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Landscapes as represented in textbooks and in students' imagination: stability, generational gap, image retention and recognisability

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ABSTRACT

The paper focuses on the representation of landscapes and the depiction of landscape features in the photographic images of textbooks, the perception, recognition and imagination of landscapes by the school population, and the possible link between both. The empirical element of the study is based on the case of Slovenia and includes quantitative and qualitative analysis of photographs in textbooks and questionnaires completed by primary and secondary school students (aged 10–18 years). The results show that the photographs emphasise natural, rural, and tangible aspects of landscapes, while students' imagination also includes urban, dynamic and, especially, intangible elements. We discuss the relevance of stability, generational gap, image retention, and recognisability. One of the key conclusions is that there is a dichotomy between the representation of landscape in textbooks and in students' imagination, but it is not clear-cut.

1. Introduction: landscape, photography, and geographical imagination

Photography in various publications, for both lay and professional audiences, tends to give the impression that two landscape types prevail in Slovenia: rural and Alpine. The predominance of high mountains is striking, especially considering that these cover less than one-tenth of the country. The rurality is less surprising; rural landscapes dominate Slovenia, yet the contribution of agriculture to employment and income is insignificant. This raises some questions: what kind of landscapes are pictured in textbooks in general? Is rural and Alpine photography over-represented in textbooks and therefore assumingly distorts realities? In Slovenia, the use of textbooks is mandatory at both the primary and secondary level of education, therefore the textbook content has a considerable influence on students' knowledge and perception. Teachers can choose between textbooks of several publishing houses, but they must be officially approved by the Expert Councils of the Republic of Slovenia for various levels of education, and thus proven to be in line with the curricula.

The significance of students' imagination extends beyond scientific interest. Young people are the future decision makers, hence it is essential to know what kind of images they are exposed to, and how they view and understand the world, since people behave according to how they see the world and not how the world really is (Schlitz, Vieten, and Miller 2010).

This paper is built around three notions: landscape, photography, and geographical imagination. The geographical imagination is an overarching concept for framing human's sensitivity to the world, and the landscape is one of the pillars thereof. Photography is a communication tool for expressing and representing the relationship between them. Despite the researchers' awareness of other tools for linking human sensitivities and landscapes, such as art, literature and music, the prominent role of textbooks in Slovenian school and the size of the sample entailed a linear study including only textbook photography.

Landscape, despite being a key analytical concept in several social and environmental sciences (Wylie et al. 2009), lacks clarity and unambiguity, mainly because it conveys a complex and multi-vocal relationship between the natural environment and human society. It is both the result of this interaction and concurrently the process itself. This dynamic aspect was emphasised by Mitchell (1994), who wittily explained landscape to be more a verb than a noun. Connected to a landscape's structural aspect, one must recognise both tangible and intangible elements. Among numerous scholarly orientations (e.g. Shaw and Oldfield 2007), that of Cosgrove (1998) and Cosgrove and Daniels (1988) is relevant to this paper: landscape as a way of seeing and representing the world. Cosgrove (2003) further elaborates: 'Landscape thus denotes primarily geography as it is seen, imaged and imagined.' Implicit in this statement is the representation of landscapes which can take a myriad of (not only) visual forms with photography having a prominent role.

Photographs have been effectively and widely used in research since the advent of photography and have proved their importance for geography's scholarly paradigm. The fundamental use of photography is for gathering and evidencing information (Schwartz 1996). Equally important is its role in constructing and transmitting geographical knowledge (Rose 2008), thereby having a long tradition in schooling (Hall 2015). It has also been a powerful research method or practice (Cooper 2017). Moreover, the authority or 'constructive' power of photography (Van Leeuven and Jewitt 2004) goes far beyond the classroom into the general sphere of communicating ideas about the world and shaping one's worldview.

However, it was only at the end of the twentieth century that photographs became a subject of geographical inquiry. Its usefulness as a research subject is based on the fact that photographs (including scientifically conceived photographs) have 'layers of meaning beyond the visual facts presented in the images themselves' (Schwartz 1996). One of the most influential analyses of photography is Lutz and Collins (1993) content analysis of the *National Geographic* journal. Further impetus was given by applying the concept of geographical imagination and the visual turn in humanities which brought to light visuality and photography as a primary source for examination in cultural and historical studies (Cosgrove 2006; Rose 2001). Photo elicitation methods have proved to be effective in gaining an insight into children's spatial perceptions (Leonard and McKnight 2015; Pyyry 2015).

Geographical imagination as a discursive practice has accompanied humans since the beginning of human history; nevertheless, as an academic concept, it is no older than a few decades. It has begun to be used in postmodernist approaches in social theory that have also had significant influence on geography and related fields. The main theoretical premise behind geographical imagination is that space is becoming less material and more metaphorical. The term has been exposed to wide range of ideas from numerous fields causing it to become conceptually broad causing a pluralisation, hence the term is also called imaginative geographies (Hoelscher 2006). The concept focuses on understanding the modes in which society and its ways of life are reflected in space, settlements, and landscapes (Gregory 1994). In this paper, the term geographical imagination serves as an umbrella term that includes the comprehension, perception, and representations of place and space, landscape and nature reflected in photographs, texts, and discourses.

