On the Question of How Web 2.0 Features Support Critical Map Reading

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Abstract

Web 2.0 technologies enable users to produce and distribute their own content. The variety of motives for taking part in these communication processes leads to considerable differences in levels of quality. While social media contexts have developed features for evaluating contributions, user-generated maps frequently do not offer tools to question or examine the origin and elements of user-generated content. This paper discusses the effects of the integration of Web 2.0 features with web maps for critical and reflective map reading. The initial findings of a content analysis study of user-generated web maps show evidence of a lack of assessment tools. Based on this, I characterize a framework of debatable maps that might encourage critical map reading.

Keywords:

GeoWeb 2.0, Neogeography, critical map reading, Geomedia Literacy, ICT Literacy

1 Introduction

Today web-mapping tools enable users without any formal training to produce, edit and share their own maps. Users' motives and purposes are manifold: maps are created for sporting and outdoor activities, sharing favourite places, argumentation by political or social movements, planning and decision making, as well as marketing and other commercial interests (Coleman et al., 2009; Hoffmann, 2014; Moseme & van Elzakker, 2012). Basically, all these maps are made from a specific perspective and provide the information the authors want us to see.

Consequently, these user-generated maps provide the same opportunities and face the same challenges as other Web 2.0 contents. As anyone is able to become a communicator, recipients are required to check and elaborate the quality of the information. At the same time, we have to consider different traditions and practices between the perception of maps and, for instance, social media contexts. Because cartography has been a specialized discipline for a long time, recipients are used to seeing maps as non-controversial representations of space (Monmonier, 1991; Schneider, 2006). Of course, we know that no map will be totally objective, but the discussion about the construction of meanings and

power relations within cartography is still mostly an academic concern (Crampton, 2001; Crampton & Krygier, 2005; Glasze, 2009; Harley, 1989; Wood, 1992).

The rise of neogeographical practices intensifies the challenge to deal with visualizations that are made for specific purposes and interests. Users are required to overcome traditional map-reading habits by including some basic questions of critical cartography in their map-reading skills. This demand is a basic pedagogical concern in geography and its focus on critical and reflective map-reading skills (Gryl, 2010 & 2014).

However, the approach of my research seeks to identify further options to support critical map reading that functions without additional instructions. The basic idea is to transfer the widespread skills of ICT literacy by embedding features into web maps which are used to evaluate Web 2.0 content. In this way, it may be hypothesized that web tools for discussion, rating or referencing will affect and change the perception of a map as an objective, non-controversial visual representation of space.

In fact, the logic of this argumentation is not ground-breaking, and social media contexts have shown ways of dealing with user-generated content for several years. But, surprisingly, map-making and map-using applications have frequently omitted to integrate functional features for the critical examination of their user-generated content. Section 2 presents facts about the current distribution of Web 2.0 features within web maps. Section 3 proposes characteristics of a framework intended to support the critical thinking[1] of ordinary map users. The conclusion, in section 4, discusses requirements for an empirical testing, as well as the limits of the assumed transfer effects.

2 Pilot study: Distribution of Web 2.0 features within web maps

The emergence of social media sites, blogs, wikis and other online communities has given rise to a collection of tools and functionalities to assess and debate user-generated content. Comment boxes, 'like' buttons and rating scales, as well as additional information or sharing options, are commonly used. These features are helpful for locating and classifying the contributions of other users. Due to the almost normative implementation of these features within most Web 2.0 contexts, one might expect that map-making applications, or the mode of map presentation, would also follow these practices.

However, initial exploration of the availability of these functions related to web maps shows fewer options for questioning or discussing the intention, origin or quality of the map and its particular elements. Moreover, a closer look at scientific sources shows surveys of digital map-making features (Hoffmannn, 2014), but no analysis of the features or information appropriate for evaluating the intention of user-generated maps. In order to verify this first impression, I decided systematically to examine the distribution of assessment-related Web 2.0 elements and those of other media within web maps.

[1] In this paper, I use the terms `critical thinking´, `critical map reading´ and `reflective map reading´ interchangeably. For the differences between the concepts and for how they overlap, see Carlos & Gryl (2013).

