



## Pre-service geography teachers' voices on the choice of spatial examples. Results from the first year of an educational design research study

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Received: September 2016 – Accepted: March 2017

### Abstract

In contrast to many of the former curricula, the new *Curriculum 21* in Switzerland offers teachers considerable freedom in choosing spatial examples. As part of an educational design research project, this study investigates the reasoning behind pre-service teachers' choices of spatial examples for their own teaching and coursework as well as their interests and wishes for how spatial examples should be chosen for initial teacher training courses. Students in one institution in Switzerland completed an online questionnaire at the end of the autumn term 2015 as well as the spring term 2016. The results indicate that several factors such as e.g. the students' and pupils' interest or being the location of current events are judged as more important than the curriculum both for the students' own choices and for what they wanted the course spatial examples to focus on, although there are some differences between the two areas. Besides helping to understand pre-service teachers' reasoning, the project's results will also add new evidence that can help build a design process for initial teacher training courses in geography.

**Keywords:** Spatial Examples, University Students, Geography Teacher Education, Interest, Didactic Decision Making

### 1. Introduction

No matter whether they teach primary school or university students, teachers have to make didactic<sup>1</sup> choices every day.

<sup>1</sup> Throughout this paper, *didactic* and *didactics* is used in line with the meaning it has e.g. in the Germanophone area (see e.g. discussion of GIS didactics in Viehrig, 2015 or the footnote in Molin et al., 2015 for the use in Sweden). Based on Clare Brooke's presentation at the 2016 IGU-CGE conference in

Part of geography education is to "[...] think about the question of how location matters" (van der Schee, 2012). Consequently, in geography education, one of the didactic decisions is the choice of one or more spatial examples. For instance, when looking at the polar climate zone, is it dealt with on a general global level or do the students learn about one or more examples from e.g. Canada and/or

Singapore, it is spelled with a "k" to mark the difference from the meaning *didactics* has in the Anglophone area.

Russia and/or the USA and/ or Antarctica? What impact do these choices have on the students' geographic learning?

In some jurisdictions, these choices are already largely pre-determined by the standards/ curricula. For instance, in Australia, the curriculum includes “[...] a study of the world in[...] the primary years, working out progressively from Australia to the neighbouring countries and then to each of the continents. In the secondary years there are case studies of themes in each unit that will enable students to learn more about particular regions or countries of the world. The locations of these case studies are prescribed to ensure coverage of the world and countries of particular significance to Australia, as well as to reduce repetition” (Maude, 2013, p. 261).

In Switzerland, the great diversity of curricula for general secondary schools has been sought to be harmonized, creating among other measures the so-called *Curriculum 21* as foundation for the curricula of all German-speaking cantons (D-EDK, n.d.). While often, the old curricula provided fairly specific prescriptions in terms of mandatory spatial examples (see ch. 2), the *Curriculum 21* allows teachers to choose nearly all spatial examples freely by themselves.

What factors do teachers take into consideration when using that freedom and deciding on a spatial example? What are the consequences for pre-service teacher education? There seem to be few studies dealing with these questions, especially in the Swiss context.

## 2. Background: spatial examples in selected Swiss curricula

The School of Education of the University of Applied Arts and Sciences Northwestern Switzerland (PH-FHNW) serves as teacher education institution for four cantons: Basel-city, Basel-Landschaft, Solothurn and Aargau.

All German speaking cantons have accepted the curriculum framework (D-EDK 2017a). The cantons decide on implementation and possible adaptations. Aargau envisions the

introduction for the school year 2020/21 (D-EDK, 2017b). In Basel-city, the *Curriculum 21* is already in force since the school year 2015/2016 (D-EDK, 2016b). In Basel-Landschaft and Solothurn, the secondary school portion of the *Curriculum 21* will be introduced in the school year 2018/2019 (D-EDK, 2016a; D-EDK, 2016c).

The *Curriculum 21* (Erziehungsdepartement des Kantons Basel-Stadt, 2016) is a competence-oriented curriculum. Similar to other such curricula elsewhere (see e.g. Fuchsgruber et al., accepted), descriptions are fairly open, giving the teacher a lot of freedom of choice. Most descriptions of spatial examples, for instance, stay very general, including for instance “different regions of the world”, various climate, vegetation and landscapes zones, current phenomena, European weather patterns or the Arctic/ Antarctic region. The only more specific examples are Switzerland, the Swiss Alps and the Mediterranean. In the history part of the curriculum, besides Switzerland there is also world history, which includes e.g. “European expansion”, the explorer’s journeys, as well as a competency outlining that students should “[be] able to create a short historical description of a selected region from the beginning of the modern area to today (e.g. regarding the home country, a holiday destination, the USA, the Near East, China)” (translated). There is also a section on upheavals, which includes e.g. colonialism or the French revolution.

The curriculum for geography in Basel-Landschaft (BKSD, 2006) also has some more general examples, such as for instance Europe and Europe’s cultural regions, the world’s cultural regions, countries of the South or climate zones. It is already more specific than the *Curriculum 21*, however, in that it not only features Switzerland, but also the EU, “three different of Switzerland’s neighbouring countries”, “one country each from North/ Middle/ South/ West and Eastern Europe”, “one large city each in Switzerland, in Europe, in Asia and in North America” as well as a number of specifics within Switzerland, such as the Gotthard or the “Jura, Central Plateau, Alps and South Switzerland” regions (translated).

The curriculum in Aargau (Kanton Aargau, 2014) again features some general descriptions such as for instance different climate, vegetation and landscape zones, Europe or the Third World. It also contains Switzerland as well as sub-regions. Additionally, it contains some very specific spatial examples. Firstly, there is “Mediterranean cultures” with “Industrialized intensive cultures: *Netherlands, Denmark, Spain, agriculture in Eastern Europe, agriculture in the EU*” (p. 278/ p. 285, translated). Secondly, the large cities to be dealt with are explicitly enumerated, namely, “*London, Paris, Rome, Madrid, Berlin, Moscow*” (p. 279/ p. 285, translated). Thirdly, “touristic development in the tropics” prescribes “*Kenya, Caribbean, Maldives, Thailand*” (p. 280/ p. 287, translated) as spatial examples. Lastly, in the area of cultural and economic regions, the curriculum states “most important economic powers outside of Europe: *USA, Russia, Japan, China*; other important regions: *India, South East Asia, Arabic-Islamic Area, Central and South America, Australia*; large cities” (p. 280/ p. 287, translated).

