

STUDENT DOCUMENTATION FOR REPRESENTING THE IDEAL CITY

Hadrian-Vasile CONȚIU

Babeș-Bolyai” University, Cluj-Napoca, Faculty of Psychology and Educational Sciences, ROMANIA

hadrian.contiu@ubbcluj.ro

ORCID ID: <https://orcid.org/0000-0001-8108-2092>

Andreea CONȚIU

”Al. Papiu Ilarian” National College, Tg. Mureș; „Babeș-Bolyai” University, Cluj-Napoca, Faculty of Psychology and Educational Sciences, ROMANIA

andreea.contiu@ubbcluj.ro

ORCID ID: <https://orcid.org/0000-0001-5228-287X>

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ABSTRACT

This study highlights the necessity and effects of using worksheets to identify and correct potential gaps, to validate prior knowledge that will be related to new information, concepts, or procedures, as well as the use of portfolios for gathering, selecting, and structuring information to be utilized in later stages. The study involved 79 students aged 16-17, of both genders, from three 10th-grade classes at "Al. Papiu Ilarian" National College in Târgu-Mureș. To achieve the research objectives, students were engaged in a project-based learning activity. The students went through several stages, with the current study detailing the documentation phase. The necessity of involving students in practical experiences for the development of critical thinking and scientific skills is emphasized.

Keywords: *worksheet, portfolio, plan, map, Ideal city, urban planning*

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INTRODUCTION

The representation of urban space within an ideal city poses a challenge for students and teachers to think geographically about the future and has been the objective of several high school-level studies (Dulamă et al., 2012, 2013). With the development of the internet on a global scale, students in Romania began to research geographical systems using available online sources. Web sources have been used in bibliographic research and in the learning of geography (Ilovan et al., 2018c). Online documentation has been employed in geographical research related to urban bioregions, as an emerging topic (Ilovan et al., 2020f). Some studies have analyzed online geographical research methods used by students interested in territorial planning (Ilovan et al., 2016).

Based on research from printed sources, 8th-grade students identified the urban identity of major cities in Romania, presented it in written texts, and captured it in photographs grouped into posters (Sanislai et al. 2016). Other studies focused on determining the territorial identity of historic

urban centers in cities located in western Romania (Ilovan et al., 2018b), as well as analyzing residents' perceptions of central squares and the quality of urban life in the city of Cluj-Napoca (Ilovan et al., 2018a). The urban cultural landscapes in the center of Cluj-Napoca, shaped by architecture strongly influenced by the city's historical changes, were represented in drawings and thoroughly analyzed (Maroși et al., 2019).

Photographs play an important role in research related to urban and rural spaces. The internet is a generous source of photographs that can be analyzed with students in various educational contexts. A series of cultural landscapes were posted in a discussion group on the social media platform Facebook and were analyzed individually (Dulamă et al., 2016a). Other photographs were described by students based on an observation grid (Dulamă et al., 2016b).

Many studies have been dedicated to urban regeneration projects. International workshops have provided a favorable context for deepening and clarifying concepts related to urban regeneration and sharing experiences (Ilovan et al., 2019a), as well as for working in groups using information and communication technology (Ilovan et al., 2020c). A series of studies have focused on the digital mapping of urban landscape changes in post-socialist Romania (Ilovan et al., 2019b), including the industrial areas of Cluj-Napoca (Ilovan et al., 2019b).

Urban regeneration projects have been initiated and implemented in many cities in Romania. To understand the changes occurring in the urban landscape, students conducted direct observations, analyzed, and discussed with experts from various fields the sites that have been the focus of urban regeneration in Cluj-Napoca: "Technology Park" (Ilovan et al., 2020a); "Someș Delivery" (Ilovan et al., 2020b); "Fabrica de Pensule" (Ilovan et al., 2020d); "Grădini Mănăştur" (Ilovan et al., 2020e).