The research design was a content analysis of 217 web maps. Because there is no register of all user-generated web maps, I used a convenience sample that came from a collection of neogeographical use cases, generated by our research group at the Leibniz Institute for Regional Geography. The sample includes maps from all over the world, with a strong focus on German-language maps. It concerns static and interactive maps that were made by Web APIs, mash-up maps, participatory maps, but no professional GIS applications. This sampling method is, of course, limited in how representative the maps are, but it should enable the demonstration of some tendencies in the distribution of certain features.

The coding scheme considered the essential interaction modes and channels that are usually embedded in websites with Web 2.0 characteristics. The findings are listed in Figure 1. The values of the items include the existence of the specific features related to single POIs or pins, as well as to the map as a whole. The results show that 77% of the maps refer to further information via hyperlinks, 43% give the option of sharing or embedding their content, and 31% include additional information in the form of photos or videos. These higher-rated items are used to disseminate or enrich the map's content. On the other hand, very few maps feature elements that are appropriate for questioning or discussing the map's content. Only 3% show time stamps for editing, 5% are accompanied by a forum, 6% use rating scales for the user's contributions (e.g. added places), 12% embed 'like' buttons, 15% offer comment boxes, and 20% give an option for reporting probable errors.

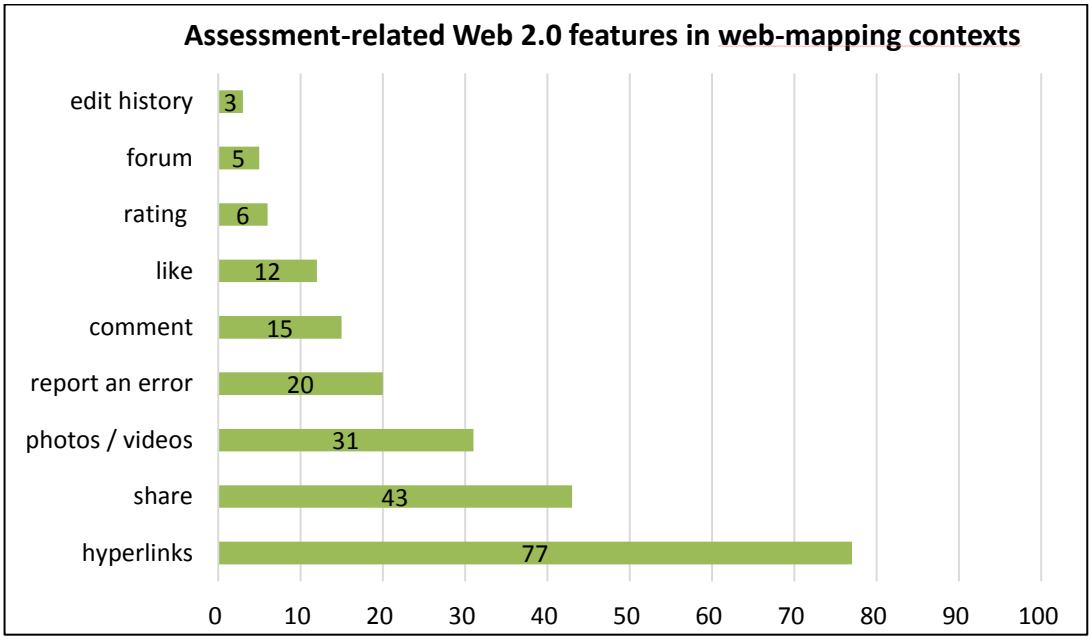

Figure 1: Web 2.0 features in web maps, in %, n=217 (own Figure)

In summary, the findings show that the majority of user-generated web maps fail to include a framework that might be appropriate to support the critical perception and evaluation of

user-generated content. However, it has to be mentioned that embedding certain features and additional media will not enforce a user-driven assessment, but it can help to encourage an evaluation of the map's content. Of course, it has to be questioned whether it is meaningful to include all these features in every type of map. Nevertheless, what I wish to demonstrate is the generally low level of meta-information and meta-communication around user-generated web maps.

3 Assumption: Framework for critical map reading

There are particular reasons for encouraging geomedia literacy by embedding an established Web 2.0 infrastructure. These considerations are based on the overlapping skills that are part of ICT literacy as well as geomedia literacy. However, embedding Web 2.0 features assumes the user's familiarity with the use of web applications, requiring at least a basic level of ICT literacy.

