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The usability of satirical maps as an educational aid in history class

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The usability of satirical maps as an educational aid in history class

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Statement of Authorship

Herewith I declare that I am the sole author of the submitted Master's thesis entitled:

"The usability of satirical maps as an educational aid in history class"

I have fully referenced the ideas and work of others, whether published or unpublished. Literal or analogous citations are clearly marked as such.

Munich, 10.09.2019

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Abstract

While traditional cartography presupposes certain constraints in terms of dimensional accuracy and conformity with design guidelines, the genre of satirical maps distances itself from such restrictions. This study looks into the satirical map, which, as part of alternative cartography, follows a broader view of the map as a medium for conveying more than only spatial information. The scientific exploration of maps of this kind has received little research attention, although related research has shown that the use of comics and humor in an educational context, which share aspects with satirical maps, have proven to be effective in the uptake and memorization of information. In Dutch and German history classes, satirical maps are used as historical sources, without the usability of it actually having been determined. This thesis aims to explore the advantages and disadvantages of the satirical map in history class in contrast to those of a plain map. A usability study is conducted on two secondary schools, including class experiments (N=91), observations, and interviews with teachers (N=7). The results show that despite their incongruity with scientific constraints, satirical maps provide qualities of their own. Teachers believe satirical maps to be especially useful in practicing 21st-century skills, the most important of which involve analytical and critical thinking, including recognizing and explaining context-dependency and multiperspectivity. Whereas there is little difference in the level of engagement and discussion between the students that received a satirical map to study, and those that studied the plain map, their evaluation shows multiple differences. The average student finds the use of a satirical map useful, interesting, and entertaining, although most satisfaction scores lie below that of the plain map. The results of the usability test show a low efficiency for both maps, and a higher effectiveness for the plain map. However, according to the official learning objectives in history class, satirical maps can function well as an educational aid in history class precisely because they have different qualities than plain maps.

Keywords: alternative cartography, satirical maps, history class, usability testing, persuasiveness, political cartoons

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1

Introduction

1.1 Context of Research

Maps are generally viewed as providing a function, be it for navigation, tourism, safety, or other purposes. They should be accurate, useful, and meaningful (Baynton-Williams, n.d.; Caquard and Dormann, 2008; Cartwright et al., 2009). Apart from these vital functions, maps can also include humor, satire, propaganda, and related features. The focus in cartography is not on any of these features, but including them could support narratives, make the map reader interested, and keep the map reader engaged (Delp and Jones, 1996; Houts et al., 2006; Caquard and Dormann, 2008; Kim et al., 2017). Moreover, it could help the reader acquire knowledge from the map and enhance the understanding and recall of map features. This is especially interesting in the face of history education, where maps are often utilized as a teaching aid and can help to contextualize historical geopolitical conflicts. The way in which such general political maps (which is the regular map type shown in educational history books, from now on referred to as *plain* maps; see example Appendix A.1) are mainly used in school is in showing an ‘objective’ presentation of geographical features. However, as with any other social discipline, history can be recounted from multiple perspectives. In the teaching of history, political cartoons, newspaper articles, and descriptions of eye-witnesses are just some of the resources often used, given their ability to provide historical information. As maps can provide similar nuanced information, one wonders whether they can play a similar role in history education. Or are they bound to show the ‘factual’ situation, as traditional cartography has claimed they do?

As a first attempt to answer these questions, this research looks at a particularly opinionated type of map, called the satirical map. Satirical maps have much in common with cartoons and comics, a literary genre that also lacks recognition (McCarthy, 1977; Eisner, 2008). Political cartoons have especially been researched, mainly as a useful medium in the classroom (Dougherty, 2002; Hammett and Mather, 2011; McMahon, 2014). As an educational aid, just as cartoons and comics can be, research has been done on the advantages of using humor in cartography (Caquard and Dormann, 2008) and in school (Rule and Auge, 2005, p. 548). Satire, caricatures, comics and cartoons are regularly employed in a textual environment and have seldom been connected to cartography. As a teaching aid however, these have been given great attention (Smith and Leptich, 1963; Brown and Wachs, 1968; Delp and Jones, 1996; Rule and Auge, 2005; Kleeman, 2006; Hammett and Mather, 2011; Kim et al., 2017). Moreover, numerous studies have shown that the use of visual content has proven to be useful as an educational aid in several disciplines (Smith and Leptich, 1963; Brown and Wachs, 1968; McCarthy, 1977; Delp and Jones, 1996; Dougherty, 2002; Rule and Auge, 2005; Kleeman, 2006; Kim et al., 2017). What propaganda maps, geopolitical maps, and persuasive maps all have in common, is that they possess aspects that can be found

in satirical maps. Of these three, most research has been done on persuasive cartography. This is not surprising, considering that ‘persuasive’ works as an umbrella term for all overtly opinionated maps. Lastly, for the topic of this thesis is on the usability of satirical maps, the ISO standards on usability evaluation (ISO, 1998, 2018) provide a useful starting point. In the last decade, the focus of research has shifted to that of usability in the case of digital or interactive maps. However, map use research on static maps has a longer history (van Elzakker, 2004). According to the ISO standards, usability can simply be applied to a static product in the same way (ISO, 1998, 2018).

1.2 Problem Statement and Research Identification

As satirical maps combine aspects of both the general political map and the political cartoon, they have the ability to reflect the contextual nature of history, without lacking the spatial relationships that have to be present in a map. Figure 1.1 shows an example of such a satirical map, which includes cartoonish and humoristic characteristics. The artistic figures in this map, many of which can be seen ‘angling’, illustrate the author’s satiric commentary on the colonial competition of Europe’s greatest powers at the end of the 19th century. Even though satirical maps possess this quality, “until relatively recently, satirical maps, with their exaggerated pictorial appearance, were excluded from the cartographic canon because they lacked the requisite scientific and mathematically objective qualities it was felt essential for a map to possess” (Harper, n.d.).



Figure 1.1 Satirical maps include comical, artistic, humoristic and satiric elements (Soucacos, 2015, p.167)

Satirical maps therefore currently belong to the less explored category of alternative cartography, a category that does not necessarily follow the scientific constraints traditionally employed by cartography. The poor status of satirical maps within the discipline of cartography is reflected in the literature. To the author's knowledge, very few publications are available that discuss the historical use of satirical maps, and none that discuss the current use of satirical maps. In contrast to the satirical map as an unexplored concept, its most prominent components – cartoons, art, humor, and satire – have often been subject to study.

As previous research on satirical maps has focused on their origin, their pictorial appearance, and their place in alternative cartography, the purpose of this thesis is to look into the satirical map as an educational aid, an unexplored field in literature. Whereas several satirical maps are being used in history class (Interviews, 2019; see Chapter 4), no exploration of its usability exists. By collecting those findings in literature on related topics (e.g. visual content, persuasiveness, engagement etc.) and applying them to satirical maps, this thesis provides a starting point in investigating the usability of satirical maps in today's history class. The focus hereby is on upper secondary school education, but the conclusion also includes recommendations for lower secondary school classes. The hypothesis guiding this thesis research follows the belief that satirical maps have specific qualities of their own that can be effectively applied in history class. In contrast to using a plain map, using a satirical map supports analytical and critical thinking, and helps to get a deeper understanding of the event depicted on the map. Therefore, the hypothesis for this study reads: satirical maps possesses characteristics that are contributory in reaching history class objectives, which makes the satirical map a beneficial medium in history class.

1.3 Research Objectives and Questions

Even though multiple studies prove visual content to be useful in educating the map reader (Smith and Leptich, 1963; Brown and Wachs, 1968; McCarthy, 1977; Delp and Jones, 1996; Dougherty, 2002; Rule and Auge, 2005; Kleeman, 2006; Kim et al., 2017), satirical maps are little used in secondary school history class. This leads to the research objective of this study, which is *to discover the use and usefulness of satirical maps as an educational aid in secondary school history class and to give recommendations for its potential use*. Five sub-objectives specify what is to be examined in this thesis.

The first sub-objective addresses the topic by providing an overview of what is known about satirical maps. The second aim is to discover which objectives are set in secondary school education, and more specifically in history class. Sub-objectives three and four then respectively focus on the use and the usefulness of plain as well as satirical maps. As a result, the overall usability of both types of maps can be compared and evaluated. The fifth sub-objective combines the findings from sub-objectives three and four and focusses on the current and potential usability of satirical maps as an educational aid in

history class. It thereby sums up all findings and explains the recommendations given concerning the potential usability of satirical maps. The following list consists of these five research sub-objectives, complemented by corresponding research questions and sub-questions.

1. Summarize what is known about satirical maps

- What is known about the usability of satirical maps?
 - What is the position of satirical maps in the field of cartography?
 - For what purpose have satirical maps been used?

2. Summarize what is known about learning objectives

- What is known about education objectives?
 - What objectives are considered important in a general sense?
 - What are the specific learning objectives in history class?

3. Explore the use of both satirical and plain maps

- How do students and teachers value the use of a satirical map in contrast to a plain map?
 - How satisfied are the students in using the satirical map in contrast to the plain map?
 - When does a student prefer to use a satirical map and when a plain map?
 - How engaged are the students in using the satirical map in contrast to the plain map?
 - How is the communication between the students while working with either map?
 - When does a teacher prefer to use a satirical map and when a plain map?

4. Explore the usefulness of both satirical and plain maps

- How effective and efficient is working with a satirical map in contrast to a plain map?
 - What is the perceived and factual effectiveness of a satirical map in contrast to a plain map?
 - What is the efficiency of a satirical map in contrast to a plain map?

5. Identify the usability of satirical maps as an educational aid

- What conclusion can be drawn concerning the usability of a satirical map in contrast to a plain map?
 - To what extent do the satirical maps meet the learning objectives of history class?
 - When should a satirical map be preferred over a plain map and vice versa?

1.4 Thesis Structure

- Chapter 1** This introduction presents the context of this thesis. It thereby explains which topics are related and useful to look at in the process of achieving the research objective. This is followed by the problem statement and research identification. To complement the identification of this research, the research objectives and questions are listed.
- Chapter 2** Here a literature review is conducted and divided in two subchapters to separate the literature review on satirical maps from that of the analysis of history class objectives. First, the satirical map is placed in the broader genre of alternative cartography, after which the focus increasingly shifts to the particularity of the satirical map, and the graphic features found in it. Second, an overview of history class objectives is presented to comply with the requirements for the usability study.
- Chapter 3** The methodology chapter explains the fundamentals of social research, shows the main research methods, clarifies the concept of usability, and describes related user research. Subsequently, the second subchapter presents their implementation in this thesis. This includes the experiments and interview that are conducted, the participants therein, the maps used, the context in which the usability test is carried out, the observations done, the pilot-study, and the software used to process the data.
- Chapter 4** This chapter shows explains the research findings. First for satisfaction and followed by the effectiveness and efficiency of both the satirical and the plain map. Next is the discussion, which sets up the link between the usability test results and the literature, and an elaboration on the overall usability, resulting in a detailed account on the degree of fulfilment of history class objectives. Additionally, limitations and uncertainties are explained.
- Chapter 5** Lastly, the conclusion deals with the overall research objective. As a conclusion, what has been researched, how, and what the main findings are, is summarized.

2

Related Work

Because what is written about satirical maps is historical rather than scientific, this review of related works focuses on related subjects, characteristics of which can be found in satirical maps too. This chapter starts with an explanation of what satirical maps are a part of, namely of a variety of non-traditional cartographic maps that usually include geopolitical ideas, propaganda, and persuasiveness (Section 2.1.1). This overview provides the basis to investigate satirical maps as such. The origin, typical use, and development of satirical maps will be discussed in Section 2.1.2. Subsequently, the chapter goes deeper into the literature on related subjects, borrowed from other scientific disciplines (Section 2.1.3). Because satirical maps consist of cartoonish figures, the vast literature on (educational) cartoons and comics, especially political cartoons, have proven to be closely related. Moreover, the artistic appearance of satirical maps demands a look into the literature available on art in cartography, which includes a brief introduction in critical cartography. Likewise, literature on textual as well as visual satire and humor, including closely-related sorts as caricatures, contributes further to the solid foundation with which satirical maps can be explained. Figure 2.1 below illustrates the top-down approach followed in this chapter.

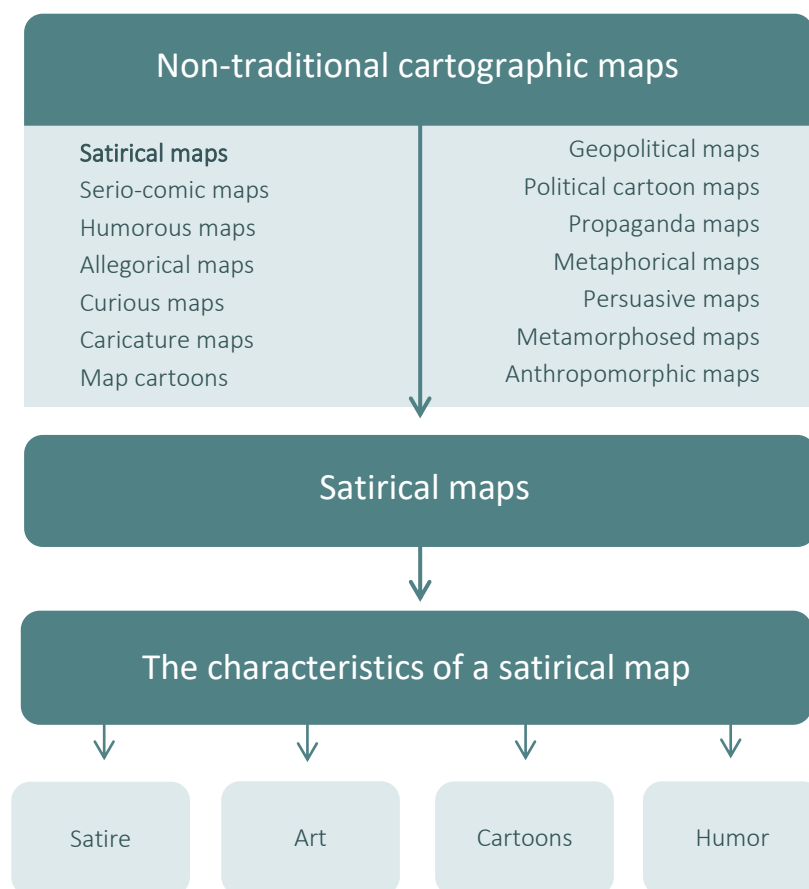


Figure 2.1 To be discussed in this chapter

2.1 Breaking Down Satirical Maps

2.1.1 Non-Traditional Cartographic Maps

Since the seventeenth century cartography has held the idea of a factual science (Wood and Fels, 1992; Kosonen, 2008). Critical cartography has dismissed this notion and made it clear that maps are not as exact as they have been claimed to be (Boria, 2008; Kosonen, 2008). As mentioned, all maps are intrinsically subjective and Boria (2008) even calls them persuasive. Though some maps do actually include more subjectivity than others. A couple of map types can be differentiated here. Persuasive maps form one type. However, the concept of persuasiveness can be found in most other map types as well, for instance in propaganda maps, geopolitical maps, and satirical maps (see figure 2.2). Oftentimes aspects of these intertwine, thereby proving their close relationship. Pickles (2011, p. 401) has adopted a definition that shows the commonalities: “Persuasive cartography is a type of cartography whose main object or effect is to change or in some way influence the reader’s opinion, in contrast to most cartography which strives to be objective.” Nearly all of the persuasive maps mentioned apply ‘open’ persuasiveness, which means they are easily recognized as having the goal to persuade (Boria, 2008).

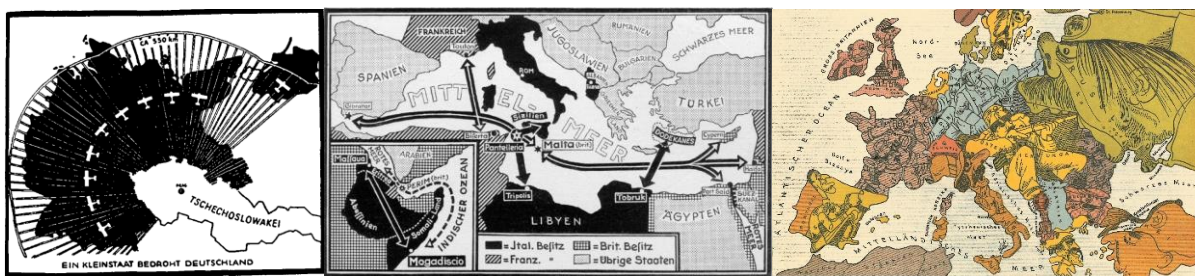


Figure 2.2 From left to right: a propaganda map, a geopolitical map, and a satirical map
(Quam, 1943, p. 27; Boria, 2008, p. 287; Soucacos, 2015a)

A type of map that includes both persuasive and propaganda aspects, and has much in common with satirical maps, are geopolitical maps. Having its origin between the two world wars of the 20th century, geopolitical maps are strictly political and openly ideological. While traditional cartography is useful in portraying a static political situation, a geopolitical map explains the political situation via a dynamic representation of causes and effects (Boria, 2008). It shows the interpretation of the author, and is made to be unambiguous. As they are designed for the public, a simple style is necessary to make sure as many people as possible can understand the map. This genre has been viewed as direct propaganda by the dictatorial regime. It is thereby lacking the scientific basis that is so important in traditional cartography (Boria, 2008); the same scientific basis that says that accurate measurements guarantee truthful representations (Boria, 2008). Geopolitical maps show that even with inaccuracy the map can be truthful; sometimes it is a matter of what the truth is, i.e. what the facts say, but other times it is about which representation is felt to be true. There are a variety of other names for maps with most of the mentioned attributes. Depending mainly on the specific period in which it has been made and the

intended function for which it has been made, various alternative names exist: (serio-)comic map, humorous map, allegorical map, curious map, caricature map, metamorphosed map, and numerous others (Baynton-Williams, n.d.; Harper, n.d.). Ashley Baynton-Williams mentions how such ‘cartographic curiosities’ are created for entertainment purposes and for exploring the possibilities of a map having artistic attributes and a personal perspective. More about this can be read in the following section on satirical maps.

2.1.2 Satirical Maps

This section explains what satirical maps are, when they have been created, why they have been created, by whom and for who they were created. However, to understand satirical maps it is necessary to have a look at the broader genre of cartographic curiosities. This is the genre that distinguished British author-researcher of old maps Baynton-Williams (2015, n.d.) has placed them in. Reason being is that many aspects of satirical maps can be found in earlier anthropomorphic maps, political cartoon maps, and other non-traditional cartographic maps (Barron, 2008). The addition of political meaning and satirical illustrations has been a use in mapmaking since the 16th century (Harper, n.d.; Barron, 2008), which according to Meurer and Peter (2008) form the roots of this alternative group of maps. However, going back many centuries ago, artistic cartographers already used metaphors to capture the essence of the country or region displayed on the map (Barron, 2008). The earliest example of anthropomorphic cartography dates back to the 14th century, where the coast of southern Europe takes on the shape of a woman. It was however not until the 19th century that the political cartoon map emerged, which reflected the political and cultural changes of a transforming Europe. In the years between 1848 and 1870, characterized by revolution, war, and overall political turmoil, the political cartoon map took its definitive form. Illustrated satirical magazines and newspapers flourished in this ‘golden’ era, especially in Great Britain, France, and Germany (Barron, 2008; Kastriti, 2015). Moreover, at this time such maps were also produced in Dutch, Spanish, Italian, Russian, and Japanese language (Pereltsvaig, 2014). As a result, the art of the cartoon and that of cartography got together, making many cartoon artists leaders in this new map genre (Barron, 2008). In the relatively peaceful years after 1870 up to the first World War (WW1) the political cartoon map genre changed accordingly and included a wider geographic focus and more serio-comic satire. When WW1 started, the genre developed in one that produced maps to be deployed as a serious medium for political propaganda (Harper, n.d.; Barron, 2008). Hence, Meurer and Peter (2008) have classified this period as the renaissance of the genre. As soon as the war was concluded and the Treaty of Versailles was compiled, the production and use of these maps came to a halt (Barron, 2008; Svolopoulos, 2015). One reason was that the war and large political struggles were over. The other is – believed by many and proven in many cases – that new methods of media (e.g. videos, internet, social media) can disseminate information much more quickly and effective (Barron, 2008; Garyfallos, 2015).

Thus, dependent on what characteristics the map owns and what name it has been given accordingly, the origin of non-traditional cartographic maps vary (Harper, n.d.). As mentioned, the maps in this genre have been given many names. This non-exhaustive list includes anthropomorphic maps, serio-comic maps, curious maps, political cartoon maps, propaganda maps, caricature maps, metaphorical maps, map cartoons, and also, satirical maps (Baynton-Williams, n.d.; Harper, n.d.; Barron, 2008; Meurer and Peter, 2008). Much of the inspiration for this thesis' research is drawn from *Satirical Maps* by Panayotis Soucacos (Soucacos, 2015a). In his book, the term 'satirical maps' has been used as a relatively generic term, comprising a variety of map cartoons with an emphasis on the politically motivated serio-comic maps from WW1. For both this reason and because literature regularly favors this term over that of similar terms in the genre, the term satirical maps has been adopted and used throughout this thesis.

So, what are satirical maps exactly? Closely connected to politics, humanities, visual communication, and propaganda, satirical maps "constitute significant historical testimonies" (Livieratos, 2015, pp. 45–46). Researchers disagree on the exact origin of the satirical map, but do acknowledge its diffusion and popularity through Europe from the mid-19th century until and especially during WW1 (Soucacos, 2015a). Satirical maps reflect the creator's perspective on a certain historical event and were mainly produced to influence the public opinion (Livieratos, 2015). They are humorous compositions with which a critical stance is taken against the international political situation (Kastriti, 2015). Or as Harper (n.d.) puts it: "A satirical map is an illustration with a cartographic element that has been produced specifically to make a comment upon the social, economic or political state of things." It does this by combining a typical cartographic map delivery with anthropomorphic and/or zoomorphic figures (Kastriti, 2015). A satirical map thereby often includes caricatures as a comical depiction of the complicated situation at the time. Sometimes these satirical figures were simply placed on the map, other times they were morphed into the shapes of the countries they represent. Harper (n.d.) hereby stresses that it is the interaction between the figures that enables the map to work in communicating its view (e.g. hostile exchange of face expressions, dogs biting each other, firing pistols, etc.). On top of that, they carry generally simple messages, and do that in a direct and graphically appealing way (Svolopoulos, 2015). This has been seen as especially useful in the explanation of the author's view in a concise way that can be understood by a broad public (Kastriti, 2015). The majority of satirical maps show the historical and geographic area of Europe, but as has been mentioned before, they belong to a special category of maps that do not pursue a scientific spatial representation, as what is standard in traditional cartography (Soucacos, 2015b). However, satirical maps fit into the cartographic discipline very well, according to the ICA's (International Cartographic Association) longer definition of cartography as "a unique facility for the creation and manipulation of visual or virtual representations of geo-space – maps – to permit the exploration, analysis, understanding and communication of information about that space" (Rystedt, 2003). For example, the satirical map in figure 2.3 shows a visual representation of Europe. The comical and artistic as well as the serious character of the map can be clearly

recognized. On the left of the map one can find a short explanation for the way in which the European countries are portrayed (i.e. explanatory text is frequently added (Kastriti, 2015)). This map shows the geopolitical situation in Europe around 1900 in a satirical way, in which the author has made use of anthropomorphic as well as zoomorphic figures to symbolize the state in which the various countries were at that time. Figure 2.4 on the following page shows a rather rare satirical map, for only few satirical maps were made after WW1. In this Portuguese map the Cold War political situation is humorously presented, this time without morphing of the various zoomorphic figures.



Figure 2.3 Humoristic (satirical) map of Europe from 1953 (Harper, n.d.)



Figure 2.3 Serio-comic (satirical) map of Europe from 1900 (Harper, n.d.)

The educational value of satirical maps has not been researched until now, but hypotheses have been made for related map types. Anthropomorphic maps have been mentioned as may-be useful in education (Barron, 2008). In 1869 a series of anthropomorphic maps with the name *Geographical Fun being Humorous Outlines of Various Countries* was published in London. The introduction states that: “It is believed that these illustrations of Geography may be rendered educational and prove of service to young scholars, who commonly think Globes and Maps but wearisome aids to knowledge, by enabling them to retain the outline of various countries so humorously caricatured in the work, by associating them in their mind’s eye with odd fancy figures” (Barron, 2008, p. 10). According to the writer the maps may also “lead to the profitable curiosity of youthful students” (Barron, 2008, p. 11). Moreover, Garfield (2012, p. 174) tells the story of Isaac W. Moore, an engraver by trade who by chance got to the idea of representing the United States of America as a bird. Soon Moore figured such a zoomorphic representation might prove beneficial to the ease with which (geography) classes can be absorbed and retained by the youths’ memory. These two examples emphasize the use of such maps in geography. However, maps are also inherent to history. In history class, satirical maps have been and are in many schools still used as a medium to teach history (Interviews, 2019; see Chapter 4). Particularly the more serious political satirical maps from the WW1 can be well utilized in explaining the complex situation of treaties and rivalries in Europe at the time (Harper, n.d.). Satirical maps show motifs from different sides of a conflict, many of which are re-used today by political cartoonists. As a result, satirical maps, or however one likes to call them, continue to be valid in showing a richer perspective on historical events.

2.1.3 The Characteristics of a Satirical Map

In this section the satirical map is broken down into its most apparent elements. As satirical maps possess satirical-humoristic artistic and comical illustrations, their relation to the satirical map and their current and proposed use in education is explained. As figure 2.1 in the beginning of this chapter has shown, there are four main subjects: art, cartoons, humor, and satire.

2.1.3.1 *The art in cartography*

Cartography is a mapping science, like surveying, geodesy, and geomatics. It has developed from basic field work in which maps were drawn by hand to a sophisticated procedure that uses all sorts of data, ranging from satellite images to social media data (Olson, 2015). The ICA has adopted this broader view and their definition now reads: “Cartography is the art, science and technology of making and using maps” (Rystedt, 2003). There is discussion on what components are actually inherent to cartography and which of them are more important (Krygier, 2014). Some argue that cartography is merely the technology of making maps via surveying and putting that data on paper or screen. Others see in cartography the science in accurately representing mapped features, and see art in the design and presentation of data. The emphasis on one or the other can vary per scientific discipline. However, the idea that science and technology are favored over art is well shared (Harley, 1989; Wood and Fels, 1992; Caquard et al., 2009; Cartwright, 2009, 2010; Moore, 2009; Krygier, 2014); empirically verified cartographic guidelines dictate the representation of data (Kraak and Fabrikant, 2017). Only after constructing the correct representation, an artistic style is chosen to give the map an attractive appearance. Decades ago, Brian Harley, cartographer and advocate of critical cartography, already went so far as to say that “‘art’ no longer exists in ‘professional’ cartography” (Harley, 1989, p. 274).

Critical cartography has called for a shift away from such normative models of traditional cartography (Harley, 1989; Edwards, 2006). Critics on the status-quo believe that scientific maps should and cannot solely rely on scientific correctness. Firstly, because art is necessary to ensure that users can understand the map and that they are activated by the map (Cartwright, 2010). According to Kraak and Fabrikant (2017), the addition of artistic characteristics can help to engage the user, instigate emotions, and retain attention. Secondly, because no map is totally objective. Every map follows a certain social perspective, which is subjective, dependent, and biased per se (Harley, 1989; Pickles, 2011; Muehlenhaus, 2013). The way in which this perspective is shown is formed by the artistic characteristics of the map.

2.1.3.2 Cartoons

The term ‘cartoon’ has been used since around 1900 to describe a humorous or satirical illustration (Kleeman, 2006). Published in magazines and newspapers, a cartoon addresses current (social) issues and thereby provides commentary on a variety of topics. Comics and caricatures are both sub-categories of cartoons (Kleeman, 2006). Eisner (2008, p. xvii) defines a comic as an arrangement of images, which often come in the form of a strip or a book, and Kleeman notes caricatures “are artworks that exaggerate or distort the features and characteristics (or the basic essence) of a person or a group of persons to create a readily identifiable visual likeness” (Kleeman, 2006). Even though there are differences between cartoons, comics, and caricatures, they are often used interchangeably. Eisner (2008, p. xv) and Williams (2012) both note that the comic gives the reader full control over the speed and order in which the comic is being read. He calls this the ‘active engagement’, which can be applied to satirical maps as well. An important advantage of the medium of cartoons, and thus also of comics, lies in the relatively quick and easy way to convey complex ideas to a wide audience (Kleeman, 2006; Williams, 2012; Peterle, 2015). However, the narrative that is given is constructed by the author, which therefore, similar in case of a map, contains a ‘chosen’ truth. The formerly underrated medium of comics has recently got more attention (Kleeman, 2006; Eisner, 2008, p. xvii). One important reason that has helped to promote the use of comics is today’s omnipresence of other media (e.g. television, video games); the comparable fast-pace visual information processing of which has become to seem natural and even preferable to younger generations.

Often when the word ‘cartoon’ is mentioned, a political cartoon is meant (Kleeman, 2006). Dougherty describes political cartoons as “succinct, sharp analyses of the events unfolding around us. They tie up in one space historical knowledge, familiarity with current events, and a vast repertoire of cultural and political symbols” (Dougherty, 2002). In history class, these types of cartoons are regularly employed, due to several factors among which their accessibility, the provocative nature, and the enjoyment students have in decoding their hidden messages (Smith and Leptich, 1963; McMahon, 2014; Interviews, 2019). The literature on cartoons show a variety of examples of how these are used and what advantages they bring with them. These are rather general, though most apply to a classroom environment, and more specific to history class, as well. For instance, in the work of Kleeman (2006) it was observed that a cartoon requires prior knowledge from the reader about the subject(s) of the cartoon, like caricatures do too (Smith and Leptich, 1963; Dougherty, 2002; Kleeman, 2006; Ginn, 2015). However, if the cartoons are made understandable, they can be used for mass communication. Be it for mass education or for promoting political goals (it helps that illiteracy does not form a problem here). Cartoons are useful in gaining attention, and in increasing the understanding of and promotion of a certain idea (Kleeman, 2006). Moreover, they can increase student engagement and student enthusiasm, encourage students to use their imagination, and initiate lively classroom discussions. Even more importantly, they can teach in the process by which the student gathers, interprets, and evaluates

information in order to consider alternatives, identify bias and form a personal opinion (Brown and Wachs, 1968; Delp and Jones, 1996; Dougherty, 2002; Kleeman, 2006; Hammett and Mather, 2011). All these activities are particularly stimulated in history class. In addition, when a geopolitical issue is to be explained and critical thinking is stimulated, images (e.g. political cartoons) form an ideal teaching medium (Hammett and Mather, 2011). One of the many examples that can be used is shown in figure 2.5. Was the Persian Gulf War a war for oil? This political cartoon suggests this notion. Once published in a newspaper, this analysis on the situation at the time can currently be used in class to discuss this historic event.



Figure 2.5 “Raising the oil pump” by Jim Morin (Dougherty, 2002, p. 265)

Additionally, Kleeman (2006) claims cartoons also provide advantages for the teachers. Teaching becomes more enjoyable and relevant, and cartoons add to the variety of mediums that can be used, thereby making the activity of teaching more diversified. Lastly, some of the research on cartoons (and similar concepts) have focused not on the advantages in class, but on the learning outcome for the students. In this regard, Kim et al. (2017) found that students in anatomy class, who read a text and additionally some comics about it, got a higher score on their test than the students who only read the text. Delp and Jones (1996) have noted a similar advantage of the use of cartoon illustrations for the

comprehension of instructions. In their research, patients had to study wound care instructions, some with and some without cartoon illustrations. Even though the written text was identical for both groups and they were both contacted after three days, the experimental group that were given the cartoon instructions performed better and also happened to be more satisfied with the instructions given. In their study Houts et al. (2006) assume this positive effect of pictures to be true. In their research, the addition of pictures increases the attention to and recall of health education information. Moreover, it was found that pictures can increase the comprehension of relationships, may they be social and/or spatial. These findings can be linked to what in education research is called the 'pictorial superiority effect' (Houts et al., 2006). In education and psychology research, according to Houts et al. (2006) more than 200 studies have reported that people remember a text better when pictures were added.

2.1.3.4 Humor

Humor has several functions and is good for more than just offering a pleasurable experience (Caquard and Dormann, 2008). Previous studies have found many positive effects of humor in the classroom (Rule and Auge, 2005; Caquard and Dormann, 2008; Boukes et al., 2015). By sharing humor, a positive atmosphere can be created, in which enjoyment is shared and intimacy is strengthened. The use of humor in teaching can lead to an increase in attention of the students, and in an improvement in attitude and engagement in the tasks that need to be completed (Ulloth, 2002). And as attention is needed in order to remember the information on a later point in time, attention is seen as a highly important factor in learning (Higbee, 1996). Regarding the engagement, it is noted that humor is the easiest way to engage students, because one must pay attention to understand a joke (Rule and Auge, 2005). Moreover, humor stimulates curiosity, reactions of surprise, and interest; each supports the students' engagement. Also, humor is believed to promote interaction, decrease stress, and reduce anxiety while completing tasks. On a more general level, humoristic texts or images appear to attract attention, can clarify certain points of view, and enhance the comprehension and retention of information. In his book on doing psychology experiments, Martin (2008, p. xi) writes that "not only did the students report that the humorous chapters were more interesting and informative, but also that students tended to recall more items from the humorous version during a delayed recall test." Moreover, David (2001) found that school classes in which no humor is present are considered boring, and that the use of relevant humor results in a more interesting and supported class. On the other hand, humor can also have unwanted effects. When humor is used in conveying a certain message, there is a good possibility of the message being discounted as just a joke (Smith and Leptich, 1963; Nabi et al., 2007).

2.1.3.5 Satire

Satire is an art and a type of humor. Most literature on satire is devoted to the written form, although political satire can be regularly found in pictorial form. Colletta (2009) states that satire is built upon a set of values that is used to judge from, thereby knowing that what is judged is subject to change (i.e.

corrigible faults). It uncovers human flaws and ridicules these. This usually takes on the form of an attack of criticism of what the author considers to be “dangerous religious, political, moral, or social standards” (Cuddon, 1991, p. 202). Attitudes of amusement, scorn, contempt, indignation, all are possible, as long as it ridicules the subject of interest, which is a social issue per se (Abrams, 1999; Nabi et al., 2007). In their study on using satire as a device for engaging the audience in the climate change debate, Bore and Reid (2014) stress that by using satire there is the risk of trivializing the seriousness of the topic, and at the same time it adds an expectation of laughter that can turn out disappointing. However, the use of satire can help in constructing a positive engagement with the topic. It can encourage audiences to take action and does so by taking away feelings of fear and helplessness.

Abrams (1999) believes the difference between satire and comics is the goal it works up to.

A comic has the goal to evoke laughter, while satire uses laughter as a weapon against an idea, a person, a nation, an institution, or any other criticized ‘subject’ in society. The satirist always includes a deeper meaning and social significance besides the humorous way of transferring the message (Colletta, 2009). Similarly, satirical maps consist of illustrations depicting judgements on the social situations at the time in which they are made. According to Kreuz and Roberts (1993), such illustrations can prove to be cognitively heavy; because a satirical text calls for more processing than a ‘normal’ text. With the same logic the cognitive load of a satirical map, which includes numerous representations, is higher than that of a ‘normal’ (i.e. traditional) map.

2.1.4 Conclusion

This subchapter has introduced the genre of non-traditional cartographic maps, sometimes called cartographic curiosities. This genre is characterized by an emphasis on persuasion and a lack of scientific basis. One type of such maps, satirical maps, have been explained as a specific type of curious map with its own history, even though it shares many characteristics with other maps of its genre. The most common characteristics (i.e. artistic-, cartoonish-, humoristic-, and satiric figures) have been assessed, and the subjects they are borrowed from explained. Focus thereby has been on the use of cartoons, art, humor, and satire (as a type of humor) as an educational aid in the classroom. With this background information, the potential usability of satirical maps can be hypothesized.

2.2 Objectives in (History Class) Education

This thesis is focusing on satirical maps, but with a special focus on its purpose in education. To examine the objectives in student education, with an emphasis on history class objectives in secondary school, papers and official documents including the learning objectives have been reviewed. This chapter starts with an overview of goals in secondary school in general. Subsequently, by having reviewed the exam requirements of both Dutch and German secondary school history class, a list of sought-after student skills reveal what the learning objectives are in higher-education history class in particular. How exactly these objectives are used to evaluate the usability of satirical maps is described in Section 3.2.2.2.

2.2.1 Goals in Secondary School

Literature points out the critical role student engagement has in higher education (Shernoff et al., 2003; Kahu, 2013; McMahon, 2014). It is therefore disappointing that several studies in the last few decades have documented low levels of student engagement (Shernoff et al., 2003; Marks, 2007). The advantages of high engagement in class are vast and well documented: engagement mainly leads to better persistence, learning, and achievement (Shernoff and Hoogstra, 2001; Shernoff et al., 2003; Marks, 2007; Bryson, 2016). A variety of studies have found that engagement varies per person and can often be attributed to individual factors (Shernoff et al., 2003; Marks, 2007). However, Csikszentmihalyi (1990) has proposed a theory that can explain most engagement in class. This ‘flow theory’ assumes there is the flow, a state of deep absorption in an activity that is felt as intrinsically rewarding. The activity is worth doing, no matter if a further goal is reached or not. In their study on student engagement in high school classrooms, Shernoff et al. (2003) used flow theory as the perspective to explain student engagement. In their study they divide engagement into the concepts of concentration, interest and enjoyment. Concentration, which is a flow experience, has been shown to belong to optimal learning. Interest is fundamental for the user’s motivation. Enjoyment of the task at hand leads to feelings of accomplishment and satisfaction. They found students to be more engaged during individual and group work than when they wrote a test, watched a video, or listened to the lecturer. Also, non-academic subjects were evaluated more engaging than academic ones, but at the same time more complexity was needed for students with a higher skill set in order to keep them engaged (i.e. tasks that are too easy or too difficult correspond to low engagement). They conclude that activities that are considered both academic and enjoyable have the best chance of engaging students.

