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DEVELOPING GEOGRAPHICAL THINKING THROUGH THE REPRESENTATION OF THE IDEAL CITY

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ABSTRACT

This study highlights the importance and effects of developing geographical thinking through the conception and creation of a 2D representation of an ideal city plan. The aim is to identify and correct possible gaps in students' understanding of urban space, plans, and maps, and to validate their prior knowledge, which will serve as the foundation for connecting new information, concepts, or procedures. A total of 79 students, aged 16-17, of both genders, from three 10th-grade classes at "Al. Papiu Ilarian" National College in Târgu-Mureș, participated in the study. In order to achieve the research objectives, students were engaged in a project-based learning activity. They went through several stages, with the current study detailing the stage focused on creating the ideal city plans (2D representations). The study emphasizes the necessity of involving students in practical experiences to foster the development of critical thinking and scientific skills.

Keywords: plan, map, ideal city, geographical thinking, urban facilities

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Introduction

In recent decades, within Romania's pre-university education system, less attention has been given to the study of geography, a trend reflected in the national curriculum frameworks and high school geography syllabi (Ministry of Education and Research, 2004, 2006) as well as in the lower secondary curriculum (Ministry of National Education, 2017). Specialist literature emphasizes the importance of geography in understanding the world we live in, and in developing geographical thinking, which helps individuals adapt more effectively to this world (Dulamă, 2011), while also contributing as responsible citizens to the development of a sustainable economy (Romanian Parliament, 2023).

Through the study of geography, students develop the key competencies outlined in the "Law on Pre-University Education" (Romanian Parliament, 2023), as well as a set of transversal competencies, such as: oral communication (Dulamă, 2008a), written communication (Conţiu et al., 2022; Dulamă, 2008d; Dulamă et al., 2011), time management, teamwork (Dulamă, 2008b), and cooperation (Pop-Păcurar et al., 2023), presentation skills, critical thinking (Dulamă, 2004a,b, 2007, 2008c), self-directed learning, analytical thinking (Cîineanu et al., 2023), planning, digital literacy (Pop-Păcurar et al., 2023), decision-making,

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problem-solving (Dulamă, 2010a), information management (Dulamă, 2008b), and research skills (Dulamă, 2010b,c; Ilovan et al., 2016; Magdaș, 2018).

The study of geography provides a wide range of contexts in which students develop various geography-specific competencies (Dulamă, 2010c; Ilovan et al., 2015; Mândruţ, 2012; Mândruţ & Ardelean, 2012), which are essential throughout life. During geography learning activities, both secondary and university students engage in diverse and innovative hands-on experiences (Conțiu & Conțiu, 2011), such as those related to ecological cities (Conțiu, 2009), trees and their natural habitats (Conțiu & Conțiu, 2009), museum exhibit studies (Conțiu & Conțiu, 2013), the creation of virtual plant portfolios (Conțiu et al., 2021), and the completion of various tasks within team-based and project-based contexts (Glava, 2003; Glava & Glava, 2005).

Urban space represents a geographical "laboratory" in which students can acquire geography-specific concepts and develop analytical thinking (Cîineanu et al., 2023) as they observe the design of urban gardens (Dulamă, 2010f), various models of micro-scale territorial development (Conțiu & Conțiu, 2023), the planning of urban centers (Ilovan et al., 2018a,b; Conțiu & Conțiu, 2025), or the arrangement of peripheral areas (Ilovan et al., 2020d). Through close observation and in-depth analysis of urban settlements, students begin to understand the unique physiognomy of the city and uncover the significance of concepts such as local identity (Sanislai et al., 2016; Ilovan, 2021, 2024a), urban development (Dulamă & Sanislai, 2016a), and the urban cultural landscape (Dulamă & Sanislai, 2016a; Ilovan, 2022). Some studies emphasize how the urban environment can be used to develop students' competence in exploring, presenting, and designing urban space (Ursu et al., 2019), analyzing the dynamics of change in urban planning (Benedek et al., 2022; Filip & Ursu, 2018), and understanding urban regeneration processes (Ilovan et al., 2020a,b,c), as well as creating tourism plans (Osaci-Costache et al., 2013).

The study of geography aims to develop students' and university students' ability to make forecasts, find solutions to the problems faced by urban dwellers, and design urban spaces that provide optimal living conditions for inhabitants. One way to challenge students in finding creative solutions is through the creation of projects for urban spaces or ideal cities (Dulamă et al., 2012, 2013). By expressing and applying creative thinking, students combine existing elements in an innovative way, thereby developing their ability to generate new ideas (Cropley, 2001; Lucas & Spencer, 2021). The representation of urban space by students in the form of an ideal city involves geography-specific competencies, which are developed through exercises over an extended period of time (Conțiu & Conțiu, 2025) and contribute to the advancement of geographical thinking from the perspective of a sustainable economy.

The creation of the ideal city plan involves a mental representation of urban space, an understanding of the significance of places derived from their association with human activities (Drăgan et al., 2025), a cognitive projection of a particular territory (Miclea, 1999), encoding both the places and the sequential relationships between them (Moore & Golledge, 1976, apud Johns & Blake, 2001). Specialist literature emphasizes that a good knowledge of the environment is a sine qua non condition for making spatial decisions (Kitchin, 1994). Spatial representation is the product of processing, organizing, and graphically transposing the perceived spatial elements (Ilovan, 2024b), meaning the "translation" of the mental map into reality (Drăgan et al., 2025). Although some researchers (Zhang et al., 2019; Meenar et al., 2022) explore new ways of creating mental maps in the digital environment, in terms of efficiency and accessibility, Drăgan et al. (2025) argue that these lack the qualitative depth of spatial representations created manually.

This research was initiated based on the observation that students face difficulties both in identifying the components and functions of urban space, the relationships between them, and in representing them on a plan (Dulamă et al., 2012, 2013), as well as in bridging the gap between theory and practice (Conțiu & Conțiu, 2023). The aim of this study is to develop geographical thinking and investigate the effects of creating 2D representations (plans) of an ideal city on students' knowledge and competencies. This process was preceded by research and fieldwork applications guided by the teacher through specific instructions, requirements, and criteria, as well as by conducting individual, direct observations in the field (cf. Conțiu & Conțiu, 2024). In this way, students learn to think about urban space in an integrated, prospective, and sustainable manner. This research is part of our ongoing effort to find practical ways to enhance students' understanding of geographical

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space, the quality of representations of this space (Dulamă et al., 2012; Mândruţ, 2012; Mândruţ & Ardelean, 2012), and continues a series of other studies at the high school level (Dulamă et al., 2012, 2013; Conțiu & Conțiu, 2023, 2024, 2025). To achieve the study's objective, three research questions were formulated:

Q1. What is the students' conception of the ideal city as reflected in the city plans and their presentations?

Q2. What elements do students include in the 2D representation of urban space in the form of an ideal city?

Q3. What are the students' knowledge and gaps regarding urban space, plans, and maps as highlighted through the representation and presentation of an ideal city?

Method

Participants

The research was conducted during the 2024-2025 school year at the „Al. Papiu Ilarian" National College in Târgu-Mureș. A total of 79 students, of both genders, aged 16-17, participated in the study. Three 10th-grade classes were selected. Two of these classes have a scientific profile with specializations in „Natural Sciences with intensive English" (GE^{A}) and „Mathematics and Computer Science with intensive Computer Science" (GE^{B}). One class has a humanities profile with the specialization „Social Sciences with intensive German" (GE^{C}). The criteria for selection were as follows: the existence of parallel classes with different specializations corresponding to the scientific and humanities profiles, the inclusion of classes within the teaching norms of the two authors of the study, and the class level (10th grade). Students from each class were divided into groups of four or five, homogeneous in age but heterogeneous in gender and geography competency level. In total, 6 groups of four students and 11 groups of five students were formed (Conțiu & Conțiu, 2023, 2024).

Procedure

The students were involved in a project-based educational activity. The activities were organized and carried out during Geography lessons and outside of them. The students were tasked with completing a project titled: Representation of the plan and model of the ideal city based on a given reality (the medieval citadel of Târgu Mureș and its surroundings) (Conțiu & Conțiu, 2023, 2024). The students went through four stages: (1) the documentation stage (November-December); (2) the fieldwork stage (January-February); (3) the creation of the ideal city plans (2D representations) (March-April); (4) the creation of the ideal city models (3D representations) (May). At the end of the project, each team presented their results to their peers during the Geography class. The first two stages were presented in previous studies conducted by Conțiu & Conțiu (2023, 2024).

Educational Activities

In this study, we present the stage of creating the ideal city plans (2D representations), which took place during March-April, in 2024. This stage consists of three sub-stages.

Substage *1. Discussing the task and objectives with the students*. The students were assigned the task of creating, in groups, the plan of the ideal city on an A2-sized cardboard, using various tools, after they had previously conducted research and carried out field applications. Each group was tasked with writing a short text describing the steps they followed in developing the plan and justifying the name and functionality of the ideal city.

The task was formulated as follows: Form teams of four or five students. Each team will create a plan for an ideal city on an A2-sized cardboard, in the form of a 2D representation, using colored pencils, markers, pens, and rulers. You will write a short text about the steps followed in its design and creation, and you will justify the choices and solutions for layout and functionality. Each team will present the completed plan in front of the teacher and the class, will explain the working steps, present the solutions provided, and argue why they believe it represents an ideal city.

