



## Geographical Education in an Increasingly Complex World: What, How, and Why

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### Abstract

This article examines the interplay between geographical research, teaching and societal change, highlighting the challenges and opportunities for geography education in a rapidly evolving and complex world. It discusses the integration of research-based knowledge into teaching practice, the relevance of Public and Participatory Geography and the framework of What, How and Why for curriculum design. Drawing on both international literature and the Italian tradition of geography education, the article emphasizes the potential of geography to foster critical thinking, environmental awareness and active citizenship among students.

**Keywords:** Geography Education, Research-Didactics Integration, Public Geography, Participatory Geography, 21st Century Skills

### 1. Essential Relationships between Research and Geographical Education

When, in December 2012 – with the strong support of the Italian Association of Geography Teachers, several Italian and international scholars and with the indispensable contribution of the then co-editor Cristiano Pesaresi – I founded the *J-READING (Journal of Research and Didactics in Geography)*, one idea lay at the heart of the editorial initiative: to study the relationships between the sphere of research and the sphere of didactics, which all too often communicate poorly with one another. This idea was, moreover, clearly highlighted by the very

choice of the title given to the new journal.

From Issue 0 onward, research and didactics have constituted the two key words around which most of the articles published over nearly fifteen years of activity have engaged in various ways. In this regard, I wrote in the first editorial (De Vecchis, 2012, p. 7):

*The aim of contributing to the construction of a bridge between didactics and research, strategic for the development of the subject, is at the basis of this new editorial project [...]. The terms didactics and research, in fact, complement each other and combine for a solid cultural education in order to deal with analytical-interpretative and educational-professional needs.*

In the same Issue 0, two distinguished scholars in the field of geography education, Joop van der Schee (2012) and Joseph P. Stoltman (2012), highlighted the strategic role and prospects of geographical education in an extraordinarily complex and rapidly changing world<sup>1</sup>. It is precisely this very complexity and

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<sup>1</sup> Very recently, under the auspices of the Commission on Geographical Education of the International Geographical Union, a volume edited by Magali Hardouin and Caroline Leininger-Frézal (2025) was published, examining how Geography curricula (formulated, organized, and implemented at different levels: local, regional, national, and supranational) should concretely respond to the challenges that an increasingly complex world poses to the educational sphere. Shortly beforehand, again upon the initiative of the Commission, two other significant volumes worthy of mention were published, precisely because of their focus on the relationship between research and teaching. The first addresses issues that are fundamental to the recontextualization of Geography, such as the epistemic relationships between the academic discipline and school practice, the design and assessment of the Geography curriculum, the role played by students in transforming knowledge in the classroom, and the selection and adaptation of geographical content (Fargher et al., 2021). The second, drawing on contributions from scholars in geography education from many countries, reflects on the potential of geographical thinking through strategies for developing geographical education, both in theoretical research and teaching practice (Brooks et al., 2017). The same publisher has recently released a handbook outlining the current state of knowledge in the field of geography education, examining practices in geographical education at both primary and secondary school levels (Bednarz and Mitchell, 2024).

Reflections and proposals on the teaching of Geography as a response to present and future challenges can also be found in a recent issue of *J-READING*, edited by Fabio Fatichenti and Philippe Charpentier (2025). This thematic issue includes several contributions which, although addressing different contexts, share the common objective of re-examining geographical education so that, by being more closely oriented toward contemporary issues, it becomes more meaningful for students. The contributions address: proposals for a new curriculum for geographical education in Italy at the lower secondary level (Fatichenti, 2025); the teaching of Geography in French primary schools, centred on everyday artifacts present inside and outside the

sudden transformations that must become the subjects of study for geographical research, which, in interpreting them, can draw upon its own interdisciplinary nature, further strengthened in recent decades thanks to the intensification of its relationships and fruitful interactions with many other disciplines: from environmental to socio-economic sciences, from statistical to technological and information sciences.

The latter (geotechnologies and in particular Geographic Information Systems) on the one hand offer geography extraordinary potential, especially in the collection of territorial information and in the representation of terrestrial space at various scales and through multiple modes; on the other hand, they require geography teaching to devise new approaches and new teaching strategies<sup>2</sup>.

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classroom (Charpentier, 2025); the development of new methods of geography teaching in response to the many current challenges, such as cultural and social diversity or climate change (Joublot Ferré, 2025); ecological sustainability in lower secondary school geography textbooks in Austria and the United Kingdom (Meissl et al., 2025); the renewal of geography teaching through the proposal of new content, but above all through a rethinking of the approaches to be adopted (Mérenne-Schoumaker, 2025); an action-research project focused on the construction of geographical knowledge and the development of critical and complex competences among lower secondary school students (Pache et al., 2025); and the case of Madagascar, where History and Geography school curricula are still influenced by a colonial perspective, characterized by content referring to France (Veriza, 2025).