The link between imagination and what is being imagined is very close in the case of landscape, because vision, visuality, and aesthetic sensibility play a key role in comprehending both geographical imagination and landscape. Despite the strength of media-constructed visuality and the

prevalence of digital images, photography remains an essential vehicle for 'producing and consuming' geographical imagination (Hoelscher 2006).

A considerable number of studies have addressed geographical imagination following Edward Said's seminal 1978 book 'Orientalism' (e.g. Gregory 1994; Harvey 1990; Schwartz and Ryan 2003), as well as the geographical imagination of students (Béneker et al. 2010; Bourke 2017). Similarly, several analyses addressed landscape photography, mostly focusing either on small collections (Stylianou and Philippou 2019), individual photographers' achievements (Vasudevan 2015) or the representation of landscapes for the tourism industry (Anderson 2012). On the other hand, textbook photography and its role in geographical imagination was less often a subject of scientific scrutiny. While there are some studies looking at how certain parts of the world are represented in textbooks (Hamann 2007) or at the role of textbooks for the national imaginary (Morgan 2003), they do not focus on photography only. Furthermore, researchers have not treated landscape photography in textbooks in much detail; a rare example is provided by Yasar and Seremet (2007).

To the best of our knowledge, this research represents a first attempt to study a large and comprehensive set of textbook photography by evaluating all landscape elements of each photograph and carrying out an extensive analysis of how the school-age population comprehends and perceives landscapes. The overall objective of this paper is to provide an insight into the geographical imagination of Slovenian landscapes. Specific research questions are: (i) how landscapes are represented in textbook photographs and which landscape features become apparent, (ii) how landscapes are seen, perceived, recognised and imagined by the school population, and (iii) is there a link between the findings.

2. Methods

2.1. Case study: Slovenia

The study was conducted in Slovenia for several reasons. Firstly, due to internal compactness, homogeneity and size, Slovenia is a relatively coherent country in terms of ethnicity and culture. Owing to long-standing programs for overcoming regional disparities (Nared 2020), not only is the inter-regional inequality in all pivotal aspects, i.e. social, educational, and economic low, but also the urban-rural divide is getting more and more blurred in some aspects (Kozina and Clifton 2019). According to OECD, Slovenia is the country with the lowest income/wealth inequality (OECD 2019). Additionally, centralism is clearly pronounced in many sectors, including education. All these make Slovenia a suitable case study.

Secondly, Slovenia meets the purposes of the study due to its landscape diversity as a result of the nation's advantaged position at the junction of the Alps, the Pannonian Plain, the Dinaric Mountains, and the Mediterranean. What is more, its location at the crossroads of different cultural influences and the region's turbulent history complement the landscapes' mosaic. Among the landscape elements, the most notable are land-use diversity, land fragmentation, dispersed settlements, and prevalence of forests. They all strongly depend on relief, rocks and vegetation which have been identified as the most essential for the internal structure, function, and appearance of Slovenian landscapes (Perko, Hrvatin, and Ciglič 2017).

2.2. Analysis of the textbook photographs

2.2.1. Selection of textbooks and photographs
The selection of textbooks followed two steps with one and two criteria, respectively. Firstly, we reviewed the curricula of a variety of subjects which were anticipated to include learning content about Slovenian landscapes. This step yielded a list of nine primary school and 16 secondary school curricula for 17 different subjects from different fields. Secondly, based on the identified curricula, we compiled two extensive lists of textbooks that are authorised for use in schools: the primary school

list included 150 and the secondary school list 56 textbooks. By applying the inclusion criterion of being used by at least two-thirds of the students, the final list of 31 primary and 19 secondary school textbooks was completed (for the workflow see Supplementary material).

The selection of photographs was carried out by *in vivo* screening of all the selected textbooks which were obtained from the National and University Library in Ljubljana. The procedure based on a single inclusion criterion: depicting rural and urban landscapes in Slovenia. We excluded photographs depicting indoor motifs, portraits, and focused individual objects devoid of place/space positioning. A total of 949 photographs were designated for analysis. After being digitised, photographs were analysed using Atlas.ti program.

2.2.2. Data analysis: photographs

For scrutinising each photograph, we elaborated a set of 13 indicators: 11 landscape related and two location ones. The former ones were influenced by visual and visible aspects of the culture-nature and subject-object relationship. The location indicators were macro and micro location (exact location). All indicators but one, i.e. micro location, were set up with predetermined categories (Table 1) following: (i) the landscape structure, and (ii) the country's characteristics. The macro location followed the classical five-unit regionalisation of Slovenia (Gams 1983), adopted by the national school system.

The core and the most time-consuming part was a coding process which was – pursuing uniformity – conducted by only one person. To guarantee rigour and consistency, and to achieve a substantial level of inter-group coding agreement, several series of team coding were performed. Each trial series was comprised of three to five photographs.

The entire study was designed and carried out by a team of eight experts from various fields (geography, psychology, sociology, philosophy, history, and geodesy) from two institutions (Research Centre of the Slovenian Academy of Sciences and Arts, and the University of Ljubljana). During the preparatory phase, the team involved a group of students in the preparation of the questionnaire to avoid possible ambiguities and misunderstandings of the questions.