The curriculum in Solothurn (Kanton Solothurn, 2007) is in force since 1992. There are some general descriptions such as climate and vegetation zones, but it also includes topics that are listed specifically, including “The Jangtse-Plain”, “Land loss and land gain at the North Sea coast”, “River oasis at the Nile”, “Brasilia, a new city”, “Rotterdam, door

to the world” and “Salt caravans at the edge of the Sahara” (p. 98, translated). That it is an open enumeration is indicated by “etc.” at the end. Also explicitly named is the Mediterranean region for the area of land use.

### 3. Indications from previous research

Generally, research indicates that teachers tend to use/ adapt the materials they were trained with. For instance, in a study on GIS professional development in the USA, Baker, Palmer and Kerski (2009) found that “[s]ixty-two percent of respondents used the same materials in the classroom that they used during training [...]” (p. 177), “[...] two-thirds of respondents indicated that they created their own GIS lessons” (ibid.) and ten percent used published materials. A study on a three year in-service teacher training program for the new Israeli science curriculum showed that “in most cases, new teaching methods or materials applied, were those presented during the training program” (Kapulnik, Orion and Ganiel, 2004). Consequently, when changing from the old curricula to the *Curriculum 21*, there is a fairly high likelihood that teachers will either use the same materials and spatial examples they used under the old curriculum or those that are presented during pre- and in-service teacher training.

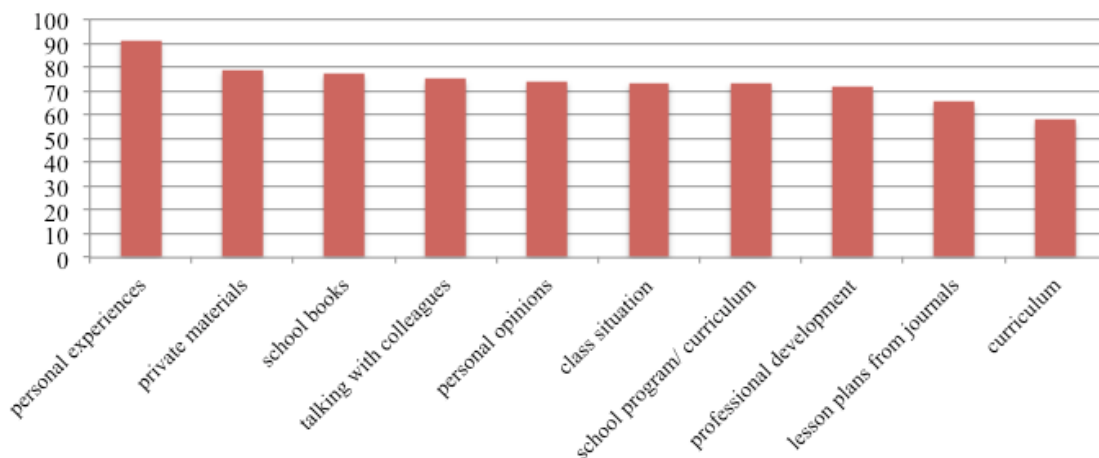


Figure 1. Percentage of teachers claiming a factor has a “great” or “very great” influence on the methods used in classroom practice (translated; selection). Source: based on Marmann (2005, p. 173).

In terms of how teachers implement curricula, a study in North Rhine-Westphalia (Germany) by Marmann (2005) focused mainly on the area of methods. The study found that 76.6% disagreed (totally or rather) that “The new publication of the curriculum has changed my classroom practice in terms of methods”. Moreover, 73.4% agreed (totally or rather) that “My personal conviction about a method is more important than the methodological directives of the curriculum” and 66.9% that “The curriculum has no innovative effect on my classroom practice in terms of methods, because already before the curriculum has been published I designed my classroom practice as described in the curriculum” (p. 170, translated). In terms of the subjective factors influencing the choice of methods used in classroom practice, nine factors were more influential than the curriculum (Figure 1). On the one hand, this is further evidence that there is a fairly high likelihood that teachers might use the same spatial examples used before the change to the *Curriculum 21*. On the other hand, given the high importance accorded to personal experiences/ opinions, teachers might now also have more freedom to integrate new countries as spatial examples, i.e. e.g. those that they regard as especially interesting or important.

That geography teachers’ geographic knowledge and their experiences (e.g. travel) are very likely to influence their decisions regarding spatial examples under the new curriculum is also supported by other research. For instance, a study by Brooks (2006) with experienced teachers in the UK showed that their experiences (e.g. school, university courses, travels), i.e. “[...] the relationship that they developed with geography has left ‘residuals’ that still affect their practice”. (p. 366). In one of the interviews one teacher explicitly reflects on the choice of spatial examples, “[...] to fulfil examination criteria whilst also teaching appropriate content and enabling students to engage with the geography of experience that he personally enjoys:

...I was pleased to see [place] come back in the national curriculum, and we’ve gone big on place here... In our GCSE we do our GCSE through three places: Italy, Nigeria and Japan. If you want to do population, we do it of there, if we need to plot a climate graph, we do a climate graph of there. Before that when we are working out the GCSE we used to have case studies from all around the world, now we have just three places where we take our case studies. (Extract from interview, 2003).

Paul is also a geography textbook author, and he uses his own books in his teaching. He reflects how his travel experiences have influenced his book writing which have then in turn been the main resource for his teaching” (ibid., p. 360). Thereby, the different interviewed teachers “[...] have not interpreted these curricula, or indeed the geography contained within them in the same way. [They are i]nfluenced by their own ‘passions’ [...]” (ibid., p. 366), such as certain geographical places or themes.