The students should achieve several objectives in this activity: designing and creating the plan for an ideal city; representing the urban space on a plan; justifying the solutions and opinions about the layout and functionality of a city and about the ideal city.

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Substage *2. Forming the groups and creating the ideal city plan as a group*. The students formed the groups: 5 groups of 5 students in Class A (GE^A); 6 groups of 5 students in Class B (GE^B); 6 groups of 4 students in Class C (GE^C). Each group organizes its activity, distributes the tasks independently, designs, and creates the ideal city plan during geography lessons and outside of them, in accordance with the requirements expressed by the teacher.

Substage 3*. Presentation of results*. The teams create a short text in which they present the steps followed in representing an ideal city in the form of a plan, the solutions chosen regarding functionality, and explain the choices related to the city's name and layout. The research results are discussed with the teacher and with the other teams during a geography lesson. The ideal city plans are evaluated by the teacher and by another team selected by the teacher.

Instruments

The research data were collected using an evaluation grid for the ideal city plans. *The evaluation grid for the ideal city plans* includes two categories of elements: *basic (cartographic) elements* and *content (geographical) elements*. The first category includes: the title (name of the ideal city), the scale (numeric and graphic), the legend (conventional symbols: elements of altimetry and planimetry), the orientation towards the North (wind rose), the project name, the names of the team members and class, and the name of the coordinating teacher. The second category includes content elements of the plans created by the students: buildings for housing and neighborhoods, administrative facilities, educational facilities, cultural facilities, religious facilities, healthcare facilities, commercial facilities, tourist, sports, and recreational facilities, special facilities, financial facilities, industrial buildings, agricultural spaces, communication networks and infrastructure, the hydrographic network, and vegetation elements (Table 1).

Analysis of the written texts

The written texts regarding the creation of the ideal city plans composed by the students are analyzed based on three criteria: presenting the steps followed in the design and creation of the plan; explaining the name given to the ideal city; justifying the solutions chosen for the layout and functionality of the ideal city.

Results and Discussion

a) Analysis of the ideal city plans created by the students

Figure 1 presents the 17 ideal city plans created by the students. We will now analyze the representations of the ideal city made by the students, grouped into the 17 teams.

Târgu Cetății (group 1, GE^A; Figure 1) stands out due to its obvious resemblance to the city of Târgu Mureș in terms of the Mureș River floodplain and the positioning of certain functional areas, with the exception of the current Unirii neighborhood on the right side of the Mureș River, which has been "transformed" into an industrial zone (preserving in its structure units also present in the urban reality of the city: a chemical plant, a furniture factory, a pharmaceutical factory, along with the unique addition of a park with photovoltaic panels), bordered to the east and north by arable land. These areas are incorrectly represented in the legend with the same conventional symbol as the landfill. Green spaces dominate (including deciduous and coniferous forests located in the eastern part of the plan), the hydrographic artery (unnamed) is crossed by two bridges and is passed under by a subway line, and in the southwest, there is a micro-hydroelectric power plant. The presence of an ecological landfill is specified (according to the oral and written explanations accompanying the text). Basic administrative facilities (city hall, police station, fire station, courthouse), financial institutions, kindergartens, and pharmacies are missing, indicating difficulties in understanding the administrative and socio-economic functionality of a city. Only the numerical scale is correctly represented. The students did not understand how to graphically represent the scale. The street infrastructure is partially rectangular and somewhat underdeveloped. On some buildings or facilities, their intended use is written, which makes it easier to interpret the plan. Only green spaces, arable land/landfill, and the hydrographic artery are colored.

Nuvon City (group 2, GE^A; Figure 4) stands out for its complex street structure, of a rectangular type, largely superimposed on the current configuration of the Târgu Mureș city plan (which served as a model).

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Street and boulevard names are specified. The river of the same name is represented, crossed by two pedestrian bridges and three road bridges. The latter are too close to each other to be efficient. On the right bank of the river, green spaces are represented (Nuvon Park and the dog park), near a stadium and a zoo. Conventional symbols are represented without proper clarification in the legend, making them impossible to decipher. The scale is partially correct, both numerically and graphically (the latter having the wrong unit of measurement). The ideal city benefits from administrative facilities, such as the prefecture, city hall, and fire station, but lacks a police station, courthouse, or prison. Educational, cultural, and religious facilities are well represented. It is the only team that represented student dormitories and ecclesiastical administrative buildings (deanery). Additionally, unique elements include a lavender field, a cotton field (including a textile factory), a dog shelter, and a stud farm. The direct mention of certain types of urban facilities on the plan facilitates its analysis and interpretation. Only the hydrographic elements (Nuvon river) and vegetation (green spaces, Nuvon Park, dog park, trees, lavender field) are represented in color.

Figure 1. *Târgu Cetății* (group 1, GE^{A})

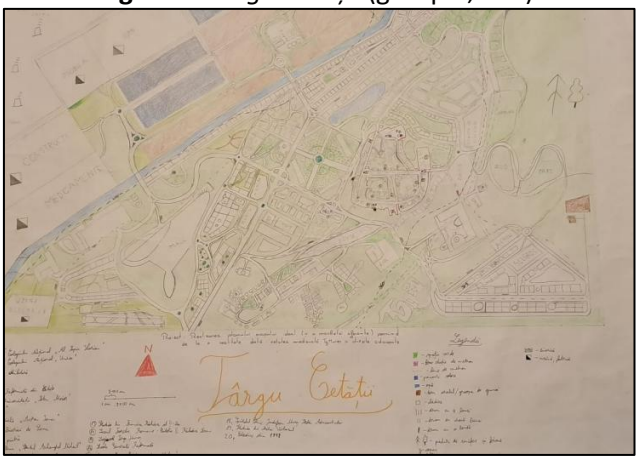

Figure 2. *Terra Nova-E* (group 4, GE^{A})

Civitas Marisiensis City (group 3, GE^{A}; Figure 3) stands out for its spatial organization based on a street network similar to that of the current city of Târgu Mureș. The Târgu Mureș citadel and its surroundings (the chosen urban site/real given environment) are represented to scale, without detailed urban facilities. The administrative facilities are located in the central part of the city (city hall, prefecture, courthouse, notary office, cemetery), south of a pedestrian center. There are no tourist, sports, or recreational facilities mentioned. The industrial function is present through factories on the right bank of the river (unnamed): wood processing, furniture, glass, beer, textiles, along with photovoltaic parks. Nearby, there are green spaces (parks, dog parks), lakes (named "Lake of Wishes" on the water surface, but without color or conventional symbols), a zoo, and a mall. Agricultural land and greenhouses (the only team to represent them) are located in the southern part of the city, without being detailed in the legend. Nearby, in the southwest, the airport is represented. The legend includes both planimetric and altimetric elements (contour lines), but the latter are represented incorrectly. The scale is provided both numerically and graphically, but they do not correspond as they are different.

Terra Nova-E (group 4, GE^{A}; Figure 2). Although the students were given two separate tasks (creating the plan and the model of the ideal city), team 4 (GEA) presented a single result, superimposing elements of the model onto the plan. This indicates the team's lack of attention and a misunderstanding of the differences between a 2D plan representation (with all the necessary cartographic elements) and the creation of a 3D model. The representation has a polycentric structure, with many green spaces and solar panels, indicating a sustainable economy, according to the oral explanations. The plan lacks basic cartographic elements (title, scale, legend, orientation, metadata), as well as most of the facilities, except for some tourist, sports, and recreational facilities (the zoo, a stadium), identifiable on the plan by the abbreviation "ZOO" and the oval shape. Buildings intended for housing (grouped into neighborhoods/residential areas), the hydrographic network, the street network, and parking spaces can be inferred but are only explicitly described orally.

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Figure 3. *Civitas Marisiensis City* (group 3, GE[A])