The basic features of the data were explained by descriptive statistics. However, to verify the prominence of specific visual features, these were complemented by the location coefficient which

Table 1. Indicators and categories within used for coding of the photographs.

Indicator group	Indicator	Category
Location	Macro location	Pre-Alpine, Alpine, Mediterranean, Dinaric, Pannonian landscape types, undefined
	Micro location	Exact location
Selected natural geographical features	Landform units (relief types)	Plain, hummocks, hills, mountain range, water, cave, coastal plain, hollow depression, mixed
	Landforms in the foreground	Flat surface, undulating surface, gentle slopes, steep slopes, rock walls, water surface, karst underground, other
	Landforms in the background	Flat surface, undulating surface, gentle slopes, steep slopes, rock walls, water surface, karst underground, other
	Water elements	River, stream, lake, swamp, sea, spring, pond, other water element, mixed, no water elements
Selected human geographical features	Land use in the foreground	Forest, field, grassland, permanent crop, park, water, built up, barren land, mixed use, other
	Land use in the background	Forest, field, grassland, permanent crop, park, water, built up, barren land, mixed use, other
	Settlement	Urban settlement, rural settlement, not settled
	Residential buildings	Solitary farm, one house, several houses, no residential buildings
	Non-residential buildings	Industrial and service buildings, cultural buildings (including ruins), sport buildings, hayracks, no non-residential buildings
	Infrastructural facilities	Motorway, paved road, gravel road, railway, airport, cycling path, pathway, power line, cableway, gas pipeline, mixed, infrastructural facilities not visible, no infrastructural facilities
	Movable elements	One person, several people, an animal, several animals, a mean of transport, several means of transport, no movable elements

illustrates the extent to which the depiction of a particular category diverges from the Slovenian average for that indicator. The more the location coefficient exceeds the value of 1, the more a particular category stands out in a given indicator. A value below 1 indicates a below average representation.

The location coefficient calculation can be formulated using the equation:

$$LC_{i,j} = \frac{\dfrac{P_{i,j}}{\sum_i P_{i,j}}}{\dfrac{\sum_j P_{i,j}}{\sum_i \sum_j P_{i,j}}}$$

where $LC_{i,j}$ is the location coefficient for a certain indicator category in a landscape; $P_{i,j}$ is the number of photographs depicting a certain indicator category in a landscape; i = C1, … ,C94 are the indicator categories from Table 1 and j = L1, … ,L5 are the analysed landscapes (Alpine, pre-Alpine, Mediterranean, Pannonian and Dinaric).

2.3. Analysis of students' geographical imagination

2.3.1. Questionnaire design and sample

We tested the questionnaire within a small group of students and thereby corrected and amended it before administering the questionnaire from April to June 2013. We opted for a paper form instead of an online survey to prevent the use of internet information. The tasks were to be solved in order, without the possibility of returning to previous questions or making a final revision.

To include schools from across all landscapes types (Alpine, pre-Alpine, Mediterranean, Pannonian, and Dinaric), simple random sampling was not used. We decided instead for a three-stage sampling considering: location, primary and secondary schools, and school grade (for the location see Supplementary material). We needed at least 385 students to achieve the desired precision of estimation (with 5% uncertainty, where the critical value 'z' is 1.96, with a difference of 1 between the population average and the estimated average and at a population standard deviation of 10).

The survey was carried out in 9 primary schools (in the fifth and ninth grade) and eight secondary schools (in the first and third-grade). According to age, the composition of students was the following: 10–11 (years): 218, 14–15: 156, 15–16: 170, and 17–18: 178. Altogether, 722 students were included: 338 girls, 378 boys and six undefined.

The questionnaire included 11 questions of different types and 3 colour supplements. Only one question was a general one (the gender) as other general information was provided by a pre-generated code for each questionnaire sheet composed of a school and grade identifier. For this paper, only questions Q4, Q5, and Q6 are relevant.

Q4 concerned cognitive mapping; students were asked to fill in a blank map with the landscape elements that would help them characterise the country for a foreign friend. Drawing and writing were both allowed. Q4 was positioned first among the questions considered in this paper to prevent the use of ideas and material from the rest of the questionnaire.

Q5 referred to an appraisal of the characteristics of seven selected landscape elements which are either widespread or generally deemed to be relevant: a mountain, a hill, a hummock, a plain, a town, sea, and countryside, and four sectors having a pronounced impact on landscape forms and processes: forestry, industry, agriculture, tourism. A 5-point Likert scale was used giving a range from (5) 'strongly characteristic' to (1) 'not at all characteristic'.

Q6 about how landscapes were perceived and evaluated was the most wide-ranging. Each type was presented with five photographs that depicted (1) the most characteristic natural or land-use features; (2) features highlighted by the curriculum; (3) features used in the tourism industry; (4) features of human activities, and (5) an image of romance and adventure (see Supplementary material). Sequence of photographs altered from one set to another to prevent routine completion. Students were given the following tasks: (Q6.1) write down the landscape group to which each set of

photographs belongs; (Q6.2) rate on a scale of 1–5 how much the student is attracted to landscapes within each group; (Q6.3) rank the photographs within an individual group from the most to the least characteristic; (Q6.4) list three notions that the student would use to introduce that landscape group to a foreigner unfamiliar with Slovenia.