McMahon (2014) argues that for a college class to be considered successful, students need to analyze, evaluate, and communicate information. McMahon calls these tasks ‘higher-order thinking skills’, which goes much further than just memorizing dates and names. Higher-order thinking skills are necessary to achieve a deeper learning experience, which can lead to a deeper understanding of a topic. To get to this deeper understanding, attention to a task has shown to be more important than the amount of

time spent on the task (Rule and Auge, 2005). A very useful medium that can help to get to this level of thinking is the (political) cartoon (Hammett and Mather, 2011; McMahon, 2014). This point is even more evident when it is recognized that history is full of warfare, and that warfare is a place of emotions. Caswell (2004) therefore argues that (editorial) cartoons are especially useful and informative to a historian, and thus useful for history class as well.

In the previous sections on cartoons and humor it has been mentioned that there are many advantages to the implementation of these in class for both the students and the teacher. However, some research studies include recommendations that have not been mentioned yet. For instance, Brown and Wachs (1968) believe the works of satire or caricature to be especially effective when the teacher has made selections of these for a certain purpose. Kleeman (2006) adds that cartoons are not that strong when it comes to the goal of recalling specific facts, but that it is much better in assessing the broad understanding of a topic. For a teacher to reach the learning objective in mind, Smith and Leptich (1963) propose that the use of a comic should be preceded by an introduction to avoid misconceptions. Apart from giving the reader sufficient background to the cartoon, Hammett and Mather (2011) also discuss the importance of choosing the right images, which are those that are likely to bring debate and discussion into the classroom. Two points are still worth mentioning. First, there is a disadvantage that comes with the stereotyping in many cartoons. Caswell (2004) claims stereotyping can lead to offensive connotations and as a result can let some students experience negative emotions in class. Second, Smith and Leptich (1963) believe teachers would use more cartoons, and would use them more effectively, if more information about the cartoons would be available. Thus, the questions of who the author is, when the cartoon was made, for what this particular cartoon has been used, and similar questions, could increase the use of cartoons in class.

2.2.2 Learning Objectives

To examine the usability of satirical maps as an educational aid in secondary school history class, it is necessary to know which learning objectives in these classes are strived for. On a general level, literature on education provides the main points that need attention. These have been described in Subchapter 2.1 and in Section 2.2.1. On the lower and more specific level actual exact objectives of secondary school history class can be distinguished. As this thesis includes class experiments in the Netherlands and in Germany (Bayern), two internet sources have been considered. In the Netherlands the objectives of history education are nationwide applicable and clearly stated by the '*College voor Toetsen en Examens*' ('College of Tests and Examinations'), who are in charge of administering the exams for Dutch secondary education (*Examenblad Geschiedenis*, 2019). In Bayern (Germany) the objectives for history class are listed on the site of the '*Staatsinstitut für Schulqualität und Bildungsforschung München*' ('State Institute for School Quality and Educational Research Munich') (ISB, 2004).

From all the objectives in the documents mentioned, a selection has been made of those that are most relevant for evaluating the usability of satirical maps in history class. Most of the objectives in the documents coincide, though the emphasis varies (ISB, 2004; *Examenblad Geschiedenis*, 2019). Firstly, there are many rather general objectives that is strived for in history class. The German education guideline has chosen for a general approach in explaining what it is that the students in history class should learn (ISB, 2004):

- The fundamentals, which includes knowledge (facts), skills and attitudes, is of fundamental importance in the subject of history¹.
- Analytical thinking as well as the willingness to consider the multicausality of phenomena and events are particularly promoted in the subject of history¹.
- To build historical methodological competence, in particular the ability to deliberately collect, classify and evaluate data as well as to rationally argue, is of fundamental importance for the accomplishment of life beyond the subject teaching¹.
- To strengthen their technical basis, subject-specific methods are taught across all grades and their competent handling is practiced. The students encounter the different forms of historical sources and the appropriate evaluation methods¹.
- To gain historical insights into structures, developments, events and personalities that have shaped the past and thus also influence life in the present. It therefore supports the search for historical findings¹.

However, a usability evaluation requires more detailed objectives and the Dutch documents studied provide these. Often noted is the need for students to be able to (1) assess data for usability, reliability and representativeness, and to process and use this information. Furthermore they stress the need to (2) be able to acknowledge context-specificity and multiperspectivity, and the need to use different types of historical source material to form an opinion and/or to answer questions (3). These three core objectives are mainly retrieved from the Dutch documents studied, but do coincide with the German objectives, as has also been confirmed by the interviewees (Interviews, 2019). The objectives are sorted in a way so that the core objectives are followed by the documented objectives from the official reports that they relate to.

¹ Staatsinstitut für Schulqualität und Bildungsforschung München (ISB), 2004

1. Assess data for usability, reliability and representativeness, and to process and use this information

- When assessing the usability of information from a source [...], the candidate can take into account the background and motives of the maker, the type of causes that the maker mentions (and does not mention), the representativeness from his point of view, and the time in which the source is manufactured ^{2 3}.
- Determine when one can accept something as a fact and distinguish between such facts and opinions, prejudices and/or stereotypes ^{2 3}.
- Explain on the basis of concrete examples or source interpretations that historical stories are a construction of the past ^{2 3}.
- Can judge film, sound or news sources regarding their intentions, credibility and information content and incorporate these findings into the process of forming an opinion ⁴.
- The students can use their knowledge of the analysis of visual sources (e.g. images, photographs, graphs, statistics and election posters) in order to understand manipulation attempts and to address them argumentatively ⁴.
- Discuss and collaborate in a team ⁵.

2. Acknowledge context-specificity and multiperspectivity

- History class has a basic function in terms of working with many subjects. Among these geography is well integrated (space as a factor of historical importance) ¹.
- The differentiated consideration and evaluation of historical testimonies leads to perception from different perspectives and thus enables the insight into the conditionality and limitation of human-historical experiences ¹.
- Compare views, values and motives that led people in the past to the views, values and motives of contemporaries ⁶.
- Form a picture of historical events, phenomena, developments and persons on the basis of historical data. Thereby taking into account the context-specific nature of the sources, and assess what determines this context-specificity ⁶.
- When giving judgments about the past, the student can take into account the role of value patterns in the present and past ⁷.
- When giving judgments about the past, the student can take into account time and place boundaries of interpretations and judgments from people from the past and from contemporary people, including himself ⁷.

² GESCHIEDENIS VWO. SYLLABUS CENTRAAL EXAMEN 2019, NADER VASTGESTELD 2018

³ GESCHIEDENIS HAVO SYLLABUS CENTRAAL EXAMEN 2019 Versie, 2019

⁴ Staatsinstitut für Schulqualität und Bildungsforschung München (ISB), 2019

⁵ Examenprogramma geschiedenis en staatsinrichting vmbo, 2018

⁶ GESCHIEDENIS EN STAATSINRICHTING VMBO | Syllabus centraal examen 2019, 2017

⁷ Examenprogramma geschiedenis vwo vanaf CE 2015, 2015; Examenprogramma geschiedenis havo van CE 2018, 2018

3. Use different types of historical source material to form an opinion and/or to answer questions

- Collect information from sources based on a specific question and use it as evidence in answering that research question ^{2 3}.
- Can analyse maps about historical and current topics in order to discuss key current and historical problems with coherent arguments and to subsequently take a stand ⁴.
- Can judge the statement of political and historical caricatures and explain their view on it ⁴.
- Process personal experiences and assignments of others in word, sound, and image ⁵.
- Recall facts ⁶.

2.2.3 Conclusion

This section has shown what the important goals in education are (2.2.1), and more importantly, what the student learning objectives for secondary school students in history class are (2.2.2). In education, student engagement is a keyword. In assessing student engagement, concentration, interest, and enjoyment have found to be useful. Moreover, higher-order thinking skills are stressed, which are skills that go further than simply memorizing facts and which can lead to a deeper understanding of a topic. In the section on learning objectives, a selection has been shown of those objectives that are most relevant for evaluating the usability of satirical maps in history class. Four objectives have been distinguished as most commonly mentioned. These have accordingly been described, thereby the literal objectives added.

3

Methodology

The first part of the methodology chapter will provide a scientific background on research fundamentals and methods relevant for this research. Moreover, cartographic research on usability will be introduced, and related user research studies described. The actual way of applying these methods is elaborated on in the subsequent Chapter 3.2 ‘chosen research approach’. In this second subchapter, all details of the used methodology are explained, including the research design, the way in which the concept of usability research is applied, the data collection, and the data processing.

3.1 Theoretical Background

In this subchapter, the fundamental components of social research relevant for this thesis are described, which are the design, type of data, participants, and social research criteria. Next, the interview, experiment, observation, and survey are explained as the most relevant research methods. The concept of usability – in general and within the discipline of cartography – is discussed and user research on comics and satire is reviewed for suggestions on how to design the usability test in this thesis.

3.1.1 Research Fundamentals

The first choice when setting up a research study is the choice for a research design. Only a few research designs are common, though many variations exist (Bryman, 2012). A research design is the framework for collecting and analyzing data. Or as Bryman (2012, p. 45) more elaborately states, “the research design is a structure that guides the execution of a research method and the analysis of the subsequent data.” As a result, every research follows a certain design. If a research design combines characteristics of multiple research designs, it is called a mixed design. Four types are relevant for this thesis: experimental design, comparative design, cross-sectional design, and case study design. Because research studies do not have to follow a specific design, and can thus choose to combine characteristics of multiple design types, a summary of the qualities of these designs is hereby provided.

- First, an experimental design can involve a laboratory experiment or a field experiment (Bryman, 2012, p. 50). The former takes place in a contrived setting, whereas the field experiment refers to real-life settings. A true experiment presupposes the manipulation of the independent variable in order to determine whether it has an influence on the dependent variable. Participants are often divided in two or more groups to be able to distinguish different types of the independent variable. In social research, a survey is commonly conducted at the end of the experiment.

- Second is the comparative design, which entails studying at least two contrasting cases, for which similar methods are used (Bryman, 2012, p. 72). Thus, data is collected for at least two cases (which can be nations, cultures, schools, etc.) and compared.
- Third is the cross-sectional design, which “entails the collection of data on more than one case [...] and at a single point in time in order to collect [...] data in connection with two or more variables (usually many more than two), which are then examined to detect patterns of association” (Bryman, 2012, p. 58). A drawback of this design is that it lacks the internal validity (see table 3.1) that is found in most experimental research (Bryman, 2012, p. 59). Frequently employed in cross-sectional research are surveys, structured observation, semi- and unstructured interviewing.
- The fourth design is the case study design, which investigates a single case detailed and intensively (Bryman, 2012, p. 66). This can take the form of a single classroom, a single school, a single community, a single person, etc.. Participant observation and unstructured interviewing are common, and quantitative as well as qualitative methods can be deployed.

As mentioned, the choice for a research design decides if the researcher will collect (mainly) qualitative or quantitative data. In research, there is a dichotomy between these two, but as Bryman (2012, p. 408) describes, research can be qualitative, quantitative or somewhere in between. Qualities that are rather qualitative are the use of words resulting in rich/deep data. In qualitative research the motivation and meaning are important, and points of view are explored, often in an unstructured way to increase contextual understanding. On the other hand, a quantitative design is focused on numbers rather than words, the set-up is rather structured, and generalization is a primal goal. To make generalization of results possible, hard and reliable data is strived for by use of theory testing in an artificial setting.

Participants are central in social research because many social related studies endeavor to understand the behavior of people. The need for participants is therefore intrinsic to social research, which makes these people the ones to ask and/or to analyze (Martin, 2008, chap. 4). According to the latest view, “a participant is supposed to be a naive, well-motivated observer who will react to experimental manipulations in an uncontaminated way” (Martin, 2008, p. 70). However, this does often not match the real situation, for personal motivations and morals can vary per person. Participants can be cooperative, defensive, and non-cooperative. In the first case the term participant can be exchanged for ‘respondent’. In the case of a respondent displaying defensive behavior (i.e. respondent does not answer truly, but pursues a positive outcome for him/herself), the researcher should be more cautious in making conclusions. Lastly, non-cooperative participants should be excluded from the study; their participation is failed and so they can be labelled non-respondents.

The last relevant ‘fundamental’ component of social research included in this brief section deals with the multiple criteria that have been formulated to safeguard the quality of social research. The following table 3.1 shows the most prominent criteria for evaluating social research: reliability, replicability, and validity. Some apply primarily for quantitative research, others for qualitative research as well. Validity can furthermore be split into four aspects: measurement, internal, external and ecological.

Reliability	<i>Are the findings of the study repeatable?</i>	<i>Concerned with the consistency of measures</i>
Replicability	<i>Are the findings of the study replicable?</i>	<i>Focus on explaining procedures in great detail</i>
Validity	<i>Does the measure of a concept really measures that concept?</i>	<i>Focus on the integrity of the conclusions</i>

‘Measurement’ validity	<i>A valid measure reflects the concept it is supposed to be measuring (highly related to reliability).</i>
‘Internal’ validity	<i>If a causal relationship is concluded, how sure is it that the independent variable causes the change in the dependent variable, without influence of a possible intermediate variable?</i>
‘External’ validity	<i>Can the results of study be generalized beyond this specific research context? I.e. do the results only count for the respondents, or can it be applied more generally?</i>
‘Ecological’ validity	<i>Are the results applicable to our natural daily life? Findings should not only be technically valid, but also practically.</i>

Table 3.1 Social research criteria, their main question and focus (Bryman, 2012, chap. 3).

3.1.2 Research Methods

Even though the research design decides which methods are useful for collecting data, the research methods themselves entail many possible techniques. The decision on what method(s) fit(s) best to a certain research study is dependent on the desired results. As such, the methods can be seen as the second step in setting up the research study, after having chosen the research design. This section gives an explanation of four commonly used research methods, which are relevant for this thesis. These methods are the interview, experiment, observation, and survey.

3.1.2.1 Interview

A survey technique that is quite different than the ones still to be mentioned, and probably the most widely used method in qualitative research, is the face-to-face interview (Martin, 2008, p. 215; Bryman, 2012, p. 469). The interviewer and respondent meet for an individual interview at a chosen location. The interview can be structured or unstructured. In the former case the questions the interviewer wants to ask are scripted, whereas in an unstructured interview the questioning is more free and explorative. This makes the structured interview better for controlled questioning, followed by an easier analysis. However, in comparison, the unstructured interview may seem more natural and could go more detailed into spontaneous topics. A mix of both is possible and is called semi-structured interviewing.

3.1.2.2 Experiment

There are traditional experiments, quasi-experiments and variations possible (Martin, 2008, p. 193). The main difference is that traditional experiments are based on random assignment of participants. In the cases where this is not possible, one can choose to do a quasi-experiment. An experiment can be useful if there is an interest in finding out the relationship between certain circumstances and a behavior (Martin, 2008, p. 5). However, there is an infinite number of circumstances and a similar number of behaviors. Thus, in experiments scientists manipulate at least one circumstance and subsequently measure at least one behavior. After completing the experiment, it should be consequently possible to make a clear statement about what influence the different circumstances have on the behavior. If for instance the circumstance (i.e. independent variable) varies between sunny weather and rainy weather, the behavior of a person (i.e. dependent variable) that wants to go to the beach can vary accordingly. “When an experiment is done correctly, it is possible to make a clear statement that any change in the measured behavior, that occurs when the circumstance of interest is manipulated, is caused by the manipulation” (Martin, 2008, p. 6). No other method equals the experiment in making such strong causal statements, which is why it is a widely used method in science.

3.1.2.3 Observation

Sullivan (1989, p. 259) claims observations are a good way to get information about the response to a product. However, there are many ways to carry out an observation (Bryman, 2012). Firstly, an observation can be overt and/or covert. The first discloses the researcher as being an observer, the second keeps the researcher's objective a secret (Bryman, 2012, p. 433). Observations can also be structured and/or unstructured (Bryman, 2012, p. 273). A structured observation systematically observes the behavior of people, in which the researcher follows explicitly formulated rules for both the observation and recording of the behavior. Where stalking can be a (rather extreme) example of structured observation, unstructured observation can be seen in daily life, where people (spontaneously) observe the people around them and the things they do. Another aspect of the observation method that can vary is the level of obtrusiveness (Bryman, 2012, p. 325). The 'simple observation' refers to observations where the researcher has a nonintrusive and passive role in the research situation. Slightly different, the 'contrived observation' has the observer actively change the setting in some way and/or record the observations with the use of hardware. Both the simple and the contrived observation are 'non-participant observations', in which the observer monitors, but does not participate in the social setting. This in contrary to 'participant observation', where the observer immerses in a certain social setting (Bryman, 2012, p. 273).

3.1.2.4 Survey

Surveys are regularly employed to gather information about a group of people (Martin, 2008, p. 212). A survey can include a visual or oral (interview) questionnaire, and therefore functions as an umbrella term (Martin, 2008, pp. 10–11). Data is collected from a sample of people and if done well, results can then be generalized to a larger population. A wide variety of information can be included in a survey. What is especially useful, is that it can include information that could not be directly measured (e.g. opinions and motivations). This can be done via open-ended questions and/or closed-ended questions, the latter being more restrictive. Thus, "surveys allow you to ask not only what people do but also why they do it" (Martin, 2008, p. 212).

There are several ways to employ a survey and thereby gather data (Martin, 2008, p. 212). A technique often used in the past is the mail survey, nowadays often traded in for the e-mail survey, where the participant receives the survey by post or email. Closely related are the surveys sent over the internet via 'new' media, like Facebook and WhatsApp, thereby using one of the many (free) online survey services. The obvious advantages are manifold; small cost, fast distribution and collection, possible higher anonymity and privacy (and thus more honest responses), and simple set-up. However, there are disadvantages as well. The lack of pressure can result in a low motivation to participate and survey questions can hardly be explained when they happen to be unclear for the participant. Moreover, these online surveys only offer limited control over time restrictions.

Another way to collect survey data is via a telephone survey, which is basically the oral version of an email survey. Although it is more personal, it is also harder to get into contact with the participant and questions can seem more difficult. Moreover, on some occasions it is possible to employ a group administration of a survey. This means there is access to a group of participants and a survey of all can be conducted. In this way, relatively much data can be gathered in a short time frame. Situations in which such is possible vary, though all can include groups with many participants (e.g. tourist group, sport team, school class). Of course, participants can refuse to participate, confidentiality becomes an issue when respondents sit close by, and it often proves to be difficult getting a representative sample of the general population.

3.1.3 Usability Studies in Cartography

In cartography, empirical studies on usability are often quantitative and controlled (Roth et al., 2017). Most cartographic studies on usability look into what influence a certain map design or user factor has on the map use outcome. Van Elzakker (2004) distinguishes two types of map use research that complement each other: ‘perceptual and cognitive research’, and ‘functional map use research’. Perception research deals with the initial reactions of the user. Cognitive research goes further by also including the user’s experience, memory and thought processes. They explore if and why maps work, whereas functional map use research assesses to what extent a map meets the purpose it is made for. After the rapid technological development in the last three decades it is not surprising that the majority of these studies is focussed on interactivity. However, Roth et al. (2017) have presented a research agenda for such studies and indicate that many of the recommendations can also be applied to static digital maps and paper maps. Roth et al. (2017) recommend that one should choose purposeful sampling if possible and that participants should represent the future users. Furthermore they state that conducting field studies can be a valuable addition to the laboratory tests, and that consistency, control, and repeatability are very important for user tasks in quantitative studies.

In a study on the usability of mobile geo-applications, Van Elzakker et al. (2008) note that two basic usability testing methodologies can be distinguished. As mentioned in Section 3.1.1, the laboratory-based method is based on the total control of external influences, whereas the field-based method acknowledges and embraces the contextual situation (which is at least partly responsible for the users’ behavior and activities). Even though the advantages of doing field-based usability research are obvious, only a low percentage of usability research is done in this way (van Elzakker et al., 2008). Besides the choice for field-based or laboratory-based testing, there are numerous other research methods and techniques that can be applied in usability testing: survey, observation, video/audio recording, eye movement recording, data logging, thinking aloud, interview, comprehension tests, and several others (Sullivan, 1989; van Elzakker et al., 2008; Çöltekin et al., 2009). Usually, a combination of methods provide the best results (van Elzakker et al., 2008). Surveys and interviews can include direct questioning,

which is useful to discover what the users think and feel (Sullivan, 1989). In combination with observations, the response towards the product as well as the reason for this response can be examined. Moreover, Sullivan (1989) claims that a comprehension test is the best method to discover what the user has learned.

To make usability evaluation easier, the International Organization for Standardization has come up with the ISO 9241-11 standard. This standard provides guidelines, general principles and techniques, on how to design, perform, and evaluate usability tests (ISO, 1998; Bevan, 2009), with a focus on user performance and satisfaction (ISO, 1998). ISO 9241-11 applies to working with visual displays, but can just as well apply to most other situations where a user interacts with a product to achieve a certain goal: “Evidence suggests that the ISO 9241-11 provides a useful, solid, and flexible construct to assess different types of products” (Borsci et al., 2019). The ISO standard has been accepted in the cartographic discipline and are often adopted in cartographic research on usability (Çöltekin et al., 2009; Nivala et al., 2003, 2008; van Elzakker et al., 2008). In the most recent version of the ISO 9241-11 standard, the definition of usability is formulated as followed: “Usability is the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” (ISO, 2018, p.2). Thus, according to the ISO 9241-11 standard (ISO, 2018), effectiveness, efficiency and satisfaction are the important three concepts of usability:

- *Effectiveness*
which includes the accuracy and completeness with which users achieve specific goals.
- *Efficiency*
which is a term that summarizes the resources needed to achieve the intended results (e.g. time, materials, and human effort)
- *Satisfaction*
which measures the extent to which the user's physical, cognitive and emotional responses after using a system, product or service are in accordance with the user's needs and expectations. An older version of the International Standard phrases it as “freedom from discomfort, and positive attitudes towards the use of the product” (ISO, 1998, p. 2).

3.1.4 Related User Research

This thesis aims to discover the use of satirical maps as an educational tool. As mentioned, this is an unexplored field of research, which means that no examples of similar research can be used to help set up the methodology. However, as elaborated upon in Chapter 2, the concepts of cartoons, art, humor, and satire have often been subject to study. As a satirical map possesses characteristics of each of these, it is useful taking into account the way in which user research on these concepts has been conducted.

Most related user research has dealt with the use of comics (see 2.1.3 on cartoons). For their research, Kim et al. (2017) produced educational anatomy comics and presented these to a group of students (N=215). Each panel of the comic included a caption, dialogue, and an illustration to explain certain anatomical features. For assessing the learning utility of these comics, two groups of students were selected and divided into control and experimental groups, of which only the experimental groups were given time to read the comics. Subsequently, a descriptive test was chosen to evaluate the comics as an educational aid, regarding the memorization of anatomical terms, as well as the organization and comprehension of anatomical knowledge. Three questionnaires were used to evaluate the students' satisfaction, which included questions about the interest in and perceived accessibility of the comic, the comics' perceived effect on students' comprehension of anatomy, and the comics' perceived helpfulness on the students' academic performance in an anatomy course. Additionally, all participants were asked to give their overall opinion. Moreover, the effectiveness of the educational comics was evaluated through quiz grades and questionnaire replies. As a limitation, Kim et al. (2017) admit that the lack of proper control groups restricted their study; a control group that would have read the anatomical information by use of a conventional medium would have been more useful than a control group that had not read the anatomical information at all.

A similar approach was taken by Rule and Auge (2005), who have done research on the use of humorous cartoons in teaching mineral and rock concepts in science class. Similar to Kim et al. (2017), a divide between control groups and experimental groups was made and only the latter received the cartoon format. The classes were randomly assigned to these groups and consent of all participants (N=63) was obtained. In this specific study by Rule and Auge (2005), a pretest was conducted to assess the initial student knowledge about the topic, and both groups of the students were surveyed for their opinion on the use and satisfaction of learning about minerals and rocks. Finally, a posttest – identical to the pretest and mostly including multiple-choice questions – was carried out, with which the knowledge gain per student was analyzed. One practical limitation noted by Rule and Auge (2005) was the unavailability of technological tools in the school building, which meant a hindering of lessons and time being wasted.

The use of cartoons can also be found in user research outside the school class. In their study, Delp and Jones (1996) have evaluated the effect of cartoon illustrations on patient comprehension of wound care instructions. Similar to Kim et al. (2017) and Rule and Auge (2005), one group received information with illustrations and one group without illustrations. The amount of participants in this study (N=205) was thereby comparable. Also, after a certain time the participants were asked to answer questions, in order to assess their recall and understanding of the information they had seen at the start of the experiment, as well as their satisfaction about it. In the case of these patients this was three days later, by telephone survey, and the questions asked were based on information taken directly from the instructions. The limitations described by Delp and Jones (1996) focus on the telephone survey, because of which only just over half of the participants could be reached (mainly caused by inaccurate information given during registration). Consequently, results may not be generalizable to patients from other institutions.

Bore and Reid (2014) show that user research not necessarily implies the interest in individuals, but can also mean an interest in groups of people. With an emphasis on satire, their research looks into the usefulness of satire as a device for engaging audiences in public debate. With four techniques used, their approach is mixed: qualitative interview, a performance analysis of the satirical play shown to the audience, survey questionnaires with people from the audience, and focus group discussions with people from the audience. In this study, the results of the one method is used in the next, which causes an enrichment of data.

These examples show that there are a couple of methods and techniques that are useful to apply in doing user research. As mentioned, the experiments in user research nearly always include a survey. Moreover, the multimethod study of Bore and Reid (2014) show that a combination of more than two methods is possible, and as mentioned in Section 3.1.3, video/audio/eye movement recording, thinking aloud, comprehension tests, and several other techniques are also feasible. However, as the limitations of these studies show, some methods and techniques have their disadvantages as well.

3.1.5 Conclusion

This subchapter started with the fundamentals of social research and the most common research methods: the interview, experiment, observation, and survey. Subsequently, the methods and techniques in cartographic usability research have been described and, following the ISO standard, the concept of usability has been explained. Last, a summary has been given of related user research, which can in large part be applied to the approach used in this thesis research on satirical maps.

3.2 Chosen Research Approach

Whereas the previous Subchapter 3.1 has provided the framework and explained the many possibilities available in doing research, from here on the focus is on this thesis study in particular. This subchapter explains the implementation of the methodology and usability components mentioned, in order to answer the research questions of this thesis. First will be explained which research design for this thesis is chosen, followed by a description of how usability is specified for this thesis. Furthermore, the participants and maps selected, and the variety of methods and techniques used to collect and process data are described.

3.2.1 Research Design

The research design, which is the overall strategy that this research is based on, is a mixed design. Above all, this thesis follows the comparative design, and does this with the use of an experiment. Even though, some aspects are borrowed from the case study design and the cross-sectional design. The main part of action in this research is conducting a usability test, which takes the form of a classic experiment. As mentioned (see 3.1.2), an experiment can be useful if there is an interest in finding out the relationship between certain circumstances and a behavior (Martin, 2008, p. 5). Specifically, this research explores the usability of satirical maps by conducting a field-experiment, in which the action of a map-related task by participants is tested. By doing so, it compares satirical maps with plain maps, and deepens the results by further comparing the two types of maps for different groups; Dutch students, German students, students who participated in the regular experiment, and those that participated in the alternative experiment. Case study elements include the focus on history class, specifically those given in the upper classes of secondary school, and the typical case study techniques of participant observation and unstructured interviewing are carried out (as will be described in Section 3.2.4). However, this research takes into consideration classes in both Germany and the Netherlands, which is characteristic for a cross-sectional design and not for a case study design. Hence, this thesis does include the focus on two cases and also includes common used methods in cross-sectional research, such as surveys, structured observation, and semi-structured interviewing. However, this research includes but does not focus on exploring the ‘patterns of association’ between the German and Dutch class, or the regular and alternative experiment; it rather combines these ‘these cases’ to make conclusions about all classes examined. Moreover, interviews have been conducted with teachers of several levels, which therefore makes the results – to a certain extent – generalizable to other schools and classes. Thus, the overall research is not intended to be a case study, and neither does it follow a strict cross-sectional design. However, aspects of both are included and do give this experimental study a mixed design.

3.2.2 Conducting the Usability Test

3.2.2.1 How Usability is Specified

The term usability has been explained in the theoretical background (Section 3.1.3), but only in general terms. This section explains why the focus on usability is important, what it includes, and how it is used in this research.

Since Van Elzakker et al. (2008) claim a combination of methods provide the best results, which advice Bore and Reid (2014) took and found to be true in their research, this usability study has incorporated a few of the methods that are said to be helpful in usability research (i.e. experiment, questionnaires, interviews, and observations). Moreover, this study follows the usual research of functional map use by assessing the map use for a group of people (van Elzakker, 2004), in this case for a group of students. On some aspects, however, this study is different than any other usability study. This study is based on a field-based methodology, which Van Elzakker et al. (2008) have noted are scarcely been carried out. However, the main difference is that the usability test in this study is focused on the usability of one type of static map, in combination with the evaluation of that map in a classroom. This means that for one, the ISO standard needs to be adjusted to fit this usability test. Furthermore, as the teachers have their own perception on the usability of satirical maps, their opinions are included in the results and work complementary to the usability assessment of the students in class.

The title of this thesis is: *The usability of satirical maps as an educational aid in history class*. This includes looking at the 'usability' of satirical maps, which on the one hand implies looking at the 'use', and on the other hand at the 'usefulness' of these kind of maps (see following figure 3.1).

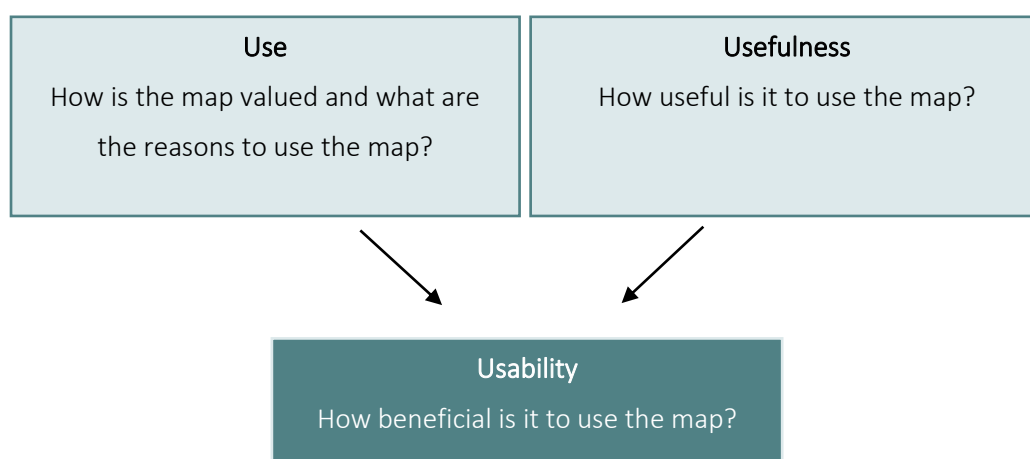


Figure 3.1 Usability of a satirical map in class

In the section on usability studies in cartography (3.1.3), the term usability has been explained by referring to the ISO 9241-11 standard, which defines usability as the “extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” (ISO, 2018, p. vi). As has been shown in figure 3.1, the three components of usability have been adapted to apply for this specific study. The concept of satisfaction has been expanded by including the satisfaction of the teacher. This non-user satisfaction contains possible reasons to use the map, e.g. to learn specific aspects of the map, to increase discussion, and to increase attention. The effectiveness and efficiency with which the map is used to get to a deeper understanding of what is depicted on it, is renamed to the map’s ‘usefulness’. Finally, the outcome of the use and usefulness of a map indicate the usability of the map, i.e. how beneficial it is to use the map.

The specified users are students in secondary school history class, the context of use is the classroom, and the goal is to find out in what way satirical maps as an educational medium can be beneficial in learning history. The concepts of effectiveness, efficiency, and satisfaction are altered to fit this goal. First, within this usability study, effectiveness of map use is defined as the accuracy with which users achieve a deeper understanding of the content of the map. The other component of the map’s usefulness is efficiency, which entails the time, materials, and human effort needed to achieve a deeper understanding of the content of the map. Last, the use of the map is measured by the satisfaction, which is the emotional response on the map by the student, and to a lesser extent by the teacher, during and after map use.

3.2.2.2 How Usability is Evaluated

The usability evaluation in this thesis includes an archival study, several interviews, and a usability test in class. Figure 3.2 depicts the order with which this thesis seeks to reach the research objective.

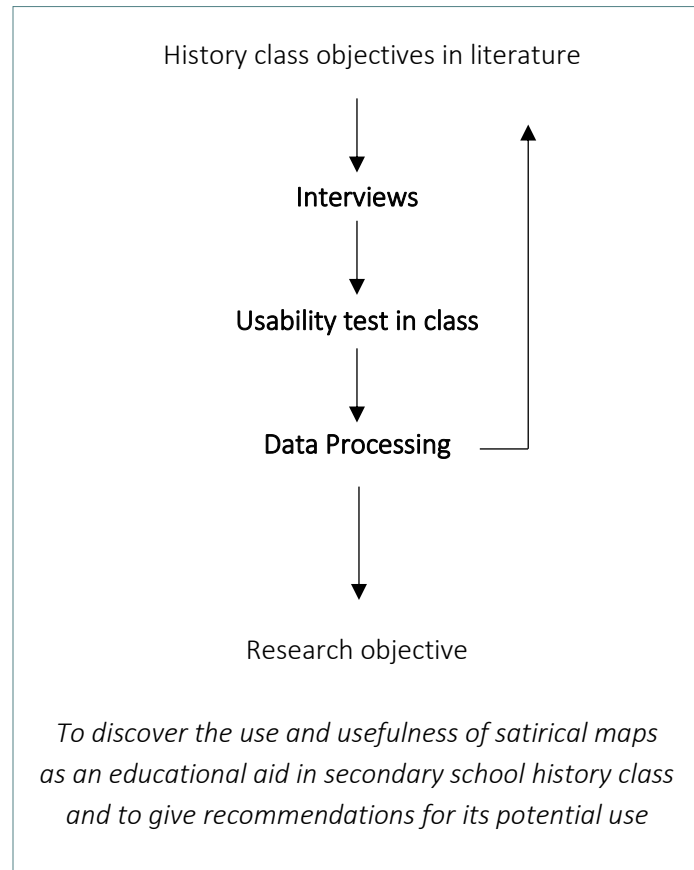


Figure 3.2 Order of tasks to reach the research objective

To examine the usability of satirical maps as an educational aid in secondary school history class, the learning objectives need to be known. In Subchapter 2.2 the education goals have been reviewed for secondary school in general, and with a focus on the learning objectives in history class. Subsequently, a selection of relevant learning objectives is collected and are checked by the interviewees. This means that a selection of 20 objectives in the form of statements – chosen by relevance for working with satirical maps – make up part of the interview (see Appendix D1). The reason for this check is to see if the objectives are indeed deemed important by the people that have practical experience with history class. Once the interviewees have given their view on these statements, the most important objectives from this list are selected accordingly (results can be seen in table 4.4).

When the objectives have been found and confirmed (some more than others), the usability study can proceed with the usability test in class. The usability test consists of class experiments, including maps and observations, and a survey via questionnaire. An elaborate explanation of these will be given in the following sections (3.2.3 and 3.2.4). After data processing, the experiment data can be linked back to the list of objectives from the start of this process (see figure 3.2). This is when questions can be answered, such as: What are the differences between both maps in relation to the most important objectives? And what is therefore the contribution of the use of satirical maps in history class?

3.2.3 Case Study Selection

This section describes the two things that have been selected: the participants that provide the data, and the maps as the objects of interest. The participants include interviewees, which are or were history teachers from secondary schools. Most participants however, belong to the class experiments. Divided over five classes, a number of 91 participants have taken part in the usability test, and are here described by gender, age, and nationality. In the second part, the five maps that have been selected to be used in the class experiment are showed and explained.

3.2.3.1 *Participants*

As this thesis aims to find out what use satirical maps in history class can have and how useful this use is, the audience targeted are students and teachers engaged in history education. Purposive sampling has been chosen to select only those students that have history class. In the rest of this thesis, the words participants and respondents are used interchangeably for those people that are participating in the study. For the participants that respond to specific questions asked (i.e. are cooperative; see 3.1.1), the term respondents is preferred. Some of the following statistics deal with overall participant numbers, and others are about specific questions; both are referred to as 'N'.

Seven teachers have been interviewed, of which one is recently retired and another is currently a professor in history didactics (see table 3.2). All of them give or have given class to students in either a Dutch or German upper secondary school. Five of the interviewees are Dutch, two of them are German, and the ratio male/female is 5 for 2 as well.

INTERVIEWEES			
Interviewee	Gender	Age	Occupation
1	M	67	Retiree (former teacher on Dutch secondary school)
2	M	61	Teacher on Dutch secondary school
3	F	29	Teacher on Dutch secondary school
4	M	45	Teacher on Dutch secondary school
5	M	43	Teacher on Dutch university
6	M	39	Teacher on German BOS
7	F	37	Teacher on German BOS

Table 3.2 Interviewees that have participated in the usability study

The participants in the class-experiments have been divided in five groups. Table 3.3 shows the different classes and the number of students of each class participating in the experiment. The number of male and female participants is close to equal, one person indicated to not belong to either of these groups.

