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# Using cognitive mapping method to track down tourism students' spatial orientation regarding tourist attractions in the city of Lviv (Ukraine)

**Abstract:** Spatial orientation, in addition to being crucial for human survival, is one of the key professional competences of a tourism graduate. Thus, the development of spatial orientation throughout university programs in tourism is vital for future specialists in this field. The question of the effectiveness of training tourism majors with regard to the formation of space orientation has not been addressed in Ukrainian higher education so far. Therefore, the purpose of this study was to trace the dynamics of geospatial literacy in students of tourism during the bachelor's and partly master's levels of study at Ivan Franko National University of Lviv and find its possible links to the curricular and extracurricular offering of the institution. The study comprised two parts: analysis of the curricula at both levels, specifically syllabi of compulsory and elective disciplines and course descriptions, and a comparative assessment of students' geospatial orientation in the city of Lviv with a special focus on its tourist attractions using the method of cognitive mapping. Students of the 1st and 4th year of the bachelor's program, as well as the 1st year of the master's program participated in the study. The research results show a significant improvement in students' spatial orientation in the city over years and suggest a positive correlation between the university's offering (both curricular and extracurricular) and the progress observed.

**Keywords:** cognitive mapping; geospatial orientation; professional training; sketch map; student tourism

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## Introduction

Tourism activities are inseparable from spatial movement, and, consequently, the knowledge of the territory where one travels is essential. Thus, tourism requires spatial orientation, i.e. the ability to find and use geospatial data for travelling (Go, Gretzel, 2016). At the same time, knowledge and ability to use geospatial data as well as free

orientation in space constitute the components of professional competence of a tourism graduate. This presupposes the ability to distinguish features of geographical landmarks (shape, size) and their spatial relation to each other (position, direction, and distance), skills in using maps and electronic devices for orientation in space.

Development of geospatial orientation is particularly relevant to professional training of tourism majors since the ability to plan and design travel routes is an essential component of the professional competence of specialists in tourism. In this study, the method of cognitive mapping was used to trace the dynamics of the formation of spatial orientation in students of tourism at Ivan Franko National University of Lviv, Ukraine (LNU) throughout the BA and partly MA (only the first year) programs in relation to the educational offering of the curriculum, i.e. courses of disciplines that prepare students for such professional activities, in which geospatial orientation plays the key role.

## Development of geospatial orientation as part of professional training of tourism majors

Geospatial orientation or spatial ability reflects an individual's capability of mentally manipulating spatial information (Go, Gretzel, 2016) and depends on using geospatial data. The latter concept refers to the information that determines the geographical location and characteristics of natural and man-made objects and boundaries on the surface of the Earth. It includes data on objects and phenomena that are directly or indirectly related to their location on Earth that is defined in a certain system of space coordinates (location information), as well as data sets about such objects (their attributes) and connections between them (Stock, Guesgen, 2016).

A number of studies in psychology and neuroscience that explored the phenomenon of spatial ability in humans link it to an individual type of intelligence required for coping with complex spatial thinking tasks (Hegarty, 2010), gender peculiarities (Hegarty, 2018), the use of spatial language and learning styles (Newcombe, Stieff, 2012). Although researchers express general agreement upon the fact that individuals have different mental ability to handle spatial information (Go, Gretzel, 2016), they advocate the idea that "spatial skills can be improved through training" and that "spatial education is possible in some form at all ages" (Newcombe, Stieff, 2012: 955).

Professional training of future specialists in the field of tourism is an educational process whereby students obtain special knowledge, acquire competences, and gain practical experience that eventually enable them to meet the demands of the tourism employment market. Knowledge and ability to use geospatial data, which can be referred to as spatial literacy, is part of tourism-related competence that constitutes an important component of professional competences of a tourism graduate (Zehrer, Mössenlechner, 2009). Spatial literacy encompasses a range of abilities essential for living and working in a spatial world. It involves knowledge about spatial concepts (location, distance, direction, scale, etc.) and forms of spatial representation (maps, projections, graphs, 3D-models), and entails ability to apply spatial reasoning, i.e. to use spatial data for various purposes, e.g. for calculating the shortest distance, planning a route, etc. (National Research Council, 2006).

Zwartjes (2014) refers spatial thinking to basic skills that are equal in value to mathematics or language skills and ought to be taught to everyone. At the same time, the development of space literacy is a vital component of tourism specialists' training.

According to the Hospitality, Tourism and Events Industry Competency Model (2017) developed by the US Department of Labor, space-related competences are mentioned in the groups of competences essential for specialists in the sector of Tour Operations and Travel Arrangements. In particular, these include "ability to describe key points of interest and attractions and respond to questions about them" and "awareness of travel routes and sites to be visited based on knowledge of area" (Hospitality, Tourism and Events Industry Competency Model, 2017: 31–32).