2.3.2. Questionnaire data analysis

Given the variety of data collected, several methods were used in the data analysis.

The basic features of the data from Q4, Q6.1, and Q6.4 were explained by descriptive statistics after some preparatory steps. The items recorded on the blank map in Q4 were transferred to a table along with information about the landscape group they belong to: written notions directly and drawins by converting them into words first. The written notions in Q6.4 were also transferred to the table and grouped into ten categories.

For analysing the Likert scale (Q5 and Q6.2) and ranking (Q6.3) questions, the method of weighted averages was appropriate due to the varying number of responses for each element. We assigned the response 'not at all characteristic' a weight of 1, 'strongly characteristic' a weight of 5 and appropriate values to responses in between. Likewise, we assigned a factor of 5 to elements ranked in first place, a factor 1 to elements ranked in fifth place, and appropriate factors to elements ranked in between. In both cases, we multiplied the frequencies of affirmative answers by the weights and divided them by the frequency of answers for a particular element.

3. Results

3.1. Results of the analysis of textbook photographs

3.1.1. Location

The majority of photographs depict landscapes in the pre-Alpine region since some of the largest and most densely populated areas fall in this category. These, together with pictures of Alpine landscapes, which from the standpoint of European macro-regions make up the Alpine region in the broadest sense, are depicted in nearly half of the photographs. Photographs of the remaining three regions
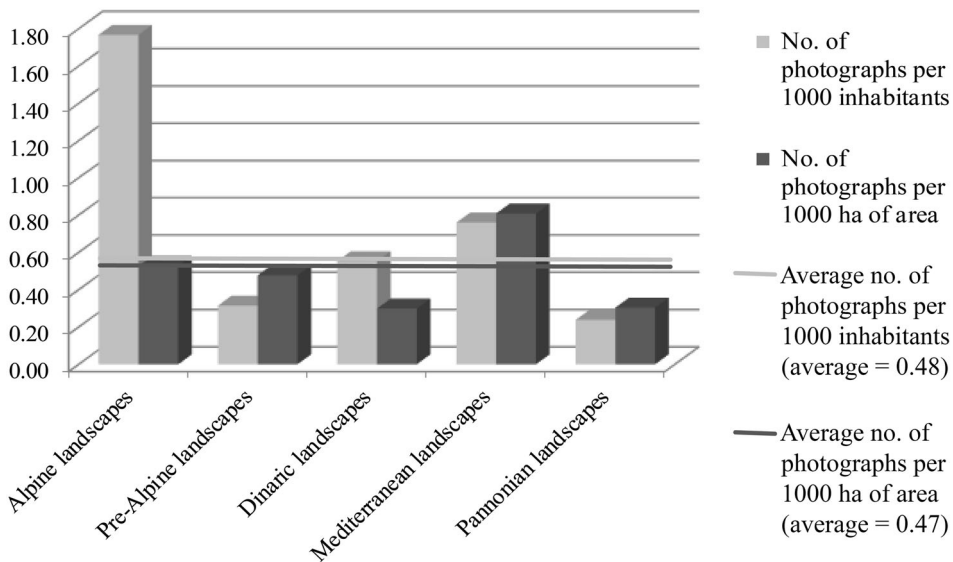

Figure 1. Number of photographs in textbooks depicting different landscapes with respect to the number of inhabitants and the size of the area of the region.

follow in roughly equal proportions. However, the results are different when comparing the number of each region's photographs with the size of that region and the number of inhabitants (Figure 1).

3.1.2. Physical geographical features

Morphologically Alpine landscapes, which are varied, and Pannonian landscapes, where flatland and hills are evenly interspersed, are the most uniform. It was thus a straightforward task to classify them into one of the selected categories and less frequently in the category of mixed. A noticeably higher degree of uncertainty was observed for the other landscapes which consequently led to their frequent presentation as the mixed type. Great morphological diversity is especially apparent in pre-Alpine, with a mixture of flatland, hills and mountains. Hilliness is an outstanding component of the Dinaric landscapes (Figure 2).

Landscape forms show considerable variety in types and in the foreground/background position. In the foreground, a flat surface stands out, especially in Pannonian and pre-Alpine landscapes. In comparison, various types of steep slopes are discernible in the background. Water elements appears in the foreground, whereas they are usually absent in the background, except for Mediterranean landscapes. Generally, water elements are most frequently pictured in Mediterranean landscapes, in which the sea strongly predominates. Lakes are depicted in different landscapes and rivers are most commonly depicted in Pannonian and pre-Alpine landscapes. In Dinaric landscapes, the karst underground appears in the foreground and background, since many of the photographs feature caves.

3.1.3. Social geographical features

The indicator 'land use' reveals considerable differences between the various categories and between the foreground/background positions. The category mixed use is most frequently in the foreground (38%), followed by the category barren land (30%). Within agricultural use, grasslands in Alpine, forests in Dinaric, and fields in Pannonian landscapes are noticeable. For the indicator 'land use' in the background, the shares of the categories mixed use and forest increase, but otherwise the categories of barren land in Alpine and forest in Dinaric landscapes stand out.