PARTICIPANTS						
Class	Frequency	Percent	Cumulative Percent	Male	Female	Other
VWO5 (1)	18	14.3	19.8	10	8	0
VWO5 (2)	23	18.3	45.1	12	11	0
BOS 11D	22	17.5	69.2	11	10	1
BOS 11C	16	12.7	86.8	6	10	0
BOS 11B	12	9.5	100.0	7	5	0
Total	91	100.0		46	44	1

Table 3.3 Students that have participated in the usability study

The first two groups of participants are Dutch classes, both on the level of preparatory scholarly education (VWO), and both in their second to last year. The subsequent three groups of students have class at a German upper secondary school (BOS: ‘Berufsoberschule’) and are also in their second to last year. All participating students are thus relatively mature with an average age of just over 19 years, corresponding to the high classes they are in (see table 3.4).

AGE OF PARTICIPANTS				
Class	N	Minimum	Maximum	Mean
VWO5 (1)	17	16	18	16.76
VWO5 (2)	23	16	20	16.96
BOS 11D	21	19	25	21.48
BOS 11C	16	19	24	21.19
BOS 11B	11	19	23	20.82
Overall	88	16	25	19.44

Table 3.4 Age of participants per class

Another aspect in which the Dutch classes differ from the German classes is the variety of nationalities. Table 3.5 clearly shows that the Dutch classes are nearly homogenous, whereas the German classes have a large variety of nationalities. There are numerous other nationalities, which have been grouped to provide a clearer overview (see table 3.6): besides the Dutch and German students, some students come from an other country in Europe ('European'), a few come from places outside Europe ('Other'), and some of the students indicated that they have a double nationality ('Mixed').

NATIONALITIES PER CLASS						
Class	Dutch	German	European	Other	Mixed	N
VWO5 (1)	16			1		17
VWO5 (2)	21			1	1	23
BOS 11D		11	4	5	2	22
BOS 11C		6	8		2	16
BOS 11B		9		2	1	12
Overall	37	26	12	9	6	90

Table 3.5 Nationalities of participants per class

The classes thus vary in the amount of nationalities their students have. There are in total 21 different nationalities indicated by the students. Among these, multiple 'mixed' nationalities were mentioned: Dutch-American, Turkish-Macedonian, German-Turkish, and German-Tunisian. Most students are Dutch (see table 3.6), many are German, and a few have a different European nationality (i.e. Kosovan, Polish, Turkish, Bosnia-Herzegovina, Croatian, Kosovan, Latvian, and Romanian) or come from countries outside of Europe (Afghanistan, Ghana, Nepal, Somalia, Suriname, Tanzania, and Togo).

NATIONALITY OF PARTICIPANTS						
Nationality	N	Percent	Cumulative Percent	Male	Female	Other
Dutch	37	41.1	41.1	21	16	0
German	26	28.9	70.0	16	10	0
Europe	12	13.3	83.3	5	7	0
Other	9	10.0	93.3	3	5	1
Mixed	6	6.7	100	0	6	0
Total (N)	90	100		45	44	1
Missing	1	1.1		1	0	0

Table 3.6 Nationalities of participants

From the Dutch and German students, a considerable higher number of males is present, in contrast to the other groups, where there were more female as male students. One student did not indicate his nationality.

3.2.3.2 Maps

To test the usability of both a satirical map and a ‘plain map’ (i.e. a geographic/cartographic map regularly used in history class; see figures 3.6 and 3.7), five maps were selected. These maps were selected not just on their appearance, but as much on their author, publisher, language of text, and degree of subjectivity. From these five maps, three are satirical and two are so-called plain (see the following figures 3.3 to 3.7; maps are enlarged in Appendix A). Because two maps were used in the Netherlands, the text in these maps are Dutch (figures 3.3 and 3.6). The plain map has been borrowed from a translated edition of the atlas of world history (Santon and MacKay, 2010, p. 221).

The maps that are used for the German part of the usability test consist of two satirical maps (figures 3.4 and 3.5), the first of which is English, the other German. These two maps are visually very similar, but what mainly differentiates them is their subjective point of view. Where the one shows the German Empire and Austria-Hungary as being in trouble, the map made in Germany follows a German point of view (*“nach deutscher Auffassung”*), depicting these countries much more positively. The German plain map is also borrowed from a history school atlas (PUTZGER Historische Weltatlas, 2001, p. 156) and again shows a depiction of the first part of WW1 (figure 3.7).

The first map (figure 3.3) was created by Louis Raemaekers, a Dutch cartoonist who created hundreds of political cartoons during World War 1. Most of these in the form of posters, postcards, and brochures, although much work also appeared in newspapers. Even though the Netherlands were neutral at this time, Louis Raemaekers’ personal experiences with the war urged him to create anti-German cartoons and, for that reason, had to flee the country. His map, published in Amsterdam in circa 1915, shows a Dutch perspective on this war (Soucacos, 2015a). While each country is depicted as a human figure, it is therefore a metamorphosed as well as an anthropomorphic map.

The second map (figure 3.4) has been published in 1914 by Geographia (London), drawn by the Anglo-Russian artist John Henry Amschewitz (n.n., 2019). It is considered a serio-comic map of Europe on the outbreak of the war, decorated with caricatures both human and non-human: John Bull as Great Britain, Germany as the eagle from the title, Russia as a bear, the Ottoman Empire reluctantly being pushed in the war by a German officer, and many more.

The last satirical map that is used in the usability test is highly similar to map 2, only this time it was issued in Hamburg, Germany (figure 3.5). With a ‘German angle’, this map is an edited version of the previous map by J.H. Amschewitz’ (Soucacos, 2015a). Most of the same caricatures are present, yet in a contrasting pose. This map is also from 1914, but published in the *Epistolary Bulletin* (Hamburg) and without a name of the author.

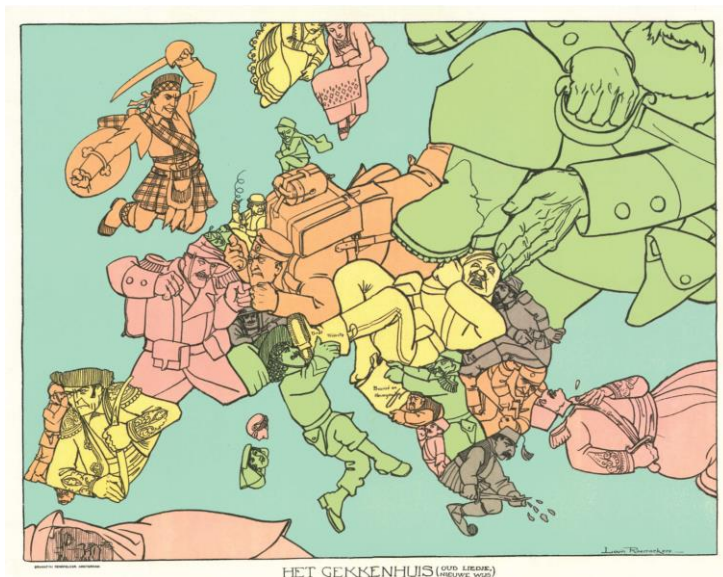


Figure 3.3

Satirical map 1
Het Gekkenhuis⁸
(Soucacos, 2015a, p. 221)



Figure 3.4

Satirical map 2
European Revue. Kill that eagle.
("European Revue (Kill That Eagle)
1914.jpg", 2008; by Paul K is licensed
under CC BY 2.0)

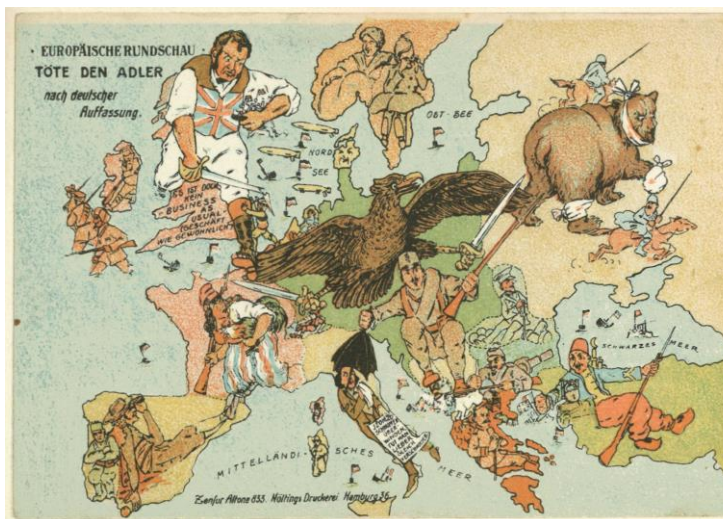


Figure 3.5

Satirical map 3
Europäische Rundschau. Töte den Adler
nach deutscher Auffassung.⁹
(Soucacos, 2015a, p. 199)

⁸ The insane asylum (old song, new tune)

⁹ European Revue: Kill that eagle (The German angle)

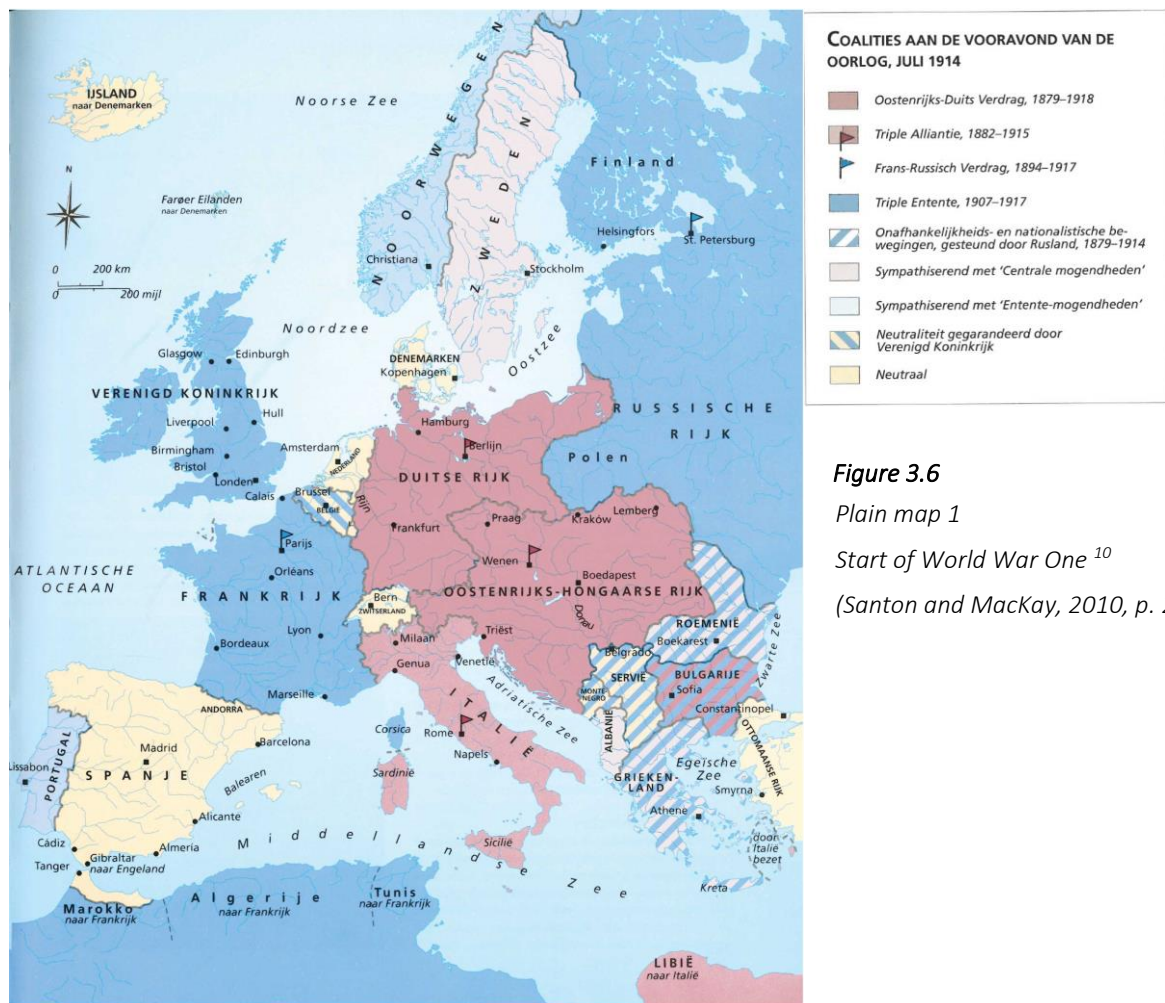


Figure 3.6

Plain map 1

Start of World War One ¹⁰
(Santon and MacKay, 2010, p. 221)

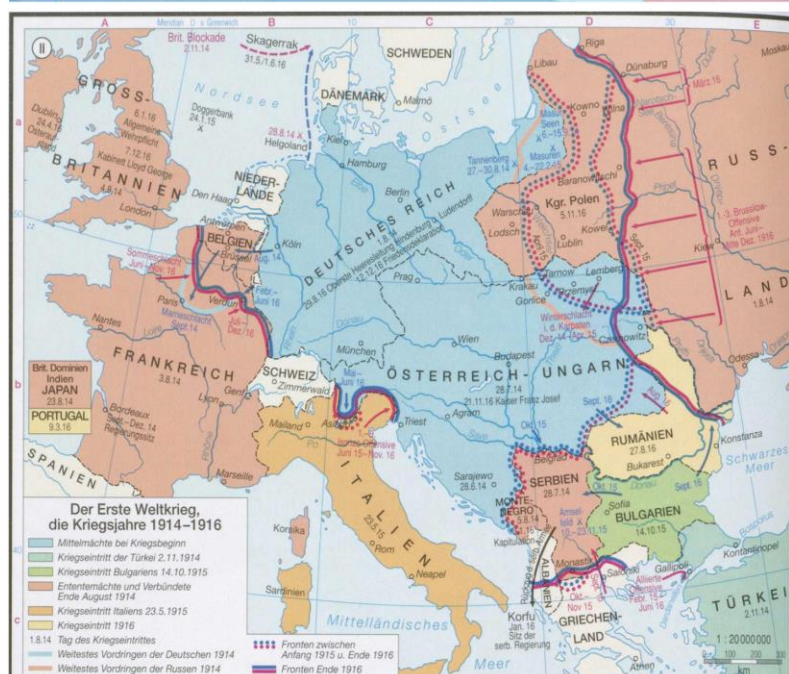


Figure 3.7

Plain map 2

World War 1 ¹¹
(PUTZGER Historische Weltatlas, 2001, p. 156)

¹⁰ Title of the legend: "Coalitions on the eve of the war, July 1914"

¹¹ Title of the legend: "The first world war, the war years 1914-1916"

After these five maps were selected, eight textboxes were added around the border of every map. Each of these textboxes contain a fact, and every one of these facts deal with a certain event or some countries' state in the war. The reason why a specific set of facts has been chosen, is that these facts can be visually interpreted in each of the five maps. The following list of facts (Haywood, 1999; Santon and MacKay, 2010) was chosen:

1. *The German Empire fought a two-front war with the 'Triple Entente', consisting of Russia, France, and Great Britain. The tactic of first defeating France and then focusing on the east failed when the German troops were stopped 80 km before Paris.*
2. *Austria-Hungary had a treaty with the German Empire since 1879. The treaty remained valid until the end of the war.*
3. *On June 28, 1914, Archduke Frans Ferdinand of Austria-Hungary was shot in Sarajevo by a Serbian nationalist. After an ultimatum, Austria-Hungary declared war on Serbia. Two days later, Russia mobilized its troops to support Serbia, after which the German Empire declared war on Russia.*
4. *The Ottoman Empire (present-day Turkey) entered the war on October 29, 1914, on the side of the central powers (triple alliance).*
5. *Italy had been a member of the 'triple alliance' since 1882 and supported the German and Austro-Hungarian Empire at the start of the war, but joined the Allies in April 1915.*
6. *A few neutral countries were not in the conflict, for example Spain and Switzerland.*
7. *Both the German Empire and the United Kingdom guaranteed Belgium's neutrality. When the Germans used Belgium as a gateway to reach France, the United Kingdom decided to honor its obligations and declared war on the German Empire.*
8. *The United Kingdom was helped by troops from across the British Empire, including Australians, New Zealanders and Indians.*

These facts are linked via thin lines to visual cues in the map (see the maps enlarged in Appendix A). Additionally, the text boxes are covered, so every user test participant has to open the cover to be able to read the text under it. Ideally, the map and text boxes work as an interconnected whole. The map user sees a visual cue and reads the historical fact belonging to it. This visual cue can be a certain face expression, map figures fighting each other, map figures watching the show from a distance, etc.. Turning the order around, the text boxes can also encourage the reader to read the map. Most importantly, apart from providing the reader with an explanation of what is depicted on the map, the addition of text gives the reader certain learning points, of which some are tested in the questionnaire afterwards.

3.2.4 Data Collection

This subchapter explains about all the methods and techniques used to collect data. As has been done in the previous Subchapter 3.1, a description of the interviews is followed by an explanation of how the usability test has been conducted via (class) experiments, observations (during the experiments), and a survey. Each receive their own section.

The data now presented has been collected in just over one month time in the summer of 2019, starting with the first interview on June 1st to the last interview on the 10th of July. In this period of time, the class experiments were carried out between the 4th and the 28th of June.

3.2.4.1 Interviews

This research has included face-to-face interviews with history teachers. These interviews are semi-structured, for they are scripted, but leave enough room for significant issues to spontaneously emerge. Thus, the interview follows a certain order, but this order is rather flexible and participants are free to bring up what they see as relevant. The advantage of using this technique lies in the flexibility with which results are gathered; both the scripted questions as the additional issues can prove to be useful. The open-endedness of the interview permits for an iterative process of refinement, which strengthens the interview by using completed interviews as a way of enriching interviews still-to-be-done (Bryman, 2012, p. 472).

The interviews have been carried out to examine the educational requirements of history class, and to learn about the experiences these teachers have with and expectations they have for the use of maps and satire in class. This means that, as mentioned in Section 3.2.2.1, interviewees were asked to respond to statements about the objectives of history class (see results in 4.1.2). However, the interview includes many more questions, which are mainly qualitative (see Appendix D1). In summary, the interviewees were asked:

- about their personal goals in class and the overall goals encouraged by the school.
- about the way of teaching history, educational aids used, and what has changed over time
- about their view on the use of maps as an educational aid
- about their view on the use of satirical maps as an educational aid in teaching history
- about the experiment done (three of the teachers have been asked more questions, for they were the teachers of the classes in which one of more experiments were conducted).
- about the usefulness of a set of satirical maps for history class about WW1 (in the form of an exercise that consisted of arranging six satirical maps in order of expected usefulness in class. The interviewee was free to set its own order, thereby adjusting the range of 1-6 to own liking. The outcome of the ordering, as well as remarks on it, is described in Section 4.1.2.

The seven interviews were the last necessary step in concluding what objectives are most important in history class. As a result, these findings have been used to create the majority of questions in the questionnaires. Moreover, it has been used to adjust the focus to a couple of specific objectives (see table 4.4 in Section 4.1.2). The results chapter (4) will discuss which objectives belong to this group and if these objectives are met by neither, either or both the plain and satirical map.

3.2.4.2 Class Experiments

The class experiments form the actual test. How do students work with a plain versus a satirical map? Which map do they find more useful, more entertaining, more interesting? Which map do they learn more from?

Before commencing the class experiments, a pilot study was conducted on the 29th of May 2019. This pilot study consisted of a test run of the class experiment, in which ten participants got to see one of the maps and had to fill in a questionnaire thereafter. For this occasion, the Dutch plain map and Dutch satirical map were used. The facts thereby were translated to English, as was the questionnaire. With an average age of 26 years, a gender ratio of 50/50, and 7 out of 10 participants discussing the satirical map, this pilot study was not fully in accordance with the averages found in the Dutch and German classrooms, but it does give an indication of how the experiments were to be carried out. In the completed pilot study the use of covers over the facts along the map was confirmed; using covers attract curiosity and avoids demotivation of reading all the historical facts. Furthermore, this test has proved to be useful in resolving unclear phrasing of certain questions, and in correcting the ambiguity and spelling mistakes in certain questions. Moreover, the size of the groups was chosen to have a maximum of four, so that everyone of the participants could have a look on the map at the same time. Lastly, the pilot study has been useful in providing clarity about the order of the tasks in the experiment. This includes the instruction note given to every student at the start of the experiment and the timing of the different tasks. After the pilot study, the maps and questionnaires were updated to be used in the experiments on the two schools. Because two different experiments were set up, each carried out in different classes, they will now be explained.

The experiments can be divided in two types: the ‘regular’ and the ‘alternative’ experiment. Whereas the regular experiment lets the student look at just one map, either plain or satirical, the students participating in the alternative experiment are provided with both types. These experiments form in combination with the questionnaires the usability test. Tables 3.7 and 3.8 show in detail how both parts of the usability test are conducted, namely that of the regular and alternative experiment, respectively.

1. EXPERIMENT	
Regular class experiment	<ul style="list-style-type: none"> • The experiment consists of dividing the class in two even groups. One group gets to see a satirical map, the other a plain map. • These groups are chosen randomly by the use of numbered tickets.
Observation	<ul style="list-style-type: none"> • These two groups are then separated in smaller groups of three to four students. Each of these small groups get to study one map intensively and get the chance to discuss this map (see figure 3.8). • The small groups of students are observed while they study the map. • Their attention, satisfaction, and the groups' discussion are noted. • The duration of this phase is 10 minutes.
2. SURVEY	
Questionnaire (first part)	<ul style="list-style-type: none"> • Every student needs to fill in a questionnaire about the map they have studied. The questionnaire consists of open and closed questions, and a drawing exercise. • The closed questions are mainly about their satisfaction in using the map, e.g. how interested they are in the map, if they consider the map useful, etc. • The open questions and drawing are mainly about the actual effectiveness and efficiency, e.g. what do they remember? • The duration of this phase is 20 minutes.
Follow-up Questionnaire (second part)	<ul style="list-style-type: none"> • This last part of the survey is conducted after 3 to 4 days and examines the students' recall of the historical facts shown on the maps • The open questions solely deal with the effectiveness and efficiency of the studied map (from a few days earlier), and therefore deals with the extent to which the student has a deeper understanding of the map. The closed questions mainly ask for their opinion about the map. • The duration of this phase is 10 minutes.
Details in Appendix C	<ul style="list-style-type: none"> • All four regular questionnaires

Table 3.7 Usability test in detail (in case of regular experiment)



Figure 3.8 Usability test in progress

1. EXPERIMENT	
Alternative class experiment	<ul style="list-style-type: none"> The experiment consists of dividing the class in even groups of around 3 to 5 students. All groups get to see both the plain and the satirical map (one plain and two satirical maps in the case of German class 11B). These groups are chosen randomly by the use of numbered tickets.
Observation	<ul style="list-style-type: none"> All groups get to study both (or three) maps intensively and get the chance to discuss them. These groups of students are observed while they study the maps. Their attention, satisfaction, and the groups' discussion are noted. The duration of this phase is 10 to 15 minutes.
2. SURVEY	
Questionnaire (first part)	<ul style="list-style-type: none"> Every student needs to fill in a questionnaire about the maps they have studied (both the plain and satirical map(s)). The questionnaire consists of one page of open questions. Furthermore, for each type of map, one page with closed questions is included. These closed questions are mainly about the satisfaction in using the map, e.g. how they like the map, how interested they are in it, if they consider the map useful, etc. The open questions focus on the comparison of the plain and satirical map(s), e.g. which one is more useful? Which one is more enjoyable to work with? The duration of this phase is 20 minutes.
Follow-up Questionnaire (second part)	<ul style="list-style-type: none"> This last part of the survey is conducted after 3 to 4 days and examines the students' opinion about the maps This questionnaire solely consists of closed questions about the maps they have studied a few days earlier, e.g. has the experience with one (or both) of the maps increased their interest in maps? Have the students talked with anyone in or outside class about one (or both) of the maps? The duration of this phase is 10 minutes.
Details in Appendix C	<ul style="list-style-type: none"> Both alternative questionnaires

Table 3.8 Usability test in detail (in case of alternative experiment)

Five experiments have been conducted, one in each class. Table 3.9 shows per class how many groups were made and how many students each group consisted of.

Class	Type	Satirical Map			Plain Map		
		Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
VWO5 (1)	regular	3	3	3	3	3	3
VWO5 (2)	alternative	Two groups of 4 and three groups of 5					
BOS 11D	regular	4	4	3	4	4	3
BOS 11C	regular	4	4	-	4	4	-
BOS 11B	alternative	Four groups of 3					

Table 3.9 Type of experiment done and the number of students per class and group

The participant group of the usability test are students. They are the independent variable in this research, and their opinion and performance are the dependent variables. As the theory claims, an experiment is a good way to discover the relationship between certain circumstances and a behavior (Martin, 2008, p. 5). In this study there are two circumstances: the use of a satirical map and the use of a plain map. The behavior, which is the opinion and performance of a student, is what can be changed by using either of the maps. Thus, in the experiment the circumstance that is manipulated is the type of map that is used by the student.

The approach taken is similar to what has been done in related user research (Delp and Jones, 1996; Kim et al., 2017; Rule and Auge, 2005). Every school class has been divided in two groups, consisting of one experimental group that uses a satirical map, and a second group that uses a plain map. This second group is the control group, for this is the group that sets the norm and to which the usability of satirical maps is compared to. However, the situation is different in case of an alternative experiment. In this experiment, which has been conducted on two occasions, every group received both type of map. This alternative experiment was set up for three reasons. First, one of the classes indicated a time constraint that had to be kept. Second, this alternative experiment made it possible to collect data on direct comparison of the maps. Third, it has helped to find out if there is a difference between the opinion (about the map viewed) of students only seeing this one map versus those that see both maps.

As shown in table 3.9, after every class was split in two, smaller groups were made. These groups have been equally divided if possible, which means that every map was being viewed by the same amount of groups, and preferably by the same amount of students. The size of the group was set to four, which has later been decreased to three after deliberation with the teachers of the classes participating in the usability test. With this number, every student is able to look at the map and read the facts. Moreover, a discussion is most probable when a group consists of not too many and not too few students. To fill the groups, students have been randomly assigned to a certain group, based on the number they drew from a bowl. For these participants have been randomly assigned to the experimental and control groups, it is an actual experiment (Bryman, 2012, p. 56).

Three of the teachers that were interviewed have made at least one of their classes available for participation in the usability test. The overall time available per class was one full class hour, which came down to 45 minutes. Also, another 10 to 15 minutes from a subsequent class was made available. In the first hour, the classroom experiment and the first part of the survey were conducted. Three to four days later, the second part of the survey was conducted in the time available. The data gathering in the Netherlands was done on a Tuesday and the subsequent Friday, in Germany this was done on a Monday and the following Friday.

3.2.4.3 Observations

The experiment included semi-structured and informal observations of the behavior of the students in class. In every class an observation was made during the time that the students looked at and learned from the map(s) that were provided. The main points of interest were:

- Does any of the maps lead to a discussion among the students of the group?
- What is being discussed?
- Do the students like the map they received?
- Are the students interested in the map they received?
- How long do the students keep their attention on the map they received?

Because the two alternative experiments have their focus on the comparison of both type of maps, these observations concentrated on:

- Which map leads to more discussion amongst the students?
- Which map do the students like more?
- Which map attracts more interest?
- Which map keeps the attention for a longer time?

All the observations have been recorded using the voice recorder of a mobile phone. Therefore, even though not obvious, the observer was overt during this time. Moreover, the observations were simple, i.e. the observer kept a passive role.

3.2.4.4 Survey

Because this research focusses for a large part on the opinion of the students, a survey is a useful tool to get results. It is not only important to know if one map works better than the other, it is also important why one map works better than the other. For such deeper questions, a survey can provide useful results as well. The survey conducted includes a (visual) questionnaire on paper, because using paper is common in school, quick to set-up in class, and independent of technological tools in class. The students were asked to answer open and closed questions regarding their short-term knowledge of the map, their interest in the map and their valuation of the use of the map as a medium to learn history. The design of these questions was informed by existing literature (see Chapter 2). Both the students that examined the satirical map and the students that examined the plain map received the same questions. All questions have been translated for the classes that they were used in, i.e. in Dutch and in German. Furthermore, a variety of questionnaires have been produced to attain for the different groups of students. In total, six different questionnaires have been made and completed (see table 3.10; see Appendix C for details).

Experiment	Type of map	Question.	Conducted	open questions	closed questions	drawing exercise
Regular	Satirical	1	After 2 minutes	x	x	x
		2	After 3-4 days	x	x	
	Plain	3	After 2 minutes	x	x	x
		4	After 3-4 days	x	x	
Alternative	Satirical & Plain	5	After 2 minutes	x	x	
		6	After 3-4 days		x	

Table 3.10 Six different questionnaires have been used in this study

First, the distinction is made between the regular and alternative experiment. Moreover, the amount of questions the students had to answer depends on what type of map they studied and at what time the survey was conducted. The ‘open questions’ relate to the recall by the student of both the map and the added historical facts, the ‘closed questions’ relate to the student’s experience of using the map, and the ‘drawing exercise’ has been included to see what from the map it is that got the student’s attention. A five point Likert scale was chosen for answering the closed questions, ranging from ‘fully disagree’ to ‘fully agree’. The reason to use a Likert scale is that makes the questions pre-coded, which makes it easier for a participant to complete them, and easier for the researcher to process and analyze them (Bryman, 2012, pp. 249–251).

The high response on the survey has, according to the author of this thesis, to do with the level of authority present at school. Students (normally) do what the teacher asks of them. By using this authority, the usability test has been carried out with nearly all students responding (when present in class). The response rate per question varies, but it is believed that this authority has supported this study immensely. Moreover, the availability of students has also made it easier to gather much data in a relatively short time span.

3.2.4.5 Data Processing

Most interviews have been conducted face-to-face and recorded with a mobile phone voice recorder, and one of the interviews was conducted via Skype and video-recorded via the built-in recorder. The interviews have then been transcribed by use of an online free web app called oTranscribe (<https://otranscribe.com/>). During the class experiments, the observations have been recorded with a mobile phone voice recorder as well, and also transcribed with oTranscribe.

For the experiments in class it was decided to use paper for everything. Every map and all six questionnaires were provided in static paper form. The maps were scanned, the size altered to fit onto A3, and the informational text and boxes were added in Adobe Illustrator.

The questionnaires have been processed with a statistical analysis software called SPSS. SPSS has more options to offer than excel and can quickly produce ready-made (cross-)tables, which therefore was the preferred program to manually import all the gathered data in. Following the methodology used by Du et al. (2019), the Likert scale data is transformed into more useful ‘mean scores’ and ‘standard deviations’, which has made the results easier to compare.

3.2.5 Conclusion

This subchapter has explained that this thesis follows a mixed research design, which mainly includes experimental components. The concept of usability has been specified as the use and usefulness of satirical maps in secondary school history class. This has been followed by a description of the order in which the usability test is carried out; interviews are used to select the most important learning objectives, which are then tested in the usability test, after which the results are analyzed and evaluated. Subsequently, the 91 participants and five selected maps, both necessary for executing this usability study, have been elaborated upon. Finally, the act of collecting data, through interviews, class experiments, observations, and questionnaires, has been described.

4 Results and Discussion

This chapter describes the findings of the usability study. The usability test in class, in combination with the interviews, have provided findings about the use and usefulness of the satirical maps in contrast to the plain maps. These results will now be explained, thereby following the structure of objectives and questions in Subchapter 1.3. As a result, this discussion of the results starts with the evaluation of the ‘use’ of satirical maps by both students and teachers. Apart from the ‘use’ of satirical maps, the ‘usefulness’ of satirical maps is the second component of usability that is being assessed. When these have been examined, these findings will be discussed in the research context elaborated on in Chapter 2, followed by a conclusion concerning the overall usability of satirical maps. The last section describes the limitations of the conducted usability study, and provides recommendations for future research on satirical maps.

4.1 Evaluation of the Use of a Satirical Map

In the methodology (Section 3.2.2.1), the ‘use’ component has been specified for this thesis, and can be found by asking the following question: “How is the map valued and what are the reasons to use the map.” As one of the three components of usability in the ISO standard (ISO, 2018), the user’s satisfaction is an important factor in the usability of a product. Thus, the leading question in this subchapter is: How do students and teachers value the use of a satirical map in contrast to a plain map? This part of the usability study has focussed on the satisfaction and engagement of the students in using the map as a medium to learn history, and the communication between the students in doing so. This evaluation of both maps is now being reviewed, starting with the results of the questionnaire, followed by the observed use of the map, and the opinion of the teachers in regard to the use of a satirical map in contrast to a plain map.

4.1.1 The Students’ Perspective

Questionnaire

How satisfied are the students in using the satirical map in contrast to the plain map? The questionnaires include multiple statements related to this question (see table 1). Table 4.1 shows the level of satisfaction expressed by all participants about learning history with satirical or plain maps. For better comparison of the results, the tables that are displayed in this chapter include the mean score, which are

calculated by averaging the answers on the Likert scale (see Section 3.2.4.4), and the standard deviation (SD). Thus, for the statements in table 4.1, a mean score of more than 3.0 indicates a positive evaluation. Moreover, a SD-score close to 0 means that most of the responses are very close to the average, whereas the higher the SD-score is, the more the responses vary. For example, the SD-score of 0.67 for the first statement about satirical maps means that about 68% (1σ) of the respondents gave an answer within $(3.98-0.67)$ 3.31 and $(3.98+0.67)$ 4.65.

1. The map is interesting
2. The map makes learning history more entertaining
3. I would like to see a similar map more often
4. I find this map useful for studying about WW1
5. The map does not contain too much information
6. I would recommend students learning about WW1 to look at this map
7. I would like to see a similar map more often (than is now the case) in history class
8. I would like to see the map again
9. The map did not contain too much information

Table 4.1 Statements about satisfaction

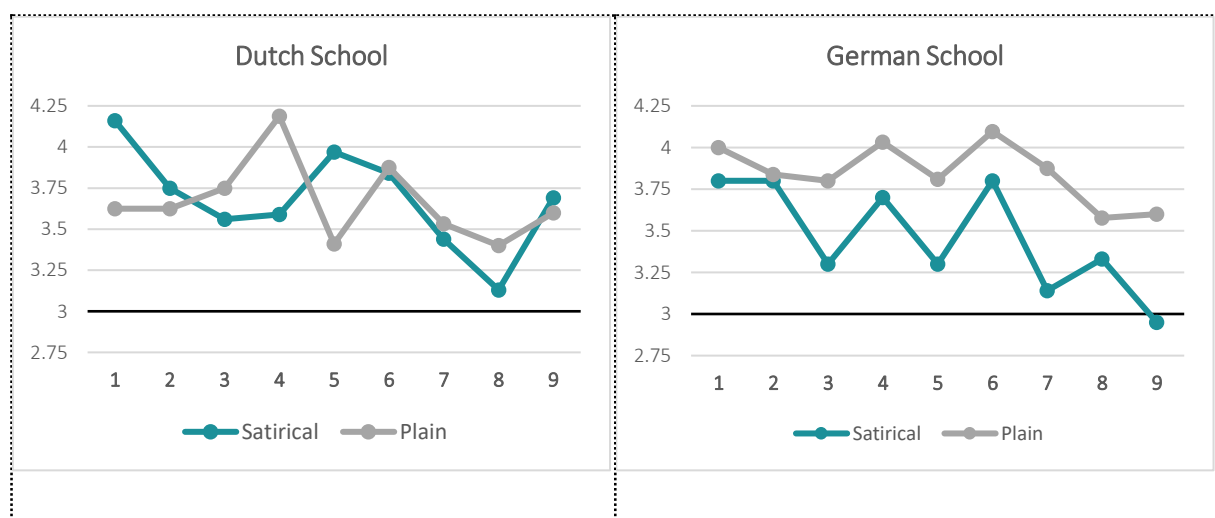
The analysis of the statements on user satisfaction show some interesting results. Figure 4.1 reveals the level of satisfaction expressed by the students (N=91) concerning the satirical and plain maps that they received. Both maps score higher than 3.0 for all nine statements. The differences between both maps is minimal, but the students who worked with a plain map expressed a higher overall satisfaction than those who worked with a satirical map.



Figure 4.1 Evaluation of the satisfaction about satirical and plain maps

The largest difference between both maps is for statements 4 and 7. Thus, on average, the plain map is, in comparison to the satirical map, found to be more useful as a medium to study about WW1, and also seems to be appreciated more as a medium in history class. From the plain map viewers, 67% would like to see a similar map more often in history class than is the case now, against 46% of the satirical map viewers. There are two statements that hardly show any difference between both maps. Both maps make learning history more interesting. Moreover, the plain map as well as the satirical map do not seem to contain too much information. However, during the follow-up questionnaire after three days the same statement was answered in favour of the plain map, which made the satirical map the 'busier' map.

There is a slight tendency for the satirical map being the more interesting map (statement 1). However, once the analysis takes into consideration the differences in school and type of experiment, the satisfaction levels turn out quite different. Figure 4.2 shows this deeper analysis, in which the satisfaction level is analysed per school and type of experiment. Here is revealed that whereas the satirical map seems to be more interesting on average by all students, it were mostly the Dutch students who express their satisfaction about it. This could also be dependent on age, as the Dutch students are just over four years younger. Moreover, a large discrepancy has emerged for statement 5, which means that the German students find the satirical map busier than the plain map, whereas the Dutch students think the opposite. Another large difference is shown for statement 7; the German students are much more eager to see a plain map than a satirical map in history class, whereas the Dutch students like to see both maps more often. Besides, the Dutch students would recommend both maps equally for learning about WW1, while the German students would more often recommend the plain map (statement 6). Overall, it can be concluded that only the German students show a clear preference for the plain map, and that they are less satisfied about the satirical map that they saw, than the Dutch students were about their map.