According to the European Qualifications Framework, competences related to space literacy are part of the learning outcomes requirement for people working in tourism, particularly in the Guiding and Leisure Time Animation Sector. A thorough description of these learning outcomes are presented in the Sectoral Qualifications Framework for Tourism (SQFT). For example, individuals working in the mentioned sector are expected to have knowledge and understanding of "information on natural and anthropogenic tourist attractions of a given area/tourist facility or a selected location, including information on geography, history, nature, culture and other areas of knowledge" (level 4), or "a broad range of specialized information in the area of sightseeing, history, geography, nature, culture, ethnography pertaining to various attractive regions of the world" (level 6). They are also supposed to be able to "provide tourists with diverse (or specialised) information about the tourist attractions of a given area/tourist facility and/or selected location" (levels 4 and 5); (Szymczak et al., 2017: 52–55).

Currently, Ukraine is not integrated into the European Qualifications Framework. Thus, the professional competences expected from tourism industry workers do not exactly correlate with those described in the SQFT. However, the Standard of Higher Education of Ukraine for the first level of higher education in Tourism (2018) emphasizes the importance of understanding of the basic concepts of "geotorial tourism" and "geospatial organization of tourist process" for further development of special professional competences, directly or implicitly connected with spatial literacy, that tourism graduates are expected to demonstrate. They include the following abilities:

- to analyse tourist and recreational potential of areas (industry competence # 17),
- to understand current trends and regional priorities for tourism development in general and in particular forms and types (industry competence # 19),
- to understand the processes of organisation of tourist trips and complex tourist service (industry competence # 20),
- to develop, promote, sell and arrange consumption of tourism product (industry competence # 21),
- to interpret and explain the peculiarities of the arrangement of tourist and recreational space (learning outcome # 04).

Studies of university curricula for tourism students were undertaken by a number of researchers. Among the most widely explored issues are the employers' requirements within the industry and the possibility to meet them through the existing curricula. Some studies address the correlations between the industry demands, students' expectations and educational offerings at universities of different countries (Wang, Ryan, 2007); investigate the past and present trends in the development of tourism education while tracing the tendencies in program goals, subject content and teaching strategies (Fidgeon, 2010); discuss challenges of curriculum design in tourism and hospitality education (Lam, Xiao, 2000). Researchers and educators emphasize the importance of developing language and communication competences in tourism students

(Kostic Bobanovic, Grzinic, 2011), broadening their knowledge of technology (Weeks, Culnane, 2001), fostering dynamic business, advanced human resource, ethical skills, etc. (Dias et al., 2017; Sheldon et al., 2008). However, little attention has been paid to the development of spatial thinking in future specialists in the field of tourism.

## Cognitive maps as a form of representation of geospatial orientation

The term "mental" or "cognitive" map was introduced in 1948 by psychologist E. Tolman and became widespread in cognitive psychology. The early developments on this concept date back to the 1970s mainly due to the contributions of geographer R.M. Downs and psychologist D. Stea who defined a cognitive map as an abstract concept that encompasses complex mental abilities allowing an individual to collect, organize, store, and recall information about the surrounding space (Downs, Stea, 1973). McDonald and Pellegrino (1993) considered cognitive maps to be mental representations in the form of visual images or otherwise that combine information perceived by several senses including semantic and affective information. F.B. Schenk regarded cognitive maps as mental conventions rather than objective and correct visualisations of territories. Thus, in the field of cognitive psychology, the term "cognitive map" is mainly interpreted as a tool for visual or graphical representation of cognitive processes that are subjective and may differ from one individual to another (Schenk, 2013).

In broad terms, mental maps can be defined as structures of social knowledge related to the interdisciplinary space of sociology, geography, history, cultural studies and psychology. Thus, not only territories, but also knowledge, ideas, and traits of personality can be subject to mental mapping. Depending on the use of mental maps, they can be referred to as "maps of consciousness", "maps of ideas", "intellectual maps", "maps of knowledge", "memory maps", "associative maps", "concept maps", "mind schemes", etc.

From the geographical perspective, mental maps are subjective cognitive representations of particular territories and comprise a number of elements, which include: *landmarks* – in urban environments primarily represented by prominent architectural constructions and sights; *nodes* – road intersections and city squares; *routes* – facilities that enable travel within the environment (motorways, roads, railways, etc.); *edges* – natural or man-made boundaries that delimit particular areas (rivers, city walls, mountain ridges, etc.); *districts* – distinct parts of a territory, such as business, residential, or industrial areas (Golledge, 1993; Lynch, 1960; Moore, Simmons, Fairweather, 1998).

According to Downs and Stea (1973), cognitive maps as mental representations of the physical environment are based on information of two kinds: that of the location and attributes of an object. While the former is related to subjective spatial geometry, the latter comprises descriptive information about the object itself as well as an individual's attitude to it (including one's interest in visiting the object). Thus, cognitive maps are not exact copies of the real environment, instead, they are "complex, highly selective and abstract" as well as "incomplete, distorted, schematized, and augmented" (Downs, Stea, 1973: 18).