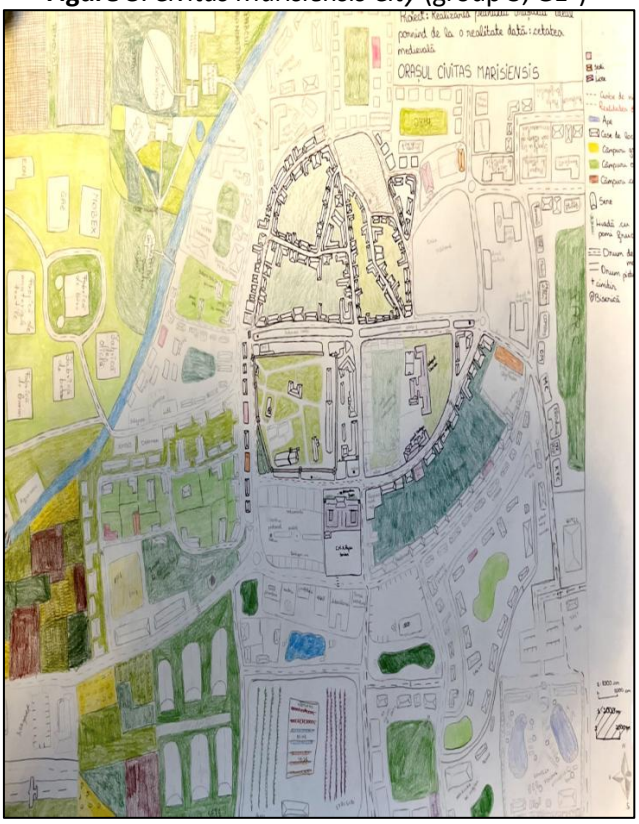
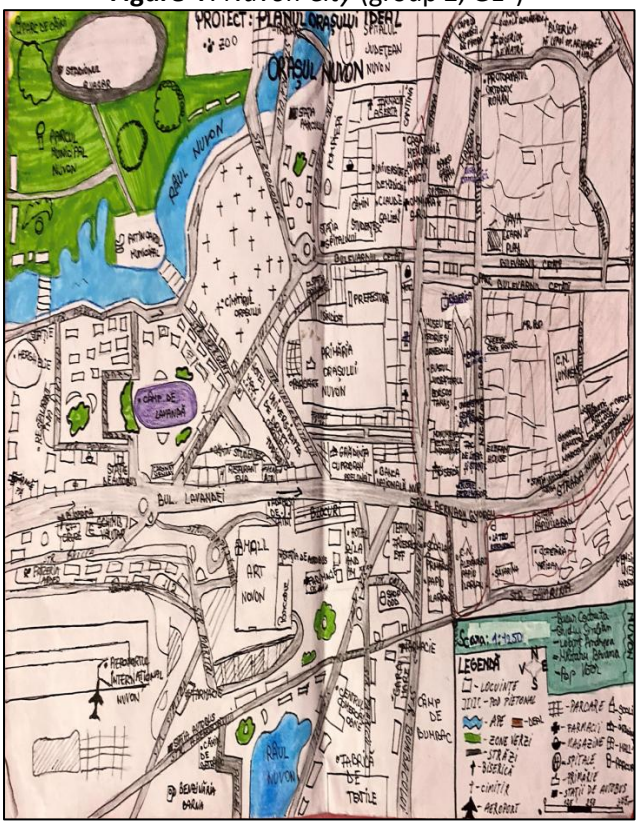
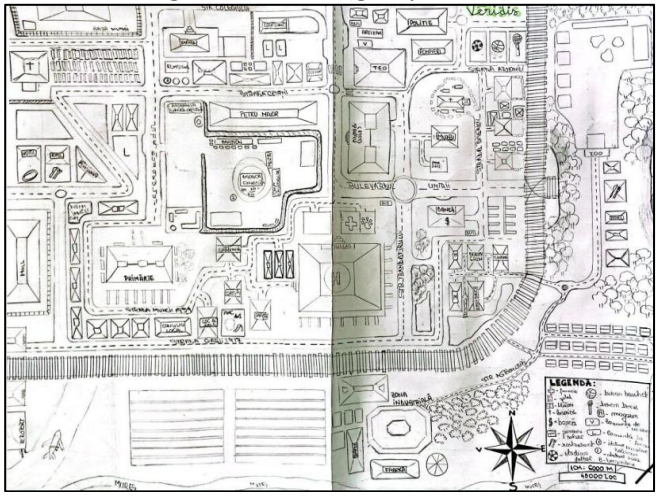


Figure 4. *Nuvon City* (group 2, GE[A])



Veridis **(**group 5, GE[A]; Figure 5) is a black-and-white representation on two A3-sized cardboard sheets, glued together. The city has, in its central part, the citadel and its surroundings considered the "given reality" (the chosen site), which groups together cultural and religious facilities, surrounded by other facilities (administrative, educational, healthcare, financial, commercial). The street network is partially rectangular. Notably, there is a railway that demarcates, to the south, the airport and the industrial area, and to the east, the tourist, sports, and recreational area. Metadata are missing, and some elements are represented on the plan without being properly mentioned in the legend (such as vegetation elements, rivers, etc.). The ideal city's population (45,000 inhabitants) is specified on the plan, along with the legend. Oral explanations provided more detailed information about the functionality of this ideal city, the specifics of the industrial sectors, the use of renewable resources, agricultural crops, etc., although these elements do not appear in the legend.

Figure 5. *Veridis* **(**group 5, GE[A])



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Melania City (group 1, GE^{B}; Figure 6) has a complex, polycentric structure and is created with great attention to detail, demonstrating the team's creative thinking and involvement. However, the legend is not properly created. A large portion of the conventional symbols used are not mentioned in the legend: various colors and hatches, streets, and blocks with unique shapes (circular, with an insular appearance), green spaces, etc. The names of some streets are specified directly on the plan. The legend includes color-coded conventional symbols (for various facilities) and symbols created by the students for this plan, predominantly using numbers, which creates difficulties in reading the plan. The representation is much more complex than what is explicitly outlined in the legend. The scale and orientation toward the north are missing. The oral explanations accompanying the plan were clarifying regarding the meaning of some functional symbols and the city's functionality (photovoltaic panels, agricultural land, sustainable economy), but there is no appropriate cartographic reflection of these elements.

Phoenix (group 2, GE^{B}; Figure 7) is primarily a black-and-white representation, with the exception of the hydrographic route and green spaces. The legend is also in black and white and uses conventional symbols mostly created by the students, which makes it difficult to read the plan. The river (Mureș) is represented incorrectly, with the students confusing the representation of flowing water with that of standing water. The colored elements on the plan do not appear in the legend. The street network has a radial-concentric appearance, but the streets are not named. It is unclear whether the areas represented in green on the plan are green spaces for recreation, forests, or agricultural land. Some functional areas can barely be inferred (for example, the residential area). Cultural facilities are completely missing. The chosen urban site cannot be identified on the plan. The scale is inaccurate, with the reality being oversized, which highlights certain gaps related to cartographic representation.

Figure 6. *Melania City* (group 1, GE^{B})

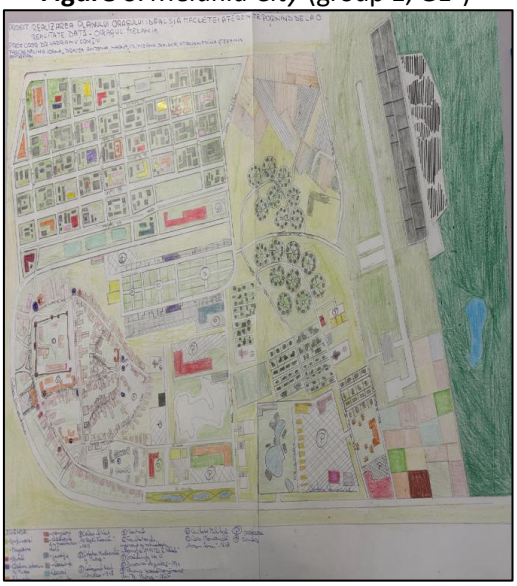
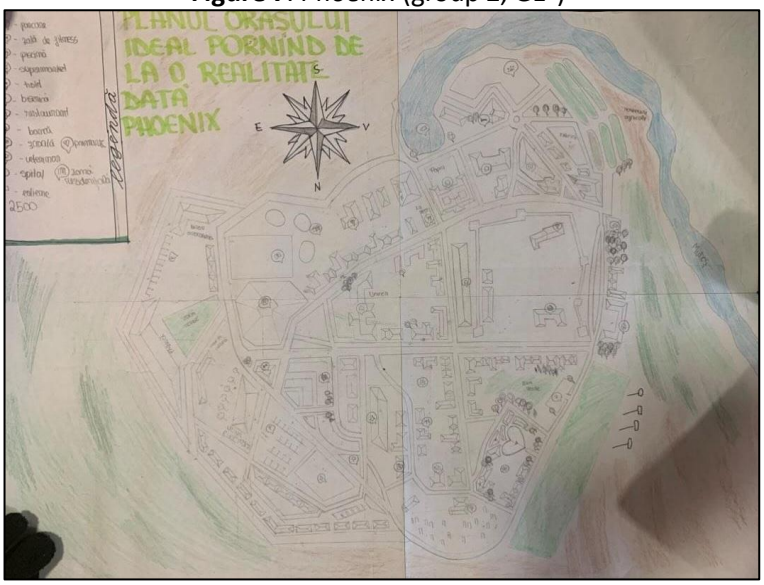


Figure 7. *Phoenix* (group 2, GE^{B})



Hestia City (group 3, GE^{B}; Figure 8) is a complex, polycentric representation with radial-concentric streets. It is the only plan where contour lines are correctly represented in the eastern part of the city, though they do not appear in the legend. Both scales, numerical and graphical, are represented. The graphical scale is incorrect, showing that the students did not fully understand the correspondence between the two. The students worked meticulously. Only the hydrographic network and vegetation elements are depicted in color. A natural park ("The Garden of Eden") and even a natural sanctuary ("The Glade") are represented in the higher, forested part of the city, but no oral or written explanations were provided. According to the oral explanations, the river has a diverted channel intended for hydroelectric use, though this is not mentioned in the legend. Residential neighborhoods are creatively named (Azur, Orizont, Steaua Nordului), surrounding the central area, where most of the urban facilities (administrative, cultural, religious, educational, healthcare) are located. Notably, the same conventional symbols were used

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for categories of administrative (police, fire department) and cultural (theater, museum) facilities. The industrial area is located in the southern part of the city, but the industrial branches are not detailed. Agricultural land is not represented. Two train stations (North and South) are shown, with the railway line bypassing the city. The airport is located in the floodplain, in the northeastern part of the city.