Understanding urban space and landscape requires a set of competencies specific to geography, which develop through practice over an extended period of time (Dulamă, 2010a, b). During educational activities, students can develop the skills to explore, present, and represent urban space (Ursu et al., 2019), the competence to analyze and interpret photographs capturing anthropogenic elements (Antal et al., 2020), the ability to create tourist maps (Osaci-Costache et al., 2013), and the skill to represent urban space and construct virtual landscapes (Dulamă et al., 2020). Working on projects in teams provides contexts for developing geography-specific competencies and for acquiring a large amount of knowledge in the field of geography through active learning (Dulamă, 2008a, b).

This research began with the observation that students struggle with identifying the components and functions of urban space, understanding the relationships between them, representing them on a plan, constructing a model, and connecting theory to practice. The aim of this study is to investigate the effects on students' knowledge and skills of using a worksheet and teacher-guided research through specific instructions, requirements, and criteria related to creating a team portfolio on a particular topic.

To achieve the study's objective, two research questions were established:

Q1. What is the effectiveness of the worksheet in identifying gaps and students' knowledge about urban space, plans, and maps?

Q2. What is the effectiveness of creating a portfolio based on requirements and criteria established by the teacher, in researching a specific studied topic?

METHODOLOGY

Participants. The study involved 79 students, aged 16-17, of both genders, from three 10th-grade classes at the "Al. Papiu Ilarian" National College in Târgu-Mureș. Two of the classes have a science profile with specializations in "natural sciences with intensive English" (GE^A) and "mathematics-informatics with intensive informatics" (GE^B). The third class has a humanities profile

with a specialization in "social sciences with intensive German" (GE^C). The selection of these classes was based on the following criteria: (a) the existence of parallel classes with different specializations corresponding to the science and humanities profiles; (b) the inclusion of the classes in the teaching schedule of the two study authors; (c) the grade level (10th grade). The students in each class were divided into heterogeneous groups by gender and geography competency level, but homogeneous in age (16-17 years). Each group consisted of four or five students, depending on the class size. Across the three classes, participants formed 6 groups of four students and 11 groups of five students, based on their free choice.

Procedure. The activities were organized and carried out starting in November 2023 and continued until May 2024 during Geography lessons at the "Al. Papiu Ilarian" National College in Târgu-Mureș, as well as outside of class time. To achieve the research objectives, students were involved in project-based learning activities. The students went through several stages: (1) the documentation stage; (2) the fieldwork stage; (3) the creation of ideal city plans (2D representations); (4) the construction of ideal city models (three-dimensional or 3D representations).

Teaching Activities. This study presents the documentation stage, conducted from November to December 2023. This stage consists of three sub-stages.

Sub-stage 1: *Discussing the Task and Objectives with Students.* Students were assigned to work in groups on a project titled: „Representation of the Plan and Model of the Ideal City Based on a Given Reality (the medieval fortress of Târgu Mureș and its surroundings)”. To complete this project, students will go through the documentation stage, followed by field applications, and then the actual creation of plans and models corresponding to the 2D and 3D representations of the ideal city. These stages will be completed over six months. At the end of the project, each team will present their results to their classmates during a geography lesson.

Through this activity, students will achieve several objectives: representing urban space on a plan; constructing a model of the urban space corresponding to the plan using various materials and techniques; describing the model in both oral and written form; justifying their solutions and opinions about city planning, functionality, and the concept of the ideal city; and leveraging creative thinking in designing the plan and model of an ideal city, according to the desired lifestyle and quality of life.

For the *documentation stage* of the project, the objectives are as follows: identifying gaps and becoming aware of the quality of their prior knowledge about urban space, plans, and maps; and compiling a portfolio on a specific research theme.

The task was formulated as follows: Form teams of four or five students. Each team will complete the worksheet (Appendix 1). The worksheet will be evaluated by the teacher and by the neighboring group. Each team will create a portfolio, structured according to the requirements and a plan or table of contents provided by the teacher (Appendix 2). Each team will design the plan of an ideal city on an A2-sized cardboard and build the corresponding model to scale, using various materials (cardboard, polystyrene, plywood, modeling paste, clay, glue, etc.). The plan and model will be accompanied by oral and written explanations. Two months are allocated for the documentation stage, and the entire project will be completed over six months. Starting in May 2024, each team will present their plan and model to the class, arguing why they believe the plan and model represent an ideal city.