The application of mental mapping method in the field of social geography can be found in studies conducted by Polish scholars. The exemplary works based on this method that illustrate its great potential are the comparative study of men's and women's perceptions and images of the urban space of the city of Łódź (Tobiasz-Lis, 2008), as well as

the study dedicated to social perceptions of the countryside by its residents with a special focus on the cognitive aspects of human-space relations (Tobiasz-Lis, Wójcik, 2014).

Mental mapping is widely used in tourism as a tool for analysis of travellers' behavioural patterns, their perceptions of particular destinations, expectations and judgements (Jenkins, Walmsley, 1993; Walmsley, Jenkins, 1992; Fridgen, 1987). Such studies provide information for local and national tourist boards and authorities about the actual state of tourism development and give insights into future opportunities and prospects in the industry.

Cognitive maps can be productively used in the sphere of education, particularly as a tool for evaluation. For example, L. Zelenskaya developed a conceptual framework for using a "memory map" or "Lynch map" to evaluate spatial orientation of geography students in the context of their professional training (Zelenskaya, 1998). O. Drozdov used mental maps to study the dynamics of the development of students' knowledge about the resources of the regions of Ukraine (Drozdov, 2012). An exemplary use of mental maps in social geography is research aimed at studying the perception of space by residents of big cities occupying large areas, having a complex transport infrastructure, and marked by a high concentration of historical and cultural, intellectual, educational, business and leisure facilities. The cognitive pictures of such cities in their residents' minds are represented by hundreds of landmarks that define the city's image. A recent research conducted in Lviv aimed to identify the representations of such landmarks in the perceptions of geography students at Ivan Franko National University of Lviv and the students of Lviv Small Academy of Sciences (Bordun, Kotyk, 2020). However, no study in Ukraine has targeted the progress in geospatial orientation made by students of tourism over time.

The purpose of our research was to define the dynamics of the development of spatial literacy regarding tourist attractions of the city of Lviv in students of tourism throughout the years of study at Ivan Franko National University. We were interested to see the correlation between the disciplinary courses within the University curriculum directed at increasing students' awareness of the city's tourist resources, as well as extracurricular factors, and the actual state of the students' knowledge of Lviv's tourist landmarks and their geospatial location. Thus, the study addressed the following research questions:

- Does the students' knowledge about tourist attractions of Lviv and their location increase over the years of study?
- Is there a link between the educational offerings by LNU and the students' progress?

Method. According to the purpose of the study and with the aim to answer the research questions, we used a combination of methods, namely the documentary research and the empirical study. To perform the former, we analysed the curricula for tourism students at the first and the second levels of higher education as well as course descriptions and/or syllabi. The latter involved a sample of participants selected from LNU students majoring in tourism and relied on cognitive mapping and questioning. The method of cognitive mapping was used to estimate geospatial orientation of the participating students with primary focus on their knowledge of the main tourist landmarks of the city of Lviv.

Instruments and administration. The main instrument of the study was a sketch map that is a graphical representation of the respondents' cognitive maps of the city of Lviv. A complementary instrument was a short questionnaire aimed at collecting

biodata about the study participants, namely their gender, place of birth and place of current residence. Both instruments were administered in a pen-to-paper manner in class at the beginning of the spring semester. The students were given blank sheets of paper and asked to draw sketch maps of the city of Lviv from memory trying to cover all the important features with a special emphasis on tourist landmarks. They were expected to perform the task in 80 minutes without prior preparation.

Participants. The sample of the study participants consisted of three groups of LNU students: first-year students of tourism at the BA level (year of entry – 2020), forth-year students of tourism at the BA level (year of entry – 2015) and first-year students of tourism at the MA level (year of entry – 2020). The first group included 82 students, the second group consisted of 74 participants, and the third one comprised 22 respondents. Table 1 provides more details on the respondents' profile. Participants of all the three groups performed the task in identical conditions under the supervision of a lecturer.

*Table 1.* Study participants' profile

| | Bachelor's level students, year 1 | Bachelor's level students, year 4 | Master's level students, year 1 |
|---|---|---|---|
| Total number of respondents, ind. | 82 | 74 | 22 |
| Males, % | 30 | 34 | 41 |
| Females, % | 70 | 66 | 59 |
| Share of students residing in Lviv for 1–3 years, % | 83 | 2 | 9 |
| Share of students residing in Lviv for 4–10 years, % | 4 | 91 | 83 |
| Share of students residing in Lviv for over 10 years, % | 13 | 7 | 8 |

Source: authors' own work based on questionnaires collected from participating students

## Results

Study of the bachelor's and master's programs curricula. Analysis of the curriculum and course descriptions of the disciplines offered to bachelor's level students of tourism at LNU revealed a number of courses that are supposed to contribute to the development of students' geospatial orientation. The list of the subjects and their scope in academic (class) hours is presented in Table 2. As stated in course descriptions, these disciplines aim to provide students with knowledge of main regional tourist landmarks, their location and associations (Tourist educational practice), urban tourism resources and geography of urban tourism (Urban tourism); form an ability to utilise the tourist potential of areas under study (Local lore tourist studies); ensure a proper understanding of the role of infrastructure in tourism (Tour operation management); develop organisational skills in planning city tours and designing excursion roadmaps (Organisation of excursions).