Viridis City (group 4, GE^B; Figure 9) has a partially semicircular street network, with most of the development occurring to the south of the unnamed hydrographic artery. It is a color representation. Green spaces border the city in the southern and southeastern parts. Residential areas (buildings, neighborhoods) and tree symbols on the plan are not included in the legend. Other elements, such as the hospital, church, road, and railway, are correctly represented. Functional elements (administrative, industrial) are missing. The oral explanations provided details about solar panels installed in the eastern part of the city, which supply the necessary electricity, as well as the importance of having both a botanical garden and a zoo, closely related to the practice of students from the biology-geography and environmental faculties (though this is not explained in the legend).

Figure 8. *Hestia City* (grupa 3, GE^B)

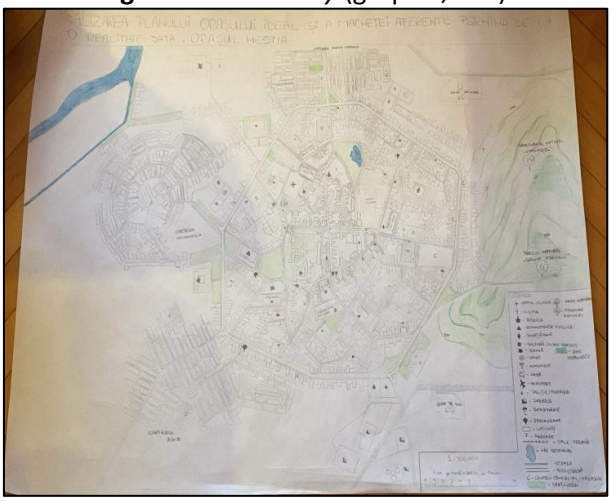
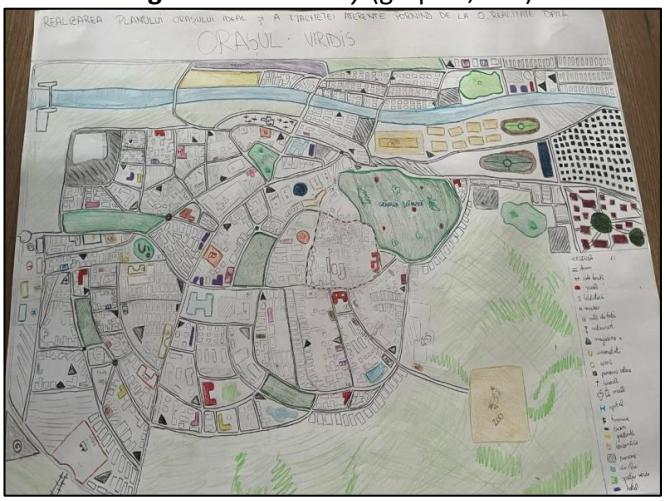


Figure 9. *Viridis City* (grupa 4, GE^B)



Solatina pe Mureș (group 5, GE^B; Figure 10) is a detailed, color representation, with a very interesting chromatic arrangement and distribution of functional zones. However, these zones are not properly mentioned in the legend. The presence of residential areas, green spaces, a stadium, or certain agricultural fields can be inferred, but they are not explicitly indicated. The industrial function is not detailed. Police, fire departments, military base, hospitals, clinics, and pharmacies are represented with the same conventional symbol, which demonstrates gaps and confusion in the representation. An interesting feature is the inclusion of a "belciug" (a traditional term for a type of gate or entrance) and a "popine" (a small, traditional building), which coincides with the land where the municipal hospital was built. The students could not explain why they chose this specific placement. A tentacular development can be noted, which is likely explained by the presence of favorable corridors (hydrographic, economic) as per the oral explanations.

Bolyaiburg (group 6, GE^B; Figure 11) is a rectangular plan, with the hydrographic artery crossing the industrial area in the western part of the city. The students used the same conventional symbol (yellow color) for both "firm" and "factory," which indicates a confusion between secondary and tertiary zones. The rectangular street network highlights regular-shaped blocks (squares, rectangles) and attempts at urban planning. Green spaces border the city on the eastern flank but are also present within the city in most areas. Churches, the airport, and the stadium are not specified in the legend. As unique elements, attention should be drawn to the "water purification station" and "bypass," as well as the inclusion of the real urban site (the chosen urban location) in the medallion, although it is not detailed at the equipment level, as required.

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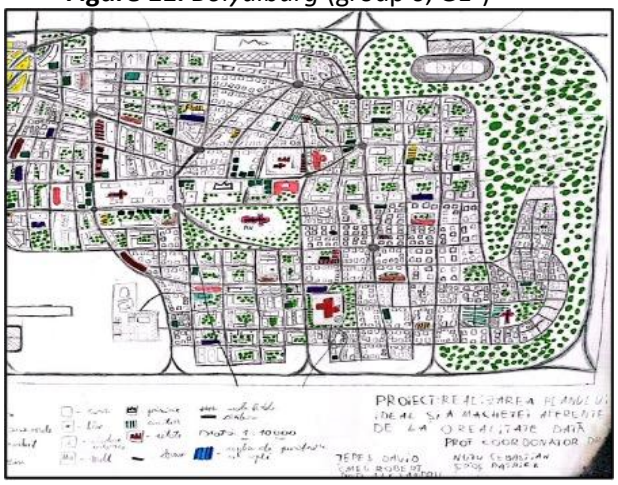
Figure 10. *Solatina pe Mureș* (group 5, GE[B]).

Figure 11. *Bolyaiburg* (group 6, GE[B])



Sallrano Civitas (group 1, GE[C]; Figure 14) is a radial-concentric plan, represented in color. In the central part, the old city (the given reality/selected urban site) is located. This is the only team that proposed, in addition to a bicycle parking lot, a heliport, mainly for medical services. From the oral explanations, it is understood that several spaces equipped with photovoltaic panels are present on the plan, but these are not listed in the legend. Some educational facilities, such as universities, are missing. Pharmacies, stores, and restaurants are not represented. Industrial buildings and agricultural spaces are absent. Apart from the zoo, all other tourist and recreational facilities are missing. Special facilities are also not included. The green spaces in the residential areas stand out, as well as the forest in the eastern part of the city, near which the cemetery is located. The students opted for a neighborhood on the opposite bank of the river (named Mureș), but represented only one road bridge, which, as in the present, causes traffic difficulties and frequent congestion.

Novapolis (group 2, GE[C]; Figure 12) is a color representation, with a partially rectangular street network. In the category of residential buildings, only apartment blocks are mentioned in the legend. Educational units are represented on the plan with the same conventional symbol, without differentiating educational facilities. Churches and cemeteries are also represented with the same conventional symbol. Some elements, such as the Nova River (crossed by three road bridges connecting to the ring road and the airport) and what appears to be a lake unit in the southeast of the city, appear on the plan but are not included in the legend. Industrial buildings and agricultural spaces are missing. Only streets and the airport form the communication networks and urban constructions. Parks and green spaces, except for trees, are represented in color on the plan and were mentioned in the oral explanations, but they do not appear in the legend. This is the only team that chose to represent a casino.

Figure 12. *Novapolis* (group 2, GE[C,])

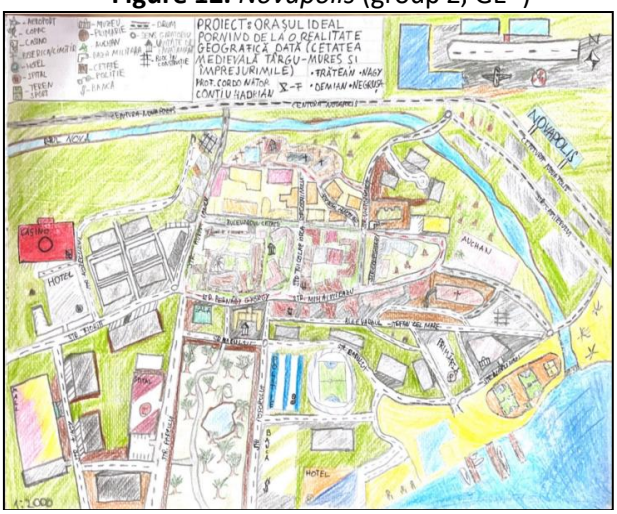
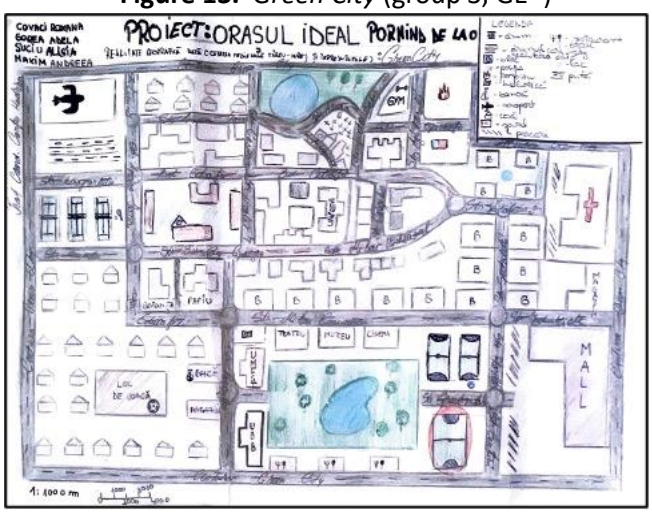


Figure 13. *Green City* (group 3, GE[C,])



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Green City (group 3, GE^{C}; Figure 13) is a largely black-and-white representation, illustrating a rectangular city plan. The city is surrounded by a rectangular belt, which is difficult to imagine in reality due to its primarily non-functional nature. The students did not grasp the negative impact of the right angles in the road infrastructure on traffic fluidity. The graphic scale is incorrect. The attempt to trace the application in the field through the historic center of Târgu Mureș (the given reality) is inaccurate. There are no flowing water bodies, only lakes, without specifying their type. Several elements (cultural facilities: museum, theater, cinema; educational facilities: universities, schools, kindergartens; commercial facilities: malls; tourist, sports, and recreational facilities: sports fields, playgrounds) appear on the plan without being properly mentioned in the legend. It can be inferred that hospitals or churches and cemeteries are represented through the presence of a specific conventional symbol, but these are not mentioned in the legend. Green spaces (parks, trees) around the lakes can also be inferred but are not included in the legend (justifying the city's name is unclear). Industrial buildings and agricultural spaces are missing.