Sub-stage 2: *Group Formation and Collaborative Work on Worksheets.* The students formed the groups as follows: 5 groups of 5 students in GE^A (Class A); 6 groups of 5 students in GE^B (Class B); 6 groups of 4 students in GE^C (Class C). Each group organized its activities, distributed tasks independently, and completed the worksheet during a geography lesson. Each group evaluated a worksheet from a neighboring group (as chosen by the teacher) and engaged in discussions with students from other groups.

Sub-stage 3: *Portfolio Creation and Presentation*. The groups created a portfolio structured according to the plan or table of contents provided by the teacher and briefly presented their research results to the class during a geography lesson. After each presentation, the students discussed with the teacher the documentation strategies used and the outcomes achieved.

Instruments. The research data were collected using a worksheet and a portfolio evaluation grid.

The *worksheet* includes 5 True/False items related to the definitions of geographic terms (contour lines, latitude, longitude, urbanization, plan) and 5 completion items that require identifying geographic terms based on their descriptions (city, scale, environment, map, conventional signs). The third task asks students to specify one aspect of an urban planning element they would like to improve.

The *portfolio evaluation grid* (Appendix 2) comprises two categories of elements: *material resources* needed for organizing the portfolio documents (each group is provided with a laminated binder for organizing the portfolio, dividers for the portfolio components according to the task, and a hole puncher for binding the documents in the binder) and *content elements* that make up the actual body of the portfolio (*Title Page*: must include the college's header, the project title, team members' names, the coordinating teacher's name, the city, and the academic year, adhering to specific formatting requirements; *Photocopied Pages*: from specialized works such as books, articles, and studies on topics like urban planning, urban settlements, types of maps/plans, city functions, urban architecture, green spaces, quality of life in a city, and urban infrastructure; *Printed Pages*: containing texts from various websites that align with the above themes; *Handwritten Reading Sheets*: involving documentation visits to the College Library, County Library, Teleki Library, etc.; *Image Collection*: depicting various types of urban plans, including rectangular, radial-concentric, semicircular, linear, and multinuclear layouts; *Bibliography*: including a list of all books, articles, studies, and websites accessed and studied for the project.

RESULTS AND DISCUSSION

a) Analysis of the Worksheet. Regarding the first two topics, which encompass objective-type items, the analysis shows that 3 groups answered all questions correctly, 10 groups exceeded the threshold of 50% correct answers, and 4 groups accumulated less than 50% correct answers.

For the first statement in Topic I, "Contour lines or isohypses are lines that connect points with the same altitude," 10 groups (58.8%) correctly answered "True" (A). The solutions to the following two requirements of Subject I highlighted that the majority of students have knowledge related to the meaning of the concepts of latitude and longitude, with 13 groups (76.5%) identifying the incorrect statements. However, for the fourth statement, "Urbanization is a continuous, dynamic process that emerged from the concentration of a population in a specific area and expanded through migration processes, natural population growth, and the gradual transformation of villages into cities," only 7 groups (41.2%) answered correctly (A). This lower percentage can be explained by the fact that the topic has only been briefly touched upon in geography lessons in the first weeks of the 10th grade (within units such as "Political Geography" and "Population Geography") and in more detail only during middle school. 11 groups (64.7%) correctly identified that the statement "A plan represents a small-scale map (greater than 1:1,000,000)" was false. Subsequent discussions with the teacher clarified this aspect, with students recalling the types of maps and the definition of a plan, which they had learned in 9th grade physical geography.