At first glance, an assumption of familiarity with Web 2.0 features seems reasonable from an examination of current surveys on the distribution of web activities. The ARD/ZDF-Onlinestudie for the year 2015 showed that 100% of 14- to 19-year-olds, 98% of 20- to 29-year-olds and 94% of 30- to 39-year-olds use the Internet (Frees & Koch, 2015). Where experience of Web 2.0 is concerned, the survey for 2012 showed that 88% of 14- to 19-year-old, 75% of 20- to 29-year-old and 61% of 30- to 39-year-old online users spent time using Web 2.0 applications (Busemann & Gscheidle, 2012). In order to make use of these applications, users had had to acquire and adopt a set of skills and knowledge about technical functions as well as social practices. These competencies are summarized as ICT literacy. "ICT literacy is using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society" (International ICT Literacy Panel, 2002:2). The left-hand column in Figure 2 lists the main components of ICT literacy. Basically, it concerns how to find, filter, evaluate and select information, as well as technical knowledge, choosing appropriate channels or features for certain purposes, considering the perspectives of other users, and ultimately reflecting upon the intention of any information provided (Pedro et al., 2011). While there is no homogeneous distribution of ICT literacy among users (Arnold & Weber, 2013) and the frequency of web activities does not guarantee the formation of high-quality skills per se, "learning by doing" might foster at least a basic level of ICT literacy.

If we examine the skills and elements of geomedia literacy, essential overlaps with ICT literacy can be identified: "Geographic Information Literacy shares some general and specific goals with Information Literacy (information search strategies, critical evaluation of sources) but also possesses some special challenges (searching for maps and geographic data, evaluation of the 'accuracy' and characteristics of spatial data and representations)" (Krygier & Peoples, 2003:19). If we wish to take a closer look at critical map reading, it is meaningful to consider the concept of "reflexive geomedia competence" (Gryl et al., 2010; Gryl, 2014). The basic demand of this approach is to reflect on the construction of meanings by maps and to question one's own perspective and the perspective of the map's author. What does the map show and what is missing? What is the purpose and intention of the map, and/or of

its author? Does this match the needs of its users? What are the consequences for action or decision-making, dependent on a map with a particular perspective on the world?

Basically, these questions are relevant for every type of map. But while offline maps require proactive reflection on the part of their users, web maps could offer an appropriate framework to assist and encourage an examination of these questions. The goal is to stimulate meta-communication and make the content of a web map a subject of debate or analysis, in order to show that there might be different perspectives on spatial issues. A framework for debating these perspectives can be provided by offering established Web 2.0 features. Figure 2 shows potential links between Web 2.0 and GeoWeb 2.0.