Lavco Citta (group 4, GE^{C}; Figure 15) is a color representation of a radial-concentric plan, spread across both banks of a canal. The spatial organization is remarkable, as is the fact that the historic center of Târgu Mureș (the given reality) is depicted in more detail (urban facilities, street names) within a medallion. Both the numeric scale and graphic scale are presented, for both the ideal city plan and the medallion. However, although the students noticed the presence of different scales, the unit of measurement is missing in both cases. The streets are classified into primary and secondary. A ring road for traffic decongestion is represented (as suggested in the accompanying oral explanations). The conventional symbol for educational institutions is shown, but the category is not specified (universities, schools – general and high schools/colleges, kindergartens). Missing elements include hotels and guesthouses, industrial buildings, agricultural spaces, and a significant portion of *the communication networks and construction infrastructure.*

Figure 14. *Sallrano Civitas* (group 1, GE^{C,})

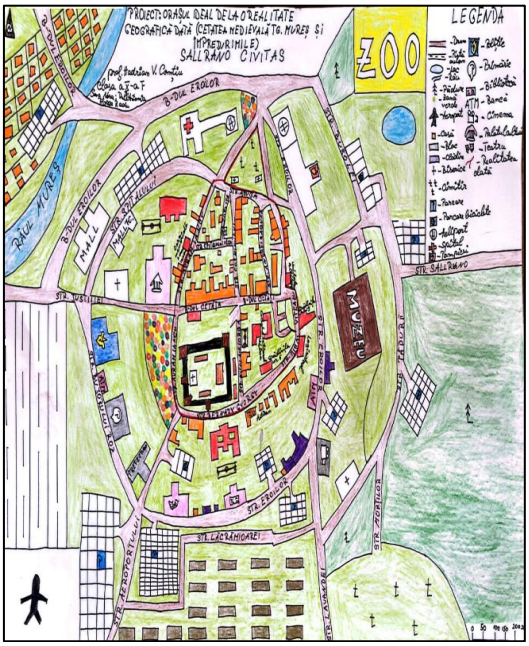

Figure 15. *Lavco Citta* (group 4, GE^{C,})

Terra Green (group 5, GE^{C}; Figure 16) is a color representation with a street network primarily formed by two intersecting arteries in an X shape. Some of the elements represented are marked in the legend with numbers, making the interpretation of the map more difficult. The deciduous and coniferous forests are differentiated. Agricultural spaces, sanitary facilities, special facilities, as well as tourist, sports, and recreational facilities are missing. Some industrial buildings, administrative, educational, and commercial buildings, communication networks, and watercourses appear on the map, but are not mentioned in the legend, indicating that the students lacked a thorough understanding of cartographic representations. The green background of the plan, which according to the oral explanations corresponds

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to the name of the ideal city (Green), is not specified in the legend.

Greenhood (group 6, GE^C; Figure 17) is a color map that only represents the main roadways. The space is well-organized, with the historical center (the given reality) clearly marked. However, several elements are missing: both the numerical and graphic scale, industrial buildings, financial facilities, special facilities, and infrastructure elements. While the streets are shown on the map, they are not listed in the legend and lack names. Sports and recreational facilities are insufficiently represented.

Figure 16. *Terra Green* (group 5, GE^C)

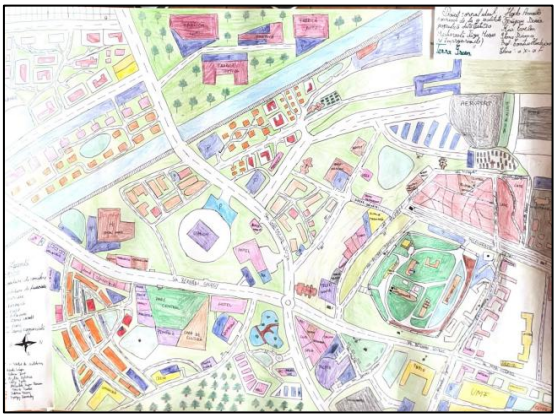
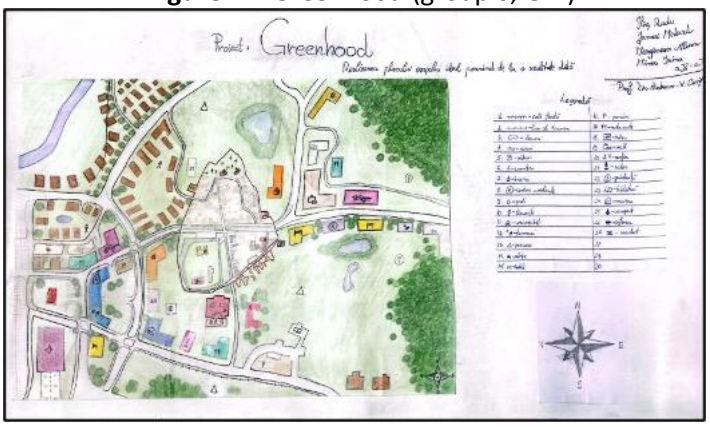


Figure 17. *Greenhood* (group 6, GE^C)



Based on the analysis of the 17 plans, we summarize a few conclusions. The students were creative, managing to surprise and propose innovative elements: circular quarters with an insular appearance, solar panels, wind parks, bike lanes and parking spaces, pedestrian paths, numerous green spaces and recreational areas, eco-friendly landfill, etc. We note difficulties in representing the graphic scale, elevation elements, lack of knowledge of some cartographic symbols, and the requirement to mention them in the legend. In many representations, some elements (for example: prefecture, educational institutions, banks, museums, shopping malls, factories, etc.) are only mentioned on the map (by name), without being included in the legend as well.

From the visual analysis of the plans, it stands out that some include the entire current city and the surrounding areas, while others represent only certain areas of the city. In some plans, the urban space is organized into rectangular, radial-concentric street networks, but in most plans, the street network indicates a random spatial organization. Regarding the provision of city functions, the plans created by the students show their concern to represent multifunctional cities, but without a clear spatial delineation of functional areas. Instead, there is a more random mix of spaces with various functions.

b) Evaluation of the representations made by the students using the evaluation grid

Table 1 presents the elements included in each ideal city plan by each team. The evaluation of the representations made by the students was carried out by the two teachers based on an evaluation grid (Table 1) and was discussed with the students during a geography lesson. Regarding the first category of elements, *basic (cartographic) elements*, 15 teams (88.2%) mentioned the name of the ideal city and the project title on the plan. A small portion, 6 teams (35.3%), also represented the graphic scale alongside the numerical one (12 teams, 70.6%), but made mistakes either in the unit of measurement or in the equivalence with the numerical scale. 16 teams (94.1%) included planimetric elements in the legend. Only 2 teams (11.8%) mentioned elevation elements in the legend. Nine teams (52.9%), and 7 teams (41.2%) specified the names of the members and the class, respectively, the name of the coordinating teacher on the plan. Regarding *basic (cartographic) elements* (Table 1), the results show that students have gaps in their knowledge regarding the correct representation of the graphic scale and the correspondence between the two scales of proportion. They also face difficulties in representing relief steps and elevation points.

Regarding the second category of elements, *the (geographical) content elements of the city plan*, 16 teams (94.1%) represented on the plan and mentioned in the legend buildings intended for residential use

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(houses, apartment blocks, neighborhoods) and residential areas/zones. Only one team, although it represented various types of buildings on the plan, did not mention them in the legend (which is missing). Among the administrative facilities, the most frequently mentioned were the town hall (12 teams, 70.6%), the cemetery (11 teams, 64.7%), the police station, and the fire station (10 teams, 58.8%, and 9 teams, 52.9%, respectively). Only one team (5.9%) represented an eco-friendly landfill.

Educational facilities are represented on the plans, with most teams (16; 94.1%) mentioning various educational institutions (elementary schools, high schools, or colleges). Ten teams (58.8%) specified the existence of a university, while one team (5.9%) also represented student dormitories on the plan, arguing orally for the need for accommodation for students who are not permanent residents of the ideal city. Only 9 teams (52.9%) considered the necessity of having kindergartens and represented them on the plan, although two kindergartens were part of the actual urban space and had been mentioned as such in the work sheet from a previous stage of the project.