Regarding Topic II, 12 groups (70.6%) demonstrated an understanding of the term "urban settlement/city." Additionally, more than half of the groups (9 groups) (52.9%) recognized the definition of the scale of proportion. However, only 7 groups (41.2%) correctly completed the requirement for item II.3, which can be partially explained by the fact that discussions about the concept of the environment are only touched upon in the lower cycle of high school, with the topic

being extensively studied in the 11th grade under the subject of Geography – Fundamental Issues of the Contemporary World. 16 groups (94.1%) correctly identified the definition of a map, and 15 groups (88.2%) recognized the use of conventional signs, demonstrating a solid understanding of prior knowledge about maps and their elements.

Table 1
Evaluation Grid for the Worksheet

Items	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.	%
I. Determine the truth value of the following statements:																			
1. <i>Contour lines or isohypses</i> are lines that connect points with the same altitude. T/F	x	-	-	-	-	x	x	x	-	-	x	x	x	-	x	x	x	10	58,8
2. <i>Latitude</i> is the angle measured in degrees, minutes, and seconds from the 0° meridian or Greenwich to the east and west. T/F	x	x	-	x	x	x	x	-	x	x	-	x	-	x	x	x	13	76,5	
3. <i>Longitude</i> is the angle measured in degrees, minutes, and seconds from the Equator to the east and west. T/F	x	x	-	x	x	x	x	-	x	x	-	x	-	x	x	x	13	76,5	
4. <i>Urbanization</i> is a continuous, dynamic process that emerged through the concentration of a population in a certain space and has expanded through migration, natural growth, and the gradual transformation of villages into cities. T/F	-	-	-	x	-	x	-	x	-	-	-	x	x	-	x	-	x	7	41,2
5. A <i>plan</i> represents a map at a small scale (over 1:1,000,000). T/F	x	x	x	-	-	x	x	x	-	x	x	-	-	x	x	-	x	11	64,7
II. Fill in the blanks with the correct answer:																			
1. has a higher population, better technical and utility equipment, predominantly tertiary and secondary activities, and a high territorial concentration of buildings and population.	x	-	-	-	-	x	-	x	x	x	x	x	x	x	x	x	x	12	70,6
2. of is the ratio that indicates how many times an element from the field (a length) has been reduced to be represented on the map.	x	x	x	-	-	x	-	x	-	x	x	-	-	-	x	-	x	9	52,9
3. signifies a set of natural and artificial elements that surround a person or a human community, an animal, a plant, or a species.	-	-	-	x	-	x	x	x	-	-	-	-	x	x	-	-	x	7	41,2
4. is a reduced, generalized, and conventional representation of the Earth's surface.	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x	x	x	16	94,1
5. As a map element, the legend includes symbols.	x	x	x	-	x	x	x	x	x	x	x	x	x	-	x	x	x	15	88,2
III. Specify one aspect you would like to be improved for each of the following urbanism elements:																			
- Functional zones	x	x	-	-	-	x	x	x	-	x	x	-	x	-	x	x	x	11	64,7
- Transport networks	x	x	-	x	-	x	x	x	-	x	x	-	x	-	x	-	x	11	64,7
- The ratio between built and unbuilt spaces	x	x	-	-	-	x	-	x	-	-	x	-	x	-	-	-	x	7	41,2
- Green spaces	x	x	x	-	-	x	x	x	x	-	-	x	x	x	x	-	x	12	70,6
- The quality of space at the pedestrian perception level	x	x	-	x	x	x	x	-	-	-	x	-	-	-	-	x	x	9	52,9

x = Correct answer (subjects I și II)/answer (subject III); - Incorrect answer (subject I și II)//missing answer (subject III)

At the last question, the subjective responses highlighted both the students' ability to critically observe certain realities of urban space and their creativity in finding solutions. Not all groups were able to fully answer this task. Most of the responses were related to the term "green spaces" (12 groups; 70.6%), followed by "functional areas" and "transport networks" (11 groups; 64.7%). Fewer details were provided regarding the "ratio between built and unbuilt spaces" (7 groups; 41.2%). An average number of responses (9 groups; 52.9%) covered the last mentioned urban planning element: "pedestrian perception of space quality".