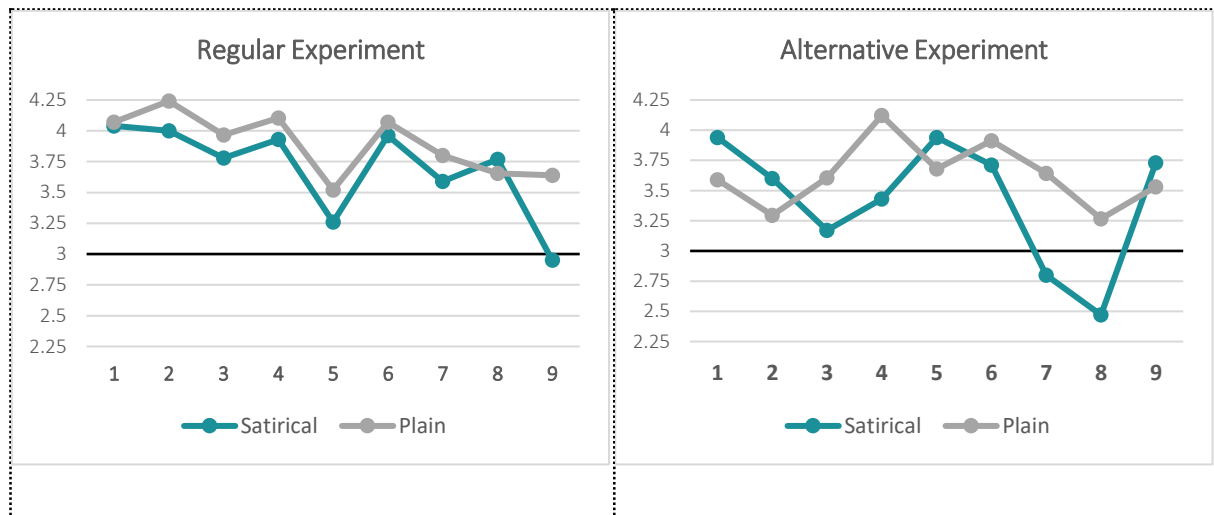


Figure 4.2 Evaluation of the satisfaction about both maps per school (above) and type experiment (below)

The other variable that can be taken into consideration is the type of experiment. It should be noted here that there is an overlap of participants between the previous (Dutch and German school) and these groups; the Dutch students have an overlap of as much as 66% with the participants from the alternative group, and merely 33% with the participants of the regular experiment. For the German students, these percentages work the other way around; the regular experiment consisted for two-third of German students. The two bottom line graphs in figure 4.2 show that, again, the initial assessment of overall user satisfaction has not been able to show some of the underlying discrepancies. Those students that do not have a plain map to compare with would like to see the satirical map again (statement 8), while the ones who could compare both maps expressed their preference in seeing the plain map again and were not interested in seeing the satirical map again. Statement 9 in these graphs display that the students only receiving one of both maps tend to find that the satirical map included too much information (while thinking back about the map three days later). In contrast, those students that have been able to compare both, do not think the satirical map contained too much information. A contrasting view is also seen for statement 7. The students that only saw the satirical map would like to see a similar map more often in history class than they do at the moment, but those that also got to see one or two plain maps were not enthusiastic to see a satirical map in history class again. Statement 4 indicates that once the students have seen the plain map, they expressed the satirical map to be less useful as a medium to study about WW1. Lastly, the first two statements that say that the map is interesting and makes learning history more entertaining, are both agreed on less once both maps could be viewed, which is especially evident in case of the plain map.

Additionally, the following tables 4.2 and 4.3 show the statements that form not a direct measure of satisfaction, but can be related. The satirical map is not found to be very humorous, although much more frequently than the plain map. The students understood that both maps were useful in some way, but seeing them and using them to learn history did for most students not mean they got more

interested in maps. The results about the lasting interest in both maps are unambiguous; the students agree with only around 20% of the statements, and the results show no strong difference for the different maps. The least score is given to statement 4, with only 5% of the students trying to find more examples of either the satirical or plain map.

Additional statements	Map	Mean Score (1-5)	SD	N
1. The map is humorous	Satirical	3.45	0.94	62
	Plain	1.90	1.00	63
2. I do not understand what this map was useful for	Satirical	1.81	0.79	36
	Plain	1.71	0.96	41
3. This experience with the map has aroused my interest for maps	Satirical	2.49	1.10	37
	Plain	2.56	0.92	41

Table 4.2 Additional statements in relation to both maps

Since the last time I saw the map...	Map	Mean Score (1-5)	SD	N
1. I have been thinking of the map for quite some time	Satirical	2.24	1.09	37
	Plain	2.59	1.07	41
2. I have talked about the map with people from my class	Satirical	2.32	1.11	37
	Plain	2.37	0.99	41
3. I have talked about the map with people outside class	Satirical	2.11	1.10	37
	Plain	1.98	0.94	41
4. I have tried to find more examples of these kind of maps	Satirical	1.68	0.85	37
	Plain	1.85	0.91	41

Table 4.3 Statements about the lasting interest in both maps

The questionnaire also include multiple open questions, which in the alternative experiment ask the student to compare both type of maps. The answers provide a deeper analysis of the reasons that a student can have to prefer either the satirical or plain map. Central in this section is therefore the question: When does a student prefer to use a satirical map and when a plain map? The answers of the Dutch students are based on the maps of figures 3.3 and 3.6, and those of the German students are based on the maps of figures 3.4, 3.5, and 3.7 (see also Appendix).

From the 23 Dutch students who have participated in the alternative experiment, 14 students believe the plain map is more useful for learning history. The main advantages mentioned concerning the plain map are that it is a map “to learn from”, which means that it includes more facts that are literally asked in tests. Secondly, it provides a better overview of countries, which include the alliances and relations between the countries more clearly. Moreover, multiple students mention that the plain map includes more information and that it shows the actual situation; the map is “neutral”, “more objective”, and “does not express an opinion.” The other 9 students regard the satirical map as more useful, mainly

because “it shows very well who took part in the war and what the role of each country was”. It does that “in a funny way”, and “the map allows you to imagine the events better, because there is ‘real’ story behind it.” “When it is explained well, it provides a better understanding of the mindset in that time”, “because propaganda maps play an important role in the course of the war”. Eight out of 12 German students find the plain map more useful for most of the same reasons. One student mentions that “the geographical situation 100 years ago is a different one than today’s”, and that therefore the plain map would be more useful to use. “It is clear that the plain map is more familiar, and when you have learned with plain maps for all your life, it is hard to switch to satirical maps.” The German students who prefer the satirical map note that exactly because the map is not objective it can be useful, and that the pictorial appearance of the map makes the student think about it more.

The students were also asked which information they found important, and that can only be seen on one of the maps. The students almost unanimously chose the clear display of alliances on the plain map, so that one knows which countries belonged to which side. Furthermore the plain map is favoured for the names it shows for each country, the borders, and the colors. However, the main advantage of the satirical map is that “it really shows war”, “it shows who was in conflict with who”, and their position in the war. For instance, “the fight between France and Germany. This has played a big role in the war and cannot be seen on the plain map”. Thus, their overall opinion on both maps is positive and they mention each map has different qualities. As a more “accurate map”, the plain map is considered to be beneficial in learning the basic knowledge, which are clear facts like the countries at the time and the alliances. As being the ‘other option’, the satirical map provides deeper information by showing a perspective (from the author), which explains a lot about “how people in that time thought about the situation”.

Observations

Literature points to the importance of engagement in classes, including class discussions. These are learning objectives in secondary school history class, and are confirmed by all interviewees (interviews, 2019). In this brief summary of the observations conducted in class, two questions are important. First, how engaged are the students in using the satirical map in contrast to the plain map? And second, how is the communication between the students while working with either map?

All five classes of students participated well in the usability test. It is clear the students are interested in the experiment, and want to do well (especially the German students). After handing out the maps, some of the Dutch groups are just learning, in other groups small discussions emerge. At this time, there is no difference noticeable in the amount of discussion. Both the groups working with the satirical as those with the plain map concentrate on reading the facts, looking at the map, and discussing when they see fit. Whereas the Dutch students note that “they made the satirical map very nice”, they also

include some unrelated subjects in the discussion and the German students are mainly interested in and really focus on what to learn from the map. They ask questions for clarification of what to learn, and thereby try to follow the assignment as good as possible. Reason for this could be that the assignment made the students aware of a test, which is perhaps why they spend more time learning individually than they do discussing the map. After four minutes, the classes seem to differentiate even more. The discussion seems to increase for the first Dutch class, whereas in the second Dutch class one of the students has seen enough. For the German classes, it seems the discussion really commences once everyone had a good look at the actual assignment, the map, and the information boxes. In these discussions, the students explain to each other what they think they see, and thus try to help each other in finding out what it means that is portrayed on the map. This is especially the case for the satirical map, which is repeatedly observed and can mean that this way of learning (in groups) stimulates discussion. The invested group members thereby involve the ones that are not that interested, which increases everyone's engagement in the task as hand. Interestingly, some criticism is given on the Eurocentric vision of both maps. "Asia and Africa were also in the war!", argues one of the German students, originally from Africa. Furthermore, another expression of discontent was heard from one group looking at the satirical map: "I will not be able to remember all this!"

What is striking in some of the groups is the want to cooperate with teammates in trying to remember the information on the maps. This does support discussion, even though the intention is undoubtedly to get better results with less workload per student. After 5 minutes, group after group starts to lose interest, whereas the second Dutch class (alternative experiment) and the German classes still open covers and investigate all maps. In their map-decorated classroom, students look at other maps to compare even more extensively. In contrast, many of the German students seem to increase their attention for the last minutes in order to learn for the following questionnaire. The German students that could compare both maps still talked more about the facts than about the look of the map.

From these observations, no overall preference for any map type is noticeable. The amount of discussion varies mainly per class, more than per map type. The lack of engagement of the students who are not interested in the map(s) cause these students to start with and talk about other things relatively fast. In contrast, those students that are interested in history lead the discussions, involve other students in the group discussion, and thereby enhances the overall engagement. Thus, it can be concluded that the maps do not cause any differences in engagement or amount of discussion, and that instead the students' personal traits are decisive.

4.1.2 The Teachers' Perspective

As mentioned at the beginning of this chapter, the use of both maps is also evaluated by the teachers. This subchapter describes this non-user satisfaction, which contains the possible reasons to use the satirical map. The main question answered here is therefore: When does a teacher prefer to use a satirical map and when a plain map? The following discussion shows the strong interconnectedness between the reason to use a map, and the map's effectiveness and efficiency. As a consequence, the evaluation of the use of a map by the teachers, as well as that of the effectiveness of both maps, are included in this section.

A history teacher has much freedom in setting up his/her history classes. Different teachers are interested in different historical times, and therefore know history in a very personal way. However, over the years, history class has been increasingly standardized. This is a good development, because in that way the results between schools can be compared, and because it is good to know which student has been taught what (Interviewee 1). Nearly all of the teachers interviewed use images, and most use maps as well; "one image says more than a thousand words" (Interviewee 2). The use of visual tools, among them satirical maps, are fun, provide variance and relevance for not just the students, but for the teachers too" (Interviewees 1 & 2). With the new technology that has come into the classrooms, the former role of the teacher as the storyteller is not standard anymore. "A teacher who just talks and talks, that is somewhat old fashion." A diverse set of activities in class is important" (Interviewee 6). However, whereas the classes have gotten more diversified through the possibility of showing videos, maps, and pictures more promptly and easily, "history is and stays a storytelling class" (Interviewee 2). "Digitization has been really useful, mainly in showing and discussing a variety of sources of information. It can all go quicker, faster and you can give more examples" (Interviewee 4). Teachers especially favour to show political cartoons. All interviewed teachers use political cartoons as a medium to discuss and test historical events, for "they provide a certain perspective on reality" (Interviewee 1). Interviewee 5 states that acknowledging multiple perspectives is one of the so-called 21st-century skills, which furthermore includes critical thinking, analytical thinking, and creative thinking. These goals can be applied throughout education as a whole and ,therefore, when applied to history, these concepts get a certain meaning (e.g. knowing what trustworthy historical information is). Critically looking at sources, preferably a wide variety of them, is very important (Interviewee 5). In contrast, remembering specific historical facts like dates, which used to be so important in history, are currently not found very important anymore (see table 4.4). "You can just as well look on Wikipedia for that" (Interviewee 5), "[...] on the ideal tool which is your mobile phone" (Interviewee 4). Both the Dutch and German teachers agree that the students should grow up as critical citizens who are curious about the world (Interviews, 2019). This view is supported by the interviewees' answers on what good history class should involve. Figure 4.4 shows that nearly all statements are agreed on by the teachers, only statement 10 scores less than 4.0. Some of the statements overlap in the goal they are pointing to, however, the coloured statements are

considered the most important objectives in history class, as they are selected for having a mean score higher than 4.5 and an SD smaller than 0.5. It should be noted that history is extremely context-related and that in every country the approach can be different (Interviewee 5).

Good history classes..	Mean Score (1-5)	SD
1. include class discussions	4.43	0.79
2. are fun	4.29	0.76
3. make the students work	4.43	0.53
4. explain about historical facts	4.29	0.49
5. explain about different points of view	4.71	0.49
6. lead to creative thinking	4.29	0.49
7. lead to critical thinking	4.71	0.49
8. lead to analytical thinking	4.71	0.49
9. help to understand historical facts / relationships	4.71	0.49
10. result in the recall of a series of facts	3.43	0.53
11. help the student in forming an opinion about historical happenings	4.57	0.53
12. educate in what is representative data	4.57	0.53
13. educate in what is reliable data	4.71	0.49
14. educate in what is usable data	4.57	0.53
15. use different types of historical source material	4.57	0.79
16. include discussion and collaboration in teams	4.14	1.07
17. include working with many other subjects (e.g. geography, politics)	4.57	0.53
In history class..		
18. the students should learn the difference between facts and opinions	4.86	0.38
19. the student should learn to consider the multicausality of phenomena and events	4.71	0.49
20. the student should use their knowledge of the analysis of visual sources (e.g. images, photographs, graphs, statistics and election posters) in order to understand manipulation attempts and to address them argumentatively	4.71	0.49

Table 4.4 Interview answers on statements about history class objectives (N=7)

According to the interviewees, the usefulness of a map depends mainly on the class in which you use it and the teacher's goal at that moment. With the use of satirical maps, you can achieve other learning objectives as with traditional maps (Interviewee 5). With satirical maps, you make well use of sources to achieve the objectives mentioned in table 4.4 (Interviewee 5). The need to acknowledge different points of view is critical in history. Historical events are always context-dependant, and a map is a great tool to explain context-dependency (Interviewee 2). A plain map can show that, but a satirical map is much more obvious in showing how people felt about an event or political situation (Interviewee 4). Moreover, the interviewed teachers believe that a satirical map is more appealing, and does probably invite the map reader to get and stay interested more, though the satirical map will also be harder to understand. "There are some explanations that just require a plain map to show, like the English sea-blockade of England so you see the few exits to the north sea" (Interviewee 4). Traditional maps are used to explain the facts, then afterward you can show a satirical map in which you see a propaganda view. They complement each other in that." The interviewees furthermore find traditional maps useful for showing how the borders have changed, how countries have developed until now, and as a tool at the side to which you can refer to in the middle of an explanation or discussion. Moreover, traditional maps are good to use as an introduction, to give a brief overview of the situation and the context. The interviewees are undecided about when it is best to use a satirical map, but do agree there are multiple possibilities. Satirical maps can be used to attract attention at the start of the class and from there refer back to background information, but in that case it should be kept simple and general (Interviewee 4). The other option is to end class with it, as a deepening of the understanding and to make sure the student understands the conflicts or issues discussed. "Induction and deduction, both can be done" (Interviewee 2).

As mentioned, the interviewees claim the satirical map to be more difficult, which makes it necessary to explain more about the map than when it would be a traditional map. Both German interviewed teachers mention that there are very few classes in a year, and very little time in a class. Therefore, hardly any time is left, if at all, to spend on analysing a satirical map, of which most figures are not relevant either. Time is a luxury in education and efficient work is necessary. "You will not reach what you want in this small amount of time. If you would have a project with many hours, then you can do that" (Interviewee 6). However, the possibility of selecting parts of the map and explaining these could make satirical maps more useful (Interviews, 2019). Unfortunately, on top of the time constraint, the satirical map figures are often caricatures that the students do not recognize. Interviewee 5 explains that as long as symbolism plays a big role, satirical maps may be less useful, because students do not possess the knowledge for that. Interviewee 4 is certain that they do not: "All the symbology needs to be explained, the students do not know the used figures anymore, that symbology has been lost. 100 years ago they were known, but nowadays that knowledge is gone." Moreover, Interviewee 3 claims that the satirical maps are too difficult for her (12-14 year old) students, and that they tend to quit if it

takes too long to understand. Hence, in practical terms, the satirical maps lack the efficiency to be used effectively in history class. This problem does not count for regular 'traditional' maps, which "are accepted immediately, because they are so ubiquitous" (Interviewee 7).

Finally, to get a more detailed understanding of when a teacher would use a satirical map, the interviewees have been asked to rank the maps in figure 4.4 from most useful to least useful in history class (see Section 3.2.4 on data collection). The results can be seen in following figure 4.3. History teachers have the freedom to fill in their class as they see fit, which means that (aspects of) satirical maps can be chosen and explained by every teacher individually. The results show that there is a slight overall preference for map 2, but that the opinions of the teachers do vary a lot. Maps that are found to be not useful are those that do not mention the author, have no title, are too full of details, are unclear, or messy overall (Interviews, 2019). Especially for the students in their first years of secondary school, the maps that have much symbology (1 and 6) will take too much time to explain (Interviewee 3). One possibility that all interviewees got excited about is to show the students both map 2 and 4 simultaneously. That combination can be used to "to teach the students to closely look and see multiple perspectives" (Interviewee 2), even in some lower classes (Interviewee 4). Interviewee 6 furthermore mentioned that "by showing both, I can explain certain proceedings in the war and I show both perspectives, which is what a history teacher should".

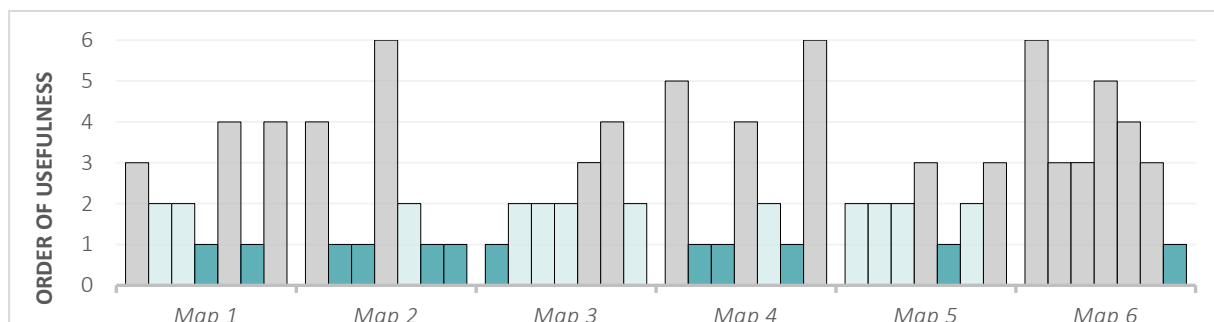
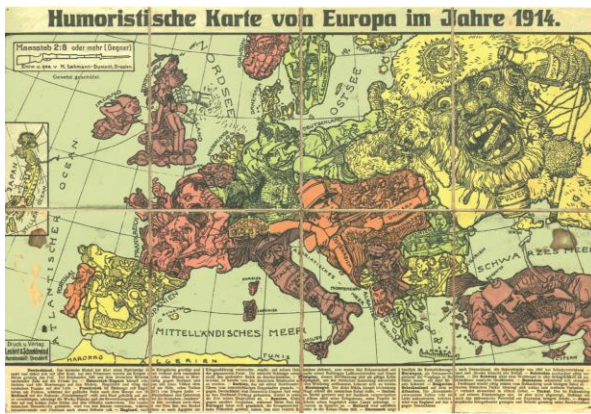


Figure 4.3 The usefulness per satirical map for history class about WW1

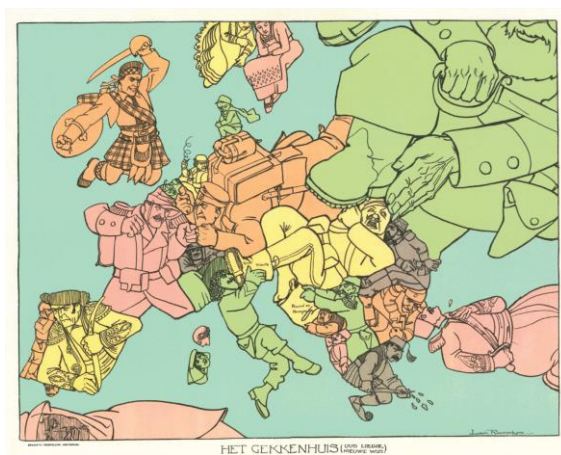
In conclusion, a satirical map is not a substitute for a traditional map, instead they complement each other. Each have their own qualities, and each can be used as a starting point, or as a summary or conclusion. Satirical maps are better in showing different perspectives and in explaining context-dependency of sources. Satirical maps are believed to be more inviting by some, but discouraging for others. They can be used in variable ways, and for a variety of reasons. History teachers have the freedom to fill in their class as they see fit, which means that (aspects of) satirical maps can be chosen and explained by every teacher in their own way. As a result, the use of satirical maps have their advantages, but these are mainly dependent on the age of the students, the clarity of the map, and the time available.



Map 1



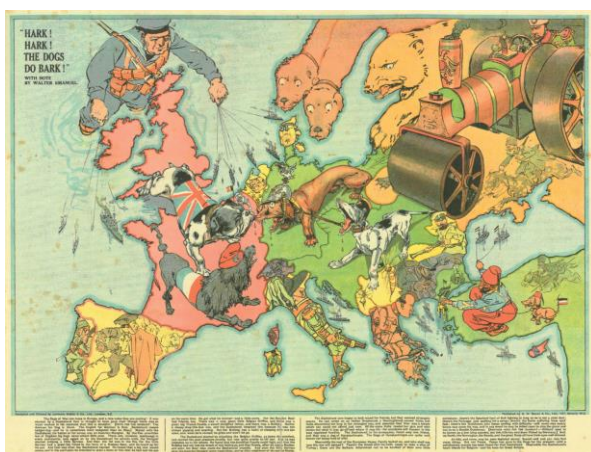
Map 2



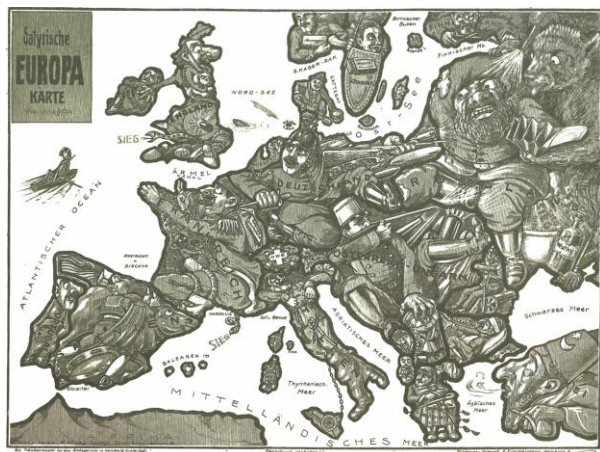
Map 3



Map 4



Map 5



Map 6

Figure 4.4 Maps from the exercise for the interviewees

("European Revue (Kill That Eagle) 1914.jpg" by Paul K is licensed under CC BY 2.0, 2008; Soucacos, 2015, p. 185, 221, 199, 207, 189)

4.2 Evaluation of the Usefulness of a Satirical Map

The ‘usefulness’ component in this thesis has been specified for this thesis, and can be found by asking the following question: “how useful is it to use the map?” As mentioned in Section 3.2.2.1, usefulness in this specific study includes efficiency and effectiveness. The leading question in this subchapter is therefore: How effective and efficient is working with a satirical map in contrast to a plain map? Whereas the teacher’s perspective on this question has been explained in Section 4.1.2, this subchapter starts with the perceived effectiveness of the maps by the students, which is assessed through a review of the closed questions from the questionnaire. Subsequently, the actual effectiveness is evaluated by examining the open questions of the follow-up questionnaire. Furthermore, as the third and last component of usability, the efficiency is assessed.

Similar to how Rule and Auge (2005) started their usability test, which was with a pre-test to assess the initial student knowledge, the questionnaire includes some questions that deals with the amount of previous knowledge, or experience, that the students already had before the start of the usability test. In the first part of this subchapter, identical to the evaluation of statements in the Subchapter 4.1, a mean score of more than 3.0 remains to be an indication of a positive evaluation. As table 4.5 shows, the students do not often use satirical maps in order to learn history, and only the German students do not use plain maps either. According to the students, the German classes do normally not use maps in class, whereas the Dutch classes do include the use of both plain and satirical maps. Most of the students had already had class about WW1 before the experiment was conducted, and knew much of the information present in the maps already. Last of all, both groups of students expressed a high understanding of maps in general.

QUESTIONS ABOUT PREVIOUS KNOWLEDGE / EXPERIENCE	Schools	Mean Score (1-5)	SD	N
1. I often use a similar satirical map in order to learn history	Dutch	1.81	0.78	32
	German	1.50	0.90	30
2. I often use a similar plain map in order to learn history	Dutch	3.47	1.05	32
	German	2.48	1.31	31
3. I see a satirical map like this regularly in history class	Dutch	3.50	1.22	32
	German	1.70	0.79	30
4. I see a plain map like this regularly in history class	Dutch	4.38	0.61	32
	German	2.61	1.05	31
5. I have already had class about WW1	Dutch	4.33	0.74	64
	German	3.98	1.02	61
6. I knew a lot of this historical information already (even before looking at the map)	Dutch	4.03	1.10	64
	German	3.28	1.17	61
7. I do generally understand maps	Dutch	4.05	0.81	64
	German	4.08	0.86	61

Table 4.5 Getting to know the students' experience and previous knowledge

Effectiveness

The leading question for this section on effectiveness is: What is the perceived and factual effectiveness of a satirical map in contrast to a plain map? The statements in table 4.6 are chosen make conclusions about the 'perceived' effectiveness of both maps. Results show that on average, both maps are evaluated either neutral or positively; the only statement (7) that received a rather negative evaluation for both maps states that the student knows more about WW1 because of the map. Considering that the students already had class about WW1 and already knew much of the information on the maps, this is not surprising. The plain map is clearly perceived as being more effective, with a better mean score for all statements. The largest disparities are evident, statements 3 and 6. Both in the first and second questionnaire, students did not believe the colors of the satirical map helped them to remember the historical facts. In contrast, the colors did work for the plain map viewers, although they were less convinced of its functioning after three days' time. Apart from statement 7, only statements 1 and 4 display a small difference between the plain and satirical, meaning that the plain map is only somewhat better understood by the average student, and that the way the plain map looks like is slightly better remembered. Finally, only the plain map was seen to support in remembering the historical facts, although less in hindsight.

1. I understand the map
2. The map helps me to remember the historical facts
3. The colours of the map help me to remember the historical facts
4. I still remember how the map looked like
5. The map has helped me to remember the historical facts
6. The colours of the map have helped me to remember the historical facts
7. I know more about the WW1 now than I did before working with the map

Table 4.6 *Statements about the effectiveness*

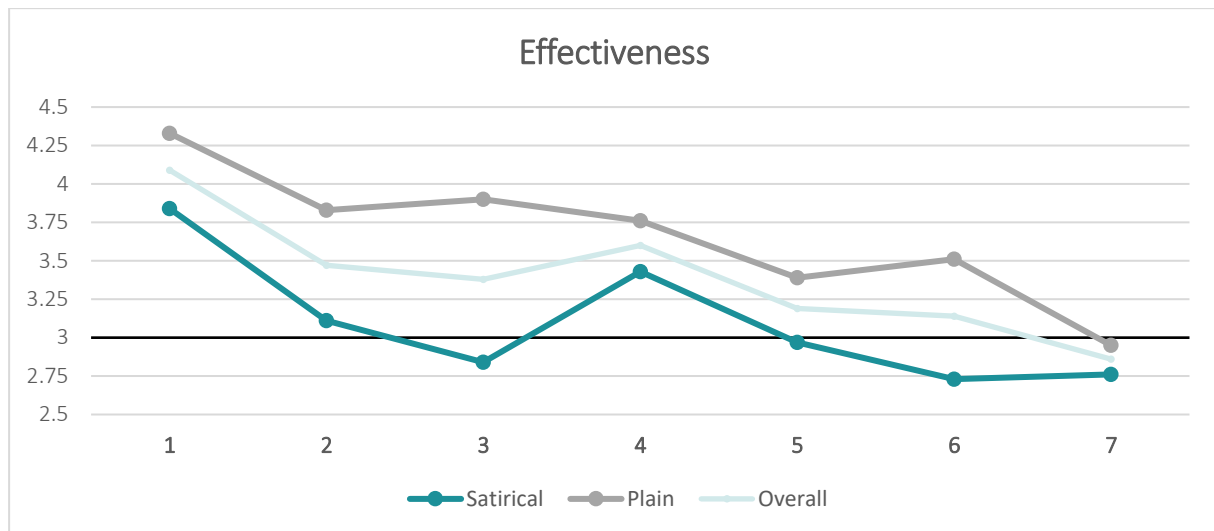


Figure 4.5 Evaluation of the effectiveness of the satirical and plain map

Figure 4.6 shows that the evaluation of effectiveness are – for the most part – unrelated to specific groups in the usability test. The plain map is favoured in every group, but in some more than others. A few results deserve some more attention. For instance, the Dutch students that worked with the satirical map thought they still remembered how the map looked like. Moreover, the SD of 0.44 shows it were not just some of the students evaluating this statement high; neither the Dutch students evaluating the plain map nor any of the German students gave such a high score. Though, comparable to this result, the students participating in the alternative experiment also evaluated the satirical map for statement 4 similar to the plain map. Remarkable is the similarity between the effectiveness assessment of the Dutch students and that of the students from the alternative experiment. Similarly, the German students and the students from the regular experiment show a high resemblance. The reason for this is in part the overlap of participants between those groups again. However, these overlaps only count for the statements (1-3) of the first questionnaire. The statements (4-7) of the follow-up questionnaire are answered by a nearly equal group of Dutch and German students (e.g. statements 4 and 5 for the satirical map were evaluated by 47% Dutch students participating in the alternative experiment).

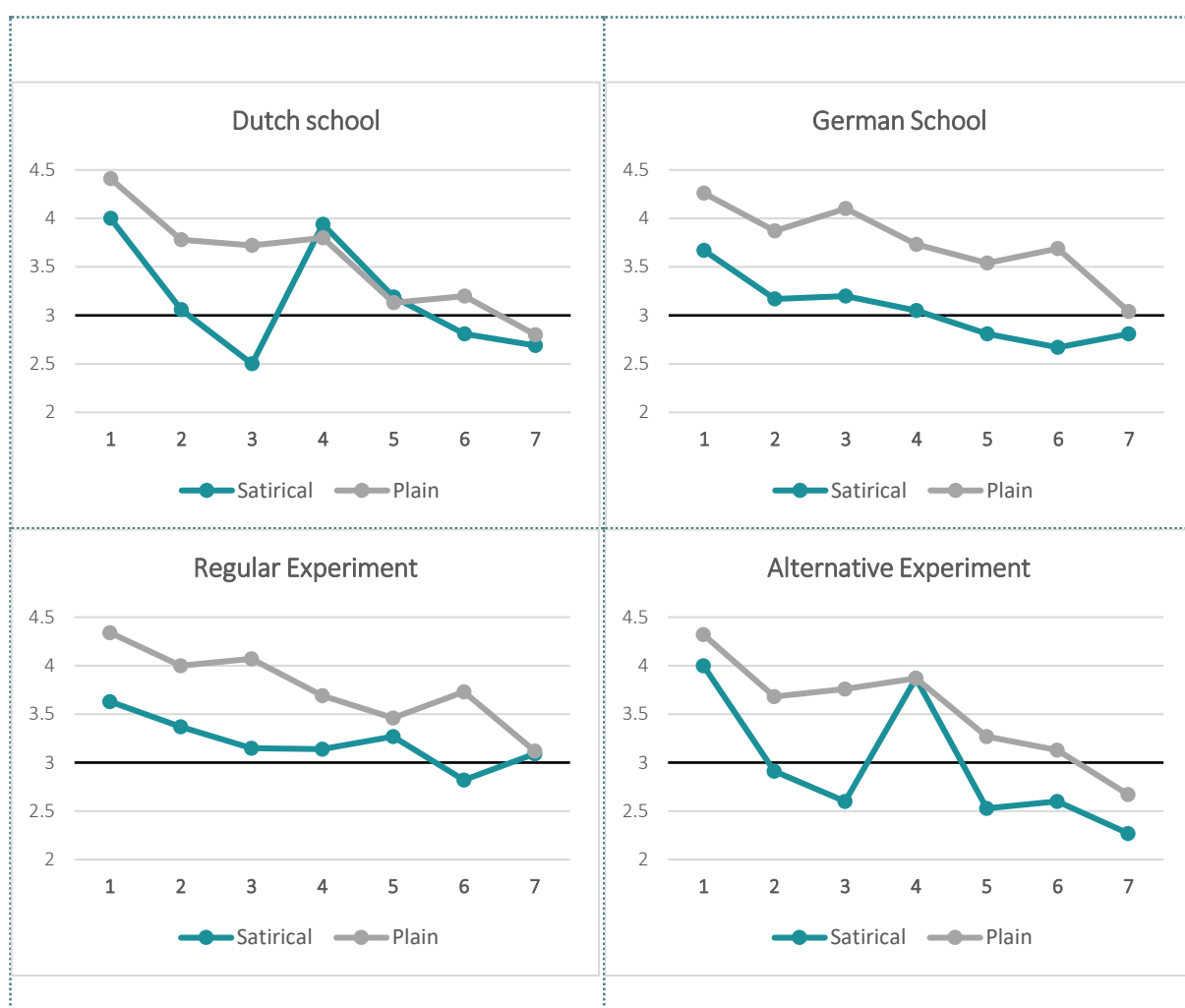


Figure 4.6 Evaluation of the effectiveness of both maps per school (above) and type experiment (below)

It can therefore be concluded that at first sight the similarities seemed to be caused by the overlap in students, but that further analysis has shown that the students who could compare both maps really did think they remembered how the satirical map looked like (more than the students in the regular experiment). Moreover, the possibility to compare both maps made the students think the satirical map did not help them in remembering the historical facts.

Apart from the statements mentioned in Table 4.6, five other statements related to effectiveness were included in the questionnaire, specifically focused on unique aspects of both maps. Figure 4.7 displays the mean scores for these statements, that are mentioned in the following table 4.7.

1. The satirical figures on the satirical map help me to remember the historical facts
2. The satirical figures on the satirical map have helped me to remember the historical facts
3. The place names on the plain map help me to remember the historical facts
4. The place names on the plain map have helped me to remember the historical facts
5. I still know which figures from the satirical map represented which historical facts

Table 4.7 Additional statements about the effectiveness of aspects of both maps

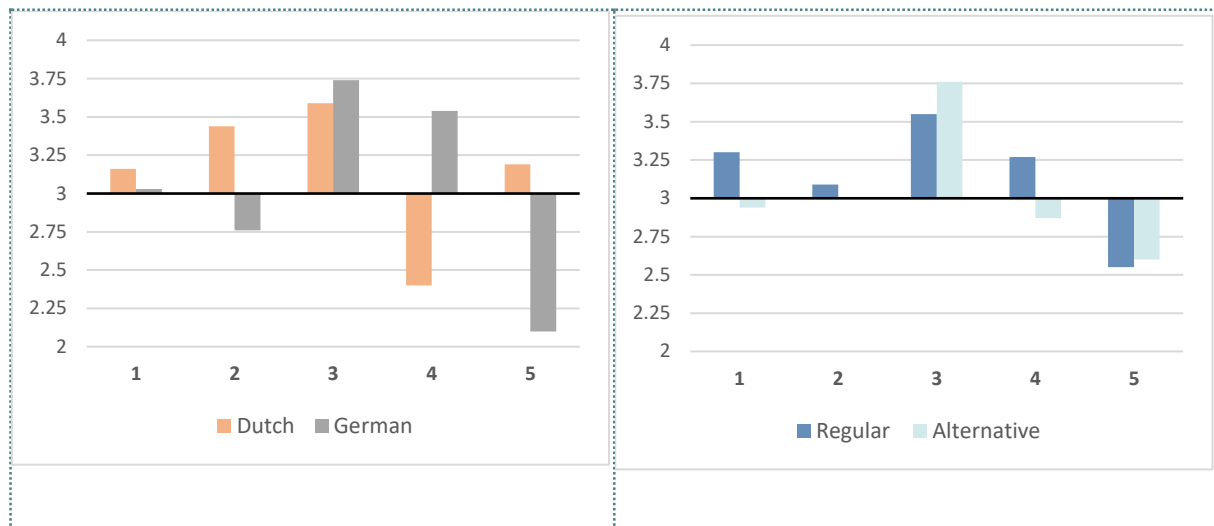


Figure 4.7 Additional evaluation of the effectiveness of aspects of the satirical or plain map

The Dutch students are more positive in their evaluation of the satirical map; both at the time of the experiment and in the follow-up questionnaire. Related to these first two statements, the results show that the German students disagree with statement 5, for they express in the follow-up questionnaire that they do not know anymore which figures from the satirical map represented which historical facts, whereas the Dutch students are quite undecided, but tend to say they do remember. Another larger difference is seen for the use of place names on the plain map (statement 4). While initially both groups of students agree that place names on the plain map help to remember historical facts (statement 3), after three days the Dutch students do not believe so anymore. According to the right bar chart, the students in both type of experiments do not differ much. Both groups of students agree that the names on the plain map help to remember the historical facts, in contrast to the satirical figures on the satirical map. However, Those who only saw the satirical map do tend to think the satirical figures help in remembering the historical facts. Again, it should be noted that for the regular experiment the statements were answered by less Dutch than German students, that for the alternative experiment the questions 1 and 3 were answered by more Dutch than German students, and that the others (statements 2,4,5) had an equal amount of Dutch and German students.