Settlements and buildings are depicted in 63.5% and 61.5% of the photographs, respectively. Generally, settlement is most frequently depicted in photographs of the Pannonian and pre-Alpine and least often in Alpine landscapes. Overall, the category of rural settlement predominates not only in
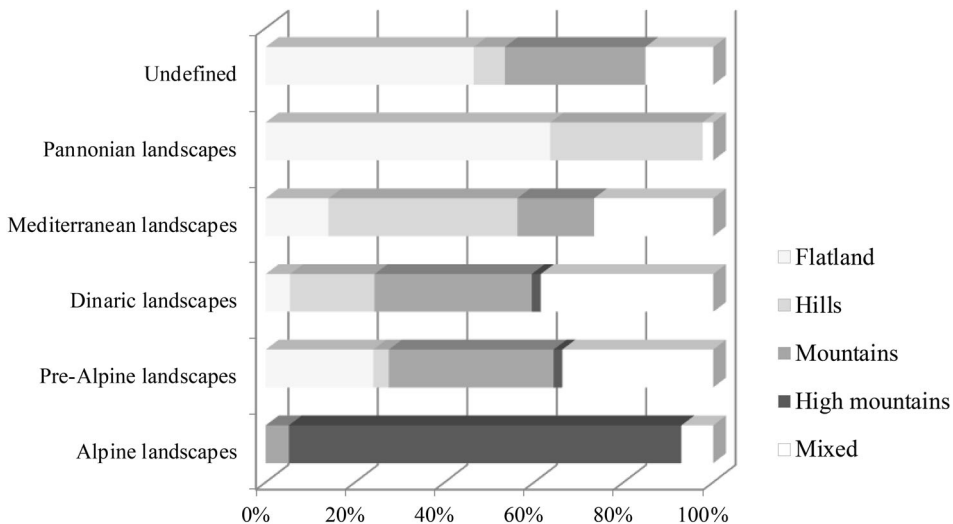

Figure 2. Predominance of relief types according to landscape shown in photographs in textbooks.

less urbanised landscapes, but also in the most urbanised pre-Alpine and Mediterranean landscapes; urban settlement is depicted in about 40% of the photographs. Only in photographs of Mediterranean landscapes is the category of urban settlement more frequent than rural settlement or not settled. A further breakdown of residential buildings shows that the category of several houses strongly predominates, while the categories of one house and a solitary farm appear more rarely, and most commonly in Alpine landscapes. Nearly a third of photographs also show non-residential buildings, mostly industrial and service buildings. Among buildings for sports and leisure, pools with thermal waters are the most frequently depicted, natural seaside and lakeside bathing areas, and ski areas and ski jumps.

Infrastructural facilities are not considered attractive motifs for photographs; as evidenced, infrastructure might not be visible, although one can assume from the context that it exists. If we consider just the indicator of infrastructure, we find that in most of Slovenia, except the Alpine part, the category of paved road strongly predominates. Motorways are noticeable in the pre-Alpine and Dinaric and the category of cableway stands out in photographs of Alpine landscapes.

The last indicator, i.e. movable elements, is absent in most photographs (74%). Although rare, it is most often seen in photographs of Mediterranean landscapes, usually as a means of transport, and in Alpine landscapes as people.

3.1.4. Prominent visual landscape characteristics

The highest location coefficients achieve a value higher than 5.00. In photographs of Mediterranean landscapes in secondary school textbooks, the most prominent are the sea (7.86) in the indicator of water elements, and coastal plain (7.59) in the indicator of landform units. Next is the category of mountain range (6.17) in the indicator of landform units in photographs in primary school textbooks that show Alpine landscapes. The value of 5.00 is also exceeded by the location coefficient for the category of rock walls in the indicator of landforms in the background, and in photographs in primary school textbooks that depict Alpine landscapes (Table 2).

3.2. Results of the questionnaire

3.2.1. Mapping of characteristic elements

The task Q4 yielded 11,358 answers, among which 346 were different. Categorisation, depending on their frequency, shows the prevalence of notions related only to a particular landscape (for example, karst caves, thermal springs, the mountain Triglav, the sea, etc.), various activities or type of land use, cultural monuments and positive or negative feelings. Dinaric landscapes were most often associated with surface and underground karst landforms, phenomena and water bodies. The settlement structure and economic activities were given far less attention than in other landscapes. Pre-Alpine landscapes are perceived as rolling, mountainous and watery, and being the population centre (with the predominance of Ljubljana). Agriculture was recognised as the predominant economic activity. Similarly, agriculture was identified as a leading category in Pannonian landscapes which were perceived as fertile plains, whereas hilly areas and viticulture were overlooked. Wine growing had a vague role in Mediterranean landscapes, too; the sea, seaside activities, tourism and recreation, and positive feelings were recognised instead.

3.2.2. Appraisal of characteristic elements

The results of Q5 show that none of the elements was evaluated prevailingly with the score (5) 'strongly characteristic' or (1) 'not at all characteristic'. Most answers were (4) 'quite characteristic': hummocks (48.3%), mountains (40.6%), forestry (38.9%), countryside (38.6%), agriculture (37.4%) and tourism (36.7%). The highest values for (3) 'moderately characteristic' were received by flatland (42.2%), industry (40.4%), hills (39.8%), and city (33.8%). The only element that was categorised as (2) 'weakly characteristic' was the sea (34.1%). When applying the weighted average method, we

Table 2. xxxxx.