Some of the responses raised more subtle issues, which were more difficult for students to detect and were subsequently discussed with the teacher. Two examples illustrate this point. The first refers to the following response given by a group to Question III (GEC, Group 5): "industrial areas should be completely isolated." While this has a positive aspect in terms of pollution and urban environmental protection, the issue might be linked to the insecurity of the industrial area if it is not properly monitored and guarded, as it would lack what urban planners call "passive surveillance"; this refers to the absence of ordinary people in that perimeter, which can lead to an increase in potentially dangerous individuals. A second example concerns the possibility of widening traffic lanes in the city's central area (response from GEA, Group 4), which, in addition to properly streamlining human and material flows, would considerably increase urban pollution levels (chemical, noise pollution, etc.).

In general, the groups provided valuable responses, based on direct experience with urban space, revealing both the keen interest students have in their living environment and their appreciation of the opportunity to express themselves on this topic.

Table 2

Categories and Subcategories of Urbanism Improvements Proposed by Student Groups

Categories	Subcategories	Nr.
Functional areas	Mall location in the suburbs (GE ^{A1})	1
	Pedestrian center (GE ^{A2})	1
	Proper placement of fueling stations (GE ^{B1})	1
	More central areas (GE ^{B2})	1
	Improvement of abandoned industrial areas (GE ^{B5})	1
	Parking areas and avoidance of functional disruptions (GE ^{B6})	1
	Expansion of the built-up area based on rigorous planning (GE ^{B3} , GE ^{C2} , GE ^{C4})	3
	Industrial areas harmonized functionally with residential areas (GE ^{C5} , GE ^{C6})	2
Transport networks	Traffic decongestion in the center (GE ^{A1})	1
	Adapting the street network to current traffic (GE ^{A2})	1
	Widening of circulation routes in the center (GE ^{A4})	1
	Improving connections between central and peripheral areas and among peripheral areas (GE ^{B1} , GE ^{B3} , GE ^{B5} , GE ^{C4} , GE ^{C6})	5
	Transit alternatives (bypass roads) (GE ^{B2})	1
	Supplementing bike lanes (GE ^{B6})	1
	Alternatives to car transport (GE ^{C2})	1
The ratio between built and unbuilt spaces	Central areas with high built density (GE ^{A1} , GE ^{C2})	2
	Reducing paved/asphalted undeveloped areas (GE ^{A2})	1
	Resizing some markets (GE ^{B1})	1
	Associating parking areas with green spaces (GE ^{B3})	1
	Efficient structuring through planning of built/unbuilt space (GE ^{B6})	1
	Solutions for the space in front of institutions (GE ^{C6})	1
Green spaces	Protection and valorization of the natural environment (GE ^{A1} , GE ^{A2})	2
	Creation/expansion of green spaces (GE ^{A3} , GE ^{B1} , GE ^{B2} , GE ^{C2})	4
	Connecting green spaces (GE ^{B3})	1

	Equipping, diversifying, and maintaining green spaces (GE ^{B4} , GE ^{C1} , GE ^{C4})	3
	Securing green spaces (GE ^{C3})	1
	Short distance between residential areas and green spaces (GE ^{C6})	1
The quality of space at the pedestrian perception level	Conservation and rehabilitation of historical buildings (GE ^{A2} , GE ^{B1})	2
	Placement of green spaces between roadway and sidewalk to reduce pollution (GE ^{A1} , GE ^{A4} , GE ^{A5})	3
	Adequate facilities for functional areas (GE ^{B2} , GE ^{C6})	2
	Increasing pedestrian safety (GE ^{B6} , GE ^{C5})	2

b) Portfolio Analysis. Only three groups met over 90% of the requirements related to the content elements of the portfolio (two at 93.3%, one at 90%), while seven groups met only 50-60% of the requirements. Detailing the analysis of the portfolio content elements, the following aspects stand out: six requirements were met by all groups: plasticized binder (as material resource); project name and members' names (on the title page); green spaces (in the photocopied page subcomponent); specifying the URLs of websites (in listed pages) and websites in the bibliography (all as content elements). In general, the analyzed portfolios show a variety in meeting the requirements, with some groups excelling in meeting essential details and others struggling to fulfill all the requirements. Areas needing improvement include the uniform use of dividers and the completion of all requirements for the title page and material resources.