The effectiveness of both type of maps has also been evaluated through an assessment of the answers given on the open questions in the questionnaire. The following analysis provides an indication of the factual effectiveness of both maps, and sees if they match the results about the perceived effectiveness mentioned at the start of this section. Thus, the following review will give an impression of the factual effectiveness of a satirical map in contrast to a plain map. As the effectiveness of map use in this thesis is defined as the accuracy with which users achieve a deeper understanding of the content of the map, the follow-up questionnaire can provide an indication.

From the students that had seen the plain map 3 to 4 days before, the aspects that were best remembered were the colors, place names, and the size of certain countries (see map drawings in Appendix B2). The German students, of them a few with Turkish nationality, hereby often noted the size of the German and Ottoman Empire. Most of the students hereby merely expressed their recollection of such overall aspects. From those who had seen the satirical map, overall aspects remembered include: the satirical figures, their posture, their outfits, their sizes relative to other satirical figures, and the dynamic representation in which the figures fought each other (see Appendix B1). The following selection of some of the answers show some of the more precise answers. Dutch students remember that: “Russia was very big” and “the boot with which he trampled others”, and “They all were soldiers.” “The man who supposed to represent the Middle-East and the fact that those different countries were drawn as one man, in contrast to the other countries”, “Poland who sat on the backpack of Germany and North-Africa that looked at Europe (as the pose showed)”. The German students also remembered some specifics: “the man with the binoculars”; “The Ottoman fighter”; “who flees to the left”; “the eagle”, “holding a sword to either side”; and “the fat Englishman” with his “silver armour and the blue and red shield.” However, the answers of several students include erroneous assumptions. The Englishman does not have a shield, the Ottoman figure is no ‘fighter’ (see for both figure 3.5) and does not ‘flee to the conflict’, but instead ‘is pushed to it by a German officer (see figure 3.4). These examples do not give proof of anything, but do indicate that a satirical map can be interpreted and/or remembered wrong, and that such would have negative consequences for the effectiveness of the satirical map as a medium to learn history (i.e. false uptake of perspectives). Overall, the plain map viewers have answered the questions with more facts, of which nearly all are correct as well. Especially the colors have been useful, which is consistent with what was expected by the students beforehand (see previous fig. 4.5 and 4.6). Then, there is the tendency of the satirical map, not to achieve a deeper understanding of the content, but to mainly provide a way to acquire a good recollection of the visual attributes of the map. The map drawings that the students made in the first questionnaire show additional evidence of this strong visual recollection (see Appendix B). Many students have added one or more facts to their description of the visual elements of the map, but more have not. There are some reasons that could have caused this; it is possible that there was insufficient time appointed for learning the map, that the objective of the questions was not clarified well enough, that the time given to answer the questions proved too short, or a combination of these.

To conclude, the results show that none of the maps are proven to be more effective in achieving a deeper understanding of the content of the map. The questions have shown to be insufficient in assessing any ‘deeper understanding’. However, the results are comparable with the perceived effectiveness expressed by the students; it does seem that the students who saw the plain map know more facts, or at least give more elaborate and correct answers, after 3 to 4 days’ time than those who studied the satirical map.

Efficiency

Apart from the effectiveness of the map, the usefulness of a satirical map is also influenced by its efficiency. In Section 4.1.2, the teacher's perspective have shown the efficiency of both type of maps, but what is the perspective of the student? In this section, it is explained what, according to the students, the perceived efficiency of a satirical map in contrast to a plain map is. Table 4.8 includes statements about the efficiency of both the satirical and the plain maps. Different than for satisfaction and effectiveness, these statements are negatively phrased, which means that a mean score of more than 3.0 is an indication of a negative (!) evaluation. Thus, the lower the mean score for a statement, the more efficient it makes the map.

1. The added text fields are needed to understand the map
2. I would have liked to get more time to look at the map
3. I would have liked to get more explanations about the map
4. I have not been able to study the whole map
5. I would have liked to get more explanations about the map
6. Without the text fields this map would have been useless
7. I would have liked to get more time to look at the map

Table 4.8 Statements about the efficiency

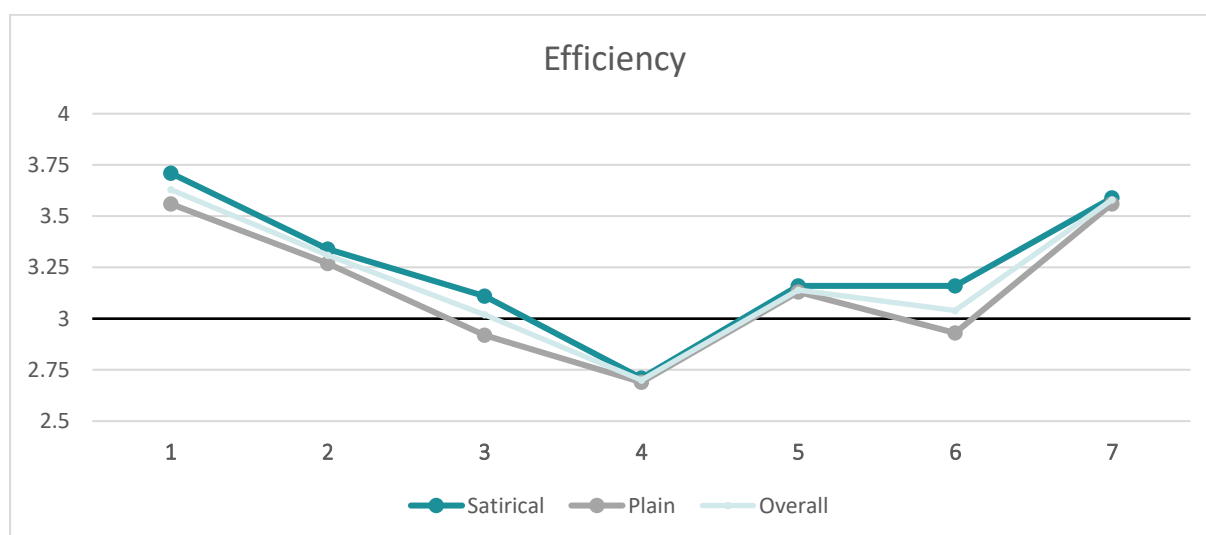


Figure 4.8 Evaluation of the efficiency of the satirical and plain map

As figure 4.8 indicates, both maps are considered hardly efficient as educational mediums. The students would have liked to get more time to view the map (statements 2 and 7), although this could be out of sheer interest (see figure 4.1 about satisfaction). The students indicate furthermore that for both maps the added text fields, which contain the historical facts, are necessary to understand the map (statement 1). The only statement that both maps are evaluated more positively than negatively on is

statement 4; the average student ($SD=1.10$) has been able to study the whole map within the given time. Many students that saw the satirical map note however, that there was not enough time given to really learn from the map. The rest of the statements score very close to 3.0, which makes them considered indecisive.

If these results are divided by the four participant groups followed so far, an image is given different from that of the overall mean scores. Now it is revealed that the German students regard the satirical map to be clearly less efficient, whereas the Dutch students tend to see the satirical map as more efficient. For instance, in contrast to the Dutch students, the extra German students regard the text fields as necessary to understand both maps (statement 1), especially the satirical map. Moreover, the German students do believe that the satirical map would have been useless without the text fields (statement 6), while the Dutch students tend to think both maps would still be useful. Considering the content of the map (statement 4), the results show that the average German student has only been able to study the plain map completely, whereas the Dutch students more frequently expressed the satirical map to be the map they were able to study completely.

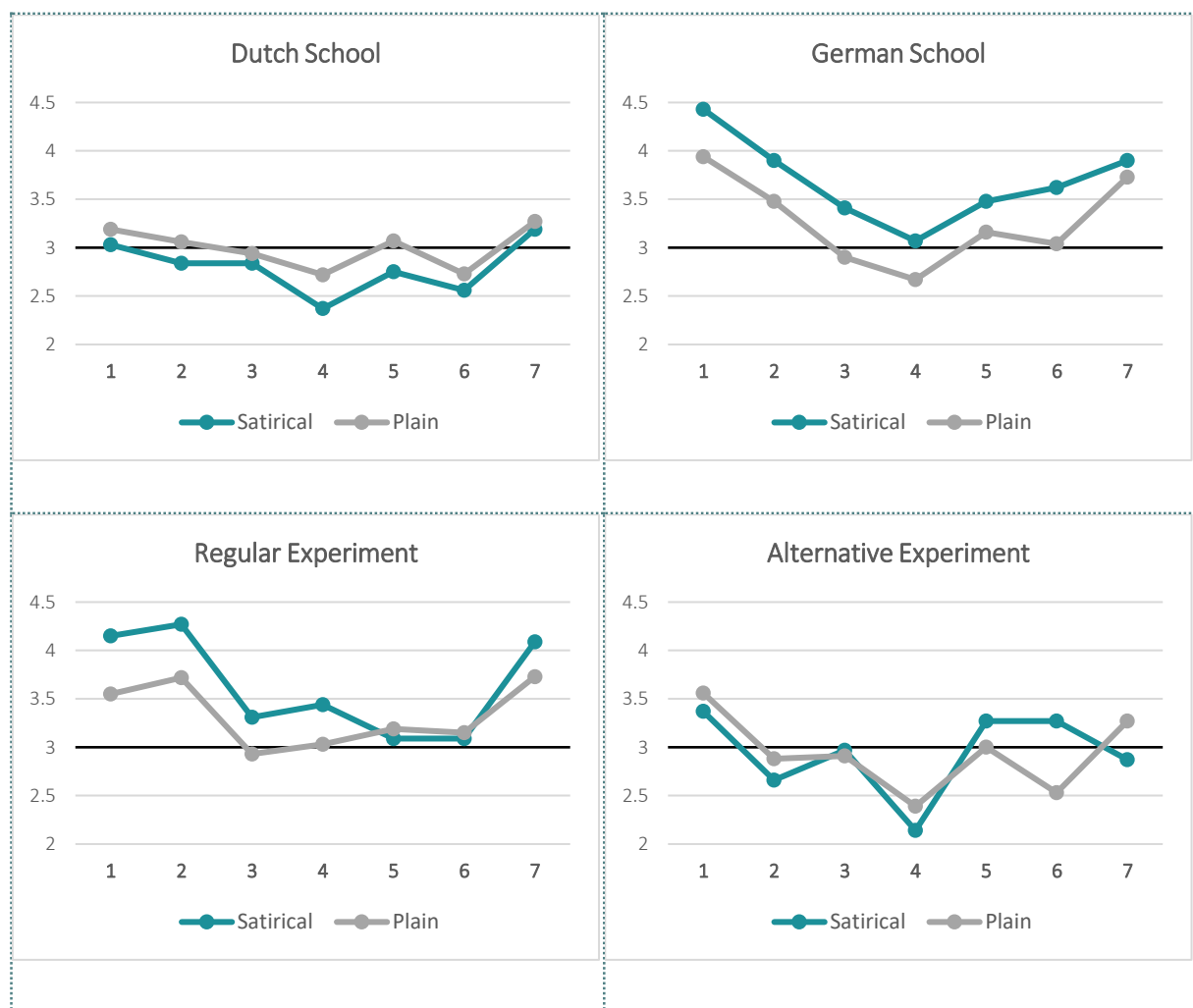


Figure 4.9 Evaluation of the efficiency of both maps per school (above) and type experiment (below)

The differences in results between the two types of experiments show in relation to efficiency a more negative evaluation of the satirical map. The groups that did not receive the plain map for comparison were more convinced that the satirical map needs the added text fields (st.1) than those students who saw both maps. Remarkably, the students from the alternative study mention that they have been able to study all of the maps completely (st.4), even though their time constraint was similar to that of the regular experiment, and they received multiple maps, and were sitting in larger groups. Overall, most of the results lie in the range of 2.5 to 3.5, which shows that the students were undecided about most statements. These results about the perceived efficiency of both maps by the students do therefore not show a clear leader.

4.3 Discussion

The findings show multiple similarities with previous research. For instance, Martin (2008) mentions that students found the humorous chapters of his book more interesting and informative. Similarly, the results show a moderate but positive significant correlation ($r=0.328$) between the map being humorous and the map being interesting. Moreover, it has been claimed that humor is the easiest way to engage students (Rule and Auge, 2005). Humor is seen to stimulate curiosity, reactions of surprise, and interest, which all support the students' engagement. The findings show that the satirical map is regarded as more humorous than the traditional map, but the observations in class have not shown a higher level of engagement. Similarly, even though the satirical map is considered more humorous, the findings show that the satirical map does not promote more interaction than the plain map.

Similar to what Kleeman (2006) claimed cartoons are useful for, most interviewees believe satirical maps are useful in gaining attention, and in increasing student engagement and student enthusiasm. The correlation between the map being humorous and the map making history more entertaining also show a moderate positive significant result ($r=0.250$). More importantly, the results show that satirical maps can just like cartoons (Brown and Wachs, 1968; Delp and Jones, 1996; Dougherty, 2002; Kleeman, 2006; Hammett and Mather, 2011) be used in the process by which the student gathers, interprets, and evaluates information in order to consider alternatives, identify bias and form a personal opinion. For these tasks, engagement is seen to be very important. A variety of studies found that engagement varies per person and can often be attributed to individual factors (Shernoff et al., 2003; Marks, 2007). The class experiments have clearly shown this to be true. Some of the students are intrinsically interested and do not shy away from showing that (i.e. explaining their view on the events depicted on the map and thereby involving other students), others are uninterested and lack the concentration needed to understand the satirical map. Additionally, Kleeman (2006) has found that cartoons also provide advantages for the teachers; teaching becomes more enjoyable and relevant, and cartoons add to the variety of mediums that can be used, thereby making the activity of teaching more diversified. Nearly all interviewees (Interviews, 2019) acknowledge that the increased ease of using visual tools in classrooms have certainly facilitated the same advantages for satirical maps. Furthermore, according to Kleeman (2006) cartoons can initiate lively classroom discussions, but the interviews (2019) made clear that the teachers found satirical maps less suitable for that task. Interviewees note that discussion entails interest and prior knowledge, and that many students do not possess those. Moreover, in some classes the learning climate is not suited for it and can lead to verbal fights.

As has already been assessed for political cartoons (Kleeman, 2006), both teachers and students acknowledge that satirical maps are better to be used for assessing the broad understanding of a topic, and much less for recalling specific facts. Even though they share many characteristics, satirical maps

cannot be compared with comics in the case of their effectiveness, since they work on a different level. Whereas the effectiveness of comics – and to a certain extent traditional (plain) maps – lies in the fact that it can ‘upgrade’ plain textual information in an attractive and therefore more engaging format, a satirical map includes dense historic information that require ‘higher thinking-skills’ for understanding. Satirical maps do not only require creative thinking, analyzing them also entails other important learning objectives, like critical and analytical thinking, thereby acknowledging different points of view and the embeddedness in a certain context. However, there is a strong tendency of the students believing the plain map to be more effective, which thereby forms an opposing view to what the main argument for conducting this usability study has been: the effective use of visual content as an educational aid in related research (Delp and Jones, 1996; Rule and Auge, 2005; Kim et al., 2017). This could be because of its humorous appearance – It has been noted that humor can have the unwanted effect of the seriousness of the message being discounted (Smith and Leptich, 1963; Nabi et al., 2007). Though it is more likely that the lower confidence in the effectiveness of satirical maps is related to the believe that the effectiveness of a map is determined by its capability of teaching historical facts, which is more evident for the plain maps. This contradicts the thought of many teachers, who actually know what is more important (i.e. 21st -century skills). Consequently, the measure of effectiveness, as has been stated in the ISO standard and used in many usability studies on maps, cannot be applied to satirical maps in a usability test as has been done in this thesis. Instead, assessing the effectiveness of each satirical map can only be done by the teacher. Every satirical map shows certain perspectives in a unique manner, and only (s)he knows which map elements are useful for explaining which historical events.

Although the distinction between factual knowledge and deeper knowledge has furthermore made it difficult to assess the ‘factual efficiency’ of both maps, the interviews and observations have proven useful in assessing the efficiency of both maps. Plain maps According to Kreuz and Roberts (1993), illustrations can prove to be cognitively heavy. However, literature also notes that caricatures are created as a readily identifiable visual likeness of a person or group (Kleeman, 2006), and multiple studies show that an important advantage of the medium of cartoons is that they are found to be conveying complex ideas relatively quick and easy (Kleeman, 2006; Williams, 2012; Peterle, 2015). When applied to the satirical map, the students perceive the first statement as incorrect. Particularly the Dutch students note that the satirical map does not seem to contain too much information, most claim they have been able to study the whole map in the 10 minutes they were given, and express their confidence in understanding the map. These factors would make the map efficient, were it not for the answers in the qualitative part of the questionnaire. The qualitative findings give a strong indication that the caricatures (i.e. satirical figures) on the satirical map are not recognizable for the students and do therefore not convey complex ideas relatively quick and easy. Instead, both students and teachers believe, like Brown and Wachs (1968), that works of satire or caricature have a higher chance of being effective when the teacher has made selections of these for a certain purpose. For a teacher to reach the learning objective

in mind, Smith and Leptich (1963) argue an introduction to a comic should be included to avoid misconceptions. Because, as some answers in the usability test have shown, the possibility that the poses taken by the figures and their dynamic representation could be interpreted incorrectly, which can lead to an inaccurate thinking process, and consequently in the memorization of a wrong perception. Students and teachers both point to the need for sufficient background in the case of satirical maps and note that it would help if the satirical map would have a clear title and author (to give the students a hint on the map's perspective). To get to a deeper understanding, attention to a task has shown to be more important than the amount of time spent on the task (Rule and Auge, 2005), but in the case of satirical maps, both are claimed to be necessary.

4.4 Overall Usability of Satirical Maps

As this subchapter follows this thesis' fifth sub-objective, the leading research question is: What conclusion can be drawn concerning the usability of a satirical map in contrast to a plain map? As the use and usefulness of satirical maps in contrast to plain maps is assessed in Subchapter 4.1 and 4.2, this subchapter aims to explain the overall usability of satirical maps by summarizing how beneficial it is to use each map. This subchapter explains to what extent the most important learning objectives are met by using a satirical map. Subsequently, a recommendation is given on which map to use for what purpose. The leading question for this subchapter therefore reads: To what extent do the satirical maps meet the learning objectives of history class?

Learning history does still involve learning historical facts, and are therefore still mentioned as one of the fundamentals in the subject of history. However, most of the learning objectives involve more activity from the student. For example, students should be able to deliberately collect, classify and evaluate data, as well as to rationally argue. They are compelled to encounter different historical sources, evaluate these, and gain historical insights from them. As has been explained (in Section 3.2.2.2), from the initial step of collecting the learning objectives relevant for the use of maps, to the final evaluation of these by the interviewees, the focus has been brought down to eight learning objectives (see figure 4.9).

1. Acknowledge different points of view
2. Critical thinking
3. Analytical thinking
4. Understand historical facts / relationships
5. Assessing what data is reliable
6. Know the difference between facts and opinions
7. Consider the multicausality of phenomena and events
8. Use knowledge gained by the analysis of visual sources (e.g. images, photographs, graphs, statistics and election posters) to understand manipulation attempts and to address them argumentatively

Table 4.9 Most important learning objectives according to the teachers (N=7)

As has been mentioned by two of the history teachers interviewed, some of the objectives mentioned in table 4.9 show an overlap. For instance, a student who is educated in recognizing unreliable data, knows how to think critically. Likewise, teaching the students different points of view to a historical event learns them to think analytical, critical, and educates them in the difference between facts and opinions. As has been mentioned several times in the discussion, the commonality between all of these learning objectives, is that they focus on 'deep learning'. In Subchapter 4.1 multiple of these

learning objectives have literally been brought up by the history teachers in the interviews, but also the students know about them. Especially objectives 1, 5, and 8 are known to the students.

The interviews have made clear that a satirical map are useful as a medium to educate students in all of the learning objectives from table 4.9. In particular, the difference in facts and opinions and the acknowledgement of multi-perspectivity are stressed. The usability test has made clear that both teachers and students look closely at the author, title, and publisher, and mention the necessity of it. Table 4.10 states the statements about the objectivity and subjectivity of both type of maps, of which the answers can be seen in figure 4.10. The low reliability and objectivity of the satirical map does not seem to be well understood. However, the subjectivity of both type of maps do seem to comply with the characteristics of a satirical map. Moreover, statement 5 is in accordance with the idea of the teachers about satirical maps, showing a specific point of view. Lastly, the students see in both maps real events taking place, but it could well be that the facts around the border of the map have influenced the answer given on this statement.

1. The map is reliable
2. The map is objective
3. The map is subjective
4. The map is propaganda
5. The author of the map displays his own vision
6. The author of the map shows real events that took place in WW1

Table 4.10 Statements about the objectivity and subjectivity of both maps

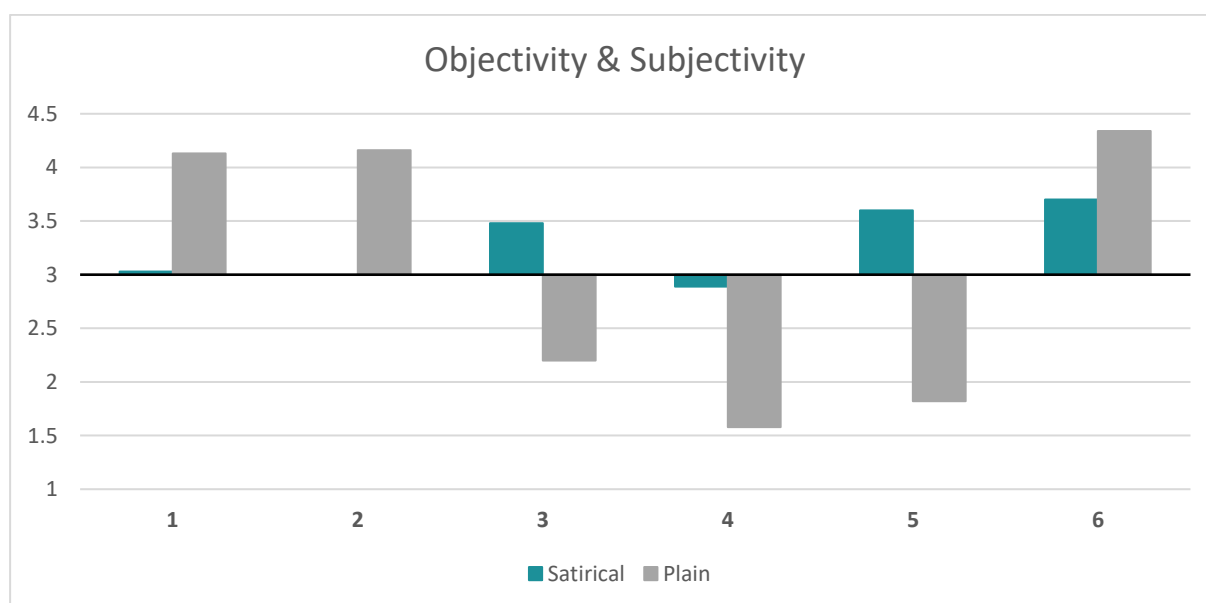


Figure 4.10 Evaluation of the objectivity and subjectivity of both maps

This review of the usability test, the interviews, and the observations, have shown that the learning objectives that are valued most by the teachers, are met by using a satirical map. Students do acknowledge these learning objectives to a certain extent, but overall they see the plain map as more useful because of its apparent way of displaying factual information. As the focus in history class is shifting to a more deeper knowledge acquisition, satirical maps should continue to be used. Thus, for learning basic historical facts, spatial information, and as a source of information to refer to in class, the plain map is better. However, is the focus on a deeper understanding of this same historic information, the satirical map preferred.

4.5 Limitations and Future Research

Reliability	<i>As the study takes place in a natural environment, there is no guarantee that the findings will be similar if conducted again. However, the findings are believed to be stable over time, as the interviews showed that history class at school has not undergone great changes over time. Moreover, there is consistency in the study, for it deals with written answers, ticked boxes, and recorded interviews. In other words, subjective judgement has been limited as much as possible.</i>
Replicability	<i>This study is highly replicable. In fact, it has already been replicated multiple times. The seven interviews that have been conducted are nearly identical, as well as the two experiments carried out in class. The questionnaires are standardized, and all other tools used to get results have been explained in this chapter.</i>
Validity	<i>How valid this research is depends on a couple of criteria, which are listed below.</i>
‘Measurement’ validity	<i>Is this study actually measuring the opinion and performance of a student? The questionnaires have been drafted in a way that allows conclusions to be made about the usability of both maps. The open questions are however flawed, for it turned out much of these questions allow for interpretation. The majority of the closed questions are straightforward and increase overall validity. However, some questions are phrased too difficult, involve ambiguous terms, or are simply unclear. As for the opinions of the students, everything has been done to make sure the participants indicated their answers truthfully.</i>
‘Internal’ validity	<i>Does the usability study really measure variations in performance? The students’ developmental levels and educational histories are taken into consideration, but it is very probable that there are other variables that influence the performance of the student in answering the questions correctly, e.g. prior knowledge about the subject, prior view at the map, or the amount of general interest in history. Moreover, the discussion of results has mainly involved assumptions, and one-way correlations have not been pursued. Proof of causality can therefore not be claimed, but the possibility is present.</i>
‘External’ validity	<i>Ninety-one students from five school classes in two countries have participated in this study. Moreover, seven teachers have been interviewed, both from Germany and the Netherlands. This alone shows that the findings can be generalized beyond just this context. How far though depends on a few factors. Only three satirical maps are used in the usability study and six have been evaluated by the (low number of) teachers. The information provided by the interviewees help in increasing the generalizability of the findings, but may not be enough to generalize the findings to all satirical maps. Additionally, this study has focused on the higher classes of high school, in two different countries, and with students who are all relatively mature and far in their education. These factors do limit to what extent the findings can be generalized. As a result, the author believes that the results of this usability test cannot be generalized to all history classes, all age groups, and all countries. However, the results are believed to show the usability of satirical maps in higher secondary school history classes in Western-Europe.</i>
‘Ecological’ validity	<i>As before mentioned about the reliability of this study, the experiments are done in a natural social setting. To investigate the opinion and performance of students in their natural habitat, namely in a classroom and via a (questionnaire) test, is capturing daily life. This means that the findings are not only technically valid, but also practically.</i>

Table 4.11 How this usability study scores on the criteria in social research

Many of the limitations have already been mentioned in figure 4.11. Some difficulties have turned out as limitations, others rather as uncertainties. The main limitation of this study is the meagre amount of questions related to the factual effectiveness of either map, restricted by a time-constraint for the follow-up questionnaire. As a result, only few open questions could be asked, and partly because of that, the factual effectiveness could not be assessed. One of the teachers initially indicated not being able to give time at all for the follow-up questionnaire, which he reconsidered and tried to enable later. This has prompted to think about a similar experiment without a follow-up questionnaire, eventually named the alternative experiment. As a result of that, there are less participants taking part in the actual experiment initially chosen. Moreover, the amount of Dutch and German students that take part in both types of experiment are not equal, which results in the reporting of correlations that are possibly false.

The uncertain elements are mainly related to the questionnaires. Statements in the questionnaires could have been phrased differently, and statements could have been deleted or added, and are thus debatable. Moreover, the questionnaires have been translated from English to German and to Dutch. It is possible that some nuance has altered in translation, even though the questionnaires have been checked by a native speaker in both languages. Two of the questionnaire questions struck as difficult to understand. These dealt with the concepts of subjectivity and objectivity, causing the answers on these questions to be questionable.

Some practical difficulties appeared during the usability test. The addition of the facts along the border of each map were intended to give the map reader more to look at and something to learn, but as a result, many students were more busy reading and learning the facts than looking at the map. Also, the observations proved difficult to carry out. For one, there were too many groups and too many students to overhear all relevant discussion about the maps. Also, it turned out more complicated than expected to see if the students are interested in the map, if they enjoy looking at it, and if one group has more discussion than the other. One would need colleagues to closely track this kind of behaviour. Finally, it is fair to presume that students whispered each other answers, and that opinions were influenced by group members. During data processing, the open questions for assessing the effectiveness of satirical maps have been time-consuming and complicated to analyse (e.g. unclear handwriting, elaborate answers), and as a result only parts have been analysed. For future research, it is therefore highly recommended to use multiple choice questions.

This thesis has taken the first step in the assessment of the usability of satirical maps. Thereby the link was made to related research topics, involving comics, humor, art, and satire, which has shown multiple considerable discrepancies. As a consequence, the knowledge gap about the 'factual' effectiveness of satirical maps has remained to be unexplored. For future research, the author proposes a different approach than the one taken in this thesis (i.e. ISO standards). It is believed that a comparative design

is not entirely beneficial, and that the focus should also include 'deep knowledge questions' and not only the recollection of 'simple facts'. Finally, interviewees have mentioned the lack of attention in understanding which classes and which students the use of satirical maps can be beneficial for. By taking into account the students' developmental levels, educational histories, and specific learning skills, a more tailor-made advice can be given to the use of satirical maps for specific groups of users.

5

Conclusion

Satirical maps are considered cartographic curiosities, and belong to a large group of non-traditional cartographic maps. These maps are known for their subjectivity and are often considered as propaganda. The usability of satirical maps have been underexplored in research, although numerous related studies on art in maps, comics, humor, and satire have proven that the use of visual content can be proven to be useful as an educational aid in several disciplines. In history class education, the learning objectives have been standardized and contain a list of skills that the students should possess at the end of secondary school. With these learning objectives in mind, a usability study has been conducted – including secondary school students and teachers – with the research objective ‘to discover the use and usefulness of satirical maps as an educational aid in secondary school history class and to give recommendations for its potential use’. This usability study has followed a mixed design, in which a comparison is made between satirical and plain maps. All the research questions have been answered, and the hypothesis can be confirmed; satirical maps do possess characteristics that are contributory in reaching history class objectives, which makes the satirical map a beneficial medium in history class.

The results of the usability study show that satirical maps have specific qualities of their own in comparison with a plain map. Whereas students favor plain maps for providing a clear and neutral overview, satirical maps are preferred when one wants to see the role of each country, and to feel that there is a real story behind the historical facts mentioned in class. Teachers stress that the plain map is a useful tool to refer to in the middle of an explanation or discussion, but that satirical maps are needed to help "the students grow up as critical citizens who are curious about the world." Therefore they do not see satirical maps as a substitute, but rather as an extension of the plain map.

The low efficiency of satirical maps forms a drawback; whereas both user study groups express that they would have liked to get more time and that additional information is needed to understand the map, the groups that had studied the satirical map stressed the need for deeper information. Teachers are aware of this necessity, but do have too little time to utilize (more) satirical maps in class. This is an unfortunate fact for two reasons. First, because results show a positive evaluation from students and teachers. The average student, as well as the teachers, find a satirical map useful, interesting, and entertaining. The humorous appearance is appreciated, and the subjective projection of historic events is seen as an advantage. Observations have revealed an urge to discuss the map, and engagement was high for around half of the students (dependent on personal background). Second, because satirical maps meet more of the important learning objectives in history class, e.g. creative, critical, and analytical thinking, acknowledging different points of view and the embeddedness of historical events in a certain context.

Over the years, these so-called 21st-century skills have been getting more attention and are currently regarded as being more important than the simple memorization of facts. In this regard, history students seem to be hanging in the past, with the majority of students being focused on 'simple historical facts' more than on 'deep learning'. The results give reason to believe that students are overall more satisfied with a plain map, mainly because of its perceived usefulness to learn historical facts. Consequently, the measure of effectiveness, as has been stated in the ISO standard and used in many usability studies on maps, should not be used to compare plain and satirical maps in a usability test, as has been done in this thesis. Instead, assessing the effectiveness of each satirical map can only be done by the teacher. Every satirical map shows certain perspectives in a unique manner, and only the teacher knows which map elements are useful for explaining specific historical events. Moreover, if many of the most important learning objectives want to be met, the teachers would do good to continuously stress the beneficial aspects of the use of satirical maps to the students, as well as to the school board. Based on the findings of this research, recommendations for future research on satirical maps were derived.