Another interview study in Sweden (Molin et al., 2015), while also showing the importance of personal experiences (such as childhood memories and travels) and teachers’ interests for the teachers’ teaching, also looked at the influence of pre-service teacher education. For some participants, pre-service teacher education broadened their understanding of the subject holistically, while for others “[...] the teaching had been hacked into pieces, and that a comprehensive perspective of the subject had been missing” or “the content discrepancy between the university course and the school syllabus was too large” (p. 15). This seems to indicate a need for pre-service teacher education to show students more explicitly how what they learn in university can be linked to what they have to teach, which also would mean that school classroom suitability might be a possible factor for choosing spatial examples in their university courses. The results may also give a hint that a more comprehensive perspective, rather than just fragmented details scattered through different courses, might be advantageous.

Curriculum change can be an opportunity to reflect on and discuss teachers' practice. For instance, in the course of the national curriculum in the UK, there has been a lot of discussion about the role of knowledge, especially with regard to place and location knowledge (Kinder, 2015). Thereby, "[t]he GA's curriculum consultation exercises demonstrated very clearly that teachers were anxious about the prescription of place knowledge within a national curriculum, as for many this was an aspect of professional choice and freedom they valued highly (and used to de-ploy their own expert knowledge as well as connect with students' experiences)" (Kinder, 2015, p. 81). However, it was argued "[...] that a coherent framework of locational knowledge is needed [...]" and "contextual world knowledge of locations, places and geographical features" was included as one of three areas of assessment, albeit with lots of freedom for the local schools (Kinder, 2015, p. 82). The national curriculum has been shown to have for instance "[...] prompted some teachers to reflect on the range of places they teach" (Kinder, 2015, p. 83). This indicates a probability that also the change to the *Curriculum 21* might prompt Swiss teachers to think about the spatial examples they use.

In general, interest and other affective variables are important factors in learning (see e.g. Duit and Treagust, 2003; Edelman, 2000; Heinze, Reiss and Rudolph, 2005; Hemmer and Hemmer, 2002; Roberts II, 2003; Vogt, 2007). Consequently, for pre-service teacher education:

- (1) the pupils' interests could provide important input for teacher education classes, since the teachers will later need to take these interests into account when planning their own teaching;
- (2) the pre-service teachers' interests themselves are important, to support their own learning.

Regarding (1), there are several studies in the Germanophone area that have included

information on secondary school pupils' interest in different regions (see e.g. overview in Hemmer and Hemmer 2010). For instance, Golay (1999), surveyed 702 students in Basel (Landschaft and city). The results for the interest in region question can be seen in Figure 2, although it has to be noted that the examples as well as that the list was only given as a text, not a map, might have influenced the pupils' answers (e.g. USA vs. other North American countries). Moreover, having to choose two meant students being not interested in any region only had the "choice" of "missing value", while students being equally interested in three of the options were forced to choose only two. Additionally, there was the problem of not exclusive answers (e.g. Artic as part of North America, rest of Europe and Asia).

Regarding (2), studies that could inform the choice of spatial examples seem to be rare, especially in the Germanophone area. From the studies included in Hemmer and Hemmer's overview book, Lüdemann and Lößner (2010, Germany) only used thematic, not regional interest items as part of their questionnaire. The text of the dissertation by Voigt (1977) was not available through several channels tried, but the title "Empirical studies of the pupil and teacher interest in geo-ecological topics in geography education on the secondary stage as foundation for creating an open curriculum" (translated) suggests that it, too, does not contain interests in spatial examples.

In general, there are few studies that deal with pre-service geography teacher education (Kerr et al., 2013). Specifically, there seem to be few, if any, studies dealing with how spatial examples are chosen in courses for pre-service teachers. However, as the previous research in other areas seems to indicate, as discussed above, which spatial examples the students' deal with in pre-service teacher education could play an important role both in their own geographic learning and in their later teaching.

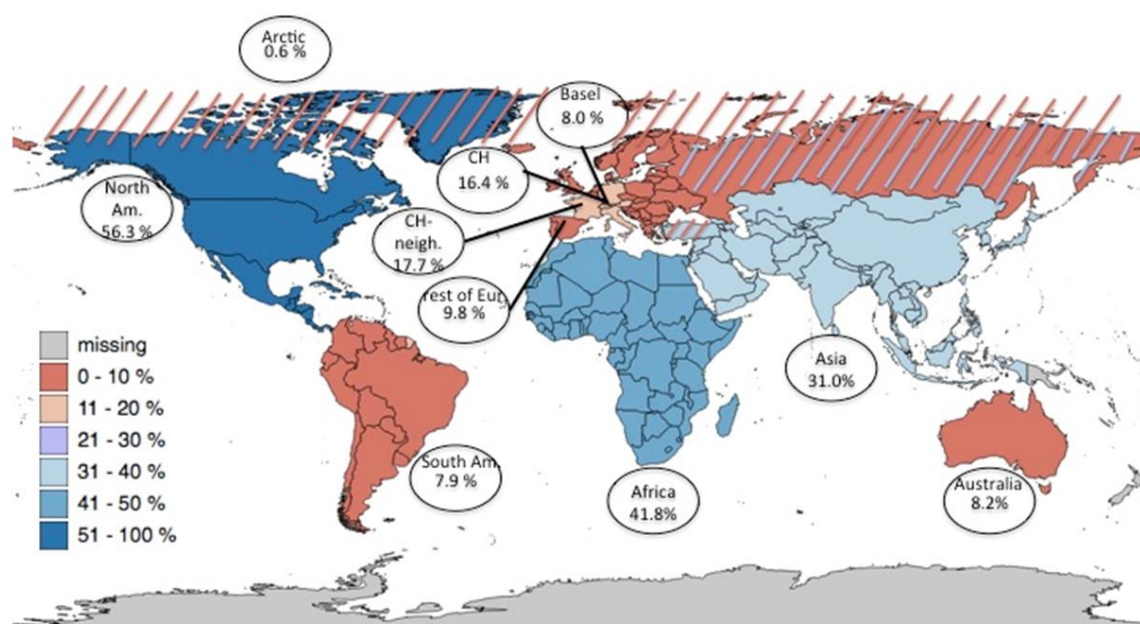


Figure 2. Results for “Which two of the regions of the earth listed here you are interested in particularly in geography? (*Check two answers for this question*)”, with the choices “Basel (city and Land)”, “Switzerland”, “neighbouring countries of Switzerland (D, F, I, A)”, “North America (e.g. USA, ...)”, “Africa (e.g. South Africa, Black Africa, ...)”, “Asia (e.g. Russia, India, Japan, Far East, ...)”, “other. Which?” (translated, p. 143) [% of students checking yes, without missings] [own graphics based on Golay, 1999, p. 96 and data from Natural Earth].