Similarly, several disciplines offered at the second (master's) level (Table 3) are targeted at developing student ability to estimate the logistic potential of tourist areas (Logistics in tourism), knowledge of the principles of geospatial studies of tourist market (Tourist service market), ability to choose destinations for event and MICE tourism (MICE tourism) – competences directly or indirectly related to geospatial orientation.

In addition to the above-mentioned curricular offerings, LNU provides a complex extracurricular Tour-guide course that comprises several theoretical and practical disciplines (see Table 4). It is a four-month course (108 academic hours) upon completion of

which students receive a certificate of a tour guide in the city of Lviv. The course provides students with in-depth knowledge of the history, art, architecture of Lviv, gives a comprehensive training in methods of organising and conducting guided tours in the city.

*Table 2.* Disciplines that develop geospatial orientation in students of tourism at the first (baccalaureate) level of higher education in LNU

| | Name of discipline | Status of discipline | Year of study | Number of academic hours |
|---|---|---|---|---|
| 1 | Geography of tourism | compulsory | 1 | 64 |
| 2 | Organisation of transport services for tourists | compulsory | 1 | 16 |
| 2 | Introductory practical training | compulsory | 1 | 180 |
| 3 | Organisation of tourist trips | compulsory | 1 | 48 |
| 4 | Tourist educational practice | compulsory | 2 | 180 |
| 5 | Organisation of excursions | compulsory | 3 | 48 |
| 6 | Urban tourism | compulsory | 3 | 32 |
| 7 | Festival tourism and exhibition activities | compulsory | 4 | 32 |
| 8 | Tour operation management | compulsory | 4 | 32 |
| 9 | Local lore tourist studies | compulsory | 4 | 16 |

Source: https://geography.lnu.edu.ua/academics/bachelor/tourism

*Table 3.* Disciplines that develop geospatial orientation in students of tourism at the second (master's) level of higher education in LNU

| | Name of discipline | Status of discipline | Year of study | Number of academic hours |
|---|---|---|---|---|
| 1 | Tourist service market | compulsory | 1 | 32 |
| 2 | Logistics in tourism | elective | 1 | 16 |
| 3 | Excursion service studies | compulsory | 2 | 16 |
| 4 | MICE tourism | elective | 2 | 8 |

Source: https://geography.lnu.edu.ua/academics/master/tourism-master

*Table 4.* Plan of the complex extracurricular Tour-guide course in LNU

| Course plan | Number of academic hours |
|---|---|
| Theoretical training | 54 |
| 1. History of Lviv | 9 |
| 2. Architecture of Lviv | 9 |
| 3. Necropolis studies | 9 |
| 4. Art and culture | 9 |
| 5. Religious studies | 9 |
| 6. Methods of conducting excursions | 9 |
| Practical training | 54 |
| 1. Preparation and conducting a walking guided tour "Lviv Midtown" | 18 |
| 2. Preparation and conducting a walking guided tour "Lychakiv Necropolis" | 18 |
| 3. Preparation and conducting a walking guided tour "Legends of Lviv University" | 18 |

Source: https://ipodp.lnu.edu.ua/news/guide-cources

Findings obtained from the sketch maps. The second part of our study involved analysis of the sketch maps produced by the participants of the survey held among the 1st and the 4th year bachelor's and the 1st year master's level students of tourism with the purpose to assess their knowledge as well as perceptions of the landmarks and main tourist resources of the city of Lviv. Lviv is a rather big city that occupies a large area and is marked by a complex urban infrastructure. The city has a wide variety of tourist attractions with a high density of historical and cultural sites, a complex and well-developed network of social, leisure and entertainment facilities, which, according to the obtained results, are represented by only a few most significant landmarks in junior students' cognitive maps, but become increasingly diversified, detailed and systematic in the cognitive maps of senior students. For the convenience of processing information on the sketch maps, we grouped the elements of the city depicted by the respondents into several categories. Traditionally, tourist resources are divided into *natural and recreational*, *cultural and historical,* and *infrastructural ones* (Liubitseva, 2002). Since our study focused on an urban area, cultural and historical resources dominated with a small share of natural and recreational ones (mainly parks). We further divided other city elements presented by the respondents into such groups as social infrastructure facilities (stadiums, sport centres, restaurants), shopping centres (malls, markets, supermarkets), transport nodes (airports, railway stations, coach stations), cultural and entertainment institutions (museums, theatres, cinemas, clubs), religious sites (places of worship, sacral monuments).