References

- Abrams, M. H. (1999) *A Glossary of Literary Terms*. 7th edn. Boston: Heinle & Heinle.
- Barron, R. M. (2008) 'Bringing the map to life: European satirical maps 1845-1945', in *Belgeo*. National Committee of Geography of Belgium / Société Royale Belge de Géographie, pp. 445–464. doi: 10.4000/belgeo.11935.
- Baynton-Williams, A. (2015) 'Satirical Maps Before The World War 1: The Birth of the Serio-Comic Map', in Svolopoulos, K. et al. (eds) *Satirical Maps. Historical and Satirical Accounts of Europe (19th-20th century)*. Athens: Miletos, pp. 60–73.
- Baynton-Williams, A. (no date) *Curious Maps | British Library - Picturing Places*. The British Library. Available at: <https://www.bl.uk/picturing-places/articles/curious-maps> (Accessed: 4 April 2019).
- Bevan, N. (2009) 'International Standards for Usability Should be More Widely Used', *Journal of Usability Studies*, 4(3), pp. 106–113. doi: 10.1.1.177.1356.
- Bore, I.-L. K. and Reid, G. (2014) 'Laughing in the Face of Climate Change? Satire as a Device for Engaging Audiences in Public Debate', *Science Communication*, 36(4), pp. 454–478. doi: 10.1177/1075547014534076.
- Boria, E. (2008) 'Geopolitical Maps : A Sketch History of a Neglected Trend in Cartography', *Geopolitics*, 13(2), pp. 278–308. doi: 10.1080/14650040801991522.
- Borsci, S. et al. (2019) 'Shaking the usability tree: why usability is not a dead end, and a constructive way forward', *Behaviour and Information Technology*. Taylor & Francis, 38(5), pp. 519–532. doi: 10.1080/0144929X.2018.1541255.
- Boukes, M. et al. (2015) 'At Odds: Laughing and Thinking? The Appreciation, Processing, and Persuasiveness of Political Satire', *Journal of Communication*, 65(5), pp. 721–744. doi: 10.1111/jcom.12173.
- Brown, L. and Wachs, H. B. (1968) 'Cartoons in the Classroom', *The English Journal*, 57(5), pp. 662–664. doi: 10.2307/812560.
- Bryman, A. (2012) *Social Research Methods*. 4th edn. Oxford: Oxford University Press.
- Bryson, C. (2016) 'Engagement through partnership: students as partners in learning and teaching in higher education', *International Journal for Academic Development*. Routledge, 21(1), pp. 84–86. doi: 10.1080/1360144x.2016.1124966.
- Caquard, S. and Dormann, C. (2008) 'Humorous Maps: Explorations of an Alternative Cartography', *Cartography and Geographic Information Science*, 35(1), pp. 51–64. doi: 10.1559/152304008783475670.
- Caquard, S., Piatti, B. and Cartwright, W. (2009) 'Special Issue on Art & Cartography', *The Cartographic Journal*, 46(4), pp. 289–291. doi: 10.1179/174327709x12574225938589.
- Cartwright, William (2009) 'Art and Cartographic Communication', in Cartwright, W., Gartner, G., and Lehn, A. (eds) *Cartography and Art*. Lecture No. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 1–14. doi: 10.1007/978-3-540-68569-2.
- Cartwright, W. E. (2010) 'Addressing the value of art in cartographic communication', *ISPRS Journal of Photogrammetry and Remote Sensing*. Elsevier B.V., 65(3), pp. 294–299. doi: 10.1016/j.isprsjprs.2010.01.004.
- Cartwright, W., Gartner, G. and Lehn, A. (2009) *Cartography and Art*. Springer Berlin Heidelberg (Lecture Notes in Geoinformation and Cartography). doi: 10.1007/978-3-540-68569-2.
- Caswell, L. S. (2004) 'Drawing swords: War in American editorial cartoons', *American Journalism*, 21(2), pp. 13–45. doi: 10.1080/08821127.2004.10677580.
- Colletta, L. (2009) 'Political satire and postmodern irony in the age of Stephen Colbert and Jon Stewart',

- Journal of Popular Culture*, 42(5), pp. 856–874. doi: 10.1111/j.1540-5931.2009.00711.x.
- Çöltekin, A. et al. (2009) 'Evaluating the Effectiveness of Interactive Map Interface Designs: A Case Study Integrating Usability Metrics with Eye-Movement Analysis', *Cartography and Geographic Information Science*, 36(1), pp. 5–17. doi: 10.1559/152304009787340197.
- Csikszentmihalyi, M. (1990) *Flow: The psychology of optimal experience*. New York: HarperPerennial.
- Cuddon, J. A. (1991) *A Dictionary of Literary Terms and Literary Theory*. London: Penguin Books.
- David, J. L. (2001) *Split a gut and learn: Theory and research*. Eric Document Reproduction Service No. ED 458 671.
- Delp, C. and Jones, J. (1996) 'Communicating Information to Patients: The Use of Cartoon Illustrations to Improve Comprehension of Instructions', *Academic Emergency Medicine*. John Wiley & Sons, Ltd (10.1111), 3(3), pp. 264–270. doi: 10.1111/j.1553-2712.1996.tb03431.x.
- Dougherty, B. K. (2002) 'Comic Relief: Using Political Cartoons in the Classroom', *International Studies Perspectives*, 3(3), pp. 258–270.
- Du, G., Kray, C. and Degbelo, A. (2019) 'Interactive Immersive Public Displays as Facilitators for Deeper Participation in Urban Planning', *International Journal of Human-Computer Interaction*, pp. 1–15. doi: 10.1080/10447318.2019.1606476.
- Edwards, J. (2006) 'Study, Marketplace and Labyrinth: Geometry as Rhetoric.', *New Formations*, 57, pp. 126–144. Available at: [http://e-space.mmu.ac.uk/9790/1/edwards 2005-6.pdf](http://e-space.mmu.ac.uk/9790/1/edwards%2005-6.pdf).
- Eisner, W. (2008) *Graphic Storytelling and Visual Narrative*. New York & London: W.W.Norton.
- van Elzakker, C. P. J. M. (2004) *The use of maps in the exploration of geographic data*. Universiteit Utrecht.
- van Elzakker, C. P. J. M., Delikostidis, I. and van Oosterom, P. J. M. (2008) 'Field-Based Usability Evaluation Methodology for Mobile Geo-Applications', *The Cartographic Journal*, 45(2), pp. 139–149. doi: 10.1179/174327708x305139.
- European Revue (Kill That Eagle) 1914.jpg* (2008). Available at: [https://commons.wikimedia.org/wiki/File:European_Revue_\(Kill_That_Eagle\)_1914.jpg](https://commons.wikimedia.org/wiki/File:European_Revue_(Kill_That_Eagle)_1914.jpg).
- Examenblad Geschiedenis* (2019). Available at: <https://www.examenblad.nl/vak/geschiedenis/2019> (Accessed: 9 May 2019).
- Garfield, S. (2012) *Op de Kaart; Hoe de wereld in kaart werd gebracht*. Rainbow & Podium.
- Garyfallos, A. D. (2015) 'World War 1 and satirical cartography', in Svolopoulos, K. et al. (eds) *Satirical Maps. Historical and Satirical Accounts of Europe (19th-20th century)*. Athens: Miletos, pp. 30–43.
- Ginn, L. K. (2015) 'Map and Geographical Imagery in Editorial Cartoons', *The Primary Source*, 31(2), pp. 1–11. doi: 10.18785/ps.3102.02.
- Hammett, D. and Mather, C. (2011) 'Beyond decoding: Political cartoons in the classroom', *Journal of Geography in Higher Education*, 35(1), pp. 103–119. doi: 10.1080/03098265.2010.498881.
- Harley, J. B. (1989) 'Deconstructing the Map', *Cartographica*, 26(2), pp. 1–20. doi: 10.1002/9780470669488.ch16.
- Harper, T. (no date) *Satirical maps of the world – The British Library*. The British Library. Available at: <https://www.bl.uk/maps/articles/satirical-maps#> (Accessed: 4 April 2019).
- Haywood, J. (1999) *Weltgeschichtsatlas*. Köln: Könemann.
- Higbee, K. L. (1996) *Your memory: How it works and how to improve it*. New York: Marlowe and Company.
- Houts, P. S. et al. (2006) 'The role of pictures in improving health communication: A review of research on attention, comprehension, recall, and adherence', *Patient Education and Counseling*, 61(2), pp. 173–190. doi: 10.1016/j.pec.2005.05.004.
- ISB (2004) *Lehrplann Geschichte*. Available at: http://www.isb-gym8-lehrplan.de/contentserv/3.1.neu/g8.de/id_26390.html (Accessed: 17 May 2019).
- ISO (1998) *ISO 9241-11. Guidance on usability*. Available at: <https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-2:v1:en>.
- ISO (2018) *ISO 9241-11. Usability : Definitions and concepts*.
- Kahu, E. R. (2013) 'Framing student engagement in higher education', *Studies in Higher Education*, 38(5),

- pp. 758–773. doi: 10.1080/03075079.2011.598505.
- Kastriti, N. (2015) 'Satirical Maps: In Between the Serious and the Jocular', in Svolopoulos, K. et al. (eds) *Satirical Maps. Historical and Satirical Accounts of Europe (19th-20th century)*. Athens: Miletos, pp. 120–135.
- Kim, J. et al. (2017) 'The Use of Educational Comics in Learning Anatomy Among Multiple Student Groups', *Anatomical Sciences Education*, 10(1), pp. 79–86. doi: 10.1002/ase.1619.
- Kleeman, G. (2006a) 'Not just for fun: Using cartoons to investigate geographical issues', *New Zealand Geographer*, 62(2), pp. 144–151. doi: 10.1111/j.1745-7939.2006.00057.x.
- Kosonen, K. (2008) 'Making maps and mental images: Finnish press cartography in nation-building, 1899–1942', *National Identities*, 10(1), pp. 21–47. doi: 10.1080/14608940701819769.
- Kraak, M.-J. and Fabrikant, S. I. (2017) 'Of maps, cartography and the geography of the International Cartographic Association', *International Journal of Cartography*. Taylor & Francis, 3(sup1), pp. 9–31. doi: 10.1080/23729333.2017.1288535.
- Kreuz, R. J. and Roberts, R. M. (1993) 'On Satire and Parody: The Importance of Being Ironic', *Metaphor and Symbolic Activity*, 8(2), pp. 97–109. doi: 10.1207/s15327868ms0802_2.
- Krygier, J. B. (2014) 'Cartography as an art and a science?', *The Cartographic Journal*, 32(1), pp. 3–10. doi: 10.1179/caj.1995.32.1.3.
- Livieratos, E. (2015) 'Satirical Maps: Between Representational Art and Ideological Influence', in Svolopoulos, K. et al. (eds) *Satirical Maps. Historical and Satirical Accounts of Europe (19th-20th century)*. Athens: Miletos, pp. 44–59.
- Marks, H. M. (2007) 'Student Engagement in Instructional Activity: Patterns in the Elementary, Middle, and High School Years', *American Educational Research Journal*, 37(1), pp. 153–184. doi: 10.3102/00028312037001153.
- Martin, D. W. (2008) *Doing Psychology Experiments*. 7th edn. Belmont, CA: Thomson-Wadsworth.
- McCarthy, M. P. (1977) 'Political Cartoons in the History Classroom', *The History Teacher*, 11(1), pp. 29–38. doi: 10.2307/492723.
- McMahon, C. T. (2014) 'Cartoons in the Classroom: Using Digitized Political Caricatures to Teach Migration and Ethnicity', *Journal of American Ethnic History*, 33(4), pp. 87–93. doi: 10.5406/jamerethnhist.33.4.0087.
- Meurer, P. and Peter (2008) 'Europa Regina. 16th century maps of Europe in the form of a queen', *Belgeo*. National Committee of Geography of Belgium / Société Royale Belge de Géographie, 3(4), pp. 355–370. doi: 10.4000/belgeo.7711.
- Moore, A. (2009) 'MAPS AS COMICS, COMICS AS MAPS', in *24th International Cartography Conference (ICC 2009)*. Available at: <https://www.mendeley.com/catalogue/maps-comics-comics-maps/>.
- Muehlenhaus, I. (2013) 'The Design and Composition of Persuasive Maps', *The design and composition of persuasive maps. Cartography and Geographic Information Science*, 40(5), pp. 401–414. Available at: <http://ian.muehlenhaus.com/download/pubs/peer-reviewed/designOfPersuasiveMaps.pdf> (Accessed: 16 April 2019).
- N.n. (2019) *viaLibri*. Available at: <https://www.vialibri.net/years/books/11972386/1914-amschewitz-john-henry-european-revue-kill-that-eagle>.
- Nabi, R. L., Moyer-Gusé, E. and Byrne, S. (2007) 'All joking aside: A serious investigation into the persuasive effect of funny social issue messages', *Communication Monographs*, 74(1), pp. 29–54. doi: 10.1080/03637750701196896.
- Nivala, A. et al. (2003) 'Usability Evaluation of Topographic Maps in Mobile Devices', in *Proc. of the 21st International Cartographic Conference*. Durban, South Africa: ICA, pp. 1903–1913.
- Nivala, A. M., Brewster, S. and Sarjakoski, L. T. (2008) 'Usability Evaluation of Web Mapping Sites', *The Map Reader: Theories of Mapping Practice and Cartographic Representation*, 45(2), pp. 129–138. doi: 10.1179/174327708X305120.
- Olson, J. M. (2015) 'Cartography', in *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, pp. 167–175. doi: 10.1016/B978-0-08-097086-8.72006-X.
- Pereltsvaig, A. (2014) *Maps as an Instrument of Propaganda, Part 1, Languages Of The World*. Available at: <https://www.languagesoftheworld.info/geography/maps-instrument-propaganda-part->

- 1.html (Accessed: 10 May 2019).
- Peterle, G. (2015) 'Teaching Cartography with Comics: Some Examples from BeccoGiallo's Graphic Novel Series', *Journal of Research and Didactics in Geography*, 1(4), pp. 69–78. doi: 10.4458/5196-07.
- Pickles, J. (2011) 'Texts, Hermeneutics and Propaganda Maps', *The Map Reader: Theories of Mapping Practice and Cartographic Representation*, (Ager 1977), pp. 400–406. doi: 10.1002/9780470979587.ch52.
- PUTZGER *Historische Weltatlas*. 103rd edn (2001). Berlin: Cornelsen.
- Quam, L. O. (1943) 'The Use of Maps in Propaganda', *Journal of Geography*, 42(1), pp. 21–32. doi: 10.1080/00221344308986602.
- Roth, R. E. et al. (2017) 'User studies in cartography: opportunities for empirical research on interactive maps and visualizations', *International Journal of Cartography*. Taylor & Francis, 3(sup1), pp. 61–89. doi: 10.1080/23729333.2017.1288534.
- Rule, A. C. and Auge, J. (2005) 'Using Humorous Cartoons to Teach Mineral and Rock Concepts in Sixth Grade Science Class', *Journal of Geoscience Education*, 53(5), pp. 548–558. doi: 10.5408/1089-9995-53.5.548.
- Rystedt, B. (2003) *A Strategic Plan for the International Cartographic Association 2003-2011*, Map, *Journal of the Japan Cartographers Association*. doi: 10.11212/jjca1963.42.2_61.
- Santon, K. and MacKay, L. (2010) *Grote Atlas van de Wereldgeschiedenis*. Bath: Parragon.
- Shernoff, D. J. et al. (2003) 'Student engagement in high school classrooms from the perspective of flow theory', in *Applications of Flow in Human Development and Education: The Collected Works of Mihaly Csikszentmihalyi*. doi: 10.1007/978-94-017-9094-9_24.
- Shernoff, D. J. and Hoogstra, L. (2001) 'Continuing motivation beyond the high school classroom', *New Directions in Child and Adolescent Development*, 93, pp. 73–87. doi: 10.1002/cd.26.
- Smith, H. R. and Leptich, D. A. (1963) 'Effective Use of Cartoons in the Classroom', *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 38(1), pp. 38–41. doi: 10.1080/00098655.1963.11475937.
- Soucacos, P. N. (2015a) *Satirical Maps. Historical and Satirical Accounts of Europe (19th-20th century)*. Edited by K. Svolopoulos et al. Athens: Miletos.
- Soucacos, P. N. (2015b) 'The Honor of an Anniversary, and the Anniversary of Honor', in Svolopoulos, K. et al. (eds) *Satirical Maps. Historical and Satirical Accounts of Europe (19th-20th century)*. Athens: Miletos, pp. 8–13.
- Sullivan, P. (1989) 'Beyond a Narrow Conception of Usability Testing A RATIONALE FOR BROADENING USABILITY', *IEEE Transactions on Professional Communication*, 32(4), pp. 256–264. Available at: <https://ieeexplore.ieee.org/document/44537>.
- Svolopoulos, K. (2015) 'Europe's Historical Background in the 19th Century, and Satirical Cartography', in Svolopoulos, K. et al. (eds) *Satirical Maps. Historical and Satirical Accounts of Europe (19th-20th century)*. Athens: Miletos, pp. 14–19.
- Ulloth, J. (2002) 'The benefits of humor in nursing education', *Journal of Nursing Education*, 41, pp. 476–481.
- Williams, I. C. M. (2012) 'Graphic medicine: Comics as medical narrative', *Medical Humanities*, 38(1), pp. 21–27. doi: 10.1136/medhum-2011-010093.
- Wood, D. and Fels, J. (1992) *The Power of Maps*. New York: Guilford Press. doi: 0-89862-492-4.

Appendix

Here, you will find all the (remaining) material that has been used in this research; from the variety of maps that were studied by the pupils in class to the map drawings made by them. Moreover, all the questionnaires are included, as are the interviews, the transcribed interviews and transcribed observations.

A. Maps

- A.1 Maps for the Dutch students
- A.2 Maps for the German students

B Map Drawings

- B.1 Satirical Maps
- B.2 Plain Maps

C. Questionnaires

- C.1 Instructions
- C.2 Regular
- C.3 Regular - Recall
- C.4 Alternative
- C.5 Alternative - Recall

D. Interviews & Observations

- D1 Interviews
- D2 Observations

E. Statistics

Oostenrijk-Hongarije had sinds 1879 al een verdrag met het Duitse Keizerrijk. Tot het einde van de oorlog bleef het verdrag geldig.

Het Duitse Keizerrijk vocht een twee fronten-oorlog met de 'Triple Entente', bestaande uit Rusland, Frankrijk, en het Verenigd-Koninkrijk . De tactiek om Frankrijk eerst te verslaan en zich dan te richten op het oosten mislukte toen de Duitse troepen werden opgehouden 80 km voor Parijs.

Op 28 juni 1914 werd aartshertog Frans Ferdinand van Oostenrijk-Hongarije in Sarajevo neergeschoten door een servische nationalist. Na een ultimatum verklaarde Oostenrijk-Hongarije de oorlog aan Servië. Twee dagen later mobiliseerde Rusland zijn troepen om Servië te steunen, waarna het Duitse Keizerrijk de oorlog verklaarde aan Rusland.

Het Verenigd-Koninkrijk werd in de strijd geholpen door troepen uit het gehele Britse Rijk, waaronder Australiërs, Nieuw-Zeelanders en Indiërs.

Zowel het Duitse Keizerrijk als het Verenigd Koninkrijk stonden garant voor de neutraliteit van België. Toen de Duitsers België als doorgang gebruikten om in Frankrijk te komen, besloot het Verenigd Koninkrijk haar verplichtingen na te komen en verklaarde het de oorlog aan het Duitse Keizerrijk in.

Enkele neutrale landen zaten niet in het conflict, bijvoorbeeld Spanje en Zwitserland.



COALITIES AAN DE VOORAVOND VAN DE OORLOG, JULI 1914

- Oostenrijks-Duits Verdrag, 1879-1918
- Triple Alliantie, 1882-1915
- Frans-Russisch Verdrag, 1894-1917
- Triple Entente, 1907-1917
- Onafhankelijkheids- en nationalistische bewegingen, gesteund door Rusland, 1879-1914
- Sympathiserend met 'Centrale mogendheden'
- Sympathiserend met 'Entente-mogendheden'
- Neutraliteit gegarandeerd door Verenigd Koninkrijk
- Neutraal

Italië was al sinds 1882 lid van de 'Triple Alliantie' en steunde aan het begin van de oorlog nog het Duitse Keizerrijk en Oostenrijk-Hongarije, maar sloot zich in April 1915 aan bij de geallieerden.

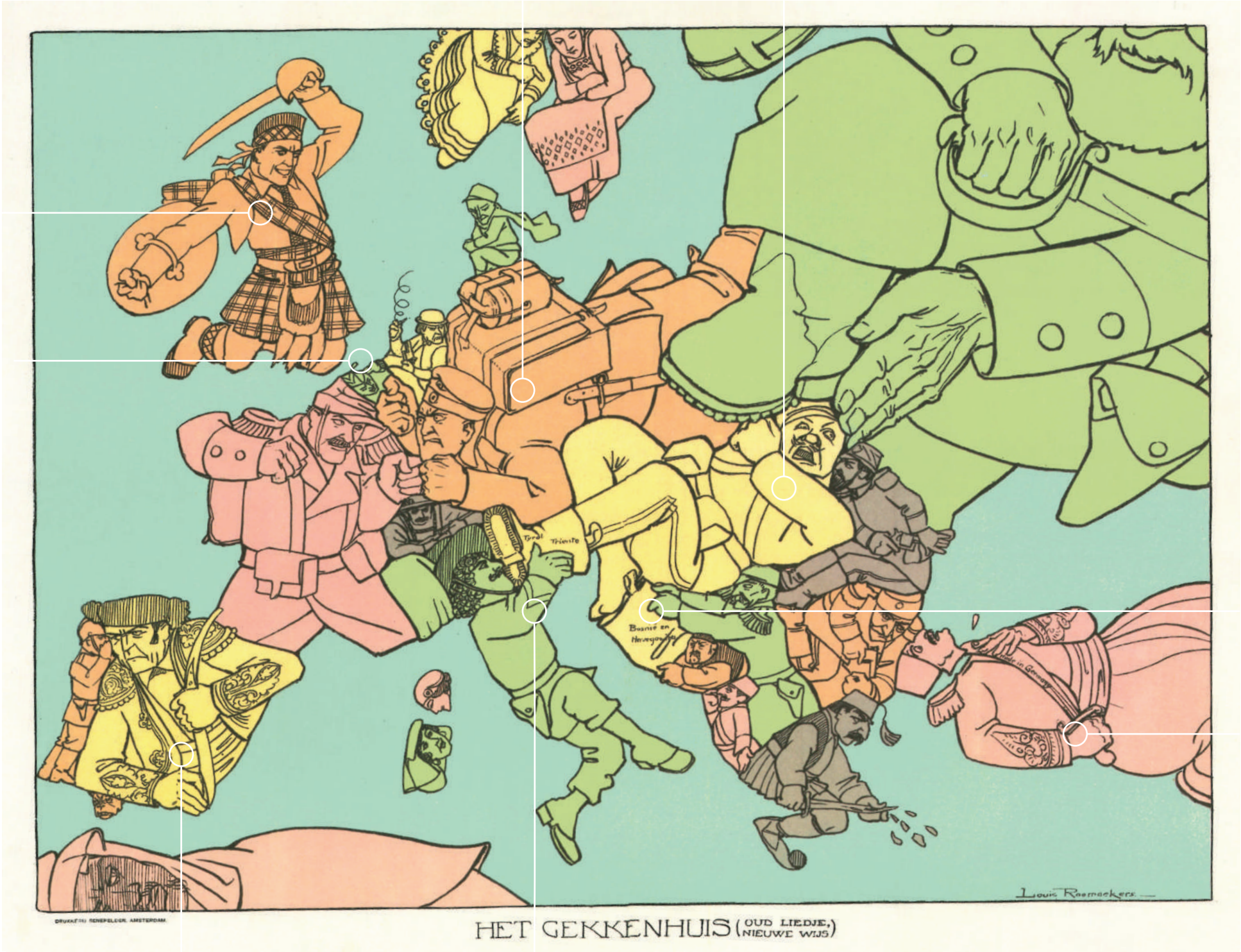
Het Ottomaanse Rijk (huidig Turkije) begaf zich op 29 oktober 1914 in de oorlog aan de kant van de centrale mogendheden (Triple Alliantie).

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Österreich-Ungarn hatte seit 1879 einen Vertrag mit dem Deutschen Reich. Der Vertrag blieb bis zum Kriegsende gültig.

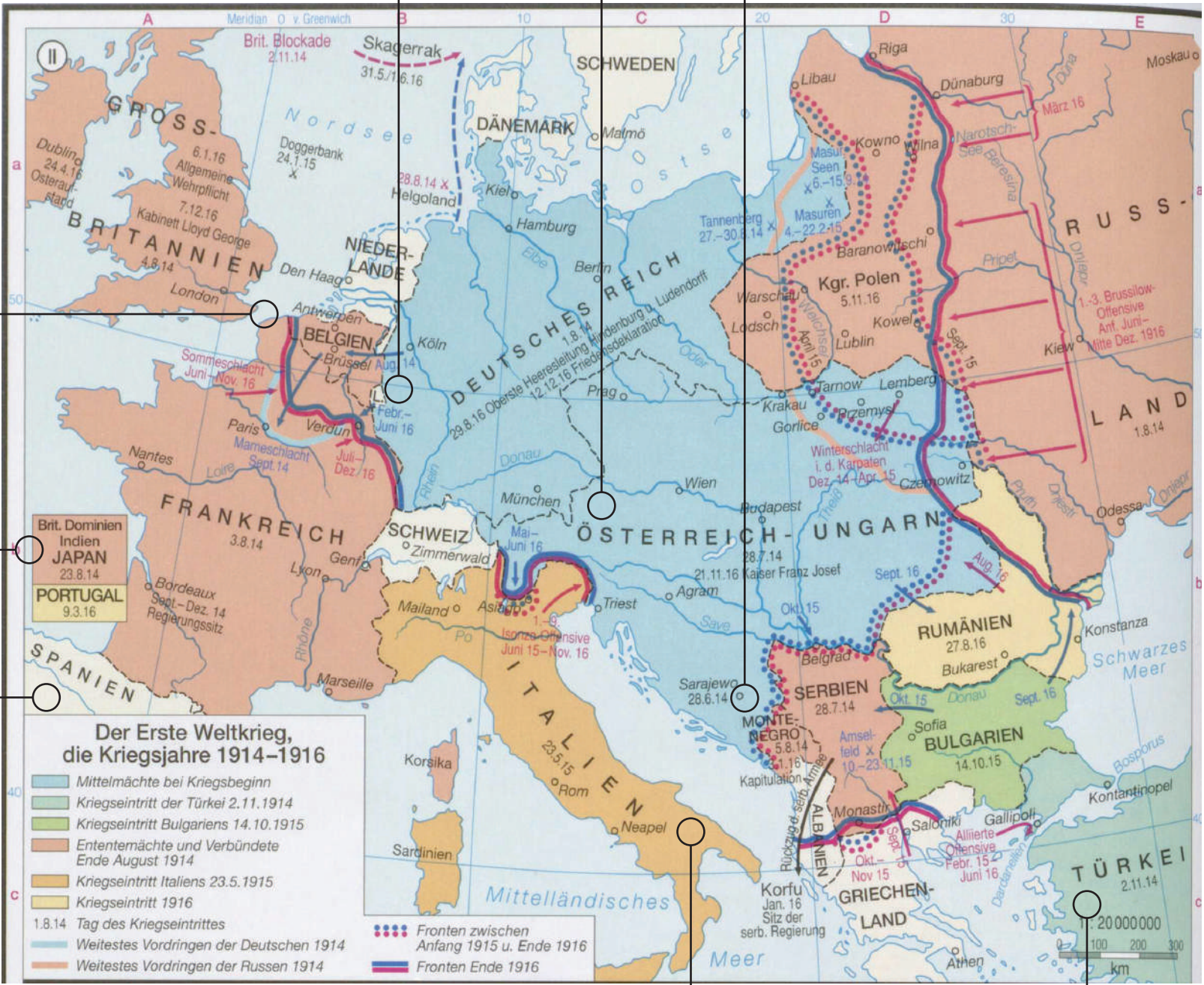
Das Deutsche Reich führte einen Zweifrontenkrieg mit der 'Triple Entente', bestehend aus Russland, Frankreich und Großbritannien. Die Taktik, zuerst Frankreich zu besiegen und sich dann auf den Osten zu konzentrieren, schlug fehl, als die deutschen Truppen 80 km vor Paris gestoppt wurden.

Am 28. Juni 1914 wurde Erzherzog Franz Ferdinand von Österreich-Ungarn in Sarajevo von einem serbischen Nationalisten erschossen. Nach einem Ultimatum erklärte Österreich-Ungarn Serbien den Krieg. Zwei Tage später mobilisierte Russland seine Truppen, um Serbien zu unterstützen, woraufhin das Deutsche Reich Russland den Krieg erklärte.

Sowohl das Deutsche Reich als auch Großbritannien garantierten die Neutralität Belgiens. Als die Deutschen Belgien als Weg nach Frankreich nutzten, entschloss sich Großbritannien seinen Verpflichtungen nachzukommen und erklärte dem Deutschen Reich den Krieg.

Großbritannien wurde von Truppen aus dem gesamten britischen Empire unterstützt, darunter Australier, Neuseeländer und Inder.

Einige neutrale Länder waren nicht im Konflikt, zum Beispiel Spanien und die Schweiz.



Italien war seit 1882 Mitglied des 'Dreibundes' und unterstützte zu Beginn des Krieges das Deutsche und Österreichisch-Ungarische Reich, trat aber im April 1915 den Alliierten bei.

Das Osmanische Reich (heutige Türkei) trat am 29. Oktober 1914 auf Seiten der Zentralmächte in den Krieg ein (Dreibund).

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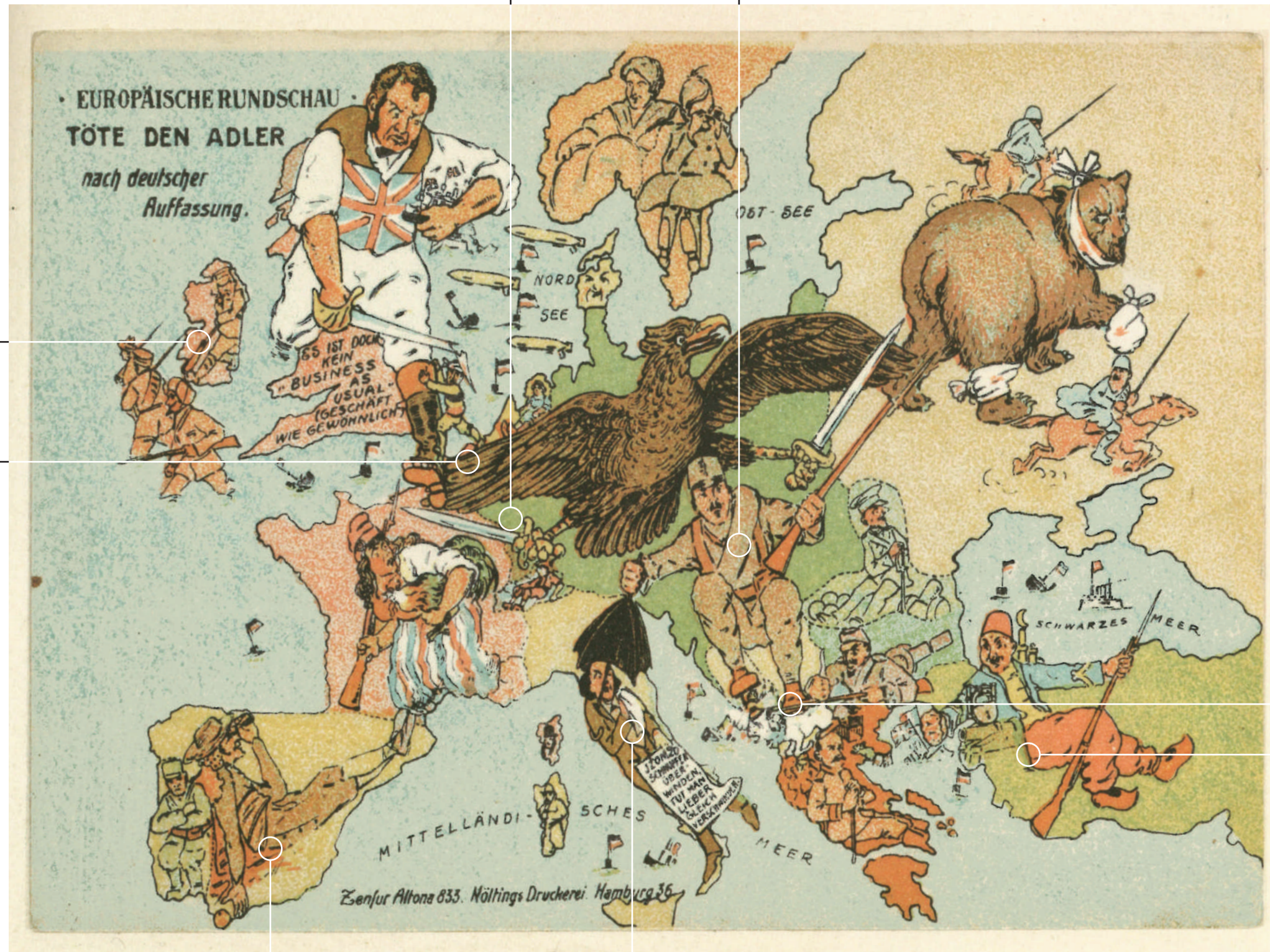
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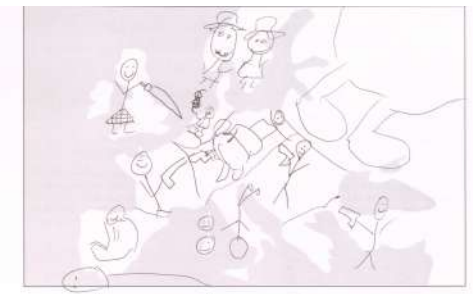
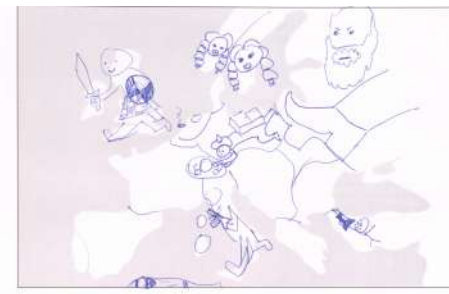
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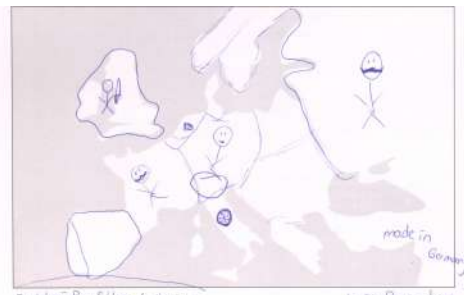
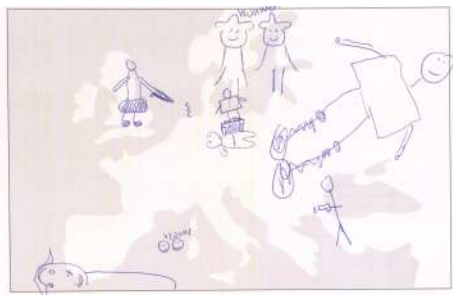
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Ik kan niet tekenen!!



Drinking Bureldora Amsterdam Louis Roemackers

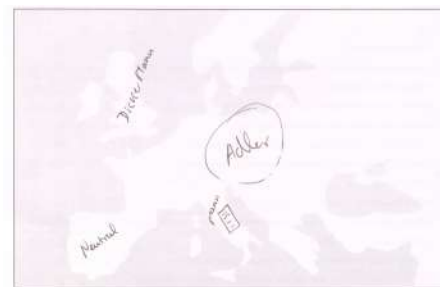
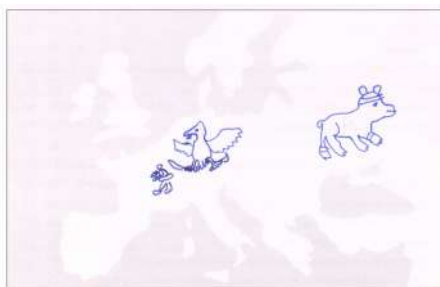
Het Gehlenhuis (oud lied Nieuwevrij)

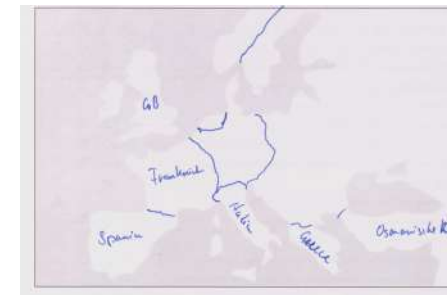
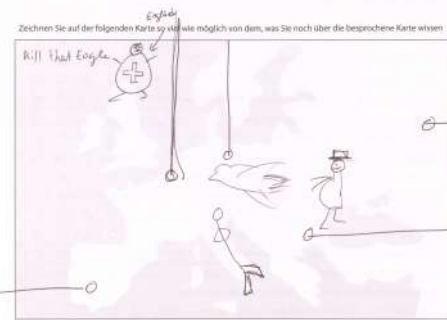
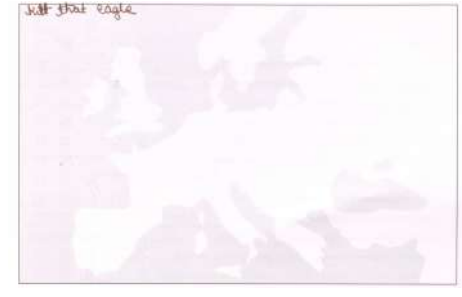
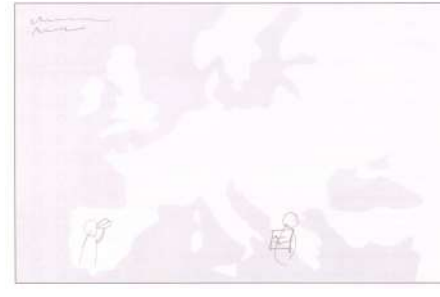
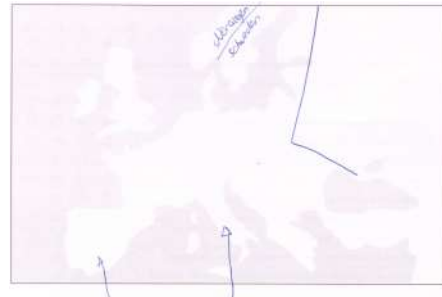


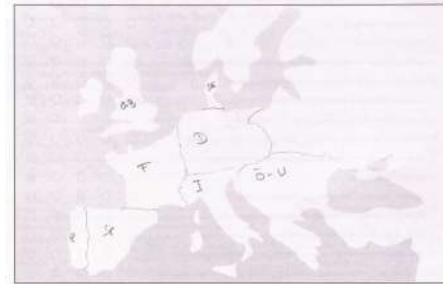
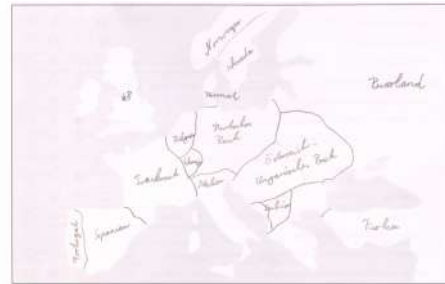
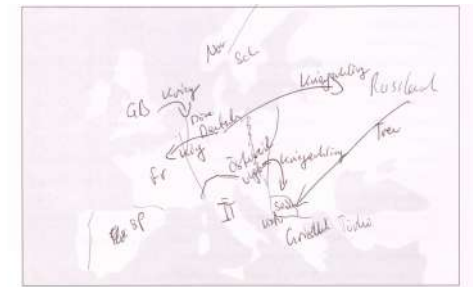
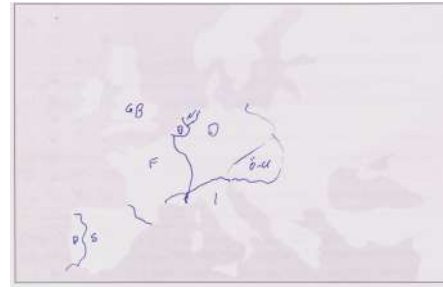
Drinking Bureldora Amsterdam Het Gehlenhuis (oud lied Nieuwevrij) Louis Roemackers



Drinking Bureldora Amsterdam Het Gehlenhuis (oud lied Nieuwevrij) Louis Roemackers









* = triple alliance
 (*) = triple entente



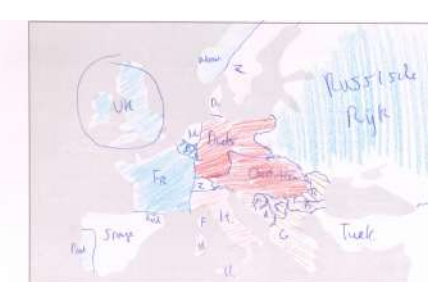
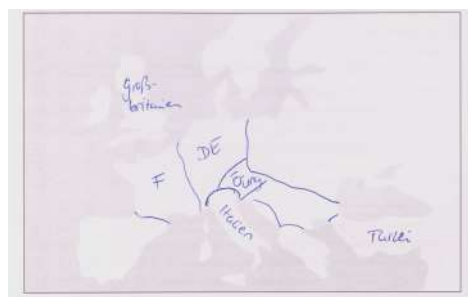
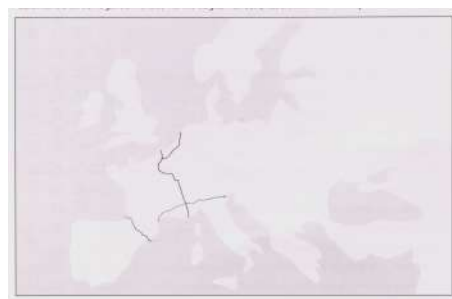
X = Duits rijk
 O = Oostenrijk
 S = Spanje
 N = Nederland
 H = Hongarije
 A = Australië
 D = Duitsland
 O = Oostenrijk
 S = Spanje
 N = Nederland
 H = Hongarije
 A = Australië



Triple entente
 Triple alliance
 Triple entente
 Triple alliance
 Triple entente
 Triple alliance



Triple entente
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van de kaart
 geleend

Regular classes:

Instructions for working with the map

1. You will receive a map shortly
 2. The text boxes around the map contain facts about the First World War
 3. Pay attention to all details, both from the map and from the related information in the text boxes
 4. Take it all in and take your time for it
 5. Try to learn as much as possible in the little amount of time that you have for it (Is the author known? Who is the author? Where was the map created? But more importantly, what can you read / see, etc.)
 6. For this exercise you do not need anything (no paper, no pen, etc.)
 7. If something is unclear, ask your group members first
 8. In some time you will receive a series of questions about this map, which you should answer by yourself.
- Thus, teamwork is not an option. This means that discussions are allowed and even encouraged, but everyone should have a look at all the information on the map.