#### 4. Methods and objectives

Educational design research (EDR) seems to be not yet used very frequently in geography education research, but has great potential as a framework for research to improve learning materials and courses on an on-going basis. Examples for EDR studies in geography education include for instance Favier and van der Schree’s study regarding inquiry projects with GIS (2012), Orion and Cohen’s work on an Ocean module (2007) and the Space4Geography adaptive learning modules’ development (Wolf et al., 2015).

EDR “[...] addresses real needs in the here-and-now through the development of a solution to a problem, while also generating knowledge that can be used in the future”, and is consequently used for things like developing educational technologies or improving teaching (Educause, 2012, p. 2, in original bold) (see also e.g. Plomp and Nieveen, 2010). EDR thereby is “[...] cyclical in character: analysis, design, evaluation and revision activities are iterated until a satisfying balance

between ideals (‘the intended’) and realization has been achieved” (Plomp and Nieveen, 2010, p. 13).

Consequently, the present research wants to contribute to

- (1) improving the local courses
- (2) investigating how pre-service teachers choose spatial examples
- (3) investigating how pre-service teachers want spatial examples to be chosen for their courses

and thus extend the empirical base for the theory of how to choose spatial examples in initial teacher training.

#### 5. Methods and sample

##### 5.1 Spatial examples in the courses

The autumn semester 2015 sample contains students from four geography as a discipline courses and four geography education courses all taught by the author. All courses are targeted to pre-service teacher students



preparing to teach general secondary school (grades 7-9).

This semester constitutes the baseline. Spatial examples were not systematically chosen. Material was partly adapted from the author's predecessor, partly from the author's earlier work, and partly newly created. In some cases, students could also freely choose a country example themselves. Courses differed in their spatial examples, which included for instance Switzerland, Russia, India, Kenya, USA, Israel, Tuvalu or Afghanistan. They also differed in how extensively the individual spatial examples were used.

The spring semester 2016 sample contains students from two geography as a discipline courses and two geography education courses all taught by the author. All courses are targeted at lower general secondary school (grades 7-9) pre-service teacher students.

Apart from the occasional exception (e.g. to include a video that explained a phenomenon well, even if it was about another country), the courses focused on a specified number of spatial examples, largely based on the most wished for countries in the last semester's study: (1) the USA, (2) Russia, (3) China, (4) Switzerland/ the Mediterranean, (5) India, (6) Japan and (7) the UK. The Mediterranean was included because it is also explicitly mentioned in the curriculum. The UK was included because it fulfilled criteria such as being part of some of the author's research, data availability, suitability to use in class/ to illustrate concepts and being the location of current events/ important in the media (e.g. *Brexit*) while at the same time being not particularly high on the students' interest or wish list, thus providing a partial control.

## 5.2 Method

At the end of the autumn semester, students from all eight courses were asked to fill out a two-part anonymous questionnaire: a paper one that was a course-specific evaluation, and an online one that was general and dealt with spatial examples. Only the latter will be reported here. The questionnaire was implemented in Unipark.

In the spring semester, in addition to a Moodle questionnaire for course specific evaluation, there was again a questionnaire that was uniform across courses, which will be reported here. The questionnaire was implemented in Unipark.

At the beginning of both semesters' questionnaires, students were asked if they consented to the responses being used scientifically or only for internal course planning after a short text with background information and aims. Students were also informed that consent was voluntary and not giving consent would not result in any disadvantages. Only the responses from students that gave consent will be reported here.

## 5.3 Sample

There are 19 (55.9%) male and 15 (44.1%) female students in the autumn semester sample.

There is one student (2.9%) in the below 20 age group, 23 students in the 20-29 years old age group (67.6%), 5 in the 30-39 years old age group (14.7%) and 4 in the 40 or older age group (11.8%, 1 student or 2.9% missing,  $n=34$ ).

11 students are in the first year of study (32.4%), 5 in the second (14.7%), 13 in the third (38.2%), 2 (5.9%) each in the fourth and fifth and 1 (2.9%) in the sixth or higher ( $n=34$ ).

In the spring semester, there are 9 (47.4%) male and 10 (52.6%) female students in the sample.

There are 14 students in the 20-29 years old age group (73.7%), 2 in the 30-39 years old age group (10.5%) and 3 in the 40 or older age group (15.8%,  $n=19$ ).

9 students are in the first year of study (47.4%), 5 in the second (26.3%) and 5 in the third (26.3%) ( $n=19$ ).

A new question compared to the autumn semester was to elicit the students' migration background. Only one student (5.3%) was born outside Switzerland. In terms of parents, there were 3 students with a foreign-born mother (15.9%) and 6 students with a foreign-born father (31.7%). Overall, 7 of the students (36.8%) had a migration background.

## 6. Results

### 6.1 Factors influencing the students' own choices of spatial examples

The students were asked “How important are the following points to you if you choose spatial examples for yourself (e.g. for planning lessons or for presentations)?” (translated), with a 5 point response scale from 1 “not at all important to me” to 5 “very important to me”. The results in terms of means can be seen in Figure 3, ordered by the mean value of the spring term. The results appear to be fairly consistent across terms. One item was added in the spring term, based on the results of the autumn term.