<sup>2</sup> A book published upon the initiative of the International Geographical Union explores the theoretical and practical aspects of geotechnologies in education, supporting teachers in the use of geotechnologies in their lessons (Muñiz Solari et al., 2005). An article published in *J-READING* presents a study based on satellite imagery concerning estimates of firewood availability in a region of southern India; this study can be used online as a practical exercise in GIS and remote sensing courses, allowing students to concretely analyze a real case and thus promote meaningful learning (Salas-Canela et al., 2024). More recently, again in *J-READING*, the issue of geospatial competence has been addressed through a “quasi-experimental study” involving secondary school students in the Balearic Islands (Pons et al., 2025).

At the same time, the teaching of geography cannot dispense with an essential orientation provided by the educational sciences and in particular by general didactics: the science of communication and the educational relationship. All subject-specific didactics refer to this framework, as they perform the delicate operation of transforming knowledge produced by research into cognitive and educational objectives, making explicit the skills and competences that can stimulate students to develop autonomous and personalized mental strategies. In other words, teaching is entrusted with the task of giving sociocultural meaning to disciplinary knowledge, organizing it according to students' ages and therefore according to differentiated levels of complexity.

## 2. Public Geography and Participatory Geographies

For geography and its teaching, it is essential to reflect on the ongoing changes in societies, which operate within a framework of increasing complexity, where intense interconnections coexist with risky fragmentations, the primary cause of dangerous territorial conflicts. This attention to present-day situations (while not being indifferent to past developments, nor to prospects for the future) should contribute to geography's social legitimation – of a communicative and relational nature – ensuring it a role of public utility which, even within the school context, is significant for the formation of a civic and political consciousness among younger generations.

In fact, geographical knowledge should be conceived as a potential response to needs arising from the real world (for example, spatial justice and inclusion) and practised as a form of care for the common good, within research, teaching and third-mission activities (*Public Geography and Participatory Geographies*)<sup>3</sup>.

<sup>3</sup> To engage in “public Geography”, it is necessary to enhance competences that express the perspectives of the social groups with whom dialogue is intended. Significantly, public engagement in academic research is a rapidly and productively growing field of inquiry, involving not only geographers who disseminate knowledge, but also geographers who co-create research together with communities. An

Significant considerations regarding the usefulness of geography are expressed and highlighted in the International Charter on Geographical Education, approved on the occasion of the 33<sup>rd</sup> Congress of the International Geographical Union (Beijing, 24 August 2016)<sup>4</sup>. In this fundamental document, right at the beginning, one reads:

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increasing number of in-depth studies in this area stimulate public involvement in research and innovation. Among the most recent and significant contributions are those by E. Frazier (2025), S. Koopman (2024), and J. Wills (2025). Access to geospatial technologies, by enabling people to connect to a rich and diversified range of spatial data services, can also provide a valuable contribution to forming opinions on issues related to places and territories (Strobl, 2024). Within the domain of public utility, albeit with some distinctions, studies on inclusion can also be counted, which are geographically significant especially when linked to migratory phenomena. By way of example, mention can be made of a special issue of *J-READING*, edited by Antonello Scialdone and Riccardo Morri (1, 2023), devoted to educational resources for the inclusion of people with a foreign background, featuring several articles focused on achievement gaps among students of foreign origin and on the search for inclusive solutions to be applied in educational contexts; particularly noteworthy are: Botelho et al. (2023); Ferri et al. (2023); and Amato and Matarazzo (2023).

<sup>4</sup> The 2016 Charter, the most recent document of the Commission on Geographical Education of the International Geographical Union, was signed by Vladimir Kolosov and prepared by Joop van der Schee and John Lindstone. It follows an earlier Charter written by Hartwig Haubrich and approved at the 27th Congress held in Washington in August 1992. Other international documents available on the Commission's website (<https://www.igu-cge.org/publications/charters/ad>) include:

- International Declaration on Research in Geography Education (IGU Regional Conference held in Moscow, Russia, August 2015).
- Rome Declaration on Geographical Education in Europe; proclaimed during the IV EUGEO Congress (September 2013); signed by Gino De Vecchis, Karl Donert, Vladimir Kolosov, Henk Ottens, and Joop van der Schee.
- International Declaration on Geographic Education for Sustainable Development (Lucerne, July 2007); drafted by Hartwig Haubrich, Sibylle Reinfried, and Yvonne Schleicher.