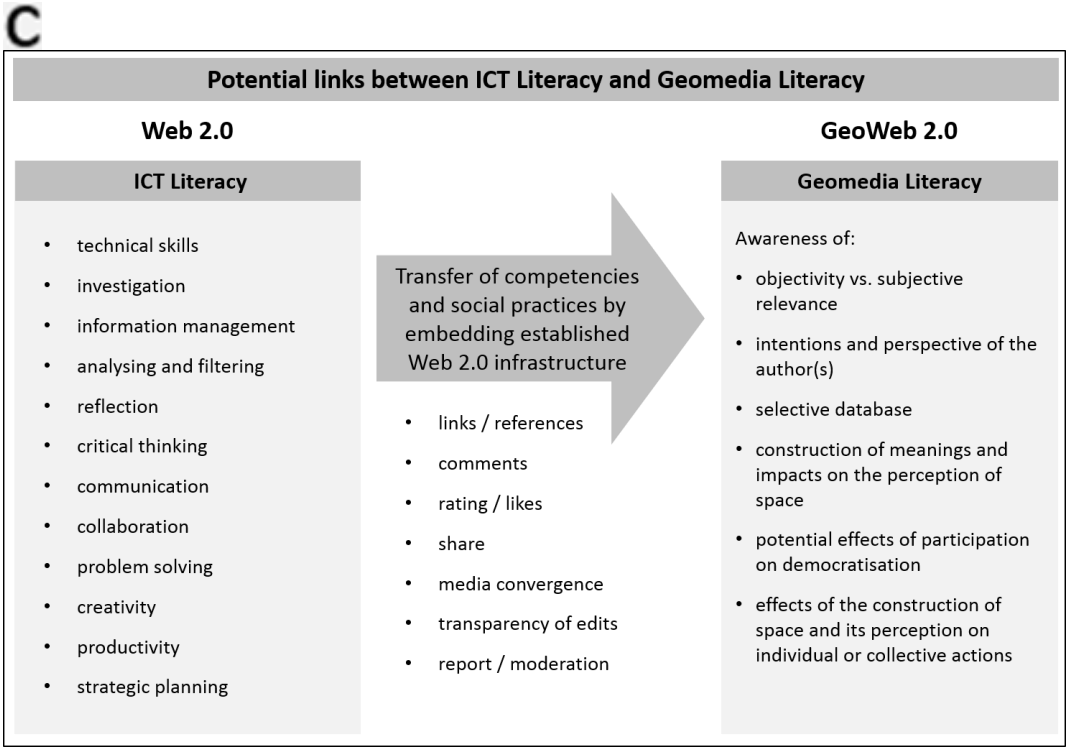

Figure 2: Transferable skills between ICT Literacy and Geomedia Literacy (own Figure)

Consequently, a realization of this concept should make every element of a web map open to debate. This would include the base map as well as pins, descriptions, coloured areas, legend, and ultimately the map as a whole. Although it would be possible to add appropriate menus with further web tools (e.g. comment boxes) to each element of the map, the usability might suffer. On the other hand, most Web 2.0 maps are mash-ups that use established base maps and visualize different types of additional user-generated content. The most prevalent user-generated elements are pins that mark particular points of interest and include a description or further information for each place. Consequently, the Web 2.0 features should primarily be related to these pinned places. Furthermore, a framework for a basic discussion about the

map as a whole could easily be realized by presenting maps within overarching websites. By offering a general comment section next to the map, users would be able to debate the intention of the map, data quality, completeness etc., without using the comment boxes associated with particular places.

Of course, the effect of embedded Web 2.0 features on critical map reading would depend on the content of any comments and/or the values of ratings, but the presence of these tools may also suggest that meanings might not be fixed. In addition, it would be meaningful to identify the web map's authors, as well as the time stamps of contributions and comments. Finally, the transparency of comments and the map's inherent perspective, as well as information about the authors/contributors, provide useful information for the critical consideration of the map. The right-hand column in Figure 2 summarizes the essential questions and considerations that indicate critical map reading. As noted before, this aspect of geomedia literacy is characterized by an awareness of the construction of meanings, of the perspectives of the authors, and of the consequences of actions.

4 Discussion

The approach outlined above constitutes a hypothesis of the impacts of Web 2.0 features on critical map reading. The background of the argumentation is not fundamentally new, but, to my knowledge, no systematic or empirical studies have been published analysing the question.

Due to the lack of statistics about the distribution of Web 2.0 features in web maps, I conducted a pilot study. This brought to light a remarkably low level of availability of Web 2.0 tools and additional (meta-)information within user-generated web maps. By reason of the convenience sample used for this study, the findings should be considered tentative.

The identification of overlaps between ICT literacy and geomedia literacy led to the assumption of the transferability of established skills if similar web tools were offered within geomedia cases. The empirical testing of this supposed transferability is still in progress. The experimental approach used for this requires participants to work on a task and make a decision by using a map that differs concerning its Web 2.0 features and meta-information. Subsequently, there are open-ended interviews that examine the process of decision making, in particular concerning the elements of the map and associated information. The research design stems from the complexity of measuring critical, reflective thinking. Because critical, reflective thinking is as an epistemological meta-competency, there are no scales for testing it, only indicators which suggest that critical, reflective thinking is taking place. For this reason, it is meaningful to trace the process of critical, reflective thinking by providing a case study that helps to examine the considerations of the participant while he/she is working on a specific task.

Finally, if the correlation between the Web 2.0 features offered and critical, reflective map reading is proved, then developers of web-mapping tools might consider more options for encouraging the debate of user-generated content. Nevertheless, the framework of debatable maps is just one option for encouraging critical map reading, and it requires basic ICT

literacy. If users do not know how to treat other Web 2.0 contexts responsibly, it is unlikely that the appropriate skills will be transferred. For this reason, the framework of debatable maps should be seen as complementary to didactic approaches which might address essential questions about the practices of map reading in a more systematic way.

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