Six factors were judged to be more important than the curriculum in the autumn semester and eight in the spring semester.

The only three factors with mean values below the middle category in both semesters were all about broadening the perspective, i.e. places that are not frequently heard about in the media, that the pupils are not yet interested in or that the teacher students do not yet know a lot about. The students could also add their own factors as a text answer, which only four of them did in the autumn semester (translated):

- “motivation and fun factor – importance for the future”
- “vividness of the examples, the human factor so that the pupils can better identify themselves with it”
- “as different spatial examples as possible (e.g. same climate, but totally different economy ...)”
- “multi-perspectivity of the displayed spatial example, including the complex of problems that are connected to that”

In the spring semester, only one answer was added, namely, “... that are not too complex to be portrayed and explained to the learners. ... that can be unequivocally assigned to one or several topics” (translated).

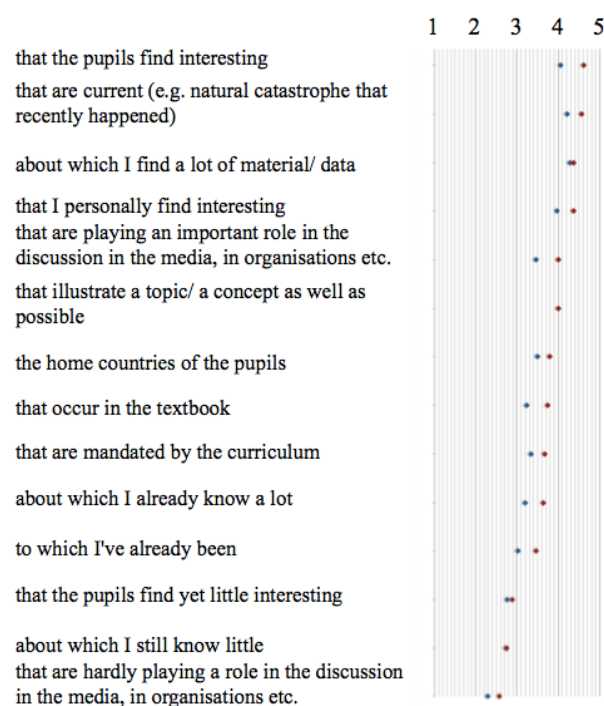


Figure 3. Mean values, responses to how important a factor is for the students' choosing spatial examples for themselves (translated). Source: own study, autumn term 2015 (blue,  $n$  between 33 and 34) and spring term 2016 (red,  $n$  between 18 and 19).

### 6.2 Factors that should influence choice of spatial examples for university courses

In the autumn semester, the students were asked as an open question “Based on what should lecturers choose spatial examples for courses?” (translated). The answers were then categorized (Figure 4). Similarly to their own choices, current events and interest (students'/pupils') were on the top. The “content” category includes for instance importance, exemplarity, vividness and links.

In the spring semester, there was a rating scale item, similar to the one used for the student's own choice of spatial examples. The results are displayed in Figure 5.



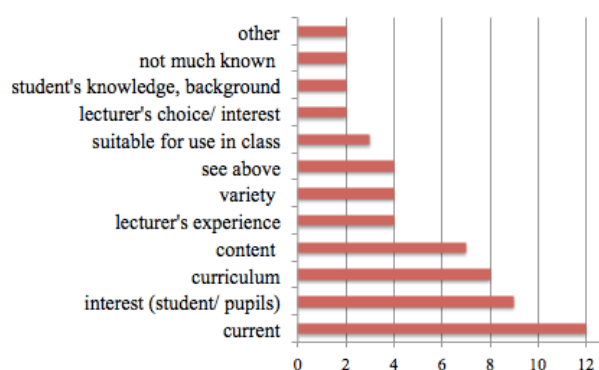


Figure 4. Number of classified responses regarding which factors should influence the choice of spatial examples for lectures ( $n=32$ ). Source: own study, autumn semester 2015.

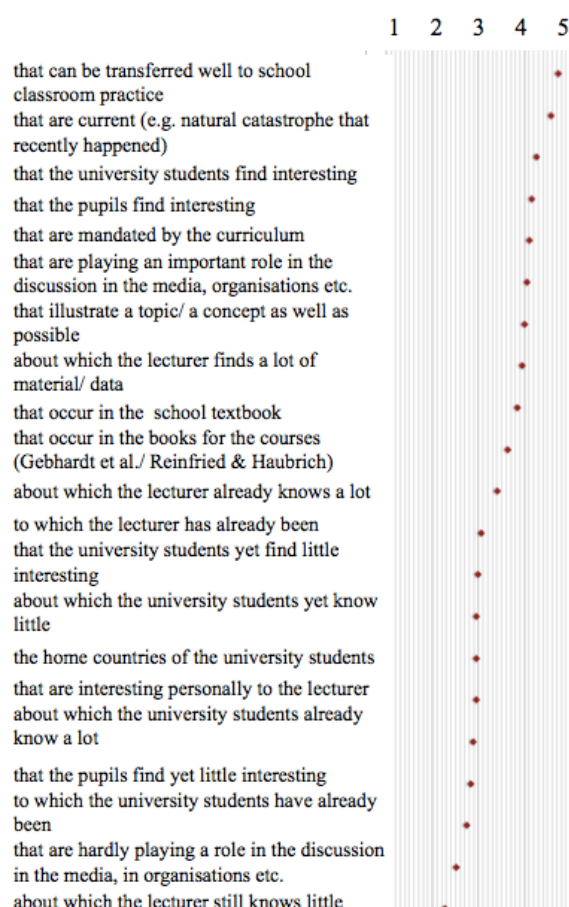


Figure 5. Mean values, responses to how important a factor should be for the lecturer's choice of spatial examples for courses (translated). Source: own study, spring term 2016 ( $n$  between 18 and 19).

Several things are interesting to note. For instance, both the interest of university students/ pupils and the topic being current/ important in the medial discussion again are very high on the

list. However, there are also differences, such as that the curriculum places much higher in the list than for the students' own work and material/ data availability lower. Additionally, while the students' own interests play quite an important role in their choosing a topic, they don't want their lecturers to do the same, as personal interests of the lecturers are rated low.