Cultural facilities are generally well represented, with various museums (13 teams, 76.5%) and theaters being mentioned, along with the medieval fortress (9 teams, 52.9%), monuments, statues (7 teams, 41.2%), and memorial houses (5 teams, 29.4%). Two teams (11.8%) proposed the existence of cinemas, arguing (orally) the need for film enthusiasts. Among religious facilities, the most frequently represented are churches (15 teams, 88.2%). Only one team (5.9%) mentioned a church administrative building (Orthodox Protopresbytery), although it was included in the work sheet and observed during fieldwork in a previous stage of the project.

Fourteen teams (82.4%) represented hospitals and clinics, both on the plan and in the legend, while 5 teams (29.4%) represented pharmacies. Only one team (5.9%) considered it necessary to include a veterinary office in the ideal city, justifying this option (in the oral explanations given during the presentation of the plans) by concern for animals. The majority of teams (14; 82.4%) highlighted the need for malls and shopping centers, as well as various shops, restaurants, cafes, confectioneries, hair salons, etc. One team (5.9%) even represented a food market. From the category of tourist, sports, and recreational facilities, more than half of the teams (9; 52.9%) represented sports complexes, stadiums, sports halls, and playing fields. Seven teams (41.2%) mentioned hotels and guesthouses, six teams (35.3%) represented a zoo, and only two teams (11.8%) depicted a botanical garden. Five teams (29.4%) and four teams (23.5%) represented fitness halls, along with recreational spaces and playgrounds for children. One team (5.9%) proposed a casino, and two teams (11.8%) mentioned ice rinks and swimming pools or swimming basins. The military unit was represented by only 5 teams (29.4%), even though it is the only special facility observed and included in the work sheets from the previous stage. Nine teams (52.9%) mentioned financial facilities in the legend or on the plan: banks, ATMs (cash machines).

Less than half (8 teams, 47.1%) represented industrial buildings (such as factories, plants, warehouses, etc.), 4 teams (23.5%) represented solar panels, and 1 team (5.9%) represented wind parks, most of these being indicated only on the plan, not in the legend. Very few teams specified agricultural spaces: 3 teams (17.6%) represented arable land, 2 teams (11.8%) represented orchards, and only 1 team (5.9%) represented greenhouses, for supplying the city with vegetables and fruits. Five teams (29.4%) represented forest areas (forests) using specific conventional signs.

Among the communication networks and civil engineering structures, most teams represented various types of streets (15 teams, 88.2%) (including highways; 1 team, 5.9%), parking lots (14 teams, 82.4%), and an airport (10 teams, 58.8%). Five teams (29.4%) considered the necessity of a railway line, but only 3 of them (17.6%) thought that it was necessary to include railway stations/train stations. Six teams (35.3%) mentioned gas stations. Only 3 teams (17.6%) specified bus stations. Two teams (11.8%) proposed bike parking spaces, emphasizing (through oral explanations) the importance of bicycles for health and reducing pollution. One team (5.9%) pointed out the importance of a metro system, while another team (5.9%) proposed a metro station, a tram line, a bus terminal, and a heliport. Fourteen teams (82.4%) represented hydrographic arteries (rivers) and parks/green spaces, while 10 teams (58.8%) mentioned artificial lakes, understanding the importance of the hydrographic network and vegetation elements for the sustainability of the ideal city. Different species of trees were represented on the plan and in the legend by 5 teams (29.4%).

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Regarding *the (geographical) content elements of the city plan* (Table 1), the results show that students have gaps in their knowledge regarding the correct representation of certain elements on the plan and in the legend. They also face some difficulties in designing the spatial distribution of functional areas, planning the infrastructure, and understanding the importance of certain categories of facilities (industrial buildings, agricultural spaces, administrative facilities, sanitary facilities, civil engineering structures, etc.) for the functionality and sustainability of a city.

From the perspective of the facilities represented on the city plans, it is observed that students paid more attention to residential areas and selectively represented other facilities (such as commercial, religious, cultural, etc. facilities). The ideal city plans created by the students strongly reflect their perceptions of the city where they currently live or study, particularly regarding the services or facilities offered (employment or educational opportunities, recreational spaces).

Table 1. *Evaluation Grid for the Ideal City Plans*

Group/ Group number			GE^A (Class A)					GE^B (Class B)						GE^C (Class C)						Total	
			1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5	6	Nr.	%
Components	***Subcomponents***	**Content elements/represented elements**																			
A. Basic (cartographic) elements	Title	Name of the ideal city	x	x	x	-	x	x	x	x	x	x	-	x	x	x	x	x	x	15	88,2
	Scale of proportion	Numerical	x	x	x	-	x	-	x	x	-	x	x	-	x	x	x	x	-	12	70,6
		Graphical	-	x	x	-	-	-	-	x	-	-	-	x	-	x	x	-	-	6	35,3
	Legend (conventional symbols)	Elevation elements	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	2	11,8
		Planimetric elements	x	x	x	-	x	x	x	x	x	x	x	x	x	x	x	x	x	16	94,1
	The orientation (wind rose)	Orientation towards the North	x	-	x	-	x	-	x	-	-	x	-	x	-	-	x	x	x	9	52,9
	Metadata	The name of the project	x	x	x	-	-	x	x	x	x	x	x	x	x	x	x	x	x	15	88,2
		The names of the team members and the class	-	x	-	-	-	x	-	-	-	-	x	x	x	x	x	x	x	9	52,9
		The name of the coordinating teacher	-	-	-	-	-	x	-	-	-	-	x	x	x	x	x	-	x	7	41,2
B. (Geographical) elements of content	Buildings intended for housing; residential neighborhoods/ areas	Buildings (houses, apartment blocks), quarters; residential neighborhoods /areas	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	x	16	94,1
	Administrative facilities	Prefecture, Local Council	-	x	x	-	x	x	-	x	-	-	-	x	-	-	-	x	-	7	41,2
		Town Hall	-	x	x	-	x	x	x	x	-	x	x	x	x	-	x	x	-	12	70,6
		Police station	-	-	-	-	x	-	-	x	-	x	x	x	x	x	x	x	x	10	58,8
		Fire station	-	x	-	-	-	x	-	x	-	x	x	x	-	x	x	x	-	9	52,9
		Courthouse, prison	-	-	x	-	-	x	-	-	-	-	x	-	-	-	x	-	-	4	23,5
		Cemetery	x	x	x	-	x	x	-	x	-	-	x	x	x	-	x	-	x	11	64,7
		Landfill	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
	Educational facilities	Universities	x	x	x	-	x	x	-	-	x	-	x	-	-	x	-	x	x	10	58,8
		Student dormitories	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
		Schools (primary and high schools/ colleges)	x	x	x	-	x	x	x	x	x	x	x	x	x	x	x	x	x	16	94,1
		Kindergartens	-	x	x	-	x	x	-	-	x	x	-	x	-	x	-	-	x	9	52,9
		Libraries	-	-	-	-	x	-	-	-	x	-	-	x	-	x	-	-	x	5	29,4
	Cultural facilities	Museums	-	x	x	-	x	x	-	x	x	x	-	x	x	x	x	x	x	13	76,5
		Theatres/ Opera	-	x	x	-	-	-	-	x	x	-	-	x	-	x	x	x	x	9	52,9
		Cinemas	-	-	-	-	-	-	-	-	-	-	-	x	-	x	-	-	-	2	11,8

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		Fortress	x	x	x	-	x	x	-	-	-	-	x	x	x	-	-	x	-	9	52,9
		Memorial houses	x	x	x	-	x	x	-	-	-	-	-	-	-	-	-	-	-	5	29,4
		Monuments, statues	x	x	x	-	x	-	-	x	-	-	-	-	-	-	x	x	-	7	41,2
	Religious facilities	Places of worship (churches, cathedrals, prayer houses, etc.)	x	x	x	-	x	x	x	x	x	x	x	x	x	-	x	x	x	15	88,2
		Ecclesiastical administrative buildings	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
	Health facilities	Hospitals and clinics	x	x	x	-	x	x	x	x	x	x	x	x	x	-	x	-	x	14	82,4
		Veterinary clinics	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	1	5,9
		Pharmacies	-	x	-	-	x	-	-	-	x	-	-	-	-	-	x	-	x	5	29,4
	Commercial facilities	Malls, shopping centers	x	x	x	-	x	-	x	x	x	x	x	x	-	x	x	x	x	14	82,4
		Shops, restaurants, cafés, pastry shops, hair salons, etc.	x	x	x	-	x	-	x	x	x	x	x	-	x	x	x	x	x	14	82,4
		Food markets	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
	Tourist, sports, and recreational facilities	Hotels and guesthouses	-	x	-	-	x	-	x	-	x	x	-	-	x	-	-	-	x	7	41,2
		Zoo	-	x	-	x	x	-	-	-	x	-	-	x	-	-	x	-	-	6	35,3
		Botanical garden	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	-	-	2	11,8
		Ice rink	-	x	-	-	-	-		-	-	-	-	-	-	-	x	-	-	2	11,8
		Swimming pool	-	-	-	-	-	-	x	-	x	-	-	-	-	-	-	-	-	2	11,8
		Sports complexes, stadiums, sports halls, and sports fields	-	x	-	x	x	x	-	x	-	-	x	-	x	x	x	-	-	9	52,9
		Fitness gyms	-	-	-	-	-	-	x	-	x	-	-	-	-	x	x	-	x	5	29,4
		Casino	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-		1	5,9
		Recreation areas, playgrounds for children	x	-	-	-	x	x	-	-	-	-	-	-	-	x	-	-	-	4	23,5
	Special facilities	Military unit	x	-	x	-	-	x	-	-	-	x	-	-	x	-	-	-	-	5	29,4
	Financial facilities	Banks, ATMs (cash machines)	-	x	x	-	x	-	x	x	-	-	-	x	x	x	x	-	-	9	52,9
	Industrial buildings	Factories, plants, warehouses, etc.	x	x	x	-	x	-	-	x	-	x	x	-	-	-	-	x	-	8	47,1
		Solar panels	x	-	x	-	x	-	-	-	x	-	-	-	-	-	-	-	-	4	23,5
		Wind farms	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	1	5,9
	Agricultural areas	Arable land	x	-	x	-	-	-	-	-	-	-	x	-	-	-	-	-	-	3	17,6
		Orchards	-	-	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	2	11,8
		Forests	x	-	-	-	-	-	-	x	-	-	-	x	-	-	-	x	x	5	29,4
		Greenhouses	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
	Networks of communication routes and public utility constructions	Streets	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x	-	15	88,2
		Pedestrian alleys	-	-	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	2	11,8
		Highway	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	1	5,9
		Bridges	-	x	-	-	x	-	-	-	-	-	-	-	-	-	x	-	-	3	17,6
		Railway	-	-	-	-	x	-	-	x	x	-	x	-	-	-	-	-	x	5	29,4
		Railway station/ terminal	-	-	-	-	x	-	-	x	x	-	-	-	-	-	-	-	-	3	17,6
		Subway	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
		Subway station	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
		Bus station	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5,9
		Bus station	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	3	17,6
		Tramway line	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	1	5,9
		Airport	-	x	x	-	x	-	-	x	-	-	x	x	x	x	x	-	x	10	58,8
		Helipad	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	1	5,9