From the collected sketch maps, we can see that the majority of respondents perceive Rynok (Market) Square, City Hall, The High Castle, Monuments to Taras Shevchenko, Ivan Franko, and Markiyan Shashkevych as the most important cultural landmarks (See Table 5). While the 4th year and master's level students demonstrated an excellent knowledge of the city's main cultural and historical sites, the 1st year ones prioritized Ivan Franko National University of Lviv (100%), Monument to Ivan Franko, located in front of LNU main building (82%), and Rynok (Market) Square (68%), which indicates a limited space orientation amidst cultural landmarks.

Table 5. Cultural and historical landmarks of Lviv

| Name of site | Bachelor's level students, year 1, % | Bachelor's level students, year 4, % | Master's level students, year 1, % |
|---|---|---|---|
| Rynok (Market) Square | 68 | 100 | 100 |
| City Hall | 53 | 91 | 100 |
| The High Castle | 38 | 97 | 100 |
| Pototskiy Palace | 15 | 94 | 100 |
| Monument to Taras Shevchenko | 46 | 100 | 100 |
| Monument to Ivan Franko | 82 | 100 | 100 |
| Monument to Mykhailo Hrushevskyy | 0 | 93 | 97 |
| Monument to Stepan Bandera | 25 | 92 | 100 |
| Monument to Markiyan Shashkevych | 43 | 94 | 100 |
| Monument to Adam Mickiewicz | 27 | 91 | 100 |
| Ivan Franko National University of Lviv (mail building) | 100 | 100 | 100 |
| Lviv Polytechnic National University | 13 | 92 | 100 |
| Arithmetic mean for the group | 38 | 95 | 99 |

Source: authors' own work based on sketch maps collected from participating students (178 samples)

The respondents depicted a number of natural landmarks (city parks and gardens) on their maps. Among the most popular ones are Ivan Franko Park and Pohulianka Park, presumably due to their proximity to the University main building and campus. In addition, all senior students marked Stryiskyi Park on their maps (see Table 6).

Table 6. Parks and gardens of Lviv

| Name of site | Bachelor's level students, year 1, % | Bachelor's level students, year 4, % | Master's level students, year 1, % |
|---|---|---|---|
| Stryiskyi Park | 28 | 100 | 100 |
| Pohulianka Park | 81 | 100 | 100 |
| Ivan Franko Park | 85 | 100 | 100 |
| Bohdan Khmelnytskyi Park | 5 | 53 | 91 |
| Iron Water Park | 3 | 38 | 65 |
| University Botanical Garden | 27 | 69 | 72 |
| Arithmetic mean for the group | 38 | 77 | 88 |

Source: authors' own work based on sketch maps collected from participating students (178 samples)

Analysis of the sketch maps revealed that shopping centres and markets play a significant role in students' live. The frequency of their appearance on the 1st year respondents' maps is often higher than that of historical monuments, theatres or museums, indicating that geospatial orientation of junior students is determined by daily needs rather than by future professional interests. However, over time, students' mental image of the city expands and the range of social infrastructure facilities becomes more diverse, as can be seen from the 4th year students' sketch maps. For example, senior students' maps tend to include sport and active leisure facilities, such as Lviv Arena Stadium, sports centres "Sport Life", "Medyk", etc. (Table 7).

*Table 7.* Social infrastructure facilities and shopping centers

| Name of site | Bachelor's level students, year 1, % | Bachelor's level students, year 4, % | Master's level students, year 1, % |
|---|---|---|---|
| Mall "Forum" | 45 | 100 | 100 |
| Mall "King Cross" | 32 | 76 | 91 |
| Shopping centre "Roksolana" | 26 | 82 | 85 |
| McDonald's | 85 | 100 | 100 |
| Chain supermarkets ATB | 63 | 87 | 95 |
| Chain supermarkets "Blysen'ko" | 87 | 95 | 100 |
| Chain supermarkets "Silpo" | 48 | 72 | 85 |
| Chain supermarkets "Arsen" | 35 | 48 | 55 |
| Chain supermarkets "Rukavychka" | 66 | 53 | 45 |
| Market "Pryvokzal'nyi" | 47 | 42 | 67 |
| Market "Halytskyi" | 54 | 36 | 45 |
| Market "Krakivs'kyi" | 46 | 45 | 55 |
| Market "Shuvar" | 57 | 61 | 85 |
| Lviv Arena Stadium | 32 | 56 | 84 |
| Stadium "SKA" | 16 | 47 | 45 |

| | | | |
|---|---|---|---|
| Fitness clubs chain "Sport Life" | 28 | 85 | 67 |
| Sports centre "Medyk" | 34 | 45 | 79 |
| LNU Sports center | 100 | 100 | 100 |
| Arithmetic mean for the group | 50 | 68 | 76 |

Source: authors' own work based on sketch maps collected from participating students (178 samples)

Among the key transport nodes, the respondents singled out Danylo Halytskyi International Airport Lviv, Central Railway Station and Central Coach Station (Table 8). However, only 27% of the 1st year students marked the airport on their maps.