### 6.3 Evaluation of spatial examples used in the courses

The students were asked "As how good do you assess the selection of spatial examples for the courses in the autumn semester 2015" (translated), using a five point scale from "not good at all" to "very good", with an option for students not having attended a specific course. Course means varied between 3 and 4.5. In general, the values for the geography (as a discipline) courses were higher than those of the geography education courses (Table 1).

geography courses	M	Mdn	SD	n
ID 1	4.14	4	0.774	22
ID 2	4.00	4	0.976	22
ID 3	3.80	4	0.919	10
ID 4	4.50	4.5	0.535	8
geography education courses	M		SD	n
ID 1	3.18	3	1.074	17
ID 2	3.73	4	0.647	11
ID 3	3.00	3	0.632	6
ID 4	3.60	3	1.342	5

Table 1. Responses regarding the evaluation of spatial examples in the autumn term 2015 (1-5). Source: own study, autumn semester 2015.

In the spring term, the students were asked to state as how good they evaluated the selection of countries/ regions in the past semester, from 1 (not good at all) to 5 (very good), this time split between evaluating the individual spatial examples on the one hand as in the autumn semester, and the fitting to a particular course on the other hand. The geography (as a discipline) courses received a

mean of 4.15 ( $Mdn=4$ ,  $SD=0.801$ ,  $n=13$ ) and 4.14 ( $Mdn=4$ ,  $SD=0.535$ ,  $n=14$ ) respectively. The values for the geography education courses will not be reported here, because they were answered by more students than were in the author's courses, indicating that some who attended the same course that was taught by someone else at another location of the university also answered there. The spatial examples received mostly mediocre ratings (Table 2), with some such as India, chosen based on students' wishes, rated even slightly lower than the partial control country UK.

examples	M	Mdn	SD	n
Switzerland, Mediterranean	4.33	4.5	0.840	18
USA	3.74	4	1.147	19
China	3.44	4	1.247	18
other examples	3.25	3	0.754	12
UK	3.17	3	0.857	18
Russia	3.16	3	1.015	19
Japan	3.11	3	0.809	19
India	3.11	3	0.737	19

Table 2. Responses regarding the evaluation of spatial examples (1-5). Source: own study, spring semester 2016.

The number of spatial examples was also to be evaluated, from 1 (way too few) to 5 (way too many). The mean was 3.05 ( $SD=0.621$ ,  $Mdn=3$ ,  $n=19$ , range 2-4), showing that the number of spatial examples on the scale from intense focus to great diversity was well chosen.

Additionally, students again had the opportunity to voice their opinion in an open comment field. Only one student chose to do so, commenting "Partly it was difficult to find examples in the spatial examples, because the media don't report about everything" (translated).

#### 6.4 Planning the next semester

The spring semester had some questions added to the questionnaire that dealt with several aspects that need to be considered in

the planning process, in addition to the country wish list and factors influencing the choice. These were (translated):

- "How many spatial examples should be chosen in the autumn semester 2016 *per course*?"
- "How many semesters should the spatial examples be repeated (within 4 years)?"
- "How much do you agree with the following statements?"
- An open comment field

The results show that although seven as a number of spatial examples in the spring term 2016 had been perceived as fairly right, the students wanted fewer spatial examples in the next semester ( $M=4.59$ ,  $Mdn=5$ ,  $SD=2.623$ ,  $n=17$ ). The range was very large, however, using all 10 options given (1 to 10 or more).

In terms of repetition of spatial examples, 31.6% (6) favoured spatial examples not being repeated at all (i.e. every semester new ones should be chosen), 52.6% (10) opted for 2 semesters and 5.3% (1) for 3 semesters ( $n=17$ ).

Several statements the students needed to voice their agreement or disagreement on were also included (Figure 6). Although students on the one hand largely agree that focusing on only a selection of spatial examples deepens understanding, they on the other hand they want to be able to choose the one they deal with in their coursework freely.

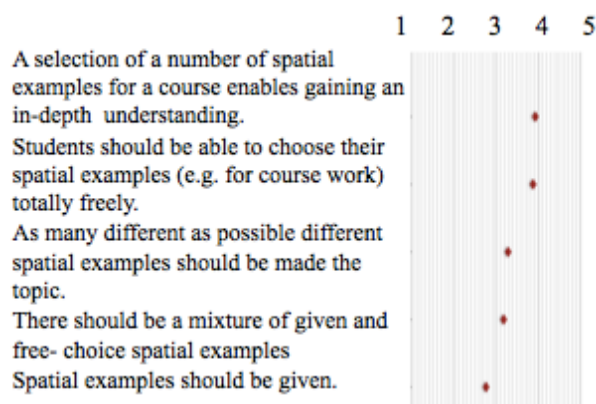


Figure 6. Mean values regarding agreement/disagreement to statements about spatial examples (translated). Source: own study, spring term 2016 ( $n$  between 16 and 17).

## 6.5 Spatial example wish-list

In the autumn semester, students could enter the answer to “What are the top 5 countries that you would like to have as spatial examples for courses?” (translated) (Table 3) in text fields. The results of all five countries are combined, irrespective of whether a country was entered in first or fifth position. Spelling variants etc. were also combined. Six students only specified a region or entered more than one country per text field (i.e. “Chile/ Argentina/ Uruguay” and “Scandinavia”; “United Arab Emirates/ Oman/ Kuwait/ (Arabic Peninsula)” and “India/ Sri Lanka”; “Iran/ Iraq”; “South America”; “Central America”; “Arabic world”). Moreover, some students did not use the blanks at all ( $n=5$ ) or did not use all five blanks, including one student also entered China twice, which was counted only once ( $n=3$ ). “America” was classified as USA.

frequency	countries	
1	Afghanistan	Burundi
	Cuba	Eritrea
	France	Honduras
	Iceland	Indonesia
	Italy	Ivory Coast
	Kenya	Kirgistan
	- Korea unspecified	Kosovo
	Moldawia	Pakistan
	Panama	Romania
	Singapur	Somalia
	Sweden	Thailand
	United Kingdom	
2	Burkina Faso	Iran
	Israel	Nigeria
3	Canada	New Zealand
	South Africa	Syria
4	Australia	Chile
	Germany	
5	Brazil	
7	Japan	
10	India	
12	Switzerland	
14	China	Russia
	USA	

Table 3. Responses from the autumn term 2015 regarding the wishes for spatial examples in the next term (without region/ more than one per blank). Source: own study, autumn term 2015.