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		Parking lots	-	x	x	x	-	x	x	x	x	x	x	x	-	x	x	x	x	14	82,4
		Bicycle parking	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	2	11,8
		Gas station	-	x	-	-	x	-	-	x	x	-	-	x	-	-	x	-	-	6	35,3
	Hydrographic network	Rivers, canals	x	x	x	x	x	-	x	x	x	x	-	x	x	-	x	x	x	14	82,4
		Lakes	x	-	x	-	-	x	-	x	x	x	-	x	-	x	x	-	x	10	58,8
	Vegetation elements	Parks, green spaces	x	x	x	x	x	x	-	x	x	x	x	x	-	-	x	x	x	14	82,4
		Trees	x	x	-	-	x	-	-	-	-	-	-	-	x	-	-	x	-	5	29,4
Total		**Nr.**	30	43	38	7	40	26	21	34	28	25	26	35	25	27	37	28	30	500	
		%	40,5	58,1	51,4	9,46	54,1	35,1	28,4	45,9	37,8	33,8	35,1	47,3	33,8	36,5	50	37,8	40,5		39,7

x = exist; - missing

c) The analysis of the written texts associated with the ideal city plans, created by the students

The analysis of the written texts associated with the ideal city plans, created by the students, is presented in Table 2. Most teams complied with the requirements regarding the presentation of the steps followed in the design and development of the plan (11 teams; 64.7%), the explanation of the choices related to the name (10 teams; 58.8%), and the justification of the solutions chosen concerning the layout and functionality of the ideal city (12 teams; 70.6%). Most of the teams that did not provide responses (due to carelessness or superficiality) were from class B (GE^B): 5 (for the first requirement), and 4 teams each (for the other two requirements). Only one team (class C, GE^C), and two teams (class A, GE^A), from the other classes, did not provide responses to the stated requirements (Table 2).

Most students used appropriate (scientific) language, presented the steps they followed, explained their choices regarding the name, and argued why the proposed city qualifies as an ideal city. The current layout of the functional areas of Târgu Mureș naturally served as a model for most teams. However, the students demonstrated creative thinking through original development proposals: parks with photovoltaic panels to meet the city's energy needs, wind farms, numerous green spaces, dog parks, recreational lakes, residential areas placed in the higher parts of the city to ensure beautiful views, circular blocks, pedestrian alleys and bicycle parking spaces, the replacement of traffic lights with roundabouts, wide boulevards, and so on.

Regarding the functionality of the ideal city, the vast majority of teams highlighted the importance of green spaces for air quality and population health, as well as the significance of the hydrographic artery for the development of tourism. The "given reality" (the chosen urban site) was placed by all teams in the central part of the ideal city. The research revealed that students face difficulties in identifying the components of urban space and in understanding urban phenomena in their complexity. Even though they were tasked with designing an ideal city, they did not manage to meet all the needs of its inhabitants (Dulamă et al., 2012, 2013). Only a small portion (2 teams, 11.76%) pointed out and explained the importance of industrial areas and agricultural spaces, with most students showing difficulties in understanding the needs for production, employment, and supplying the city with fresh fruits and vegetables. No team included water supply stations, wastewater treatment facilities, or proposed solutions for electricity and natural gas supply, or job creation. Only one team (5.9%) provided written and oral explanations regarding waste disposal and storage.

Table 2. *Analysis of the written texts associated with the ideal city plans created by the students*

Analysis of written texts / ***Group/ Group number***	**Presentation of the steps followed in the design and implementation of the plan**	**Explanation of the name of the ideal city**	**Justification of the chosen solutions regarding the layout and functionality of the ideal city**
GE^A (Class A)			
1	- research at the County Library and the College Library; - online meetings, discussions among team members, debates, brainstorming;	- "City Market": due to the long history of markets in this area (before the 13th century, when the city of Târgu Mureș was first documented);	- they did not provide information about the layout or functionality of the ideal city; - the city's energy is provided by solar panels placed on the right

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	- setting the scale (1:8500) using the Google Maps application, calculating the population size based on the types and capacity of residential buildings, calculating the energy required to represent an area with sufficient and efficient solar panels, and creating the plan.	- once the fortress was built (completed in the 17th century), this structure held significant importance at the local and regional level.	bank of the river; - they do not have "a specific rule" for representing neighborhoods, industrial areas, or the placement of amenities.
2	- studying the concepts of "urbanism" and "sustainable design," researching the needs and preferences of the inhabitants of a modern city; - sketching a plan on an A4 sheet of paper; using urban design software (without a name); designing the spatial distribution of functional areas; planning the infrastructure; - creating the ideal city plan, writing the explanations, preparing the final product presentation in front of the teacher and the class; reflecting on improving the plan.	- "Nuvon": the name is linked to the numerous buildings built in the "Art Nouveau" style in Târgu Mureș ("an ideal, sustainable, accessible city with green technologies").	- collaboration with specialists from various fields (architecture, urbanism, engineering) can bring valuable perspectives and improve the quality of the ideal city plan; - they did not justify the solutions chosen for the layout and functionality of the ideal city.
3	- the research steps were not presented.	- "Civitas Marisiensis": the name is linked to the Mureș River, which crosses the ideal city.	- the "construction" of the ideal city is based on the concept of a green city; - the city center is pedestrian; "all historical buildings have been restored," and new buildings are required to retain Gothic architectural elements "for a picturesque and romantic atmosphere"; - the city is powered by electricity generated from photovoltaic panels; it has orchards, vineyards, and agricultural land to meet the food (as well as commercial) needs of the population; - the city has an airport, and public transportation is provided by electric buses.
4	- online research related to urbanism, the functional areas of a city, green energy, etc.; - the actual creation of the plan, based on the two "pillars" of the group's activity: "creativity and balance"; - the team's goal: creating and developing a balanced city ("not perfect").	- no explanations were provided regarding the name of the ideal city.	- they proposed that the ideal city should not exceed 100,000 inhabitants to avoid traffic congestion; - they placed the ideal city on the terraces of the Mureș River and took into account the possibilities offered by the configuration of the terrain; - the city has several functional areas: a central area (with a cultural function), residential neighborhoods (modern, with green spaces, housing with solar panels), and a commercial and industrial area; - the hilly area in the north and

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			northwest (outside the city limits) is covered by a vast network of solar panels, "which contribute to the city's economy" and "promote a healthier and more futuristic lifestyle."
5	- studying city models, identifying best practices, and adapting them to the needs of an ideal city (sustainability, energy efficiency, mobility, green spaces, integration of "smart city" technologies); - sketching on paper an initial plan in which the residential, commercial, industrial, and administrative areas, as well as green spaces (parks, gardens, recreational areas, and ecological corridors), were positioned; - planning routes for vehicles, public transport, bicycle lanes, and pedestrian paths; - the actual creation of the ideal city plan.	- no explanations were provided regarding the name of the ideal city.	- the chosen solutions regarding the layout and functionality of the ideal city were not justified; - they stated that an ideal urban environment involves "a balance between functional infrastructure, ecological sustainability, accessibility, and quality of life"; - four main objectives related to the functionality of an ideal city were mentioned: sustainability (renewable energy, efficient resource management), mobility (infrastructure for efficient and accessible public transport), quality of life (ample green spaces, cultural and recreational facilities), and infrastructure (functional and aesthetic urban design).
GE^{B} (Class B)			
1	- no explanations were provided regarding the steps followed in the design and implementation of the plan.	- no explanations were provided regarding the name of the ideal city.	- the chosen solutions regarding the layout and functionality of the ideal city were not justified.
2	- no explanations were provided regarding the steps followed in the design and implementation of the plan.	- no explanations were provided regarding the name of the ideal city.	- the construction of the ideal city starting from the surroundings of the Medieval Fortress of Târgu Mureș; - two residential areas are proposed, and on the outskirts, a wood factory, a wind power plant, and a leisure complex with restaurants and two hotels.
3	- no explanations were provided regarding the steps followed in the design and implementation of the plan.	- no explanations were provided regarding the name of the ideal city.	- the city includes four functional areas: residential, commercial, administrative, and green spaces, with the chosen urban site being located in the central part; - the city center is bordered by a circular "ring road" with multiple entrances and exits, serving the purpose of improving road traffic efficiency; - on the outside are located the residential neighborhoods and the industrial area, nearby being the South Train Station which facilitates the transport of industrial products and necessary resources; - in the east, in the hilly area, is located the “Garden of Eden” Natural Park, intended for the conservation of endangered plants, and the “Clearing” Natural