*Table 8.* Main transport nodes

| Name of site | Bachelor's level students, year 1, % | Bachelor's level students, year 4, % | Master's level students, year 1, % |
|---|---|---|---|
| Central Railway Station | 78 | 100 | 100 |
| Central Coach Station | 54 | 100 | 100 |
| Coach Station # 2 | 63 | 58 | 85 |
| Coach Station # 6 | 35 | 74 | 46 |
| Danylo Halytskyi International Airport Lviv | 27 | 100 | 100 |
| Arithmetic mean for the group | 51 | 86 | 86 |

Source: authors' own work based on sketch maps collected from participating students (178 samples)

The number of public entertainment places such as theatres, cinemas and clubs in students' cognitive maps may indicate both the geography of their social life and the professional knowledge of the city's cultural institutions. Whatever may be the reason, the tendency for an increase in students' awareness of such institutions is clearly observable (see Table 9).

*Table 9.* Public entertainment institutions: theatres, cinemas, clubs

| Name of site | Bachelor's level students, year 1, % | Bachelor's level students, year 4, % | Master's level students, year 1, % |
|---|---|---|---|
| Solomiya Krushelnytska Lviv State Academic Theatre of Opera and Ballet | 65 | 100 | 100 |
| Maria Zankovetska Theatre | 47 | 54 | 90 |
| Les Kurbas Theatre | 27 | 48 | 54 |
| Kopernicus Cinema | 18 | 75 | 85 |
| Malevich Club | 26 | 100 | 100 |
| Cultural and educational centre "Hnat Khotkevych Palace" | 15 | 16 | 10 |
| Oleksander Dovzhenko Cinema | 43 | 65 | 46 |
| Arithmetic mean for the group | 34 | 65 | 69 |

Source: authors' own work based on sketch maps collected from participating students (178 samples)

The presence of places of worship, sacral monuments and museums on the sketch maps is particularly indicative of tourism students' professional development. Comparison of the maps drawn by the 1st year bachelor's level students and those of the 4th year bachelor's as well as master's level students reveals a great difference in

numbers and variety of such landmarks. For example, the 1st year students are familiar with only a few most popular religious sites of the city: St. George's Cathedral (76%), The Church of the Assumption of the Blessed Virgin Mary (The Dormition Church, 62%), St. Peter and Paul Garrison Church (The Jesuit Church, 53%), St. Mary the Protectress Church (located in proximity to University campus, 57%), while the number of churches marked by senior students is considerably greater (see Table 10). The most representative cases of the dynamics of students' familiarity with Lviv's places of worship are St. Nicholas Church (marked by 0% of the 1st year, 48% of the 4th year, 81% of master's students), Church of the Holy Spirit (0%, 48%, 85%, respectively), Church of Mary Magdalene (7%, 100%, 100% respectively).

We can trace a similar tendency with museums of Lviv (Table 11). Our results show that junior students have a rather superficial knowledge of the city's museums, whereas senior ones demonstrate proficient expertise in the field. The exemplary cases of this are the following: The National Museum-Memorial of Victims of the Occupation Regimes (depicted by 0% of the 1st year, 95% of the 4th year, 90% of master's students), The Lviv Museum of the History of Religion (8%, 69%, 81%, respectively), The Rusalka Dnistrovaya (The Dniester Mermaid) Museum (0%, 76%, 100%, respectively), Johann Georg Pinsel Museum (5%, 75%, 90%, respectively). Thus, it can be inferred that professional training throughout the years of study at University made a significant contribution to the students' knowledge of cultural, historical and religious sites of Lviv.

*Table 10.* Places of worship and main sacral monuments of Lviv

| Name of site | Bachelor's level students, year 1, % | Bachelor's level students, year 4, % | Master's level students, year 1, % |
|---|---|---|---|
| St. George's Cathedral | 76 | 100 | 100 |
| The Church of the Assumption of the Blessed Virgin Mary | 62 | 94 | 85 |
| Latin Cathedral | 45 | 87 | 85 |
| St. Michael's church (the former Carmelite church) | 42 | 58 | 54 |
| Church of St. Andrew (the former Bernardine church and monastery) | 38 | 72 | 68 |
| Church of the Holy Eucharist (the former Dominican church and monastery) | 32 | 63 | 50 |
| Church of the Transfiguration (the former church of the Holy Trinity) | 12 | 75 | 46 |
| Church of Our Lady of Perpetual Help (the former church of Our Lady of the Snows) | 3 | 27 | 35 |
| St. Peter and Paul Garrison Church (the former Jesuit Church) | 53 | 76 | 46 |
| Church of Mary Magdalene (now Lviv Organ Hall) | 7 | 100 | 100 |
| Church of St. Ann | 21 | 68 | 54 |
| Church of St. Lazare | 14 | 72 | 63 |
| Church of the Holy Spirit | 0 | 48 | 85 |
| The Armenian Cathedral of the Assumption of Mary | 6 | 76 | 90 |
| St. Nicholas Church | 4 | 48 | 81 |

