2011; Halpern, 2010; Hughes & Lavery, 2008; Martincová, 2018; Watson, 2010), which share common elements but also present differences.

In Romania, geographers have used SWOT analysis (Dulamă, 2005a) to study local communities (Cîineanu et al., 2020), cities (Voitovici, 2000), rural populations from a sustainable development perspective (Dulamă, 2005a), regions, countries, and continents (Dulamă, 2002; Pandia & Fischer, 2006), Romania's integration into the European Union (Dulamă & Ilovan, 2004), and to identify strengths and weaknesses of peoples (Dulamă, 2004b). Studies also warn about the risk of confusing strengths with opportunities or weaknesses with threats (Dulamă, 2004c). They propose ways to capitalize on strengths and opportunities and to counteract weaknesses and threats (Voitovici, 2000).

SWOT analysis is recommended for the development of critical thinking (Dulamă, 2004b), alongside expository methods (Dulamă, 2004a) and conversational approaches (Dulamă, 2004d). Research provides examples of learning activities that foster critical thinking: analyzing and interpreting maps (Dulamă & Ilovan, 2006) and diagrams (Dulamă, 2007); identifying important natural and human geographical elements, notable places and personalities, and well-known companies in different countries for representation in posters (Dulamă & Ilovan, 2009); identifying social prejudices among rural inhabitants (Dulamă, 2005a); recognizing favorable or unfavorable rural environmental characteristics for sustainable development (Dulamă, 2005a); and identifying natural and human factors that negatively affect the rural environment in the students' home locality (Dulamă, 2005a). Other studies present methods for critically analyzing information from newspapers related to environmental issues (xerophytization and desertification) and economic topics (viticulture, wine industry, and grain utilization) (Dulamă, 2005b). Critical thinking is approached from a constructivist perspective (Dulamă, 2008), being based on analysis, comparison, quantitative and qualitative evaluation, and classification, followed by argumentation (Dulamă, 2005b), prediction, and the identification of solutions.

The aim of this study is to analyze the level of development of students' analytical, critical, and evaluative thinking in the context of conducting a SWOT analysis in geography and to investigate the extent to which the use of a tabular support influences their performance. The study seeks to answer the following research questions:

- Q1. What is the level of students' performance in conducting a SWOT analysis of the population of a county?
- Q2. Are there differences between students who benefit from tabular support and those who do not?
- Q3. To what extent are students able to formulate arguments for the ideas identified in the SWOT analysis?
- Q4. What are the main difficulties encountered by students in completing the task?



METHODOLOGY

Participants

The study was conducted during September-October of the 2025–2026 school year at the Colegiul Național Nicolae Bălcescu in Brăila, Brăila County. A total of 101 tenth-grade students participated in the research and were assigned to two experimental groups: GE1 (N = 51) and GE2 (N = 50).

Research Design

The study employed a two-group design consisting of: pre-test – formative intervention 1 – post-test – formative intervention 2 – SWOT-based assessment task. These activities were carried out over a period of three weeks. This type of research design allows for the evaluation of changes in students' performance as a result of educational interventions, by comparing their results before and after the implementation of these interventions.

Procedure

In the first week, during the pre-test, students in both groups were asked to analyze data from seven demographic tables and to concisely present, in written form, the essential aspects of the demographic structure of the population in the counties of Maramureș and Constanța, using data from each table. Students were instructed to include all information related to one table in a single paragraph and to indicate the table number at the end of each paragraph (e.g., Table 1). The task duration was 50 minutes (Cîineanu, 2026).

On the following day, during formative intervention 1, students in both groups were provided with the same tables and, additionally, with model texts corresponding to each table (as required in the pre-test). Based on these materials, students in GE1 were asked to complete seven pre-structured tree-type graphic organizers. Students in GE2 were asked to analyze the same tables, read the texts, and examine how the information was structured in order to subsequently present essential aspects of the demographic structure of populations in other territorial units. The task duration was 50 minutes (Cîineanu, 2026).

On the third day, during the post-test, students in both groups were asked to analyze seven new tables containing demographic data on the counties of Mureș and Gorj and to write one paragraph for each table. The task duration was 50 minutes. The research conducted in the first week (pre-test – formative intervention 1 – post-test) is presented in the doctoral thesis entitled “The Use of Graphic Organizers in the Development of Geographical Thinking” (Cîineanu, 2026).

In the third week, during formative intervention 2, students in both groups were provided with demographic data tables for four counties. Each student was asked to select one county and, based on the tables and texts, to perform a SWOT analysis of the population in that county. Students in GE1 were given a table in which they were required to present, in written form, two strengths and two weaknesses of the population, as well as two opportunities and two threats (the latter referring to external factors) (Table 1). For each element, students were required to provide a supporting argument. Students in GE2 received the same task but without the support of the table. The task duration was 50 minutes.