Regarding the material resources component, only 11 groups (64.7%) used dividers to structure the information collected from various sources more effectively. On the title page, 12 groups (70.6%) included the college's header, the city, and the school year, while 11 groups (64.7%) specified the name of the supervising teacher.

Regarding the photocopied pages subcomponent (from books, articles, studies, etc.), the following observations were made: 9 groups (52.9%) selected elements related to urbanism and urban settlements, and to the quality of life in a city from the indicated sources; 16 groups (94.1%) included photocopied pages to illustrate types of maps/plans; 11 groups (64.7%) provided photocopies to highlight both city functions and urban architecture; and 10 groups (58.8%) included photocopied pages related to urban infrastructure.

Table 3

Portfolio assessment rubric

Components	Subcomponents	Content elements	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.	%
A. Material Resources	Plasticized binder		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	17	100
	Dividers		x	x	x			x			x	x		x		x	x	x	x	11	64,7
B. Content Elements	Title Page	College letterhead	x	x	x		x	x	x	x	x			x	x		x		x	12	70,6
		Project name	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	17	100
		Names of team members	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	17	100
		Name of the coordinating teacher	x	x			x	x	x			x	x		x		x	x	x	11	64,7
		City, school year	x		x		x	x	x		x	x	x	x	x	x			x	12	70,6
	Photo-copied Pages from specialized works (books, articles and studies)	Urbanism, urban settlements	x	x					x	x	x				x			x		x	9
	Types of maps/plans	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	16	94,1	

etc.) on the following topics:	Functions of cities	x			x		x		x		x	x	x	x	x	x	x	11	64,7		
	Urban architecture	x	x	x	x	x	x	x	x					x		x		x	11	64,7	
	Green spaces	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	17	100	
	Quality of life in a city	x			x	x	x					x		x		x	x	x	9	52,9	
Listed Pages	Urban infrastructure	x	x	x	x		x	x	x			x			x			x	10	58,8	
	Presence of the website link	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	17	100	
Hand-written Reading Sheets	Compliance with the theme	x	x			x	x	x	x			x		x		x		x	10	58,8	
	Hand-filled by accessing the College Library	x	x	x			x	x		x	x		x	x	x		x	x	13	76,5	
	Hand-filled by accessing the County Library	x						x	x	x			x					x	7	41,2	
Image Collection	Hand-filled by accessing Terleki Library					x	x	x				x						x	5	29,4	
	Rectangular plans	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	16	94,1	
	Radial-concentric plans	x	x	x			x	x		x	x	x	x	x	x	x	x	x	15	88,2	
	Semicircular plans	x	x				x	x	x	x		x	x		x	x			x	11	64,7
	Linear plans	x	x	x	x			x	x	x	x	x	x		x		x	x	14	82,4	
	Polynuclear plans	x	x				x	x					x		x		x		x	8	47,1
	Satellite images	x	x	x			x	x	x	x			x	x				x	11	64,7	
Bibliography	photographs of urban areas	x			x	x												x	x	7	41,2
	Books	x	x				x	x		x	x		x		x				x	9	52,9
	Article and studies	x					x							x	x	x			x	8	47,1
	Websites	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	17	100	

x = exists/correct.

The subcomponent of *listed pages* highlights the difficulties students face in selecting the requested information, with only 10 groups (58.8%) managing to meet the requirement *related to thematic compliance*.

Most groups performed poorly regarding *the reading sheets* requirement; 13 groups (76.5%) completed *handwritten reading sheets* by *accessing the College Library*, 7 groups (41.2%) *accessed the County Library*, and 5 groups (29.4%) used the *Teleki Library*. As a result of these findings, students were informed about the importance of utilizing library resources and completing reading sheets for their development.

