A Gender-informed Curriculum for Teaching Volunteered Geographic Information

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Gender and Geographic Information

Public Participation GIS (PPGIS) is a field which became prominent since the 1990s. It focuses on "ways the public uses various forms of geospatial technologies to participate in public processes, such as mapping and decision making" [Tulloch 2008].

It has been found that this field lacks references to or contributions from women. This deficiency of women-centric geographical information is alarming. As Elwood [2008] argues, **"the exclusion and under-representation of information from and about marginalised people and places in existing data records is linked to the ensuing exclusion of their needs and priorities from policy and decision making processes"**.

Special case of Geographic Information: VGI

Volunteered Geographic Information (VGI) is a term coined by Goodchild [2007] to describe the **creation of geographic data outside of professional routines**.
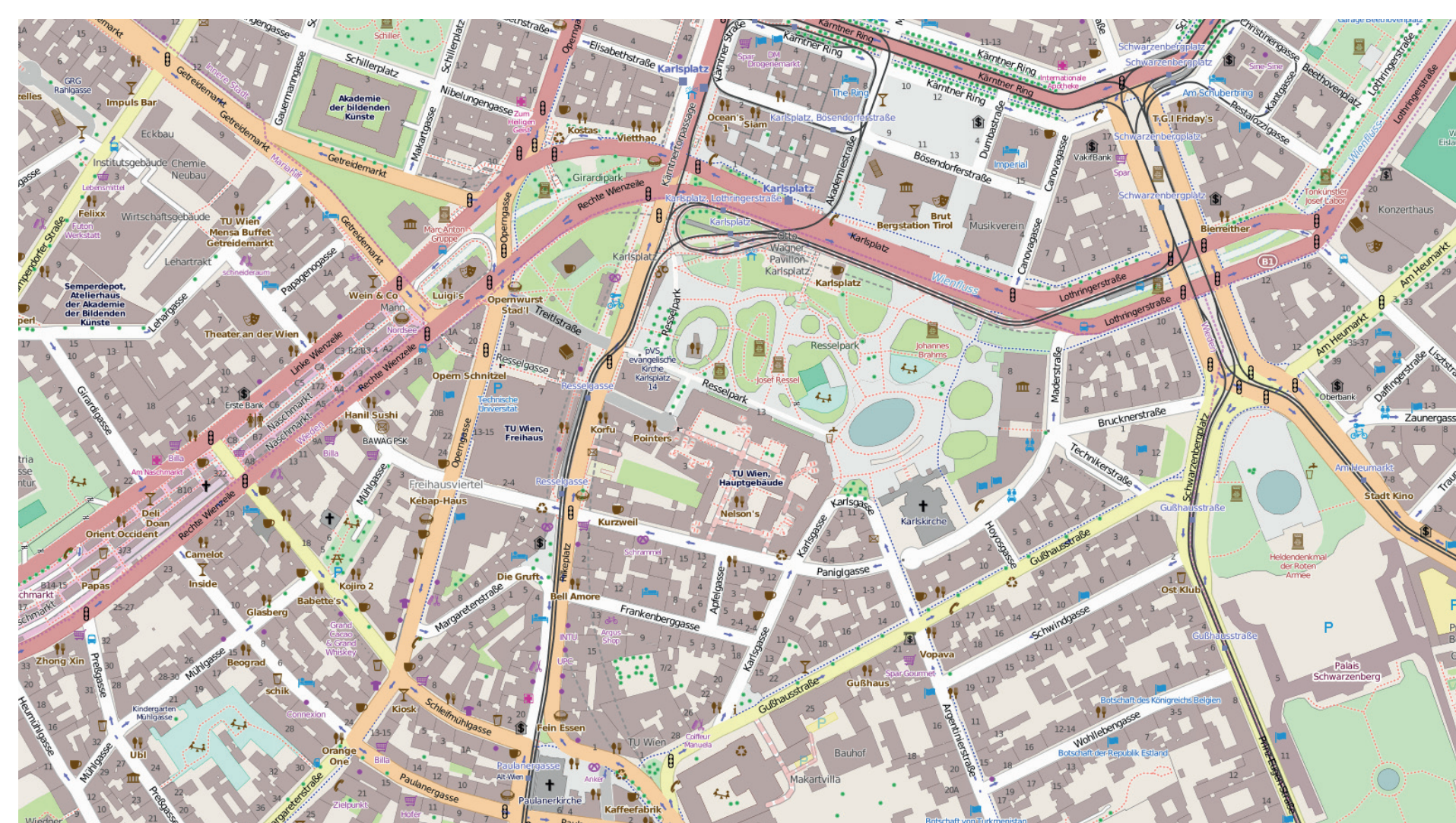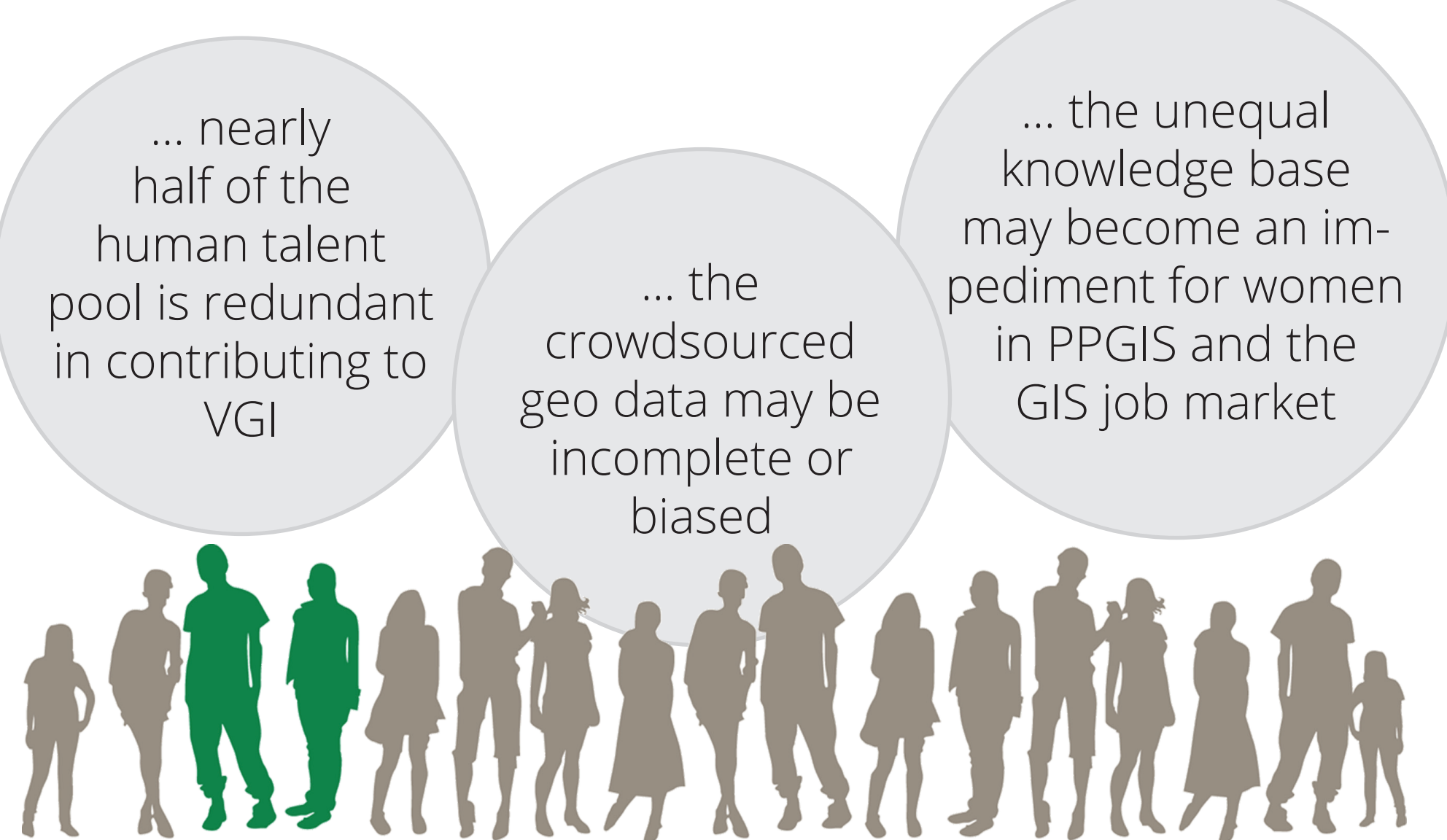

Does this map look familiar to you? It's OpenStreetMap (OSM), the best-known VGI project – a free, editable geo database of the whole world. The data are not collected by companies or administrations but by volunteers – therefore, it's also referred to as 'Wikipedia of maps'.

Studies on the demographics of OSM contributors reveal that the number of women who contribute to OSM is only about 5%; the typical OSM contributor is male, well-educated and technology-savy [Budhathoki et al., 2010].

Why is this relevant?

The extremely low number of women participating in the VGI world means that...