The results show on the one hand a high interest in countries such as the USA, China,

Russia, India and Japan as well as the country of study (Switzerland). On the other hand, the results also show the diverse range of interest of the students, as evidenced by the high number of countries being only mentioned by one student.

In the spring term, there were no texts fields but drop down lists from which the students could choose, based on Wikipedia's entry for the UN membership countries as well as one category for disputed status areas. With a sample of 19 students and five countries to choose, that means 95 possibly votes, of which 12 were not used (missing or still on “please choose”).

The results (Table 4) show again great diversity as well as strong votes for Switzerland and the USA. It is also interesting to note which countries do not show up, despite the students' own criteria. Brazil fulfils the media/ being current criteria, due to the Olympics, as does the USA (e.g. election). Other countries, which are also frequently mentioned in the media, such as Iraq or Syria, do not even get one vote.

frequency	countries	
11	Switzerland	
8	Brazil	USA
6	Australia	
4	Russia	
3	Argentina	Germany
2	Chile	China
	Egypt	France
	Iceland	Iran
	Mexico	New Zealand
	Peru	Senegal
	South Africa	
1	Afghanistan	Andorra
	Bolivia	Burkina Faso
	Ethiopia	Finland
	Haiti	India
	Israel	Italy
	Norway	San Marino
	Saudi Arabia	South Korea
	Sweden	UK
	Vietnam	disputed areas

Table 4. Responses regarding the wishes for spatial examples in the next term. Source: own study, spring term 2016.

## 6.6 Interest in regions

In the autumn semester, the students were also asked “How much are you interested in the following spatial examples?” on a five point scale from “interests me not at all” to “interests me a lot”. They were provided with a map showing the 27 regions, in order to have results based on the same frame of reference, as individual countries may belong to different regions depending on the classification. Overall, there are a multitude of different ways to demark world regions (e.g. continents, the one used by the UN (UN Statistics Division 2013), the map used to illustrate Hemmer and Hemmer’s interest study in Haubrich (2006), the CIA World Factbook ([www.cia.gov/library/publications/the-world-factbook/](http://www.cia.gov/library/publications/the-world-factbook/)), the various ones found on Wikipedia ([www.wikipedia.org](http://www.wikipedia.org)), or those used in different world regional geography materials such as e.g. <https://monarchaphuman.wordpress.com/2013/08/>; <https://vimeo.com/82899998>; <http://people.uwec.edu/ivogeler/w111/worldreg.gif>). For the map used in the study the continents were the primary considerations (which meant Turkey and Russia as separate categories). Moreover, Switzerland and other German speaking countries were each put in a separate group from other European countries. Interest considerations were also taken into account.

The results can be seen in Figure 7. No region had a mean of 4 or higher. The results were markedly different from those published e.g. in the Hemmer and Hemmer studies in some ways, with Russia scoring among the 5 top regions, while in other areas, such as a low interest in Africa, they were similar. It is also interesting that while students considered “current events” an important factor in spatial example choice, Western Asia does not show a high interest (even below that of “rest of Oceania”). Part of the reason may be negative connotations associated with the region (e.g. ISIS as major threat, see Strokes, Wike and Poushter 2016), but this cannot be ascertained by the present data. Additionally, there are differences between the countries wished for and the interest in regions, for instance, despite India being one of the individual country top

choices, South Asia was only of medium interest.

In the map for the spring semester (Figure 7), some categories were summarized into one to make it easier for the participants. Moreover, due to the Mediterranean region being explicitly mentioned in the *Curriculum 21*, it was delineated as a separate region, even if that meant that the continent scheme was broken.

Some regions now had a mean of 4 or higher. Overall, while some of the results are consistent (e.g. the interest in Central America), there are also marked differences. On the one hand, these could simply be due to the different people in the samples, especially considering the small sample size. This would underscore the need to ask one’s specific class for their interest instead of relying on survey results (e.g. lower interest in North America than expected). On the other hand, the interest could be highly influenced by the preceding semester. For instance, as the students have already heard quite a bit about some parts of East Asia (China/Japan), they could now be more curious about other parts of the world. This would indicate a need to include a question such as “How often have you already dealt with the following regions in your classes?” or “How much do you already know about the following regions?” in large scale interest studies. Maybe also partly due to the changing boundary of the region compared to the earlier study, the interest in West Asia is now the lowest of all regions.

## 7. Discussion and outlook

In general, one of the frequently used words – at least in the Germanophone educational discussion – is *Schülerorientierung* (lit. pupil orientation, i.e. taking the pupils’ wishes, interests, circumstances, learning difficulties etc. into account when planning instruction). It is also part of the rubric used to assess the pre-service teachers’ lesson videos and portfolio (Berufspraktische Studien PH FHNW, 2016). Consequently, showing the pre-service teacher students that their interests and wishes matter is not just important for their learning within the courses, but also to encourage them to take

their future pupils' interests and backgrounds into account in their teaching later on. The first year of this educational design research study is only the start of a process of designing courses with that in mind. During a future semester, it would be interesting to also collect achievement data to look at learning gains, and possibly compare courses or course parts with different spatial examples to measure how much of a difference the choice of spatial examples makes.

One of the key results of the first stage is the diverse range of interests both within one semester and across both semesters. The latter might be only a reflection of a partially different sample, it might also point, however, to a possible change in interest semester to semester based on a combination of dealing with certain spatial examples (e.g. "we had x already this semester, something else would be more interesting" or "I didn't think this was going to be interesting, but it's actually not that bad") and certain world events (e.g. the Olympics). One way to control for the former would be to include a short interest questionnaire for the chosen spatial examples also at the beginning of the semester.