| | | | |
|---|---|---|---|
| Cathedral of St. Mary the Protectress (Ukrainian Orthodox Church) | 0 | 57 | 18 |
| The Golden Rose Synagogue | 0 | 43 | 54 |
| St. Mary the Protectress Church | 57 | 74 | 85 |
| Monastery and church of St. Onuphrius | 16 | 56 | 46 |
| Church of St. Paraskeva | 0 | 25 | 18 |
| Church of Sts. Olha and Elizabeth | 37 | 89 | 90 |
| Church of the Nativity of the Theotokos | 0 | 4 | 5 |
| Arythmetic mean for the group | 22 | 59 | 62 |

Source: authors' own work based on sketch maps collected from participating students (178 samples)

*Table 11.* Museums of Lviv

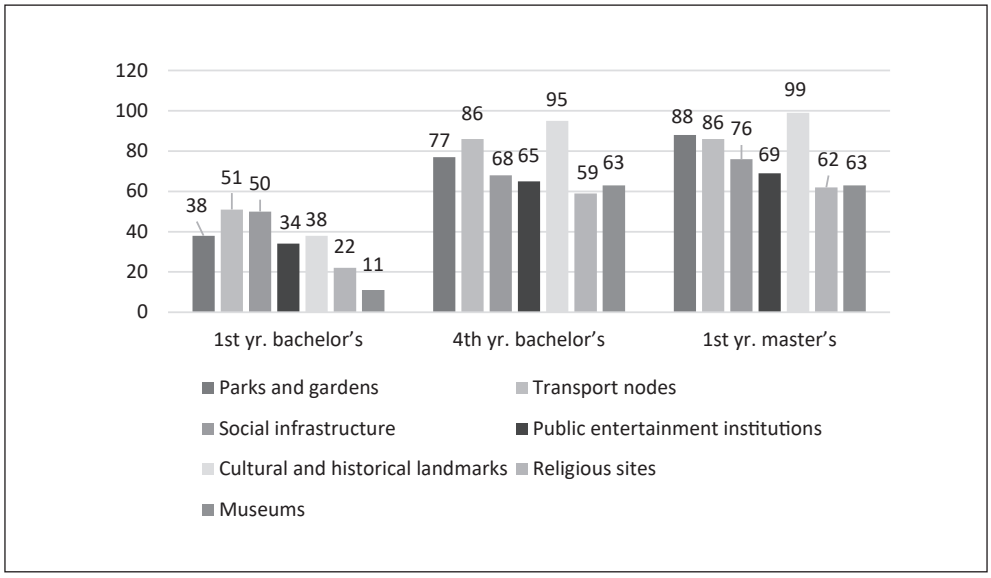
| Name of site | Bachelor's level students, year 1, % | Bachelor's level students, year 4, % | Master's level students, year 1, % |
|---|---|---|---|
| Andrey Sheptytsky National Museum of Lviv | 34 | 100 | 95 |
| The City Arsenal Armory Museum | 21 | 87 | 100 |
| The Historical Museum of Lviv | 17 | 93 | 86 |
| The National Museum-Memorial of Victims of the Occupation Regimes (the Prison on Łącki street) | 0 | 95 | 90 |
| The Pharmacy Museum "Under the Black Eagle" | 0 | 56 | 68 |
| The Natural History Museum | 4 | 48 | 45 |
| The Secret Pharmacy Interactive Museum | 0 | 32 | 50 |
| Solomiya Krushelnytska Musical-memorial Museum | 0 | 46 | 18 |
| Stanislav Ludkievich Memorial Museum | 0 | 4 | 10 |
| Olena Kulchytska Memorial Museum | 0 | 7 | 5 |
| The Rusalka Dnistrovaya (The Dniester Mermaid) Museum | 0 | 76 | 100 |
| The Museum of Ethnography | 7 | 87 | 95 |
| Johann Georg Pinsel Museum (The Museum of J. G. Pinsel Sacral Baroque Sculpture) | 5 | 75 | 90 |
| The Lviv Museum of the History of Religion | 8 | 69 | 81 |
| The National Art Gallery of Lviv | 16 | 74 | 86 |
| Benedict Dybowski Zoological Museum | 0 | 5 | 10 |
| Shevchenko Hai Ethno Park | 45 | 100 | 100 |
| The State History and Culture Museum--Preserve "Lychakiv Cemetery" | 37 | 100 | 100 |
| The Museum of Medicine | 0 | 0 | 5 |
| The Museum of Liberation Struggle of Ukraine | 26 | 62 | 23 |
| Ivan Franko Memorial Museum | 19 | 75 | 50 |
| Mykhaylo Hrushevsky Memorial Museum | 21 | 64 | 50 |
| The Museum of the History of Beer "Lvivarnia" | 5 | 85 | 81 |
| The Museum of Terror | 0 | 76 | 68 |
| Arithmetic mean for the group | 11 | 63 | 63 |