... nearly half of the human talent pool is redundant in contributing to VGI

... the crowdsourced geo data may be incomplete or biased

... the unequal knowledge base may become an impediment for women in PPGIS and the GIS job market

GIS Education in HE

Geographic Information Systems (GIS) are increasingly used in higher education across disciplines and departments. If the barriers for women in participating in VGI and PPGIS are not properly understood and duly addressed, this imbalance in geographical and spatial knowledge production and a gender digital divide may endure or even exacerbate.

As defined by de Lauretis [1987], gender is "not a property of bodies or something originally existent in human beings [...] it is the product and process of various social technologies, institutional discourses, epistemologies, and critical practices, as well as practices of daily life." **How GIS is taught in the higher education requires a rethink in relation to gender issues.**

References

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Action Learning in VGI

In 2012, the fem2map* project team designed a curriculum that aimed to equip female students with the knowledge and skills that would lead them towards becoming meaningful contributors to VGI, and also to capture their experiences, attitudes and expectations of VGI. The former is to **encourage action learning in VGI**, while the latter is to **identify some key barriers to women's participation in VGI** and to **make evidence-based policy-oriented interventions**.

Process

MAPPING SESSIONS

ACTIVITY 1 Getting to know the tools

ACTIVITY 2 Mapping from aerial imagery

ACTIVITY 3 Outdoor mapping with GPS (group activity)

ACTIVITY 4 Free mapping task and reflection

MAPPING DIARY

FOLLOW-UP SURVEY (2 and 4 months later)

With an action research design, 12 female students who were new to OpenStreetMap were recruited to a 3-month course. They were guided to do different mapping activities (e.g. outdoor mapping with GPS devices, mapping from satellite images). After each activity participants reported their experiences. After these sessions, two post-event questionnaires were sent out after two and four months to follow the participants' mapping activities.

The feedback received from the participants was mixed with positive and negative feelings. Here are some quotes from the participants on the most mentioned **positive and negative aspects of mapping**:

Positive aspects of mapping

outdoor experience *"Being outside mapping is really a lot of fun."*

"Mapping is fun, and you can add things that you like and that are interesting."

knowledge acquisition *"You get to know your city when you go and map."*

social experience *"Looking back, I would say that mapping is all about interaction – with people, with space, with maps."*

contributing tp open data *"After tagging so many points the map will be more complete."*

"We use our own knowledge to map something and other people can see that and maybe it is useful for them and it makes you happy if your contribution is used by others."

visual feedback *"A motivating experience is when the results are immediately visible."*

Frustrating and negative aspects of mapping

„It would be useful if mistakes would be highlighted once you try to upload your edited parts."

complexity of learning *„[B]eginners [struggle] to know what to do."*

„It takes time to find the right symbols and tags – if they exist."

insufficient technical feedback *„When you did a lot of work and you cannot upload it, it's really frustrating."*

time-dependent interest level *„In general it would be an advantage, if the contribution process didn't take that long, because less passionate users might lose interest during long mapping sessions."*

missing visual feedback *"Mapped Points of Interest sometimes do not appear on the map – depending on different zoom levels."*

Most participants had a positive attitude towards OSM and stated that they wanted to contribute to OSM in the future. However, post event questionnaires showed that after two months only two students had contributed to OSM again, and after four months none of the students contributed to OSM anymore.

Motivational factors reported by the participants, which may make them contribute again particularly referred to projects, group activities, mapping for a specific goal, and tools which make mapping faster. The findings of this study lead us to recommendations about how to encourage and motivate women in VGI.

Towards a gender-informed VGI curriculum

Sanford et al. [2014] emphasise the importance of a gender-informed education by drawing on "a feminist understanding about gender, particularly as it relates to power, the social constructivist framework explains that there is no essential or distinct character that is feminine or masculine." They recount what feminists have been arguing that "behaviours are influenced by a range of factors including class, culture, ability, religion, age, body shape, and sexual preference" and that "issues of gender pervade social justice and equity in aspects of existing pedagogy, curriculum, philosophy, policy and institutional organisation."

The fem2map project offered an opportunity for gender issues to be addressed alongside issues in education. This is just a beginning of how VGI can be improved, how the findings of a few students and researchers can have some impact on prospective teachers / instructors, their future students, or society at large.

*About fem2map

fem2map, short for 'encouraging **fem**ales **to map**', is the title of a project aiming at fostering the participation of women in Volunteered Geographic Information. It was supported by the Austrian Ministry for Transport, Innovation and Technology (BMVIT) within the research program FEMtech fFORTE.

Details can be found on **http:/cartography.tuwien.ac.at/fem2map**

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