Alternative classes:

Instructions for working with the map

1. You will receive three (NL: two) maps shortly
 2. The text boxes around the map contain facts about the First World War
 3. Pay attention to all details, both from the map and from the related information in the text boxes
 4. Take it all in and take your time for it
 5. Try to learn as much as possible in the little amount of time that you have for it (Is the author known? Who is the author? Where was the map created? But more importantly, what can you read / see, etc.)
 6. For this exercise you do not need anything (no paper, no pen, etc.)
 7. If something is unclear, ask your group members first
 8. In some time you will receive a series of questions about these maps, which you should answer by yourself.
- Thus, teamwork is not an option. This means that discussions are allowed and even encouraged, but everyone should have a look at all the information on the map.



Questionnaire about the studied map (regular map) concerning the First World War (WW1)

Consent to participate in this user study

Thank you for finding time for the user test, which is conducted by Wouter van der Meijden, Master student of the Technical University of Munich. It is organized within my work on the master thesis with the topic "The usability of satirical maps as an educational aid in history class".

Short description of the test and how the data will be collected will be explained by the student.

Confidentiality and rights

This study is anonymous and is not aimed to retain any personal information. All the records and data gained from the test will be anonymized and used only within the work on my master thesis research. You may refuse to take part in the study at any time. You have the right to ask questions about this research study and to have those questions answered by me before, during or after the research.

Name: _____ (used only for linking questionnaires)

Sex: m / f / x

Age: _____

Nationality: _____

Nationality father: _____

Nationality mother: _____

*On the following page you will find a number of questions about the map that you just studied.
The first few questions are open questions, please write here as much as possible.
The most questions are closed questions, which means that you are asked to tick one of the circles.
You can choose from five options, ranging from fully disagree to fully agree.
Lastly, on the last page there is a small drawing exercise.*

Questionnaire about the studied map (satirical map) concerning the First World War (WW1)

Consent to participate in this user study

Thank you for finding time for the user test, which is conducted by Wouter van der Meijden, Master student of the Technical University of Munich. It is organized within my work on the master thesis with the topic "The usability of satirical maps as an educational aid in history class".

Short description of the test and how the data will be collected will be explained by the student.

Confidentiality and rights

This study is anonymous and is not aimed to retain any personal information. All the records and data gained from the test will be anonymized and used only within the work on my master thesis research. You may refuse to take part in the study at any time. You have the right to ask questions about this research study and to have those questions answered by me before, during or after the research.

Name: _____ (used only for linking questionnaires)

Sex: m / f / x

Age: _____

Nationality: _____

Nationality father: _____

Nationality mother: _____

*On the following page you will find a number of questions about the map that you just studied.
The first few questions are open questions, please write here as much as possible.
The most questions are closed questions, which means that you are asked to tick one of the circles.
You can choose from five options, ranging from fully disagree to fully agree.
Lastly, on the last page there is a small drawing exercise.*

Questions about the content of the map

1. What did **the map** and what did **the text boxes** tell you about the United Kingdom?
Can you explain why the author showed it in this way on the map?

2. What did **the map** and what did **the text boxes** tell you about Italy?
Can you explain how the map showed this?

3. Name as many countries as possible that were neutral in this war **according to the map**.

4. What did **the map** and what did **the text boxes** tell you about Austria-Hungary in this war?
Can you explain how representative the map's view is?

5. What did **the map** and what did **the text boxes** tell you about Turkey in this war?
Can you explain how the map showed this?

6. What **on the map** was particularly striking? (What caught the attention?)

7. What was the information (**in the text boxes**) belonging to the "eye-catchers", mentioned in question 6?

8. What is your overall opinion about the use of **this map** in learning history?

Statements about the map (not considering the textfields)

fully
disagree disagree neutral agree fully
agree

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. The map is interesting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. The map makes learning history more entertaining | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. I understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. The map is humorous | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. The added text fields are needed to understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. I often use a similar map in order to learn history | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. I would like to see a similar map more often | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. The map helps me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. The colours of the map help me to remember the historical facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. I find this map useful for studying about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. The map is reliable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. I would have liked to get more time to look at the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. I would have liked to get more explanations about the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. The map contains too much information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. I have been able to study the whole map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. I would recommend students learning about WW1 to look at this map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. The placenames on the map help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. The legend is necessary to understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the objectivity/subjectivity of the map

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 19. The map is objective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. The map is subjective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. The map is propaganda | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. The author of the map displays his own vision | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. The author of the map shows real events that took place in WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about pre-knowledge

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 24. I see a map like this regularly in history class | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 25. I have already had class about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. I knew a lot of this historical information already (even before looking at the map) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. I do generally understand maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the map (not considering the textfields)

fully
disagree disagree neutral agree fully
agree

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. The map is interesting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. The map makes learning history more entertaining | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. I understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. The map is humorous | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. The added text fields are needed to understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. I often use a similar map in order to learn history | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. I would like to see a similar map more often | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. The map helps me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. The colours of the map help me to remember the historical facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. I find this map useful for studying about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. The map is reliable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. I would have liked to get more time to look at the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. I would have liked to get more explanations about the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. The map contains too much information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. I have been able to study the whole map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. I would recommend students learning about WW1 to look at this map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. The satirical figures on the map help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. I know which satirical figures represent which countries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the objectivity/subjectivity of the map

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 19. The map is objective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. The map is subjective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. The map is propaganda | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. The author of the map displays his own vision | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. The author of the map shows real events that took place in WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about pre-knowledge

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 24. I see a map like this regularly in history class | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 25. I have already had class about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. I knew a lot of this historical information already (even before looking at the map) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. I do generally understand maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Draw on the map below as much as possible of what you still know about the discussed map



Thank you so much for participating!



Questionnaire about the studied map (regular map) concerning the First World War (WW1)

Consent to participate in a user study

Thank you for finding time for the user test, which is conducted by Wouter van der Meijden, Master student of the Technical University of Munich. It is organized within my work on the master thesis with the topic "The usability of satirical maps as educational aid in history class".
Short description of the test and how the data will be collected will be explained by the student.

Confidentiality and rights

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Name: _____ (used only for linking questionnaires)

Sex: m / f / x

Age: _____

Nationality: _____

Nationality father: _____

Nationality mother: _____

*On the following page you will find a number of questions about the map that you have studied last time.
The first few questions are open questions, please write here as much as possible.
The most questions are closed questions, which means that you are asked to tick one of the circles.
You can choose from five options, ranging from fully disagree to fully agree.*



Questionnaire about the studied map (satirical map) concerning the First World War (WW1)

Consent to participate in a user study

Thank you for finding time for the user test, which is conducted by Wouter van der Meijden, Master student of the Technical University of Munich. It is organized within my work on the master thesis with the topic "The usability of satirical maps as educational aid in history class".

Short description of the test and how the data will be collected will be explained by the student.

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Name: _____ (used only for linking questionnaires)

Sex: m / f / x

Age: _____

Nationality: _____

Nationality father: _____

Nationality mother: _____

On the following page you will find a number of questions about the map that you have studied last time.

The first few questions are open questions, please write here as much as possible.

The most questions are closed questions, which means that you are asked to tick one of the circles.

You can choose from five options, ranging from fully disagree to fully agree.

Questions about the content of the map

1. Which **map elements** do you remember? Which facts from **the text fields** belong to those elements?

2.Name as many countries as possible that were neutral in this war **according to the map**.

3. What **on the map** was particularly striking? (What caught the attention?)

4. What was the information (**in the text boxes**) belonging to the “eye-catchers”, mentioned in question 3?

5. What is your overall opinion about the use of **this map** in learning history?

Statements about the map (not considering the textfields)	fully disagree	disagree	neutral	agree	fully agree
1. I still remember how the map looked like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would have liked to get more explanations about the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Without the text boxes this map would have been useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not understand what this map was useful for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would like to see a similar map more often (than is now the case) in history class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would like to see the map again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The map has helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The colours of the map have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The placenames on the map have helped me to remember the historic facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The legend was necessary to understand the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The map contained too much information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I would have liked to get more time to look at the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. This experience with the map has aroused my interest for maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I know more about the WW1 now than I did before working with the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Since the last time I saw the map...					
15. I have been thinking of the map for quite some time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I have talked about the map with people from my class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I have talked about the map with people outside class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I have tried to find more examples of these kind of maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you so much for participating!

Statements about the map (not considering the textfields)	fully disagree	disagree	neutral	agree	fully agree
1. I still remember how the map looked like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would have liked to get more explanations about the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Without the text boxes this map would have been useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not understand what this map was useful for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would like to see a similar map more often (than is now the case) in history class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would like to see the map again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The map has helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The colours of the map have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The satirical figures on the map have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I still know which figures represented which historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The map contained too much information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I would have liked to get more time to look at the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. This experience with the map has aroused my interest for maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I know more about the WW1 now than I did before working with the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Since the last time I saw the map...					
15. I have been thinking of the map for quite some time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I have talked about the map with people from my class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I have talked about the map with people outside class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I have tried to find more examples of these kind of maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you so much for participating!



Questionnaire about the studied maps concerning the First World War (WW1)

Consent to participate in a user study

Thank you for finding time for the user test, which is conducted by Wouter van der Meijden, Master student of the Technical University of Munich. It is organized within my work on the master thesis with the topic "The usability of satirical maps as educational aid in history class".

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Name: _____ (used only for linking questionnaires)

Sex: m / f / x

Age: _____

Nationality: _____

Nationality father: _____

Nationality mother: _____

*On the following page you will find a number of questions about the maps that you just studied.
The first few questions are open questions, please write here as much as possible.
The most questions are closed questions, which means that you are asked to tick one of the circles.
You can choose from five options, ranging from fully disagree to fully agree.*



1



2



1. Which map do you think is most interesting? Why?

2. Which map do you think is most useful to use for learning history? Why?

3. Which map is most objective? Why do you think that?

4. What information is important, but are only shown on either the satirical maps (1) or the regular map (2)?
Why is this information important?

5. What is your overall opinion about the use of a satirical map (1) in learning history?

6. What is your overall opinion about the use of a regular map (2) in learning history?

1



2



1. Which map do you think is more interesting? Why?

2. Which map do you think is more useful to use for learning history? Why?

3. Which map is more objective? Why do you think that?

4. What information is important, but can only be seen on one of these maps? Why is this information important?

5. What is your overall opinion about the use of a satirical map (1) in learning history?

6. What is your overall opinion about the use of a regular map (2) in learning history?

Statements about the satirical maps (1) (not considering the textfields)

fully
disagree disagree neutral agree fully
agree

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. The maps are interesting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. The maps make learning history more entertaining | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. I understand the maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. The maps are humorous | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. The added text fields are needed to understand the maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. I often use a similar map in order to learn history | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. I would like to see a similar map more often | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. The maps help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. The colours of the maps help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. I find these maps useful for studying about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. The maps are reliable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. I would have liked to get more time to look at the maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. I would have liked to get more explanations about the maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. The maps contain too much information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. I have been able to study both maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. I would recommend students learning about WW1 to look at these maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. The satirical figures on the maps help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. I know which figures represent which countries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the objectivity/subjectivity of the map

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 19. The maps are objective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. The maps are subjective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. The maps are propaganda | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. The authors of the maps display their own vision | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. The authors of the maps show real events that took place in WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about pre-knowledge

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 24. I see maps like these regularly in history class | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 25. I have already had class about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. I knew a lot of this historical information already (even before looking at the maps) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. I do generally understand maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the satirical map (1) (not considering the textfields)

fully
disagree disagree neutral agree fully
agree

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. The map is interesting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. The map makes learning history more entertaining | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. I understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. The map is humorous | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. The added text fields are needed to understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. I often use a similar map in order to learn history | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. I would like to see a similar map more often | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. The map helps me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. The colours of the map help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. I find this map useful for studying about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. The map is reliable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. I would have liked to get more time to look at the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. I would have liked to get more explanations about the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. The map contains too much information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. I have been able to study the whole map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. I would recommend students learning about WW1 to look at this map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. The satirical figures on the map help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. I know which figures represent which countries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the objectivity/subjectivity of the map

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 19. The map is objective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. The map is subjective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. The map is a piece of propaganda | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. The author of the map displays his own vision | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. The author of the map shows real events that took place in WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about pre-knowledge

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 24. I see a map like this regularly in history class | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 25. I have already had class about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. I knew a lot of this historical information already (even before looking at the map) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. I do generally understand maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the regular map (2) (not considering the textfields)

fully
disagree disagree neutral agree fully
agree

1. The map is interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The map makes learning history more entertaining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I understand the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The map is humorous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. The added text fields are needed to understand the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I often use a similar map in order to learn history	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I would like to see a similar map more often	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The map helps me to remember the historic facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The colours of the map help me to remember the historic facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I find this map useful for studying about WW1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The map is reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I would have liked to get more time to look at the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I would have liked to get more explanations about the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. The map contains too much information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I have been able to study the whole map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I would recommend students learning about WW1 to look at this map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. The placenames on the map help me to remember the historic facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. The legend is necessary to understand the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Statements about the objectivity/subjectivity of the map

19. The map is objective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. The map is subjective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. The map is a piece of propaganda	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. The author of the map displays his own vision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. The author of the map shows real events that took place in WW1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Statements about pre-knowledge

24. I see a map like this regularly in history class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I have already had class about WW1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I knew a lot of this historical information already (even before looking at the map)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. I do generally understand maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you so much for participating!

Statements about the regular map (2) (not considering the textfields)

fully
disagree disagree neutral agree fully
agree

- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. The map is interesting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. The map makes learning history more entertaining | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. I understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. The map is humorous | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. The added text fields are needed to understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. I often use a similar map in order to learn history | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. I would like to see a similar map more often | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. The map helps me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. The colours of the map help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. I find this map useful for studying about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. The map is reliable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. I would have liked to get more time to look at the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. I would have liked to get more explanations about the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. The map contains too much information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. I have been able to study the whole map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. I would recommend students learning about WW1 to look at this map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. The placenames on the map help me to remember the historic facts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. The legend is necessary to understand the map | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about the objectivity/subjectivity of the map

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 19. The map is objective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. The map is subjective | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. The map is a piece of propaganda | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. The author of the map displays his own vision | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. The author of the map shows real events that took place in WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Statements about pre-knowledge

- | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 24. I see a map like this regularly in history class | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 25. I have already had class about WW1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. I knew a lot of this historical information already (even before looking at the map) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. I do generally understand maps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Thank you so much for participating!

Name: _____ (used only for linking questionnaires)
Sex: m / f / x
Age: _____
Nationality: _____
Nationality father: _____
Nationality mother: _____

Statements about the regular map (not considering the textfields)

	trifft überhaupt nicht zu	trifft nicht zu	neutral	trifft zu	trifft völlig zu
1. I still remember how the map looked like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would have liked to get more explanations about the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Without the text boxes this map would have been useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not understand what this map was useful for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would like to see a similar map more often (than is now the case) in history class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would like to see the map again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The map has helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The colours of the map have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The placenames on the map have helped me to remember the historic facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The legend was necessary to understand the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The map contained too much information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I would have liked to get more time to look at the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. This experience with the map has aroused my interest for maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I know more about the WW1 now than I did before working with the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Since the last time I saw the map...					
15. I have been thinking of the map for quite some time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I have talked about the map with people from my class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I have talked about the map with people outside class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I have tried to find more examples of these kind of maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The questions on the following page refer to the "curious" satirical maps!

Name: _____ (used only for linking questionnaires)
Sex: m / f / x
Age: _____
Nationality: _____
Nationality father: _____
Nationality mother: _____

Statements about the regular map (not considering the textfields)

	trifft überhaupt nicht zu	trifft nicht zu	neutral	trifft zu	trifft völlig zu
1. I still remember how the map looked like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would have liked to get more explanations about the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Without the text boxes this map would have been useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not understand what this map was useful for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would like to see a similar map more often (than is now the case) in history class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would like to see the map again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The map has helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The colours of the map have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The placenames on the map have helped me to remember the historic facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The legend was necessary to understand the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The map contained too much information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I would have liked to get more time to look at the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. This experience with the map has aroused my interest for maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I know more about the WW1 now than I did before working with the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Since the last time I saw the map...					
15. I have been thinking of the map for quite some time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I have talked about the map with people from my class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I have talked about the map with people outside class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I have tried to find more examples of these kind of maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The questions on the following page refer to the "curious" satirical map!

Statements about the “curious” satirical maps (not considering the textfields)

	trifft überhaupt nicht zu	trifft nicht zu	neutral	trifft zu	trifft völlig zu
1. I still remember how the maps looked like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would have liked to get more explanations about the maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Without the text boxes these maps would have been useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not understand what these maps were useful for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would like to see a similar map more often (than is now the case) in history class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would like to see the maps again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The maps have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The colours of the maps have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The satirical figures on the maps have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I still know which figures represented which historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The maps contained too much information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I would have liked to get more time to look at the maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. This experience with the maps has aroused my interest for maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I know more about the WW1 now than I did before working with the maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Since the last time I saw the map...					
15. I have been thinking of the maps for quite some time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I have talked about the maps with people from my class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I have talked about the maps with people outside class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I have tried to find more examples of these kind of maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you so much again for participating!

Statements about the “curious” satirical maps (not considering the textfields)

	trifft überhaupt nicht zu	trifft nicht zu	neutral	trifft zu	trifft völlig zu
1. I still remember how the map looked like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would have liked to get more explanations about the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Without the text boxes this map would have been useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I do not understand what this map was useful for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I would like to see a similar map more often (than is now the case) in history class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I would like to see the map again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The map has helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The colours of the map have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The satirical figures on the map have helped me to remember the historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I still know which figures represented which historical facts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The map contained too much information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I would have liked to get more time to look at the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. This experience with the map has aroused my interest for maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I know more about the WW1 now than I did before working with the map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Since the last time I saw the map...					
15. I have been thinking of the map for quite some time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I have talked about the map with people from my class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I have talked about the map with people outside class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I have tried to find more examples of these kind of maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you so much again for participating!

Interview questions for history teachers (with class)

- Name, age, sex, history (years of experience, what school(s), classes to teach/have taught).

Test group

- In what class(es) will the experiment be taken?
- How old are these students?
- What do the students already know about WW1? (When) have they learned about this war?

Teaching history

- What are the 'learning objectives of history class in high school'?
- (What are the requirements for history class in high school?)
- Are maps (like on page 6 and 7) included in these requirements at all?
 - Is there a difference between NL and GER on the 'learning objectives of history class'? How general is it?
 - Is there a document in which the requirements are set?
 - How often does this document get renewed?
 - Have there been important changes in the way of teaching history in the time that you have been a teacher?
 - What do the students need to learn about in history class? (e.g. dates, basic ideas..)
 - What tools do the students get to learn about history? (e.g. PowerPoints, images, text, maps..)
 - How is the regular interaction in class (teacher-student and students among each other)?
 - What class activities are stimulated? (e.g. group works, discussions, tests)
 - To what extent are visual tools (e.g. images, graphs, cartoons) used?
 - To what extent are these visual tools stimulated?

Notes

Teaching with maps

- To what extent are maps used?
- How often does the class involve analysing a map?
- What maps are used?
- For what reason are these specific maps used?
- What do you want the children to get out of / learn from the map? (place names, ideas, years?)
- Do you like the use of maps in class to explain history? Why?
- Do the students like the use of maps?

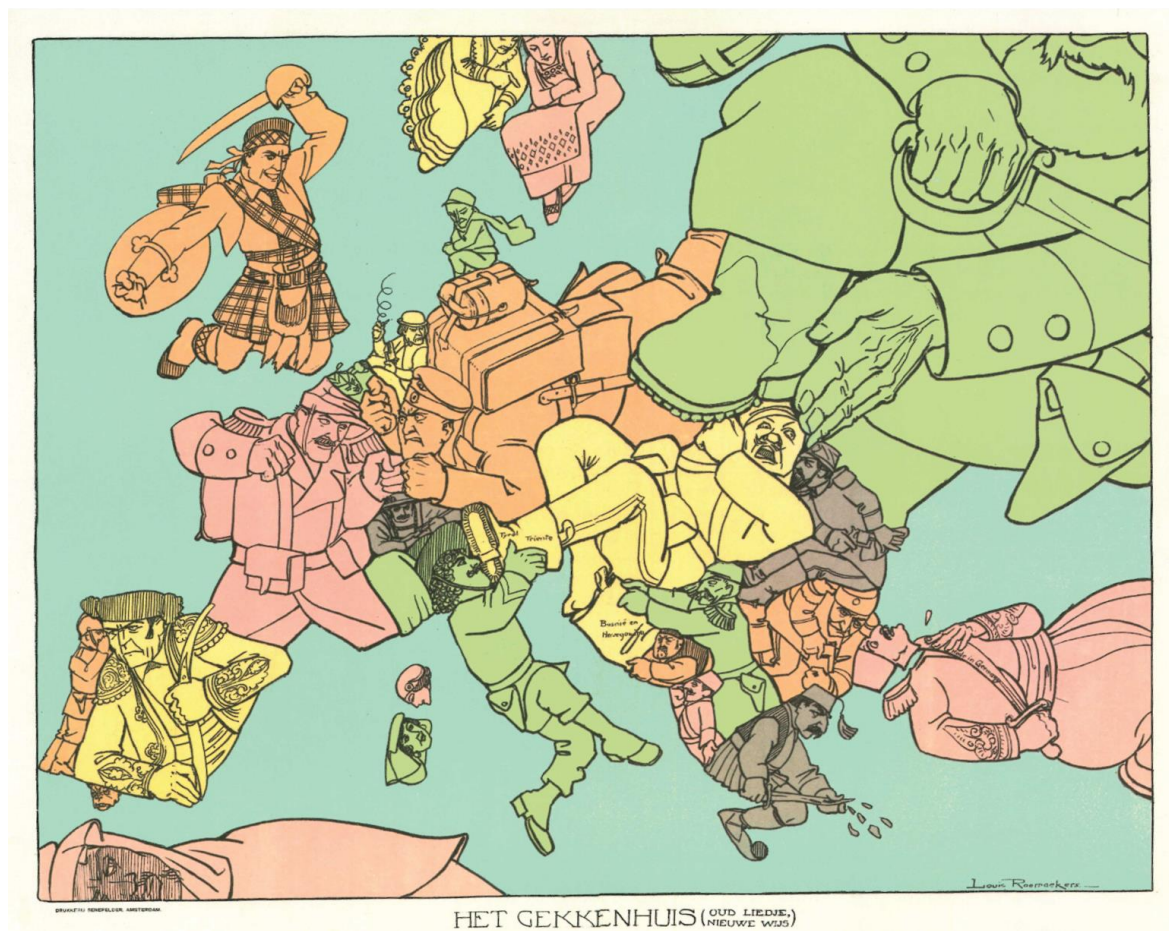
Exercise (page 3-5)

- Order the following satirical maps according to their usefulness for history class about WW1
- Why did you choose this order? Why are some maps more useful than others?
- What can you say about the satirical maps being subjective and/or objective?
- Which information (i.e. figures) would you choose to explain?
- Do you expect this exercise to be different for every teacher? Why?
- Does the use of satirical maps have an advantage over the use of plain maps?
- Does the use of plain maps have an advantage over the use of satirical maps?

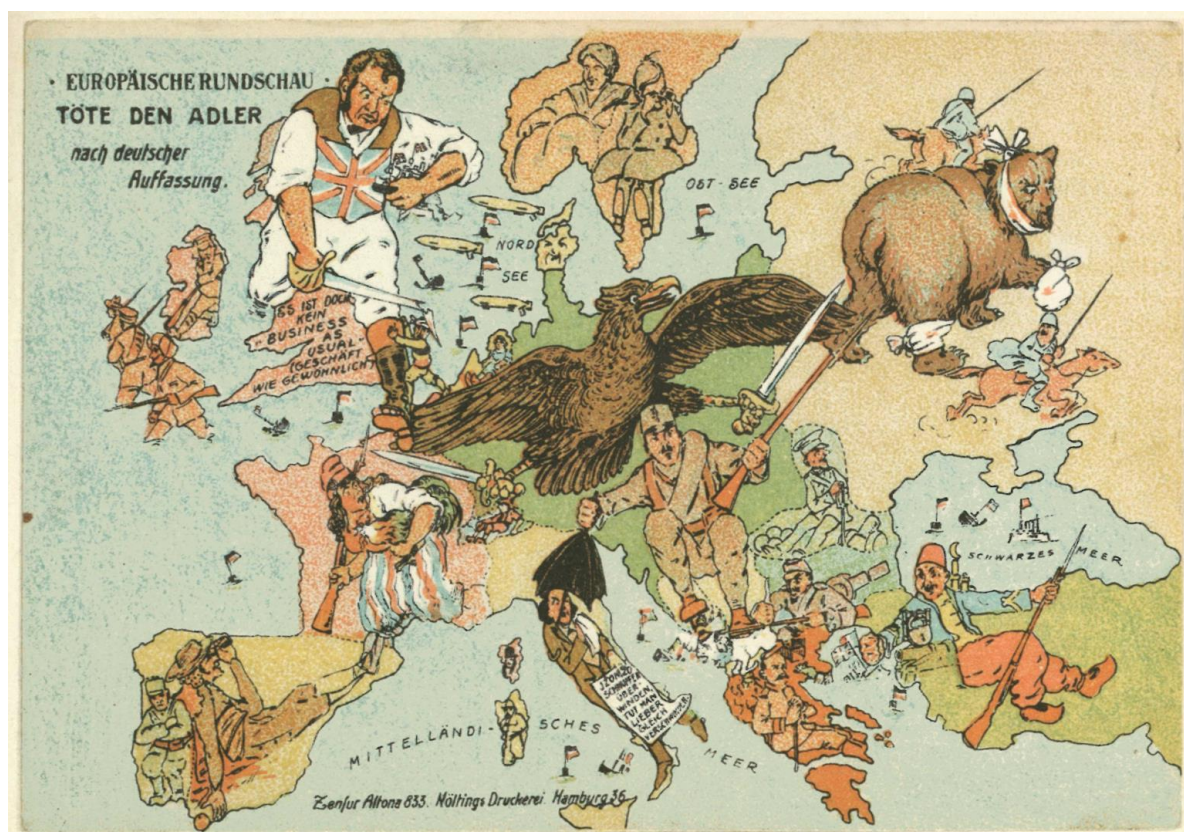
Satirical maps

- Do satirical maps effectively achieve communicating information? More than plain maps?
- To what extent is a satirical map propaganda?
- Does a satirical map show true historic information? If not, what does it show?
- Do you think the use of satirical maps can stimulate learning about history?
- Do you think the satirical maps can be used with any age? If no, for what age is it suitable?
- Do you think the use of satirical maps can increase the attention of the students, more than a 'regular' map?
- Do you think the use of satirical maps can initiate and/or increase a discussion amongst the students?
- Can you think of any further hypotheses about the use of satirical maps? Is it useful for any other reason?

Notes



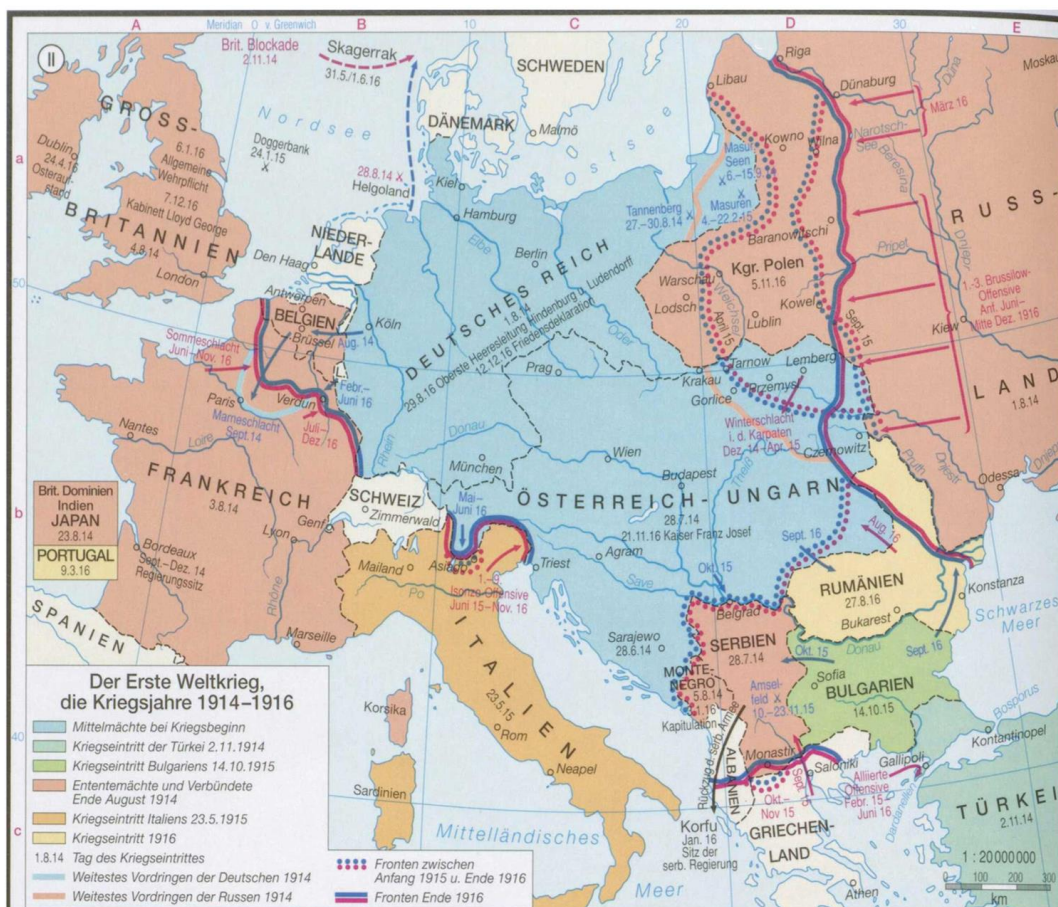
(Map 3) Source: (Soucacos, 2015, p. 221)



(Map 4) Source: (Soucacos, 2015, p. 199)



(Map 7) Source: (PUTZGER Historische Weltatlas. 103rd edn, 2001, pp. 154–155)



(Map 8) Source: (PUTZGER Historische Weltatlas. 103rd edn, 2001, p. 156)



(Map 9) Source: (Santon and MacKay, 2010, p. 221)

Experiment results

- How was the attention in class compared with normally?
- Did you feel the students liked the task? Also the ones normally not interested?
- Did you feel the students were interested in the task?
- Did you feel the students were motivated in the task?
- How was the discussion/talk between students compared with normally? (both maps judged separately)
- Did you feel the students were more engaged in the task with one of the two maps? Is that normally a challenge?
- Do you think the students also know (some of) the stereotypes depicted on these satirical maps?
- How would you preferably use such satirical maps in class for teaching purposes?
In what setting? Central in class or not? Would you use them as an introduction or as a review?
- Do you believe the satirical maps also provides the teacher with relevance, variety, and enjoyment in teaching?

Notes

00:00 The goals of history are written down in the exam document, in which the requirements are stated, i.e. what does the student need to be able to do.

01:55 Over the years, history class has been increasingly standardized. Themes have been standardized too, 10 periods in history is the standard on Dutch schools now. This is good to compare results between schools. It is good to know which student has been taught what!

02:17 Used of historic maps is definitely stated in these requirements. Mostly maps from a historic atlas (traditional maps).

The history class goals are similar in most European countries. In the case of the Netherlands, history is less about Dutch history and more about foreign countries.

08:35 History class should be entertaining, but it is definitely not the main goal!

09:44 **Political cartoons are very often used. Also in exams! In the 70's and 80's more than now, because there were more available.** Besides, the traditional (quantitative) sources were used less.

Learning years are not that important, but it is useful for knowing when what happened and what is responsible for what.

12:22 I find it more useful to work with political cartoons, for they provide a certain perspective on reality. Students have to really think about it, they need to show understanding and their view, i.e. know what are facts and opinions, critical thinking. And it makes you laugh.

The use of powerpoints has been a blessing for showing maps, cartoons, videos and such. It was also fun to prepare. Satirical maps do definitely give the teacher more enjoyment, diversity, and relevance at teaching history.

The maps probably worked well to clarify history. Students saw that.

18:01 **Would be nice to put the two similar maps together.**

Map 1 is plain, "quiet" and Dutch, and therefore the most useful one. Also, it shows the real picture of the first world war. "Number 2 I have used many times and is quite famous", and is useful to show it from the English perspective. If you tell what these dogs stand for, that can be used. Symbolization is useful, however, it is probably necessary to explain it.

Some are too full of details, unclear and are messy overall, thus not that useful in class. Good to show the german perspective though! The maps 4 and 5 should be used together, that would make it interesting (Kill the eagle).

Text is not that important, it is about the figures.

23:39 **There is not much objectivity in any of the maps.** You would expect it from the Dutch a bit, but the title makes it subjective already. It is still an opinion, even though many agree. 25:01 **There is historic information hidden, but how neutral the comic map really is depends on multiple factors.** There is a gradation on how much subjectivity is in the map.

26:08 **There are multiple elements in the map that are useful to discuss:** bulldog, English fleet,

steamroller, etc.. Different teachers know different historical things, so they would for sure stress different elements. That is the freedom of the history teacher.

Which map to use and which elements to stress depends on the class in which you teach! What can this group handle? You start differently in classes with a higher level than in classes with a lower level.

Satirical maps stress other aspects. The opinion is important, cliches are used. They can be used as an introduction, but just as well as at the end. They can fill up a whole class, talking about propaganda. Some maps have much more propaganda in them as others!

If the students like to work with a satirical map or not, is difficult to know. That counts for the normal maps too tough.

"I have used them in class, and talked about subjectivity many times. Just one map, and then I told them about it. I never really let them work with it, I only showed it on the screen. If I did show satirical maps, they did seem more interested, because it is such a peculiar picture. It can work like an eye-opener of how else to make maps".

Hypotheses: The satirical map will probably lead to more discussions in the groups.

Interviewee 2

04/06/2019

Experience: 15 years havo/vwo en last years only higher classes

02:01 Exam requirements are written down. History also involves the link between historic happenings and the here and now. Critical thinking is important, look at fake news!

The exam requirements do not really change, only the subjects change every few years. It is important they can orientate themselves, so the time periods are stressed. Some of these time periods have been assigned to explore deeper.

07:31 "I use a lot of images, 'one image says more than a thousand words'".

You can show everything that you want to with the new technology. Videos, images, all have aspects that you can use to discuss trustworthiness and the motivations of the producer. **Actually, from every source, you can take aspects and discuss them.** The teacher uses the visual aid (beamer) there is, provided by the school. The traditional way that the teacher tells a story is old fashion. All the students until the fourth class have a tablet too! Maps are both used in the books and I show them on the screen.

The standard is that the teacher is not the storyteller anymore. Discussion is definitely wanted. Often we let the students work in their books. History is and stays a storytelling class.

18:32 Super important: explains different points of view. Context-dependency, very related to time-dependency, and critical thinking are most important. Series of facts is less important (!!), even

though that is often asked in the tests.

Maps are often used in class. It is mostly about the content though. One of the satirical maps is actually used in class and even in the exam. **A map is a great tool to explain context-dependency!**

Traditional maps are used to give an overview and as a tool to describe certain battles.

38:29 Would be good to have the two maps of "Kill the eagle" together, to teach the students to closely "look" and to show multiple perspectives. If you just want to explain about coalitions and threats, the single maps are sufficient. If I would give a regular class on WW1 map 1 and 2 would be more fitting. **Which map is most useful depends heavily on the class in which you use it.**

Probably all teachers would rate the two maps that show different perspectives (Kill the eagle) first, for that reason. Depends on the level though. In the lower classes, the historic facts are still most important. In higher classes, the students need to do something with those facts, and that is where these maps can come in.

The maps are all subjective. They show how the situation was at the start of the World War, before they started to fight. "Objectivity does not exist". The observer always observes and opines whatever it sees, therefore subjectivity over the entire observation.

I think satirical maps do more invite the reader to get and stay interested. If you want purely the facts, then a traditional map is better (especially with the colouring). They both serve a goal. Satirical maps are better to use as a summary or conclusion, but can also be used to attract attention at the start of the class and from there refer back to background information. Induction and deduction, both can be done.

1:00:37 History is about constantly zooming in and zooming out, between abstract and specific details.

Variation is really good to include in history!

"Some students are intrinsically interested, others do not care. It seemed the groups that looked at the humorous map were more interested".

The stereotypes that are used in maps and cartoons are often not known by the students. It is the task of the teacher to explain them.

"The facts are objective, but as soon as you interpret them they become subjective for a number of reasons (related to time, cultural background, etc.).

1:15:34 The use of visual tools (among them satirical maps) are fun, provide variance and relevance for teachers too!

Teaches lower classes 1/2/3 mixed level and vmbo 4

Working in groups is better when the class is a bit higher, in the lower classes that does not work that well. A class consists of about 15 minutes of storytelling, the other time is used for exercises.

Discussions are good, but in some classes the learning climate is not suited for it (can lead to too many struggles/verbal fights).

09:21 Just knowing the facts is not sufficient. Knowing what changes, what develops, and why, that is more important.

