

# Cartographic education development in different schools of thought

Olesia Ignateva <sup>a,\*</sup>, Menno-Jan Kraak <sup>b</sup>

<sup>a</sup> Technische Universität Wien – [olesia.ignateva@geo.tuwien.ac.at](mailto:olesia.ignateva@geo.tuwien.ac.at), <sup>b</sup> University of Twente – [m.j.kraak@utwente.nl](mailto:m.j.kraak@utwente.nl)

\* Corresponding author

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## Abstract:

During the second half of the 20<sup>th</sup> century, the cartographic discipline was characterized by different schools of thought, often delineated by language areas. For instance, Salishchev developed the Russian or Soviet school in the Russian language area. For the English-speaking cartographers, the leader was Robinson. There was a group of scholars in German-speaking countries, and the most prominent was Imhof. Bertin created his school in France. These schools developed different theoretical concepts in cartography.

To study the interactions between schools, we conducted interviews with the current scholars from the four language areas. During the 20<sup>th</sup> century, there were limited interactions between schools due to language barriers. The ICA conferences and the translation of textbooks facilitated some interactions. However, a few non-English textbooks were translated, often long after their original publication data.

Due to globalization, American, German and French schools were influenced by the new geo-visualization paradigm by the end of the 20<sup>th</sup> century. However, the Russian school integrates slower into the contemporary global school and follows its theoretical concepts. This school has not studied the aspects of human-map interactions but sees cartography as a science incorporated into geography or geodesy.

To understand the schools' developments over the past twenty years, we analyzed the universities' curricula of the Moscow State University, the University of Wisconsin-Madison, the joint programs of the Universities of Paris 1 and 7, and the ENGS, the Technical Universities of Munich, Vienna, and Dresden. The analysis included information on the specialization disciplines such as cartography, geo-informatics, remote sensing, geography and geodesy, and cartographic subjects in detail.

The current educational trend observed is the growth of the number of electives students can choose during their specialization. Therefore, it is difficult to judge the share of cartography compared to other disciplines. Also, cartographic subjects decrease because they are integrated into geoinformation subjects. The joint Cartography M.Sc. program, where universities inherit German (and Dutch) schools, has the most credits dedicated to cartography since 2009.

Each university has its unique cartographic subjects, which link it to a certain school of thought. For example, at the MSU, Salishchev invented *Kartovedenie*, the theoretical concept of cartography, in Parisian programs, it is *Graphic Semiology*. The *Cartographic Information Systems* refers to the Viennese school at the TU Vienna.

To analyze cartographic subjects, we divided them into six groups, namely: Theoretical Cartography, General Cartography, Thematic Cartography, Mathematic Cartography, Cartographic Design, and Digital Cartography. Since the 2010-s, the role of Digital Cartography has increased in cartographic curricula at most universities (Figure 1). In the Russian school, the leading subject group is Thematic Cartography, while for American and French schools, it is General Cartography. The German programs spend more credits on the Digital Cartography subjects.