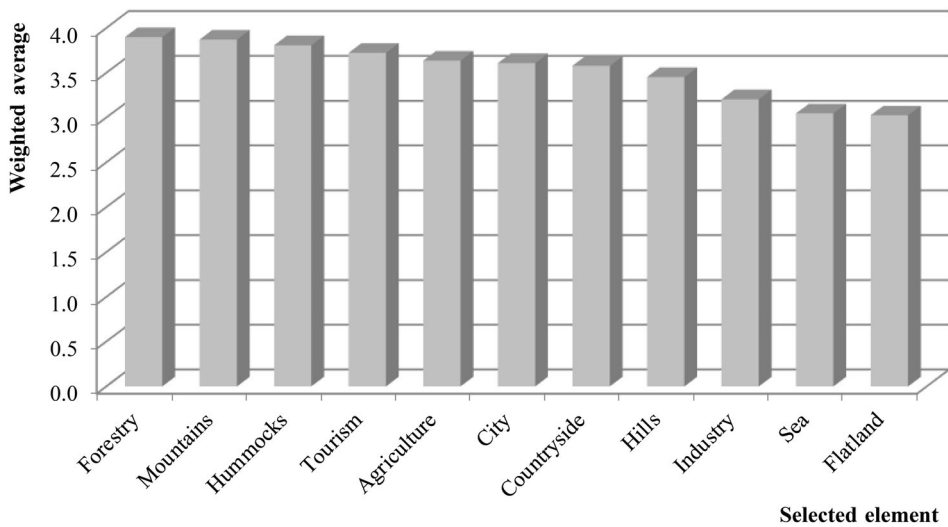| Indicator	Alpine landscapes	Pre-Alpine landscapes	Dinaric landscapes	Mediterranean landscapes	Pannonian landscapes
Landform unit	**mountain range**	**hills, mixed**	**mixed, hummocks**	**coastal plain**, hummocks	**plain, hummocks**
Landform in the foreground	**steep slopes**	**flat surface**	**gentle slopes**	flat surface	**flat surface,** undulating surface
Landform in the background	steep slopes, **rock walls**	**steep slopes**	gentle slopes, steep slopes	**gentle slopes**	**flat surface, gentle slopes**
Water elements	**lake**, no water	river, lake	lake	**sea**	**river**, lake
Land use in the foreground	**barren land, grassland**	**built up**	forest, barren land, grassland	water	water, built up
Land use in the background	**barren land**	forest, mixed	barren land, forest	/	mixed
Settlement	**not settled**	**urban settlement**	rural settlement	**urban settlement**	rural settlement, urban settlement
Residential buildings	**No residential buildings**	several houses	/	several houses	**several houses**
Non-residential buildings	**no non-residential buildings**	industrial and service buildings, cultural buildings (including ruins)	/	**industrial and service buildings, cultural buildings (including ruins)**	**industrial and service buildings**
Infrastructural facilities	gravel road, **infrastructural facilities not visible,** no infrastructural facilities	paved road, highway	/	paved road	**paved road**
Movable elements	**several people**	several means of transport	/	several people, **several means of transport**	/

Figure 3. Weighted average of selected elements with respect to the evaluation of how characteristic they are (Q5).

noted that no element was given exceptional importance, but on average scored between 3 and 4 (Figure 3).

3.2.3. Recognising and naming of landscapes

The results of Q6.1 show that participants were most confident with Mediterranean landscapes. The share of students correctly placing particular landscapes was: Mediterranean 82.5%, Dinaric 67.9%,, Alpine 65.7% and Pannonian 60.2%. Pre-Alpine landscapes were the most difficult to identify and only 48.5% of students succeeded. Naming proved to be more challenging as students mixed current names with the names used in older textbooks (Dinaric 'world', Mediterranean Slovenia, etc.) and/or the names of the historical Habsburg provinces (Styria, Carniola, etc.). To a much lesser extent, they used the names of landscape types (mountain, hill, valley, etc.) or cardinal directions (southern Slovenia, etc.).

3.2.4. Attractiveness of landscapes

Attractiveness (Q6.2) was most often evaluated with scores from (3) 'moderately attractive' to (5) 'very attractive' and rarely with scores (1) 'not at all attractive' and (2) 'not attractive'. Mediterranean landscapes received the highest score, followed by Alpine landscapes, while Dinaric and pre-Alpine
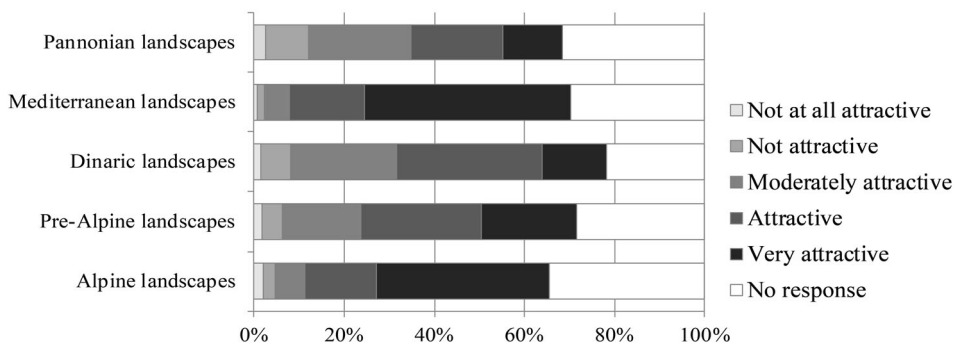

Figure 4. Opinion of students regarding the attractiveness of a particular landscape (Q6.2).

landscapes were scored as attractive and Pannonian landscapes were scored as moderately attractive (Figure 4).