In the fourth week, a SWOT-based assessment task was administered and evaluated using a scoring rubric. Students in both groups were asked to conduct a SWOT analysis of the population in Constanța County based on the provided tables and texts. They were required to identify and record two strengths, two weaknesses, two opportunities, and two threats (external factors), and to provide an argument for each item.

Instruments

The study used two tests and one SWOT-based assessment task, all developed by the author. The pre-test and post-test consisted of seven items requiring students to produce seven short texts presenting essential aspects of the demographic structure of the population in four counties, based on data from seven tables. The maximum score for each test was 20 points: 10 points for analytical thinking and 10 points for comparative thinking. One point was awarded by default. Scores were calculated individually for each student and for each test.



The SWOT-based assessment task consisted of two components: (1) identification of strengths, weaknesses, opportunities, and threats, and (2) argumentation. One point was awarded for each correctly identified element (2 points × 4 categories = 8 points) and one point for each valid argument (2 × 4 = 8 points), including acceptable answers not explicitly listed in the scoring rubric. No points were awarded by default. The maximum score was 16 points. The scoring rubric was developed based on predefined responses and evaluation criteria (relevance, accuracy, and coherence of argumentation).

Table 1

The table provided to students in GE1 to be completed in formative intervention no. 2

Strengths 1. 2.	Arguments 1. 2.
Weaknesses 1. 2.	Arguments 1. 2.
Opportunities 1. 2.	Arguments 1. 2.
Threats 1. 2.	Arguments 1. 2.

Table 2

Possible solutions to the SWOT analysis-based assessment test

	<i>Possible answers</i>	<i>Possible arguments</i>
Strengths	Mostly adult population (58.9%)	- high potential for the workforce, for the local economy and services
	Significant ethnic diversity (8 other ethnicities)	- diversity in gastronomy, traditions, customs potential/attraction for tourism - can favor international relations, cultural exchanges, cross-border projects
	Linguistic diversity	- some know several languages
	Religious diversity	- mosques + churches, different rituals, cultural events and festivals potential/attraction for tourism
Weaknesses	High proportion of elderly population (20.1%)	- increase in pension spending - increase in health spending - decrease in labor force potential
	High concentration of population in urban areas (69%)	- depopulation of rural settlements - decrease in labor force potential in rural areas (agriculture and local services) - increase in housing needs in urban areas - increase in job needs in urban areas - congestion/high traffic
	Ethnic diversity	- there may be interethnic conflicts, segregation
	Linguistic diversity	- can generate problems in communication between people of different ethnicities - schools and classes established on linguistic criteria – increase in schooling expenses (teachers, textbooks, small student numbers)
	Religious diversity	- can generate problems regarding interethnic marriages
Opportunities	Tourists	- increase in income - increase in the number of jobs
	Foreign investors	- increase in income - increase in the number of jobs
Threats	Tourists	- noise pollution, air pollution (cars), environmental pollution (waste) - congestion (people) - heavy traffic (cars)
	Foreign investors	- risk for dangerous enterprises (pollution, unprofitable enterprises)
	Foreign delinquents	- increase in the number of illegal acts (begging, theft, drug dealing)



Data Analysis

The data obtained from the SWOT-based assessment task were statistically processed using both descriptive and inferential methods. Descriptive indicators of score distribution (minimum score, maximum score, mean, and median) were calculated, along with the frequency of scores across performance intervals (0-4, 5-8, 9-12, 13-16 points), in order to highlight the overall level of student performance. To compare the results of the two groups, differences between total scores were analyzed using the nonparametric Mann-Whitney U test. Mean scores were calculated for each component of the SWOT analysis (strengths, weaknesses, opportunities, and threats), as well as for the corresponding arguments, both at the level of the entire sample and comparatively between GE1 and GE2. In addition, the ratio between identified ideas and formulated arguments was analyzed in order to assess the level of development of students' analytical and critical thinking.

RESULTS

The scores obtained by students on the SWOT-based assessment task ranged from 0 to 12 points, out of a maximum possible score of 16. The mean score was 3.47, and the median was 3, indicating a concentration of results in the lower range of the scale. The distribution of scores shows that the majority of students (71.3%) achieved scores between 0 and 4 points, corresponding to a very low level of performance (Table 3). A total of 22.8% of students were at a low level (5-8 points), and only 5.9% reached a medium level (9-12 points). No student achieved scores corresponding to a high level (13-16 points).

The comparison of results between the two experimental groups reveals descriptive differences in score distribution (Table 3). In GE1, which benefited from tabular support, the proportion of students at a very low level was lower (64.7%) compared to GE2 (78%). GE1 also shows a higher proportion of students who achieved scores in the 5-8 and 9-12 intervals. However, inferential analysis using the Mann-Whitney U test did not reveal statistically significant differences between the two groups ($U = 318.5$, $p = 1.00$).