Regarding the *image collection subcomponent*, there was a high presence of *rectangular plans* in the portfolios of the groups, with 16 groups (94.1%) including them in their collection, as well as *radial-concentric plans* (15 groups; 88.2%) and *linear plans* (14 groups; 82.4%). A lower proportion included *semicircular plans* and *satellite images* (11 groups; 64.7%), while *polynuclear plans* and *photographs of urban elements* were included in the portfolios of less than half of the groups (8 groups, 47.1%, and 7 groups, 41.2%, respectively).

Bibliography was the final subcomponent of the portfolio. It included books, articles, studies, and websites. *Websites* had the highest percentage, with 100% (all 17 groups), while *books, articles and studies* had the lowest values (9 groups, 52.9%, and 8 groups, 47.1%, respectively). This trend is

explainable by students' preference for browsing the internet over physically reading printed sources, particularly for works with a smaller number of pages.

CONCLUSIONS

The study's results show that the worksheet was an effective tool in identifying gaps and students' knowledge about urban space, plans, and maps. Group discussions among students and with the teacher helped clarify concepts, enhance knowledge, and correct misconceptions about cartographic representations that were identified during the completion of the worksheet.

The analysis of how students created their portfolios and the materials they included reveals that this process was effective in developing students' research skills both in traditional libraries and online. As a result of the stages involved in identifying sources related to the studied topic, students became aware of the importance of researching to gather information from various fields and organizing data based on criteria and requirements.

All authors contributed equally to the development of this study.

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Appendix A

WORKSHEET

I. Determine the truth value of the following statements:

1. Contour lines or isohypses are lines that connect points with the same altitude. T/F
2. Latitude is the angle measured in degrees, minutes, and seconds from the 0° meridian or Greenwich to the east and west. T/F
3. Longitude is the angle measured in degrees, minutes, and seconds from the Equator to the east and west. T/F
4. Urbanization is a continuous, dynamic process that emerged through the concentration of a population in a certain space and has expanded through migration, natural growth, and the gradual transformation of villages into cities. T/F
5. A plan represents a map at a small scale (over 1:1,000,000). T/F

II. Fill in the blanks with the correct answer:

1. has a higher population, better technical and utility equipment, predominantly tertiary and secondary activities, and a high territorial concentration of buildings and population.

2. of is the ratio that indicates how many times an element from the field (a length) has been reduced to be represented on the map.
3. signifies a set of natural and artificial elements that surround a person or a human community, an animal, a plant, or a species.
4. is a reduced, generalized, and conventional representation of the Earth's surface.
5. As a map element, the legend includes symbols.

III. Specify one aspect you would like to be improved for each of the following urbanism elements: Functional zones, Transport networks, The ratio between built and unbuilt spaces, Green spaces and The quality of space at the pedestrian perception level.

Appendix B

PORTFOLIO. Table of Contents and Requirements

A. Material Resources:

- Plasticized binder (one per group);
- Dividers;
- Hole puncher.

B. Content Elements:

1. *Title Page*, which should include:
 - College letterhead (TNR, 14, Centered, at the top of the page)
 - Project name (TNR, 16, Centered, in the middle of the page)
 - Names of team members (TNR, 12, left, at the bottom of the page)
 - Name of the coordinating teacher (TNR, 12, right, at the bottom of the page)
 - City, school year (TNR, 10, Centered, at the bottom of the page, last line).
2. *Photocopied Pages* from specialized works (books, articles, studies, etc.) on the following topics: urbanism, urban settlements, types of maps/plans, functions of cities, urban architecture, green spaces, quality of life in a city, urban infrastructure etc.
3. *Listed Pages* from various pages/websites containing information consistent with the above topics.
4. *Handwritten Reading Sheets* (from the College Library, County Library, Teleki Library, etc.).
5. *Image Collection* that captures various types of urban plans (rectangular, radial-concentric, semicircular, linear, polynuclear), satellite images of cities, and photographs of urban areas.
6. *Bibliography* (a list of all books, articles, studies, and websites studied/accessed)