3.2.5. Landscape characteristics

Students most often ranked photographs of type 3 in first place, i.e. attractive tourist features and photographs of type 5, i.e. images of romance and adventure. Photographs of type 1 featuring natural geographic and land use elements were ranked third. Photographs of type 2 featuring elements which are given special attention in school were ranked fourth and photographs of type 4 depicting distinctive activities in given landscapes were positioned last.

3.2.6. Notions associated with each landscape

Alpine landscapes are associated with mountains in general and especially with Mount Triglav. Recreation, especially skiing and water elements (Lake Bled and Lake Bohinj) complete the image. Alpine and Mediterranean landscapes are both labelled with strong positive notions. Outstanding tangible features are the sea, sea-related activities, tourism and recreation, and towns. Notions for Pre-Alpine landscapes comprise Ljubljana as the capital city, agriculture, hills and surface waters. Positive aspects are less pronounced. Dinaric landscapes are described with notions such as karst caves, underground and surface waters, forest and forestry, and karst phenomena. A negative perception is noticeable, but not particularly pronounced. The same is true for Pannonian landscapes, where agriculture, plains, wine production, and hummocks get a prominent role.

4. Discussion

There is a difference between how landscapes are represented in textbooks and how students imagine them. In contrast to the textbook photographs which make a coherent set, students display a wide range of imagination and comprehension of landscape.

4.1. Framing landscape representations in textbooks

Concerning the representation of landscapes in textbook photographs, the nature/culture dichotomy is worth mentioning along with the apparent prevalence of natural features. Generally, the human aspect of landscapes – except land use – seems to be neglected. This gives rise to some intriguing questions. (i) Is the neglect of cultural elements rooted in the tradition of Slovenian geography? Slovenian landscape science, like that of most of Central and Eastern Europe, has been influenced by the German-Russian school, stressing natural aspects while ignoring human aspects of landscape (Shaw and Oldfield 2007). (ii) Is this because natural characteristics seem to be free of contested ideologies and leave less room for diverse interpretations? Irrespective of the answer, this finding is a 'classic' example of the geographical binary of 'physical' and 'human' geography (Winter 2006).

The absence of cultural elements, especially means of transport and people, implies static and human-free landscape. Mowforth and Munt (1998) notice this feature in the photography of tourist sites where the inhabitants are 'represented as incidental or even irrelevant'. Personal data protection might be a reason, yet unlikely as the investigated textbooks were published when the rules protecting privacy were less strict. The lack of vehicles might be attributed to a practical reason: photographs of cars quickly become outdated. Whatever the reason, the lack of humans and dynamic elements support Rose and Wylie's (2006) argument that landscape is a tension between presence and absence.

All the previously mentioned divergences, nature versus culture and static versus dynamic features are inherent in land use, which is, generally, the only cultural element that is depicted as frequently as natural elements. Interestingly, the most ubiquitous land use category is not forest – the natural vegetation for the majority of Slovenia – but cultivated land. One of the reasons might be the preference for 'labour intensive mixed farming' as framed by Benson (2008). Land use is obviously considered to be a close-to-nature element. The other reason is stated by Van Zanten et al. (2014):

agricultural land use is preferred in marginal rural areas and forested land use in intensive cultivation zones. This raises the concern of to what extent human impact is desirable, and where the boundary between the desirable and the undesirable lies. Only certain outcomes (e.g. land cultivation provided it is not too intensive) of human endeavours are valued, while others (e.g. building activities) are disregarded. One gets the impression that forms surpass processes completely.

4.2. Framing the link between textbooks and students' imagination

A further divergence between what is being represented in photography and what is being imagined is evident. Given the variety of pictured landscape elements along with the prevalence of natural geographical features and considerably balanced geographical coverage of locations, the textbooks' mission, i.e. to deliver robust and tangible knowledge about landscape variety, especially in terms of physical elements, is obvious. However, students' imagination goes beyond tangible natural aspects into spheres of intangible ones, such as memory, experiences, and expectations. This is probably the reason for attributing extremely positive and occasionally idyllic qualities to Alpine landscapes; it supports the self-image of a nation of skiing and mountain enthusiasts. The interaction of young people with Alpine landscapes is quite intense and leaves strong impressions due to the activities that they engage in there (skiing, snowboarding, hiking). The same is true for Mediterranean landscapes; even though these are among the most terraced Slovenian landscapes, wine- and olive-growing is neglected and notions connected with the tourism industry come to the fore: the sea and seaside activities. The opposite appears to be the case with the Pannonian landscapes whose neutral to negative recognition can be caused by the lack of contact with them. Likewise, Vainikka (2012) states that the lack of first-hand experiences has a strong influence on spatial identities.