A detailed analysis of the components of the SWOT-based assessment task highlights important differences across types of requirements (Table 2). Students obtained slightly higher scores for identifying strengths ($M = 0.52$) and weaknesses ($M = 0.59$), compared to identifying opportunities ($M = 0.40$) and threats ($M = 0.37$). The lowest values were recorded for argumentation, particularly for threats ($M = 0.30$) and opportunities ($M = 0.35$).

The comparison by components between the two groups (Table 4) shows that students in GE1 performed slightly better in formulating arguments for strengths and weaknesses, while students in GE2 obtained slightly higher values for identifying and arguing opportunities. However, these differences are small, suggesting a limited impact of tabular support on performance across specific components. Overall, the results indicate significant difficulties among students both in identifying the elements of a SWOT analysis and, especially, in formulating arguments, reflecting a low level of development of analytical and critical (evaluative) thinking.

Table 3

Distribution of scores by performance levels

Score range	Performance level	Total (N=101)		GE ¹ (N=51)		GE ² (N=50)	
		Frequency	%	Frequency	%	Frequency	%
0-4	Very low	72	71,3	33	64,7	39	78
5-8	Low	23	22,8	14	27,5	9	18
9-12	Average	6	5,9	4	7,8	2	4
13-16	High	0	0	0	0	0	0



Table 4

Averages on SWOT task components, by groups

Components	Medii (M)						
	Total	GE ¹	GE ²	Arguments	Total	GE ¹	GE ²
Strengths (S)	0,52	0,51	0,53	S	0,45	0,50	0,41
Weaknesses (W)	0,59	0,61	0,57	W	0,48	0,63	0,55
Opportunities (O)	0,40	0,38	0,42	O	0,35	0,33	0,37
Threats (T)	0,37	0,39	0,35	T	0,30	0,32	0,29

DISCUSSION AND CONCLUSIONS

Students' Performance in Conducting a SWOT Analysis

The results highlight significant difficulties encountered by students in conducting a SWOT analysis, with the majority performing at a very low level. These findings can be explained by the high level of difficulty of the task from a geographical perspective, as students need prior knowledge and geographical thinking skills to determine whether a characteristic of the population represents a strength or a weakness, and whether an external factor constitutes an opportunity or a threat. Bendl and Marada (2021) emphasize that critical thinking is context-specific and closely related to content or subject matter.

In this study, students analyzed and compared statistical data on population structures across four counties during the first phase of the research (pre-test, formative intervention 1, post-test), but they did not interpret the meaning of these data. The analysis of possible responses (Table 2) shows that certain population characteristics (e.g., ethnic, linguistic, and religious diversity in Constanța County) can simultaneously be considered both strengths and weaknesses; therefore, the arguments used by students to support their decisions are essential. Similarly, external investors and tourists may represent opportunities if they bring benefits, or threats if they generate problems (e.g., delinquency, unprofitable investments). Difficulties in identifying opportunities and threats indicate insufficient consolidation of content knowledge and suggest the need for better integration between disciplinary knowledge and higher-order thinking skills.

These results can also be explained by the cognitive complexity of the task, which involves processes specific to higher levels of Benjamin Bloom et al. (1956), such as analysis and evaluation. Krathwohl (2002) notes that analysis involves elements, relationships, and organizational principles. In this context, students need knowledge about population and economy, including population categories defined by various criteria (age, gender, religion, language, etc.), the significance of these categories and their proportions, as well as the relationship between population and economic development. Anderson and Krathwohl (2001) emphasize that analysis requires cognitive processes such as differentiating, organizing, and attributing. In this case, students must differentiate and assign categories (strength, weakness, opportunity, threat), making evaluative judgments characteristic of critical thinking. According to the revised taxonomy (Anderson & Krathwohl, 2001), these processes involve not only organizing information but also making reasoned judgments—skills that appear insufficiently developed among the students in this study.

Use of Tabular Support

The comparison between the two experimental groups shows that the use of tabular support had a limited effect on overall performance, with no statistically significant differences identified. However, descriptive statistics suggest that such support may partially facilitate the organization of responses and the formulation of arguments, although it is not sufficient to produce substantial improvements in the absence of systematic cognitive training.

From a constructivist perspective, the high level of task difficulty places students within the zone of proximal development (Vygotsky, 1962, 1978). The results suggest that students require guidance in the process of knowledge construction. Tabular support can be interpreted as a form of scaffolding, but its effectiveness depends on its integration into a broader instructional approach that includes modeling and feedback.



Argumentation

The low performance levels suggest insufficient development of analytical and critical thinking, particularly in terms of argumentation. The differences observed between identifying SWOT elements (strengths, weaknesses, opportunities, threats) and formulating arguments indicate that students tend to list information but struggle to justify and support their ideas—an essential aspect of evaluative thinking.