Source: authors' own work based on sketch maps collected from participating students (178 samples)

Data collected on student's familiarity with places of worship and museums of Lviv occasionally reveals a somewhat atypical reverse tendency whereby fewer master's level students depicted some of such places than the 4th year bachelor's level students. For example, the Church of the Holy Eucharist was present on the sketch maps of 63% of the 4th year bachelor students and only 50% of master's students, St. Peter and Paul Garrison Church was depicted by 76% of the 4th year bachelor's and 46% of master's students, respectively. The same trend can be seen with museums: Solomiya Krushelnytska Musical-memorial Museum (46% 4th year bachelor's, 18% master's students), Ivan Franko Memorial Museum (75% 4th year bachelor's, 50% master's students), The Museum of Liberation Struggle of Ukraine (62% 4th year bachelor's, 23% master's students). This might be due to the fact that part of master's level students joined LNU only for the master's program having obtained their bachelor's degree from other institutions of Ukraine.

With a view to tracing the dynamics of the development of geospatial orientation in LNU students, we calculated the arithmetic mean for each category of tourism resources (Tables 5–11) and created a chart that depicts the tendencies over years of study (Figure 1). We can observe a significant progress in the knowledge of all types of Lviv urban sites throughout the bachelor's level, which is particularly sharp in the categories of "cultural and historical landmarks" and "museums". During the second period (from the last year of the bachelor's program to the second semester of the master's) the growth slows down. This fact may result from a longer and more intense curriculum during the years of study at the BA level with a greater number of courses, whereby students obtain most knowledge needed to expand their geospatial orientation in the city. At the same time, the most rapid increase in the number of museums as well as cultural and historical monuments on the participants' sketch maps may be indicative of the contribution of university's courses to the progress in their professional development.

*Figure 1.* The dynamics of geospatial orientation of LNU students in Lviv by categories of tourist resources




Source: authors' own work based on sketch maps collected from participating students (178 samples)

In contrast, students' knowledge of the city's social infrastructure, which is least related to university education and results mainly from their daily life experience, shows the slowest, although steady, growth.

## Conclusions

Analysis of the bachelor's and master's programs' curricula for tourism majors at Ivan Franko National University of Lviv showed that a number of courses offered to students at both levels are designed with a view to developing their geospatial orientation in the local area including the city of Lviv. For example, according to course descriptions of some disciplines taught at the bachelor's level, students are supposed to gain knowledge of main regional tourist landmarks, their location and associations, form an ability to utilise the tourist potential of areas under study, develop organisational skills in planning city tours, designing excursion roadmaps, etc. Likewise, courses offered at the master's level aim to develop student ability to estimate the logistic potential of tourist areas, choose destinations for specific types of tourism and apply geospatial principles to tourist market studies.

The second part of the study based on the method of cognitive mapping revealed a considerable improvement in students' knowledge of the city's landmarks, tourist attractions, public and social facilities. We observed a great increase in the numbers of objects depicted by the 4$^{th}$ year bachelor's students compared to the 1$^{st}$ year ones. The difference of occurrence of some, especially less popular places, on the sketch maps produced in both groups could be as high as 4– or 5–fold. A smaller difference, ranging from 5 to 20 per cent on average, was noticed between the group of the 4$^{th}$ year bachelor's students and that of the 1$^{st}$ year master's students. Such progress in students' geospatial orientation in Lviv can be attributed to a number of factors including the necessity to meet daily needs, social activities and, without doubt, professional development grounded in the University's educational offerings. The latter is evidenced by a significant increase in the numbers of such tourist attractions as museums, places of worship, historical, cultural and sacral monuments on the sketch maps drawn by senior students.

As admitted by scholars, cognitive maps are a multifunctional tool that can be used for various theoretical and practical purposes (Tobiasz-Lis, Wójcik, 2014). Our study has proved that this instrument can be appropriate for interdisciplinary studies across the fields of education and social geography, for example to estimate student's progress in knowledge of particular urban tourist objects. The main limitation of the method is that it does not allow for an accurate measurement of the extent to which the students' actual knowledge is determined by educational contributions. This goal can be achieved by combining a number of methods, such as cognitive mapping, testing and interviewing. In addition, mental mapping can be a promising way to delineate the 'life space' of students (or any other population group) in cities and trace the geography of their social activity.

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