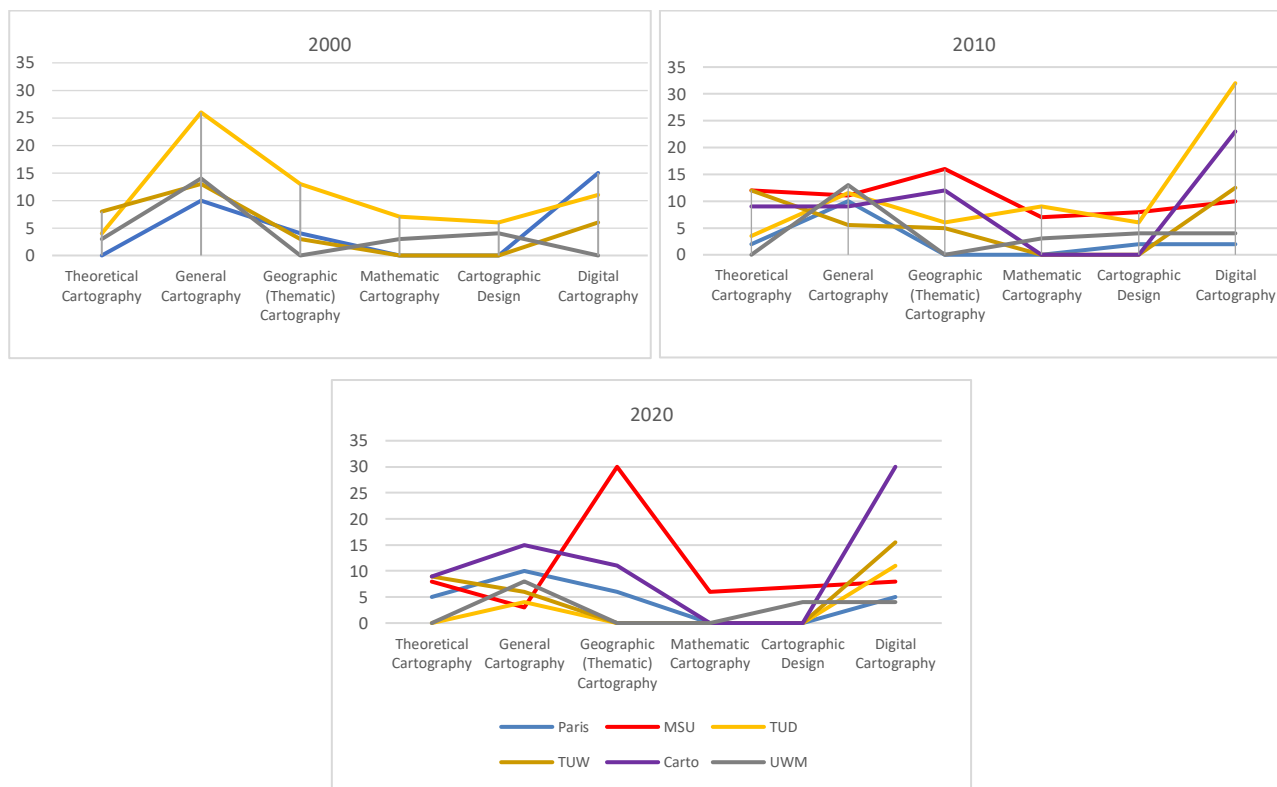


Figure 1. Credits spent on subjects categories in different study programs. Carto refers to the Cartography M.Sc. program.

Looking into the Digital Cartography subjects, there are local trends, e.g., in the TU Vienna, there are subjects like Cartographic Information Systems and Location-Based Services. In TU Dresden, these are Mobile Cartography and 3D Virtual Landscapes. Other topics come and go, like Internet Cartography, prevalent in 2010, while the Geovisualization and Interactive Cartography are very popular in contemporary curricula (Figure 2).

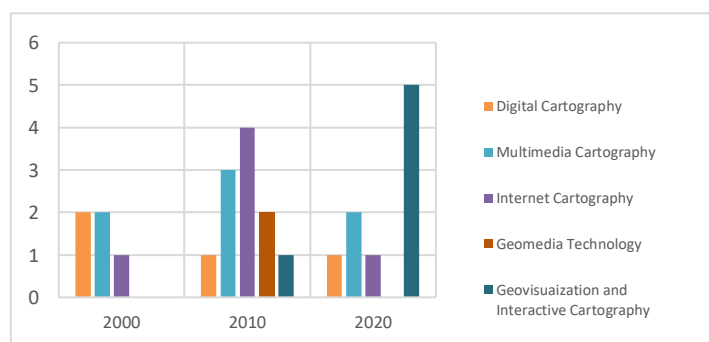


Figure 2. The occurrence of different Digital Cartography subjects in curricula in 2000, 2010 and 2020

In the curricula, we observe the changes in the cartographic domain and its schools of thought. Although cartographic education in different language areas follows the same trends, there are variations related to the theoretical concepts in cartography introduced by the older generations of scholars.

We are currently looking at the past International Cartographic Association conference abstracts to judge the influence of the schools of thought. Additionally, we will also look into the facilitating role of ICA's Commissions and Working Groups.

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