Students demonstrate a greater ability to recognize and enumerate relevant information but face difficulties in justifying it, confirming findings from the literature regarding the progressive development of critical thinking (Ennis, 1962; Halpern, 2010).

Argumentation, due to its high level of cognitive processing, requires students to integrate knowledge, apply criteria, and evaluate information—processes that do not develop spontaneously through a single activity but require explicit instruction in formal educational contexts, supported by teacher mediation. These results support the idea that the development of analytical and critical thinking requires explicit and progressive instructional interventions, including modeling, guided questioning, structured worksheets, and repeated practice. Simply exposing students to complex tasks is not sufficient; supportive strategies are necessary to facilitate understanding and response structuring.

Difficulties in Task Completion

The difficulties observed in identifying opportunities and threats suggest a lower level of development of relational, systemic, and predictive thinking, as well as limited competence in population and economic geography. Some students identified strengths as opportunities and weaknesses as threats, consistent with findings from previous studies (Dulamă, 2004c).

Students also experienced significant difficulties in providing arguments to justify why a particular aspect represents a strength, weakness, opportunity, or threat. This indicates gaps in understanding population-related issues, relationships between population groups (e.g., age, residence, ethnicity), and the connections between population characteristics and economic development within a given territory (in this case, a county). These findings suggest the need for an integrated instructional approach that combines disciplinary knowledge with systematic training in higher-order thinking.

Pedagogical Implications

The results highlight the need for an explicit and systematic instructional approach to developing students' analytical, relational, and critical (evaluative) thinking. The low performance, particularly in argumentation, suggests that students need learning activities that go beyond identifying, comparing, and classifying information and instead focus on understanding, explaining, and justifying decisions and conclusions.

The use of organizational tools, such as SWOT tables, can support response structuring; however, their effectiveness is limited without explicit instructional guidance with a feedforward role (Dulamă & Ilovan, 2016), provided through instructions, examples, and modeled procedures. Integrating scaffolding strategies – such as modeling responses, using examples, engaging in teacher-guided discussions, and providing worksheets and formative feedback – can support students in understanding task requirements and developing argumentation skills.

The results suggest that simple exposure to complex tasks is insufficient for achieving higher levels of performance. They also emphasize the importance of designing instructional activities that gradually move from guided to open-ended tasks, thus fostering cognitive autonomy. In geography education, a clearer integration between content knowledge and higher-order thinking is needed, through activities involving data analysis, interpretation of demographic and economic phenomena, and the formulation of reasoned judgments.

Limitations of the Study

This study has several limitations that should be considered when interpreting the results. First, the absence of an initial measurement of analytical and critical thinking skills does not allow for the assessment of student progress, but only a cross-sectional analysis. Second, the task simultaneously involves



disciplinary knowledge (demography and economics) and higher-order thinking skills (analysis and evaluation), making it difficult to isolate the influence of each component on performance. Additionally, the limited duration of the formative interventions, the use of a single type of task (SWOT analysis), and the relatively small sample size restrict the generalizability of the findings. The evaluation of open-ended responses may also introduce a degree of subjectivity, despite the use of assessment criteria.

Future Research Directions

Future research could investigate the development of analytical and critical thinking over longer periods, using experimental designs that include pre- and post-intervention assessments. It would also be useful to explore the impact of different types of instructional support (e.g., detailed guidelines, model examples, immediate structured feedback) (Dulamă & Ilovan, 2016) on student performance, in order to identify the most effective cognitive scaffolding strategies. Another relevant direction is the separate analysis of task components (identification/analysis vs. argumentation) to better understand the development of higher-order thinking. In geography education, further research could examine the use of SWOT analysis followed by proposing solutions for capitalizing on strengths and opportunities and addressing weaknesses and threats. Expanding research to other educational levels and larger samples would also support deeper understanding and broader generalization of findings.

General Conclusions

SWOT analysis is a tool that requires students to identify and evaluate multiple aspects of a phenomenon and to formulate arguments to support their opinions, making it suitable for investigating higher-order thinking. However, solving such a complex task in an educational context reveals difficulties related to information organization and argumentation. The results of this study indicate a low level of development of students' analytical, critical, and evaluative thinking in the context of a SWOT analysis task. Most students experienced significant difficulties, particularly in argumentation, highlighting the need for systematic cognitive training. Although the use of tabular support facilitated response organization to some extent, it did not lead to significant differences in overall performance, suggesting that the development of higher-order thinking cannot be achieved through isolated interventions but requires coherent and sustained instructional efforts throughout geography education. Overall, the study underscores the importance of explicitly integrating critical thinking activities into geography teaching, as well as adopting an instructional approach centered on guidance, reflection, and argumentation.

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