4.3. Image retention and the generational gap

The countryside is deeply embedded in the geographical imagination of Slovenes (Urbanc, Gašperič, and Kozina 2015) and more widely that of Western societies (Hopkins 1998). It seems that the image of rurality is very persistent: it has not faded at the same pace as the decrease in the farming population and the significance of agriculture. We could call this phenomenon *image retention*: a distinct image is retained in society's mind despite landcapes which 'posed' for a photograph are not present as extensively as one might assume given the number of photographs depicting a particular image. We do not argue that images are 'treasonous' (see Olwig 2004), but that they failed to follow the pace of landscape changes and underlying simultaneous socio-economic transformation of societies. Textbook creators (middle-aged or older generation) have been witnessing changes and transformations, but they have not fully integrated them into the textbooks. This might be attributed to an illusion of rurality as hinted at by Benson (2008) or to an acknowledgment of the importance of agriculture in sustaining the landscape's aesthetic (Brady 2006).

Conversely, urban elements – not progressive and vibrant, but idle and lifeless – emerged in the classroom survey and concurrently rural aspects became less prominent, suggesting that the imagination of new generations in terms of rural versus urban is more balanced with general social and economic development.

These latter findings give rise to the issue of (un)acceptability of change and progress. One possible explanation may be a generational gap which exerts impact on education process and its achievements (Al-Lawati 2019). The second point is that school is governed by an adult perspective (Kellock and Sexton 2017). Is it, therefore, necessary to integrate age-based nuances into textbook photography with a vision of the future? The next question is whether students' geographical imagination can be expected to keep pace with general socio-economic changes if school photography is incapable of embracing the present reality.

4.4. Stability and recognisability

Stability would undoubtedly be preferable in those aspects that would help establish a more reliable link between the educational process and students' imagination. One such example is the naming of different parts of Slovenia which proved to be challenging owing to constant name changes and the fact that most names are the result of scientific reasoning and do not originate in vernacular naming. This prevents names from becoming grounded in students' minds; landscape imagination is instead anchored in the historical names used in non-formal life.

For geographical imagination, it is vital that conceptions about what landscape should be, how landscape is created, and what it encompasses are easily recognisable and obvious. Landscapes with distinguishing features, a well-defined form, structure and obvious meaning (sea, for example) caused no problem for students to position them within their mental picture. On the other hand, landscapes lacking distinctiveness and recognisability were hard to situate in the forefront of students' imagination. One such example is referring to the Alpine plains which are easily mistaken for Pannonian flatland. Young people have a uniform conception of (pre-)Alpine landscapes since they imagine them as hilly and mountainous. The question is how to strengthen the presence and the position of landscapes that due to similarities have become obscure in geographical imagination. Firstly, if we consider photographs as being weak or too superficial, a possible approach could be to introduce new visualisation techniques as experimentally demonstrated by Elwood and Hawkins (2017). Not only have digital options opened a whole new universe in visualising possibilities, but they also become an important tool for identity formation and communication of individuals (Van Dijck 2008). Secondly, if we consider that photographs are wholly capable of delivering information, but students lack the requisite visual competencies, then the educational process should be improved.

4.5. Limitations

A few limitations merit acknowledgment. First, we have found no similar studies with which to draw possible parallels. Some studies are focusing on identifying landscape elements, but with evident dissimilarities. Different concepts and data elicitation permit only indirect appraisal.

Secondly, in the second part of our study, i.e. the in-school survey education expectancy bias and the clear connection of questions with the school program may have prevented students from detaching their answers from school lessons and a marking task. This was not what we wanted to achieve because it would lead to the impression that the link between textbook photography and students' geographical imagination was more straightforward and stronger than it actually was.

Furthermore, the explanatory power of analysis has some limitations. It is challenging to unravel to what extent the research question can be studied and proved. Geographical imagination is like a container of images gathered throughout one's whole life. Besides schooling, the so-called hidden curriculum or informal intramural learning (Cotton, Winter, and Bailey 2013; Morgan 2003) and personal/social life beyond school (Caba-Collado, López-Atxurra, and Magdalena 2016) are worth considering. More attention should be paid to a clearer understanding of the nature and impact of the hidden curriculum, which is crucial to how disciplines (like geography) shape their future (Cotton, Winter, and Bailey 2013), and to the many ways in which factors beyond school influence a child's/student's educational outcomes (Jacob and Ryan 2018). The aforementioned issues clearly demonstrate multi-modality of both, human experience and representations of reality in the social world. All these make geographical imagination a great intellectual conundrum.

5. Conclusion

The overall objective of this paper is to provide an insight into the geographical imagination of Slovenian landscapes. Specifically, it aims at investigating how landscapes are represented in textbook

photography and which features become noticeable, identifying how the school population sees, perceives, recognises and imagines landscapes. The final question is whether there is a clear connection between these issues.

The findings convey that textbook photography is neither comprehensive nor does it reflect the complexity of landscapes: not even in terms of forms and less so in terms of processes. It incompletely mirrors modern society and its living space. The students' geographical imagination and textbook representation are not entirely overlapping, especially when it comes to the immaterial aspects of landscapes as students' imagination is preferential and emotionally coloured. A dichotomy is apparent, but not clear-cut.

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