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			Sanctuary, dedicated to monitoring and protecting the local bear population.
4	- no explanations were provided regarding the steps followed in the design and implementation of the plan.	- “Viridis”: they were inspired by the Latin language and chose an ideal city where green spaces (parks, gardens, trees, and shrubs) predominate.	- the chosen solutions regarding the layout and functionality of the ideal city were not justified.
5	- they were inspired by the urban planning models of other cities, such as Buzău, Sibiu, Padova, Frankfurt, and Istanbul; - they planned the ideal city and used the "Paintool.sai" program to upload a photo of the city center from reality, seen from a bird's-eye perspective; then they placed an A4 sheet of paper over the computer screen and drew the city center on the paper; - they glued the paper with the city center in the middle of an A2 cardboard and represented the rest of the city.	- "Solatina on the Mureș": they justified the choice of the name by invoking a historical moment: "The Revolution of 1848 was on the verge of being defeated, but a lawyer from Târgu Mureș, Solatina Ioan, managed to turn everything in favor of the revolutionaries both in Hungary and Romania through his ideas, the support he received, and a well-organized set of reforms."	- the chosen solutions regarding the layout and functionality of the ideal city were not justified.
6	- no explanations were provided regarding the steps followed in the design and implementation of the plan.	- no explanations were provided regarding the name of the ideal city.	- the chosen solutions regarding the layout and functionality of the ideal city were not justified.
GE^{C} (Class C)			
1	- based on a tourist map (obtained from "Visit Mureș"), sketching the application's route on the ground coordinated by the professor, delimiting the area considered as the "given reality," and placing it in the central part of the ideal city; - drawing the radial-concentric street network, the hydrographic network, and placing various facilities; - coloring the plan and specifying the legend by choosing the appropriate conventional symbols.	- "Sallrano Civitas": the name comes from the abbreviation of the team members' first and last names, followed by the word "civitas" ("city" in Latin); to find it, the students applied the brainstorming technique.	- the ideal city is developed on both banks of the Mureș River, in accordance with the current plan; - on the right side of the river, there is a residential area and parking spaces; - on the left side, the historical center, other neighborhoods, with parking spaces (including for bicycles) and green spaces (for a more ozone-rich air), various facilities (administrative, educational, cultural, sanitary, financial, tourist, etc.); - the airport is located in the southern part of the city.
2	- creating a pencil sketch, first of the central area ("given reality"), and then of the other parts of the ideal city;. - representing the buildings, the most important facilities, and the street network; - coloring the plan and creating the legend.	- "Novapolis": the name combines two Greek words: "nova," meaning new, and "polis," meaning city, suggesting a city of novelty and progress.	- they chose to develop the ideal city on the southern side of the Nova River due to the accessible terrain; - the central area was located near the river "to facilitate tourism"; - on the other side of the Nova River, there is a ring road and an airport; - there are many green spaces and a leisure lake, with the purpose of improving air quality and shaping a pleasant landscape.
3	- research on urbanism and the essential concepts/elements for the development of an ideal city;	- "Green City": because they placed special emphasis on integrating green spaces; they	- it represents the ideal city due to the balance achieved between natural elements and urban

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	- discussing various scenarios for the best integration of natural elements and built structures. - creating the plan of the ideal city using graphite and colored pencils; - they wrote that "they made several attempts" and that they strived to ensure the ideal city "a greater coherence and functionality."	created parks, gardens, and green areas to provide residents with a healthy and pleasant environment; - The "Green City" project reflects the team's vision "of a modern and sustainable city, adapted to the current needs of society, but also to the challenges of the future."	constructions; - they integrated sustainable elements and modern technologies to ensure energy efficiency and environmental protection; - the city offers facilities and services, promoting the well-being and comfort of its residents; - they believed that a city with many green spaces not only improves the quality of life but also contributes to a cleaner and more sustainable environment.
4	- they believed that a city with many green spaces not only improves the quality of life but also contributes to a cleaner and more sustainable environment; - research (themes such as: green spaces, urbanism, urban planning, urban architecture, city functions, types of cities, types of plans were chosen) and selecting the information; - creating a sketch of the ideal city and using the "brainstorming" technique to express and select the best ideas related to the planning and functionality of the ideal city; - coloring the plan of the ideal city.	- no explanations were provided regarding the name of the ideal city.	- they opted for some tourist attractions (mainly dedicated to young people), such as: the botanical garden, the "aquatic" zoo, the planetarium, and the indoor ice rink; - they proposed many theaters, cafes, clubs for entertainment, and a large fitness center (promoting culture, health, and the well-being of the residents); - the residential area was located at the highest point of the city (for the exceptional view); - the city has many green spaces, and the lakes present host a unique fauna: "migratory swans" (the students justified this design choice as an attraction for elderly people).
5	- research related to urbanism and the concept of a "green city"; - creating an initial sketch of the ideal city to decide the location of the chosen urban site and the positioning of functional areas; - selecting the conventional symbols that will make up the legend; - creating the plan using graphite pencils, colored pencils, and markers.	- „"Terra Green": the name is due to the green areas designed to enhance air quality and the health of the population, as well as promote ecological education; - they wrote that the ideal city they proposed "promotes health and a better future."	- they developed the city on the northeast side of the river due to the favorable (flat) terrain and the possibilities for development; - they chose to place the central area near the river for the facilities it offers (especially for leisure); - "the given reality" is represented on a river terrace, in a higher area (reflecting the organizational structure from the medieval period); - on the other side of the river, a residential area and an industrial area were developed (surrounded by a forest, protecting the city from pollution); - the ideal city has many green spaces with the purpose of improving air quality. - the street network includes wide roads and many roundabouts (traffic lights were eliminated) for smoother traffic and a neater appearance.

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6	- they used a map of the city of Târgu Mureș to outline and represent the "given urban reality" (urban facilities, street network); - they drew the ideal city all around using colored pencils.	- "Greenhood": the name is explained by the presence of green spaces and well-maintained parks; - the city promotes an active and healthy lifestyle, with "Greenhood" being designed as "an exercise in modern urban planning, focusing on sustainability and the quality of life of its residents."	- they justified the arrangement of the green spaces in the ideal city by the need to provide its residents and visitors with oases of greenery and tranquility; - the parks are equipped with facilities for recreational activities (picnic areas, running tracks, playgrounds for children, and bike trails); - the infrastructure encourages sustainable transportation: charging stations for electric vehicles and interconnected bike lanes; - the architecture of the city blends harmoniously with the natural landscape, with buildings designed to maximize the use of natural light and incorporate green elements.

In the written texts, the students expressed their satisfaction with the activity and the plans they created, mentioning the impact it had on their own knowledge and the challenges they faced during the project development:

> „This project was something new for each of us. Combining science with art is what can be called scientific creativity, a new challenge that forced us to work as a team. It was a project that required time, a lot of work, and dedication. It was quite a difficult project, but it also awakened and developed skills rarely used in school. In conclusion, it was a project we worked on with pleasure, and it opened new perspectives for us" (Group 1, GE^{A}).

> „This activity was not only an exercise in creativity and teamwork but also an opportunity to explore and better understand the architecture and urbanism of our area. We thank you for the chance to express our vision of an ideal city, combining tradition with innovation" (Group 6, GE^{B})

> „We learned to collaborate effectively and to make the most of our knowledge and creativity to complete a project we are proud of" (Group 3, GE^{C}).

Conclusions

The results of the study show that the task of creating a plan for an ideal city was an effective tool in identifying students' conceptions of the ideal city, their knowledge and gaps regarding urban space, plans, and maps. It also helped establish connections between theory and practice, provided an opportunity for creative expression, and enabled the acquisition of skills in drafting, presenting, and analyzing an ideal city's plan, its design, and functionality, as well as in justifying the proposed solutions. The discussions among students in groups and with the teacher, during the creation and presentation of the ideal city plans, contributed to clarifying concepts, completing knowledge, and correcting misconceptions.

The students' results (the ideal city plans) show that they adhered to the criteria established at the beginning of the project activity. The analysis of the ideal city plans reveals that the students have a comprehensive understanding of the functions an ideal city should fulfill. They consider providing a range of services and facilities through which optimal living conditions are offered to the inhabitants.

Although students faced certain difficulties in representing the plans for the ideal cities (particularly with cartographic elements, which require certain mathematical skills, such as representing elements according to scale), they depicted facilities from all categories specific to an urban space. In order for students to acquire the necessary skills in representing geographical space, we believe that school

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programs and textbooks should include more practical activities, specifically applied and formative learning activities.

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