"I can decide how I fill the class and what tools I use"

The school does recommend the teacher to use every media-tool available, but it is still optional.

"I do definitely use political cartoons, but I do explain them while showing them. I put them in my powerpoints and then ask them 'What do you see here?'"

And I use political cartoons more than satirical maps. Traditional maps are useful to reference too, to have it there while I explain about a certain topic like the Cold War.

"Sometimes traditional maps are analysed first by the students. First to let them have a look and answer questions subsequently, and only afterwards explain it. This is done in the Palestina conflict for instance".

35:38 "The time that a satirical map is used, it is too difficult and the potential is not being exploited. They do ask questions about it (which are often too difficult), but do not explain it well. It could be useful, but only when it is clear that it is good for something and that it supports the student. Often the satirical map is too difficult for the students. If you give it the proper attention it needs, they could learn something from it. But at what cost, because it will take much time".

37:57 The maps that have much symbology will take much time to explain and are thus less usable in class. The two maps that look alike (Kill the eagle) would be nice to use at the same time to show the different point of view, but not one or the other (then they are much less useful). It would be way better to show and work with these satirical maps in higher years. The main reason being the maps to be too busy, too full of details, they already look too difficult.

43:48 "All can be used, but only if you explain them well. Every teacher will use these maps differently, and it will vary per class".

"It is definitely important to mention who the author is and which country the perspective is from".

50:55 Both as an introduction and as a conclusion a satirical map could be useful.

If your goal is to be clear about which countries battle against which, then a traditional map is better because its more obviously portrayed. The satirical map requires more investigation (which can be used in higher classes). The coloring is really important because it is so obvious.

1:05:23 Satirical maps could well increase the interest in history. I do think a satirical map is more appealing than a normal map.

"A satirical map is probably even harder to understand than a political cartoon. The students of the lower classes need much time to find out what figures are used for what countries, and if it takes too long they quit. In those classes, they don't give the exercise much effort or time".

The teacher's job is too explain how much propaganda is included in a map, so students do not see it as a given (objective) truth.

"It is obvious that the traditional map is more neutral and more objective than the satirical map.

"It is very dependant on the method that the school follows if and how often satirical maps are utilized!".

"It can take up a lot of time to use such a satirical map because a lot needs to be explained. That is quite a large drawback".

Interviewee 4

07/06/2019

20 years of experience, all classes (1-6) havo/vwo

02:12 Important is to: notice political developments, notice certain lines through history, in which time they live and how it has come to this situation, critical thinking, speaking out, overall development. History is about people per se and history is a mix of all other high school classes. **Less important is knowing the facts. Historic facts, i.e. when happened what exactly, can just as well be looked up on the ideal tool which is your mobile phone.** It is nice if there is a discussion, but it not that important.

Statements 12-15 are supported by statements 7 and 8. They point to a very similar goal.

"These objectives are probably the same for other countries in western Europe. Of course, every country focusses on their own country too, but overall yes. Our history is mostly about European and later western history. Every country has its own focus, more or less".

> It is therefore obvious these satirical maps are also context-related and would be used more in certain countries than in others.

Digitization has been really useful, mainly in showing and discussing a variety of sources of information. It can all go quicker, faster and you can give more examples.

"I use everything. Everything that is useful I use".

"The students should grow up as a critical citizen who is curious about the world".

"I use maps all the time; the use of maps is necessary and extremely useful in explaining history".

"Kill that Eagle" is obvious by what it wants to say and is, therefore, less useful. Showing both the maps, it is great to use (even in some lower classes). The busy maps show too much information, too much for high school students (although the older the more difficult map you can give them).

13:20 "The clarity and recognizability are most important in a map!".

There are some explanations that just require a map to show, like the English sea-blockade of England so you see the few exits to the north sea.

Traditional maps are used to explain the facts, then afterward you can show a satirical map in which you see a propaganda view. **They complement each other in that.**

"The traditional map is a map to study from, a satirical map is a map to ask questions about. That is the main difference". With a satirical map you can test the understanding. I believe in the combination".

Satirical maps are subjective and propaganda per se, and some are obviously more subjective than others. It is showing how people felt it at that time, not how it actually was (only in some instances).

"Satirical maps can be used only if the political situation has already been explained. If you give it to the students at the start, you should keep it simple and general".

All the symbology needs to be explained, The students do not know the used figures anymore, that symbology has been lost. 100 years ago they were known, but nowadays that knowledge is gone.

"Discussion entails interest and prior knowledge. It depends on the students if there is discussion, if they can bring those elements forward".

"The map is the framework with which you structure the political relationships". "When you have seen the perception of a certain side (pro-alliance or otherwise), you could explain it by using a traditional map. And then you have them on the level of thinking on which you want them to be. Reliability, representativeness, subjectivity, and then you can go on".

Interviewee 5

19/06/2019

Researcher at ILO since 2008 and before a history teacher havo/vwo lower and higher classes.

The exam program syllabus defines all the objectives.

History is extremely context-related and thus in every country, the approach can be different. However, most objectives are similar.

"History class is still a 'verbal' class in which the teacher tells and the students listen. But also important, I find, is that students have a grip on what they learn. A huge constraint here is that teachers only have around 25 classes per year in which they need to explain and work at multiple time-periods".

"Very important in history is the explanation of abstract concepts, and that you discuss those with the students and help them understand those. Useful with that is the use of videos and other visual tools. Digitalization has brought many possibilities to concretize these concepts".

Class discussions form a prerequisite to get to learning. But actually, working in groups is even more useful. So, give the students an exercise to work with, and at the end, you can talk about it together with the whole class. That is when you get to a higher level of understanding about what the findings tell you about what you learn from e.g. reviewing a source). This is the core of what good history class does.

History is not a discipline in which there is just one right story, there are always multiple perspectives.

"21st-century skills: Explains multiple perspectives ('multi-perspectivity'), which is an umbrella-term

including critical thinking, analytical thinking, and creative thinking. These goals can be applied throughout education as a whole, not just for history. Therefore, when applied to history, these concepts get a certain meaning (in this case, for instance, knowing what trustworthy information is).

> Look critically to sources

> And the use of a variety of sources are super important (maps, cartoons, etc.)

"I do think that remembering the facts are the least important goal here. You can just as well look on Wikipedia for that".

Maps are great to establish an overview of the era. Where were which countries, where were its borders, etc.

Students need to be supported more, the younger they are and the lower the level is.

But looking at maps and graphical illustrations are important for every student (it makes the story concrete! In that case it may even be more important to show and discuss maps in the lower classes).

As long as symbolism plays a big role, it may be less useful, because students do not possess the knowledge for that. "It is really dependent on what the map wants to tell, and what goal the user (i.e. teacher) has". You can use the map as a starting point by saying "Guys, what do we see here?", and also at the end to apply some concepts by saying "Do you recognize these in the map?".

"The two maps of 'Kill the eagle' would be really nice to show the students and to make the comparison and talk about their differences. Two different perspectives in a map so similar would be nice to work with..".

Map number 5 has been used in history books and is recognized as an understandable source. It is relatively clear, not that busy.

> **Number one criteria is what can be seen on the map and if that what can be seen is clear and understandable.** Apart from that, it depends of what the teacher wants to show with the map (some figures may prove useful, others not).

With satirical maps like (most of) these, you do really nice make use of sources to achieve these objectives (critical thinking, explaining multiple perspectives, analytical thinking, the difference between opinions and facts, make students work).

The satirical maps are very subjective. Adding the source is therefore very important and should be discussed in class.

With the use of satirical maps, you can achieve other education objectives as with regular 'traditional' maps. All depends on the teacher's goal at that moment though, that decides if a satirical or regular map is more useful.

10 years, class 11, 12, 13, Berufsoberschule (BOS)

After completing the 13th class, the students have the same level as when you would complete gymnasium. With that, one can go to university.

"It is important that the students know a lot (of facts), but history class is mostly about shape critical citizens. Critical against politic and media. In our school many students believe fake news and conspiracy theories. Then I have to teach them how they can come to an opinion that is not polluted by fake news. Critical and analytical thinking is therefore very important".

There are definitely important differences throughout Europe in how history is taught. "When I was a child, we actually often had to learn facts by heart. We had one notebook, which we just had to learn by heart. The modern didactic doesn't want that anymore (you wouldn't remember most of those facts anyway). Not what has happened, but how it happened. There has been a shift to understanding historic happenings, that is important now. Competence, and not just knowing! Probably that is not everywhere in Europe the same. Probably there is a difference in Western-Europe and the rest".

"I do use videos (youtube), because the students use that too and it is therefore familiar for them. Also because I can show how I use the information from Youtube, which does not always correspond to reality (much manipulation on there!). The beamer here is extremely useful, I also show many maps on there".

"We do group work in nearly every class. A teacher who just talks and talks, that is somewhat old fashion. A diverse set of activities in class is important".

Map 1 can be used. Especially to show how enemies are portrayed, like the Russian monster. The symbols are different to recognize, but the face expressions can prove useful. "We work often with caricatures and this fits in there. Also, it is a good example to show how manipulation was apparent at that time.

Map 2 will be more liked by the students, because of the nice colors and drawings. But it will be less usable in teaching. This map also has some great aspects that I can explain though".

Map 3 is relatively neutral, and is therefore less usable. "I could find aspects that I would be able to explain and ask questions from, but the other maps have more".

Map 4 should be used together with map 2. "These together are great. Showing both, I can also explain certain proceedings in the war. And I show both perspectives, which is what a history teacher should".

Map 5 looks good too, can use that well.

Map 6 is similar to map 1, good to use.

> 1, 2 and 4 are best.

"I use maps mainly when discussing the first world war and thereby to show contemporary issues. With maps I can show how Germany has changed, how the borders have changed, and how it developed until now. Because actions back then have had an influence on our history until today. It is very important to know what is wrong today, where the roots are and how it developed over the

years. Much, if not all, what can be seen today has started in history".

"I use a traditional map as a tool at the side, to refer to. Satirical maps are better used to ask questions about, to make sure the student understands the conflicts or issues. The students do not get curious when seeing a satirical map, because without background knowledge they do not know how to deal with it".

The students are always hard-working, so there was no difference in when doing the experiment as when a normal hour of class takes place. **They did not know the caricatures, those things you have to explain.**

"You could use satirical maps pretty early, like from 10 years old. To explain how one's opinion is being manipulated, that it happens and why it happens".

All maps are very subjective, there is no objectivity to be found. Even the Dutch map that looks relatively objective, is not. Who fights against who, that might be the only objective aspect of a satirical map. But even the work with colors in traditional maps show signs of subjectivity.

"I liked the idea of satirical maps being discussed and answered questions about in groups. I would prefer that over showing it on the screen. In that way, some who know or understand can explain it to those who do not understand it yet. **It is a good exercise in staying engaged**".

Interviewee 7

10/07/2019

Gymnasium in several classes, 7th, 9th and 11th class, since 2009 11-13 at OBS

The students have had more practical experiences from their previous schools (Realschule, Mittelschule) and as such lack analytical thinking which becomes important at the OBS. In their previous education, it is not common to use political cartoons for instance. At OBS they get more scientific and start with critical thinking.

"I notice students cannot engage in text reading much, so I do that a lot. I use some videos and caricatures but rarely use technical tools, for they use that in their free time already. I talk as little as possible and try to let the students work".

"I find it very important to show prejudices and to let the students feel how to deal with that. Today, in our society, knowing what are reliable data may be one of the most important things to discuss". I however use very little satirical maps.

"If I use maps (which is very rare), I use traditional maps. To me, it is more important to show how such a catastrophe can happen, with the focus on values of the time. Now I teach about Israel and there it is useful to show a map to make the students familiar with the area. Traditional maps are also useful to show how borders have shifted, where the DDR started and such".

Map 1

"One needs a lot of prior knowledge to use and understand these satirical maps. I can, therefore, understand to use them in the end, to show the opinion about what is depicted from several

perspectives. Symbology is difficult and you would need a lot of time to make it worth it. The question is also if it will be useful for what you want to accomplish".

Map 2

"Is a lot easier to use, but still needs much prior knowledge to interpret it correctly. For a test it is probably to complex, however to finish a lesson it can prove to be really good. What is useful though is the title and the author, that misses in many of the other maps".

Map 3

"When you recognize the different poses, you could analyze it pretty good. **If you take a selection, then you can use it well.** What is difficult in this map is that the figures are the countries. The countries are therefore more difficult to recognize".

Map 4

"Would be good as a contrast to map 2! The figures are relatively easy to recognize.
With the both of them, the students need to critically think and need to take into consideration multiple perspectives. Thus as a deeper form of thinking about history!

Map 5

Satirical maps are useful anyway in showing the perspective of a certain country on a topic. Here again, it is good there is a title that already explains something. It would be nice if the text would be readable.

Map 6

Black and white makes it difficult, a big disadvantage. Because it doesn't show which perspective the map takes, it is more difficult to understand for the students. "I would not use this map".

"Our classes are focussed on Germany's history (including in European context), there is hardly any time to spend on analyzing all those figures in a satirical map. Most are not relevant either. Time is a luxury in education and efficient work is often necessary. You will not reach what you want in this small amount of time. If you would have a project with many hours, then you can do that".

Traditional maps are better to use as an introduction, to give a brief overview of the situation and the location. The satirical maps more as a deepening of the understanding, a test at the end, when the students have already learned the facts. Also possible is to give the satirical map so that the students raise questions about the map.

"Because satirical maps are complex, the first reaction I expect is rejection. You have to have some good questions to make it work. The traditional maps are accepted immediately because they are so ubiquitous".

"The humour in caricatures are a different "old" kind of humour, and the students do normally not like it. It can be useful however in showing what satire is (important in today's world of fake news) and useful for the students to have the competence in recognizing that (analytical thinking). I like diversity in teaching tools as well, just like the students.

Note:

In practical history class there is very little time, very few classes, too little too explain much of a satirical map (which is surely needs). Though, small selections might work well.
Also, is it therefore better to use them at the end of a class?

Class 1

After asking, the text boxes are opened

Some give their opinion to others

After three minutes, all are still interested

There is no difference in the amount of discussion..

They are talking with each other, about whatever (also unrelated subjects)

"They made it very nice", says a student about the satirical map

After 4 minutes, there is some more discussion. **They do help each other (with the satirical map mostly) in finding out what it means.**

5 minutes in, a satirical map group has given up and are distracted by other things (introduction notes) > could be looking at the goal again though...

They do well in following the assignment, they read and re-read the instructions.

Those who are not interested now don't do anything anymore. Others who are interested also involve other students in their group (with questions) > personal traits thus important.

Introduction note is quite distracting.. > discussion/limitation.

After about 6 minutes most attention has faded away and the students talk about everything other than the assignment. Two groups of each map type are still going strong, one of each is doing something else.

Class 2

Some groups are just learning, others are also talking.

They open the covers to learn, everyone is participating (or at least try).

The students are interested in both type of maps, no real difference there.

There is discussion in the groups, they note the plain map is more neutral.

After 4 minutes, one student is done.

No real preference for any map type is noticeable

After 6 minutes, covers are still being opened and investigated. More people talk, but that may be because the teacher left the classroom.

They talk about who is neutral and who is not, according to the satirical map.

After 8 minutes, the attention has decreased. They look at other maps in the classroom, to see differences probably. Some groups are still going strong though. And within the groups, some are finished, some continue.

Class 3

Everyone is quite interested. More interested than the Dutch classes.

There is again no real difference noticeable in what group is more into it.

They all do talk about it, but mainly those looking at the plain map.

They are really focussing on what to learn from it and ask questions accordingly (they really want to do a good job and follow the assignment).

In one satirical group, the students explain to each other what they think they see.

Some criticism is given on the Eurocentric vision of both maps, even though in Asia and Africa the war also played.

Note: What is striking is the want to cooperate with teammates in trying to remember the information on the maps. This does support discussion. But is it just for getting better results with less workload per student?

After 7 minutes, 5 out of 6 groups are still trying to learn the map. One (plain map) group has given up. **Some students continue to learn, others do not > personal traits again.**

Class 4

Both maps are being viewed well, but there is not much discussion.
The plain map and satirical map now do both get some discussion going.
Again, it seems mostly that they just wanna participate well for me, the researcher.

Note: Reason for adding the facts and learning objectives is not just for testing their deeper understanding on a later date, but also to continue being interested in the map and to continue looking at it.

After almost three minutes there is still a discussion. It seems the discussion gets going once everyone has had a good look at the actual assignment, the map, and the information boxes. After almost 5 minutes, everyone is still learning, and discussion has diminished again (maybe the fact that only little time is left?).

One of the groups talk with each other, but it seems that would be the case in any circumstance and not just because it is stimulated in this exercise.

Note: One student explains his view to the rest of the group (plain map group). This is observed more often and can mean that this way of learning (in groups) stimulates discussion, involves the ones that are not that interested, and is extra useful for the ones that are interested (because they explain their fellow students, and thereby learn too).

Both the plain and satirical map groups show interest in the map and are learning as good as they can.

Class 5

They seem to mainly be busy learning the facts and are not really comparing the maps (which was expected to be happening though).

Note: The assignment made the students aware of a test. This is probably why they spend more time learning individually as they do discussing the map they need to learn.

They talk mainly about the facts than about the map itself (e.g. how it looks).

The satirical map is by one group said to be showing too much "I will not be able to remember all this". There, they feel better off with the plain map.

E. Statistics

Satisfaction

SATISFACTION STATEMENTS	Map	Mean Score (1-5)	SD	N
(1) 1. The map is interesting	Satirical	3.98	0.67	62
	Plain	3.81	0.97	62
	Overall	3.90	0.83	124
(2) 2. The map makes learning history more entertaining	Satirical	3.77	0.97	62
	Plain	3.73	1.07	63
	Overall	3.75	1.01	125
(3) 7. I would like to see a similar map more often	Satirical	3.44	1.03	62
	Plain	3.77	0.95	62
	Overall	3.60	1.00	124
(4) 10. I find this map useful for studying about WW1	Satirical	3.65	1.13	62
	Plain	4.11	0.77	62
	Overall	3.88		124
(5) 14. The map does not contain too much information	Satirical	3.65	1.06	62
	Plain	3.60	1.20	63
	Overall	3.62	0.99	125
(6) 16. I would recommend students learning about WW1 to look at this map	Satirical	3.82	0.82	62
	Plain	3.98	0.87	63
	Overall	3.90	1.13	125
(7) 5. I would like to see a similar map more often (than is now the case) in history class	Satirical	3.27	1.02	37
	Plain	3.74	0.82	39
	Overall	3.51	0.85	76
(8) 6. I would like to see the map again	Satirical	3.24	1.06	37
	Plain	3.51	0.78	41
	Overall	3.38	0.95	78
(9) 11. The map did not contain too much information	Satirical	3.27	1.04	37
	Plain	3.60	0.87	40
	Overall	3.44	0.93	77
<i>Average level of satisfaction</i>	<i>Satirical</i>	<i>3.57</i>	-	-
	<i>Plain</i>	<i>3.76</i>	-	-
	<i>Overall</i>	<i>3.67</i>	-	-

SATISFACTION STATEMENTS (SATIRICAL MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 1. The map is interesting	Dutch	4.16	0.63	32
	German	3.80	0.66	30
	Regular	4.04	0.65	27
	Alternative	3.94	0.68	35
(2) 2. The map makes learning history more entertaining	Dutch	3.75	1.02	32
	German	3.80	0.92	30
	Regular	4.00	0.73	27
	Alternative	3.60	1.09	35
(3) 7. I would like to see a similar map more often	Dutch	3.56	1.19	32
	German	3.30	0.84	30
	Regular	3.78	0.70	27
	Alternative	3.17	1.18	35
(4) 10. I find this map useful for studying about WW1	Dutch	3.59	1.21	32
	German	3.70	1.06	30
	Regular	3.93	0.83	27
	Alternative	3.43	1.29	35
(5) 14. The map does not contain too much information	Dutch	3.97	0.59	32
	German	3.30	1.32	30
	Regular	3.26	1.13	27
	Alternative	3.94	0.91	35
(6) 16. I would recommend students learning about WW1 to look at this map	Dutch	3.84	0.81	32
	German	3.80	0.85	30
	Regular	3.96	0.76	27
	Alternative	3.71	0.86	35
(7) 5. I would like to see a similar map more often (than is now the case) in history class	Dutch	3.44	1.03	16
	German	3.14	1.01	21
	Regular	3.59	0.91	22
	Alternative	2.80	1.01	15
(8) 6. I would like to see the map again	Dutch	3.13	1.09	16
	German	3.33	1.06	21
	Regular	3.77	0.92	22
	Alternative	2.47	0.74	15
(9) 11. The map did not contain too much information	Dutch	3.69	0.87	16
	German	2.95	1.07	21
	Regular	2.95	1.00	22
	Alternative	3.73	0.96	15

SATISFACTION STATEMENTS (PLAIN MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 1. The map is interesting	Dutch	3.63	0.98	32
	German	4.00	0.95	30
	Regular	4.07	0.77	28
	Alternative	3.59	1.08	34
(2) 2. The map makes learning history more entertaining	Dutch	3.63	1.07	32
	German	3.84	1.07	31
	Regular	4.24	0.74	29
	Alternative	3.29	1.12	34
(3) 7. I would like to see a similar map more often	Dutch	3.75	0.92	32
	German	3.80	1.00	30
	Regular	3.97	0.82	29
	Alternative	3.61	1.03	33
(4) 10. I find this map useful for studying about WW1	Dutch	4.19	0.74	32
	German	4.03	0.81	30
	Regular	4.10	0.82	29
	Alternative	4.12	0.74	33
(5) 14. The map does not contain too much information	Dutch	3.41	1.13	32
	German	3.81	1.25	31
	Regular	3.52	1.35	29
	Alternative	3.68	1.07	34
(6) 16. I would recommend students learning about WW1 to look at this map	Dutch	3.88	0.79	32
	German	4.10	0.94	31
	Regular	4.07	0.75	29
	Alternative	3.91	0.97	34
(7) 5. I would like to see a similar map more often (than is now the case) in history class	Dutch	3.53	0.83	15
	German	3.88	0.80	24
	Regular	3.80	0.82	25
	Alternative	3.64	0.84	14
(8) 6. I would like to see the map again	Dutch	3.40	0.99	15
	German	3.58	0.64	26
	Regular	3.65	0.69	26
	Alternative	3.27	0.88	15
(9) 11. The map did not contain too much information	Dutch	3.60	0.74	15
	German	3.60	0.96	25
	Regular	3.64	0.76	25
	Alternative	3.53	1.06	15

Effectiveness

EFFECTIVENESS STATEMENTS	Map	Mean Score (1-5)	SD	N
(1) 3. I understand the map	Satirical	3.84	0.73	62
	Plain	4.33	0.72	63
	Overall	4.09	0.76	125
(2) 8. The map helps me to remember the historic facts	Satirical	3.11	1.12	62
	Plain	3.83	1.04	63
	Overall	3.47	1.13	125
(3) 9. The colours of the map help me to remember the historical facts	Satirical	2.84	1.30	62
	Plain	3.90	1.07	63
	Overall	3.38	1.30	125
Statements in follow-up questionnaire:				
(4) 1. I still remember how the map looked like	Satirical	3.43	0.96	37
	Plain	3.76	0.73	41
	Overall	3.60	0.86	78
(5) 7. The map has helped me to remember the historical facts	Satirical	2.97	1.17	37
	Plain	3.39	0.92	41
	Overall	3.19	1.06	78
(6) 8. The colours of the map have helped me to remember the historical facts	Satirical	2.73	1.15	37
	Plain	3.51	1.05	41
	Overall	3.14	1.16	78
(7) 14. I know more about the WW1 now than I did before working with the map	Satirical	2.76	1.14	37
	Plain	2.95	1.09	41
	Overall	2.86	1.11	78
Average level of effectiveness	Satirical	3.10	-	-
	Plain	3.67	-	-
	Overall	3.39	-	-

EFFECTIVENESS STATEMENTS (SATIRICAL MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 3. I understand the map	Dutch	4.00	0.62	32
	German	3.67	0.80	30
	Regular	3.63	0.56	27
	Alternative	4.00	0.80	35
(2) 8. The map helps me to remember the historic facts	Dutch	3.06	1.16	32
	German	3.17	1.09	30
	Regular	3.37	1.01	27
	Alternative	2.91	1.17	35
(3) 9. The colours of the map help me to remember the historical facts	Dutch	2.50	1.30	32
	German	3.20	1.21	30
	Regular	3.15	1.20	27
	Alternative	2.60	1.33	35
(4) 1. I still remember how the map looked like	Dutch	3.94	0.44	16
	German	3.05	1.07	21
	Regular	3.14	0.99	22
	Alternative	3.87	0.74	15
(5) 7. The map has helped me to remember the historical facts	Dutch	3.19	1.11	16
	German	2.81	1.21	21
	Regular	3.27	1.08	22
	Alternative	2.53	1.19	15
(6) 8. The colours of the map have helped me to remember the historical facts	Dutch	2.81	1.17	16
	German	2.67	1.15	21
	Regular	2.82	1.14	22
	Alternative	2.60	1.18	15
(7) 14. I know more about the WW1 now than I did before working with the map	Dutch	2.69	1.08	16
	German	2.81	1.21	21
	Regular	3.09	1.11	22
	Alternative	2.27	1.03	15

EFFECTIVENESS STATEMENTS (PLAIN MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 3. I understand the map	Dutch	4.41	0.56	32
	German	4.26	0.86	31
	Regular	4.34	0.61	29
	Alternative	4.32	0.81	34
(2) 8. The map helps me to remember the historic facts	Dutch	3.78	0.97	32
	German	3.87	1.12	31
	Regular	4.00	1.04	29
	Alternative	3.68	1.04	34
(3) 9. The colours of the map help me to remember the historical facts	Dutch	3.72	1.08	32
	German	4.10	1.04	31
	Regular	4.07	0.96	29
	Alternative	3.76	1.16	34
(4) 1. I still remember how the map looked like	Dutch	3.80	0.86	15
	German	3.73	0.67	26
	Regular	3.69	0.84	26
	Alternative	3.87	0.52	15
(5) 7. The map has helped me to remember the historical facts	Dutch	3.13	1.13	15
	German	3.54	0.76	26
	Regular	3.46	0.90	26
	Alternative	3.27	0.96	15
(6) 8. The colours of the map have helped me to remember the historical facts	Dutch	3.20	1.15	15
	German	3.69	0.97	26
	Regular	3.73	0.96	26
	Alternative	3.13	1.13	15
(7) 14. I know more about the WW1 now than I did before working with the map	Dutch	2.80	1.08	15
	German	3.04	1.11	26
	Regular	3.12	1.14	26
	Alternative	2.67	0.98	15

Additional statements about effectiveness	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 17. The satirical figures on the satirical map help me to remember the historic facts	Dutch	3.16	0.99	32
	German	3.03	1.25	30
	Regular	3.30	1.17	27
	Alternative	2.94	1.06	35
	Overall	3.10	1.11	62
(2) 9. The satirical figures on the satirical map have helped me to remember the historical facts	Dutch	3.44	0.89	16
	German	2.76	1.22	21
	Regular	3.09	1.02	22
	Alternative	3.00	1.31	15
	Overall	3.05	1.13	37
(3) 17. The place names on the plain map help me to remember the historic facts	Dutch	3.59	1.04	32
	German	3.74	0.96	31
	Regular	3.55	1.06	29
	Alternative	3.76	0.96	34
	Overall	3.67	1.00	63
(4) 9. The place names on the plain map have helped me to remember the historic facts	Dutch	2.40	0.74	15
	German	3.54	0.81	26
	Regular	3.27	0.96	26
	Alternative	2.87	0.92	15
	Overall	3.12	0.95	41
(5) 10. I still know which figures from the satirical map represented which historical facts	Dutch	3.19	0.83	16
	German	2.10	1.00	21
	Regular	2.55	1.10	22
	Alternative	2.60	1.06	15
	Overall	2.57	1.07	37

Efficiency

Efficiency statements in questionnaire:	Map	Mean Score (1-5)	SD	N
(1) 5. The added text fields are needed to understand the map	Satirical	3.71	1.19	62
	Plain	3.56	1.15	63
	Overall	3.63	1.17	125
(2) 12. I would have liked to get more time to look at the map	Satirical	3.34	1.35	61
	Plain	3.27	1.05	63
	Overall	3.31	1.20	124
(3) 13. I would have liked to get more explanations about the map	Satirical	3.11	1.10	61
	Plain	2.92	1.01	62
	Overall	3.02	1.06	123
(4) 15. I have not been able to study the whole map	Satirical	2.71	1.16	62
	Plain	2.69	1.05	62
	Overall	2.70	1.10	124
Statements in follow-up questionnaire:				
(5) 2. I would have liked to get more explanations about the map	Satirical	3.16	0.96	37
	Plain	3.13	0.72	40
	Overall	3.14	0.84	77
(6) 3. Without the text boxes this map would have been useless	Satirical	3.16	1.07	37
	Plain	2.93	1.01	41
	Overall	3.04	1.04	78
(7) 12. I would have liked to get more time to look at the map	Satirical	3.59	1.19	37
	Plain	3.56	1.00	41
	Overall	3.58	1.09	78
<i>Average level of efficiency</i>	Satirical	3.25	-	-
	Plain	3.15	-	-
	Overall	3.20	-	-

EFFECTIVENESS STATEMENTS (SATIRICAL MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 5. The added text fields are needed to understand the map	Dutch	3.03	1.12	32
	German	4.43	0.77	30
	Regular	4.15	1.13	27
	Alternative	3.37	1.14	35
(2) 12. I would have liked to get more time to look at the map	Dutch	2.84	1.19	32
	German	3.90	1.32	29
	Regular	4.27	1.00	26
	Alternative	2.66	1.16	35
(3) 13. I would have liked to get more explanations about the map	Dutch	2.84	1.25	32
	German	3.41	0.82	29
	Regular	3.31	0.97	26
	Alternative	2.97	1.18	35
(4) 15. I have not been able to study the whole map	Dutch	2.37	1.18	32
	German	3.07	1.05	30
	Regular	3.44	0.97	27
	Alternative	2.14	0.97	35
(5) 2. I would have liked to get more explanations about the map	Dutch	2.75	0.86	16
	German	3.48	0.93	21
	Regular	3.09	1.11	22
	Alternative	3.27	0.70	15
(6) 3. Without the text boxes this map would have been useless	Dutch	2.56	0.89	16
	German	3.62	0.97	21
	Regular	3.09	1.23	22
	Alternative	3.27	0.80	15
(7) 12. I would have liked to get more time to look at the map	Dutch	3.19	1.11	16
	German	3.90	1.18	21
	Regular	4.09	1.02	22
	Alternative	2.87	1.06	15

EFFECTIVENESS STATEMENTS (PLAIN MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 5. The added text fields are needed to understand the map	Dutch	3.19	1.33	32
	German	3.94	0.77	31
	Regular	3.55	0.95	29
	Alternative	3.56	1.31	34
(2) 12. I would have liked to get more time to look at the map	Dutch	3.06	0.95	32
	German	3.48	1.12	31
	Regular	3.72	1.07	29
	Alternative	2.88	0.88	34
(3) 13. I would have liked to get more explanations about the map	Dutch	2.94	0.91	32
	German	2.90	1.12	30
	Regular	2.93	1.02	28
	Alternative	2.91	1.03	34
(4) 15. I have not been able to study the whole map	Dutch	2.72	1.14	32
	German	2.67	0.96	30
	Regular	3.03	0.87	29
	Alternative	2.39	1.12	34
(5) 2. I would have liked to get more explanations about the map	Dutch	3.07	0.96	15
	German	3.16	0.55	25
	Regular	3.19	0.75	26
	Alternative	3.00	0.68	14
(6) 3. Without the text boxes this map would have been useless	Dutch	2.73	1.10	15
	German	3.04	0.96	26
	Regular	3.15	1.01	26
	Alternative	2.53	0.92	15
(7) 12. I would have liked to get more time to look at the map	Dutch	3.27	1.10	15
	German	3.73	0.92	26
	Regular	3.73	0.83	26
	Alternative	3.27	1.22	15

Additional efficiency statements	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 18. The legend is necessary to understand the plain map	Dutch	3.97	0.97	32
	German	3.40	1.10	30
	Regular	3.64	0.99	28
	Alternative	3.74	1.14	34
	Overall	3.70	1.06	62
(2) 10. The legend was necessary to understand the plain map	Dutch	3.20	0.94	15
	German	3.19	0.90	26
	Regular	3.15	0.78	26
	Alternative	3.27	1.10	15
	Overall	3.20	0.90	41
(3) 18. I know which satirical figures represent which countries in the satirical map	Dutch	3.69	1.23	32
	German	3.03	1.10	30
	Regular	2.63	1.01	27
	Alternative	3.94	1.03	35
	Overall	3.37	1.20	62

Extra

Statements about objectivity and subjectivity	Map	Mean Score (1-5)	SD	N
(1) 11. The map is reliable	Satirical	3.03	0.94	62
	Plain	4.13	0.68	63
	Overall	3.58	0.99	125
(2) 19. The map is objective	Satirical	3.00	1.28	61
	Plain	4.16	0.88	61
	Overall	3.58	1.24	122
(3) 20. The map is subjective	Satirical	3.48	1.04	61
	Plain	2.20	1.12	61
	Overall	2.84	1.26	122
(4) 21. The map is propaganda	Satirical	2.89	1.19	62
	Plain	1.58	0.80	62
	Overall	2.23	1.20	124
(5) 22. The author of the map displays his own vision	Satirical	3.60	1.01	61
	Plain	1.82	0.89	61
	Overall	2.70	1.30	122
(6) 23. The author of the map shows real events that took place in WW1	Satirical	3.70	0.91	60
	Plain	4.34	0.85	62
	Overall	4.02	0.93	122

Statements about objectivity and subjectivity (SATIRICAL MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 11. The map is reliable	Dutch	2.75	1.11	32
	German	3.33	0.61	30
	Regular	3.33	0.62	27
	Alternative	2.80	1.08	35
(2) 19. The map is objective	Dutch	2.39	1.20	31
	German	3.63	1.03	30
	Regular	3.70	0.82	27
	Alternative	2.44	1.31	34
(3) 20. The map is subjective	Dutch	3.71	1.22	31
	German	3.23	0.77	30
	Regular	3.04	0.85	27
	Alternative	3.82	1.06	34
(4) 21. The map is propaganda	Dutch	3.38	1.16	32
	German	2.37	1.00	30
	Regular	2.22	0.80	27
	Alternative	3.40	1.19	35
(5) 22. The author of the map displays his own vision	Dutch	3.66	1.18	32
	German	3.52	0.78	29
	Regular	3.11	0.93	27
	Alternative	3.97	0.90	34
(6) 23. The author of the map shows real events that took place in WW1	Dutch	3.63	0.75	32
	German	3.79	1.07	28
	Regular	3.88	0.95	26
	Alternative	3.56	0.86	34

Statements about objectivity and subjectivity (PLAIN MAP)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 11. The map is reliable	Dutch	4.38	0.61	32
	German	3.87	0.67	31
	Regular	3.83	0.60	29
	Alternative	4.38	0.65	34
(2) 19. The map is objective	Dutch	4.58	0.50	31
	German	3.73	0.98	30
	Regular	3.68	0.90	28
	Alternative	4.58	0.61	33
(3) 20. The map is subjective	Dutch	1.68	0.91	31
	German	2.73	1.08	30
	Regular	2.29	0.98	28
	Alternative	2.12	1.24	33
(4) 21. The map is propaganda	Dutch	1.63	0.87	32
	German	1.53	0.73	30
	Regular	1.64	0.87	28
	Alternative	1.53	0.75	34
(5) 22. The author of the map displays his own vision	Dutch	1.56	0.72	32
	German	2.10	0.98	29
	Regular	2.19	0.96	27
	Alternative	1.53	0.71	34
(6) 23. The author of the map shows real events that took place in WW1	Dutch	4.53	0.76	32
	German	4.13	0.90	30
	Regular	4.21	0.79	28
	Alternative	4.44	0.89	34

Since the last time I saw the map... (SATIRICAL)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 15. I have been thinking of the map for quite some time	Dutch	2.50	1.21	16
	German	2.05	0.97	21
	Regular	2.45	1.06	22
	Alternative	1.93	1.10	15
(2) 16. I have talked about the map with people from my class	Dutch	2.38	1.15	16
	German	2.29	1.10	21
	Regular	2.55	1.14	22
	Alternative	2.00	1.00	15
(3) 17. I have talked about the map with people outside class	Dutch	2.31	1.20	16
	German	1.95	1.02	21
	Regular	2.23	1.15	22
	Alternative	1.93	1.03	15
(4) 18. I have tried to find more examples of these kind of maps	Dutch	1.81	1.11	16
	German	1.57	0.60	21
	Regular	1.86	0.94	22
	Alternative	1.40	0.63	15

Since the last time I saw the map... (PLAIN)	Classes / Experiment	Mean Score (1-5)	SD	N
(1) 15. I have been thinking of the map for quite some time	Dutch	2.73	1.22	15
	German	2.50	0.99	26
	Regular	2.65	1.02	26
	Alternative	2.47	1.19	15
(2) 16. I have talked about the map with people from my class	Dutch	2.20	1.08	15
	German	2.46	0.95	26
	Regular	2.65	0.89	26
	Alternative	1.87	0.99	15
(3) 17. I have talked about the map with people outside class	Dutch	1.73	0.70	15
	German	2.12	1.03	26
	Regular	2.00	0.89	26
	Alternative	1.93	1.03	15
(4) 18. I have tried to find more examples of these kind of maps	Dutch	1.67	0.82	15
	German	1.96	0.96	26
	Regular	2.08	0.98	26
	Alternative	1.47	0.64	15