Another important result is that on the one hand having a limited number of spatial examples that are the same across courses (at least from one of the lecturers) connects these different courses and thus potentially enables deeper understanding, to which the students largely agree. On the other hand, the results also show that not every spatial example seems to work equally well in each course and that students would like to be able to choose examples for their coursework by themselves.

In general, the results of these studies can also be discussed in light of the longstanding discussion about the role of "[...] the 'thematic geography'" (also "general geography") with a cognitive interest that is largely nomological,

i.e. directed at general principles and the "regional geography" with a cognitive interest that is largely ideographic, i.e. directed at explaining individual circumstances (Blotevogel, 2001, translated). At the moment, thematic geography is usually favored (e.g. Blotevogel, 2001; Maude, 2013). As came up again for instance in a recent discussion I had with another geography educator, this can, however, sometimes lead to a very fragmented understanding and misconceptions of an area. If the particular spatial examples/ case studies chosen are different for each topic, students might come to associate for instance India only with disadvantaged girls and poverty, because that is the only thing where India had been used as an example. The combination of a thematic approach with a number of spatial "focus examples" that are used across several courses or topics might help to avoid that, but more research on the effectiveness of this approach is needed.

The study results also indicate that the students take different factors into account when choosing spatial examples, and that the ones they use themselves somewhat differ from those that they want the course instructor to use. In general, interest, data/ material availability and being the location of a current event are high on the list of influences on the students' decision-making process. More research is needed on how students balance the different factors in their decision making as well as how they resolve possible contradictions between these factors.

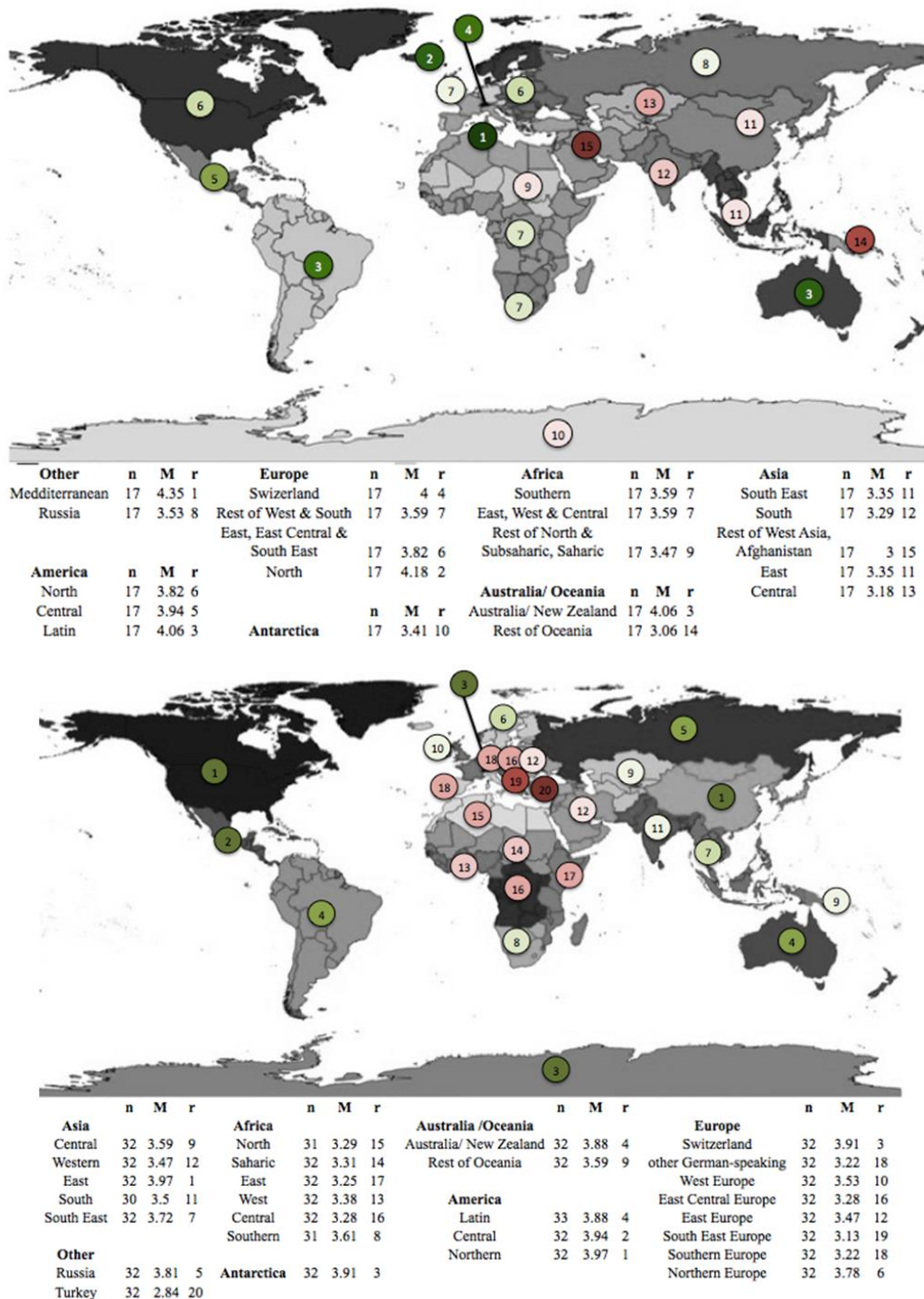


Figure 7. Results of the interest item, greenish rank (r) circles indicate a mean of 3.5 or higher, reddish of below. Source: own study, autumn semester 2015 (top) and spring term 2016 (bottom), map with data from Natural Earth (the original items were in colour, here the map is adapted to grey-scale to enhance readability of the results).



## Acknowledgements

Thanks to all students who agreed to the scientific use of their responses.

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