*When taught effectively, the study of geography can fascinate and inspire people. Ensuring the quality of geography in schools is, consequently, an essential duty of policy makers and education leaders internationally. Whether it is through appreciating the beauty of Earth, the immense power of Earth-shaping forces or the often ingenious ways in which people create their living in different environments and circumstances, studying geography helps people to understand and appreciate how places and landscapes are formed, how people and environments interact, the consequences that arise from our everyday spatial decisions, and Earth's diverse and interconnected mosaic of cultures and societies. Geography is therefore a vital subject and resource for 21st century citizens living in a tightly interconnected world. It enables us to face questions of what it means to live sustainably in this world.*

### 3. What, How, Why

In agreement with what is stated in the International Charter on Geographical Education, namely that geography constitutes an essential resource “for 21st century citizens living in a tightly interconnected world”, it must be emphasized that the research–didactics binomial should have as its constant and indispensable reference societies in their mutual relationships and in the various manifestations they develop across terrestrial space.

It follows that geographical education must necessarily rely on the research–didactics–society triad, and therefore must ask itself, respectively: the “What” (the study themes deriving from the world of research), the “How” (the methods and strategies to support students’ learning), the “Why” (the motivations for the choice of topics, deriving from the expressions of societies that are in continuous transformation). For the proper functioning of teaching/learning processes, it is absolutely necessary that the constituent elements of this triad be adequately connected to one another.

Attention to this triad – research, didactics, and society – also makes it possible to keep the disciplinary content and methodological

framework up to date and increasingly incisive. Although highly composite due to the plurality of the actors involved and their intense interactions, this framework is at the same time highly prolific, such that the various bodies of knowledge produced do not merely aggregate by simple addition, but, through their combination, can offer further (and new) interpretations of the processes of anthropization of our planet.

#### 3.1 What

The “What” to teach is related to the developments and results achieved by research, which is carried out largely by universities and public and private institutes and bodies devoted to it. The study topics of this research are continuously evolving, also in order to respond effectively to the challenges posed or imposed by nature, the physical environment, technology and society<sup>5</sup>.

To cite just one recent example, the outbreak of COVID-19 (the infectious disease caused by a novel coronavirus called SARS-CoV-2) has significantly influenced research activities, first and foremost in the medical field, but also in numerous other scientific sectors, including geography. Among other aspects, geography has studied the spatial diffusion of the virus (also thanks to the use of GIS for the production of epidemiological maps), environmental and climatic factors, territorial inequalities, and health planning.

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<sup>5</sup> A striking example is the rapid advancement of geoinformation technologies and the application of Artificial Intelligence to spatial analysis, processes that are reshaping the study of geographic space (Li et al., 2024), including considerations of environmental sustainability (Shi et al., 2025). Finally, the 2016 Charter, in addition to reaffirming how the teaching of Geography serves many fundamental educational objectives, pays particular attention to scientific advances deriving from research in computer science, digitalization, and satellite systems: “It introduces them not only to key 21st century skills but also to distinctive investigative tools such as maps, fieldwork and the use of powerful digital communication technologies such as the Associazione Italiana Insegnanti di Geografia Geographic Information Systems” (The Contribution of Geography to Education).

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• International Declaration on Geographical Education for Cultural Diversity (29th Geographical Congress, Seoul, August 2000); signed by Rod Gerber.

Major challenges confront and question the future of humanity, involving geography in both its physical-natural and anthropic-socioeconomic dimensions, which are moreover closely interconnected. In the former case, reference may be made to biodiversity loss, the climate crisis<sup>6</sup>, global freshwater consumption, land-use change, and chemical pollution, as well as to the disastrous effects originating in naturally fragile areas subject to natural hazards – such as seismic, volcanic, and hydrogeological risks – effects that are all too often exacerbated by inappropriate territorial choices resulting from ignorance or deliberate misconduct<sup>7</sup>.

In the latter case – that of the anthropic and socioeconomic dimension – phenomena of growing concern include migration, spatial imbalances in natural population dynamics, social and economic inequalities, issues of spatial justice, territorial conflicts, and conflicts related to the scarcity or insufficiency of resources.

The selection of topics to be included in the curriculum – through which knowledge is transferred from research to school – therefore derives from what emerges as new in disciplinary studies, as well as from scientific updates and reflections concerning themes of traditional analysis. However, as previously noted, the selection of topics to be proposed at school must also take into account developments deriving from didactics (the “How”), as well as societal transformations and their territorial outcomes, which in some way motivate the

choices of themes and problems to be addressed in school (the “Why”).

### 3.2 How

The “How” to teach refers above all to the sciences of education, pedagogy, general didactics, and subject-specific didactics (first and foremost geography didactics), which are themselves in continuous development, as well as to the use of language, so that it does not become an obstacle to learning<sup>8</sup>.

The way in which the “How” is implemented determines the translation of knowledge into practice, which should be directed toward achieving specific objectives chosen at the local level, but within a perspective that must not neglect the broader framework. Moreover, updating and adapting the teaching of geography to new scientific and social realities cannot be reduced to the mere proposal of new content; it also requires reflection on the approaches to be used with students, who are the true protagonists of their own learning. These approaches should help them, for example, to interpret the complexity of ongoing social and environmental processes, grasp interconnections across different scales, and evaluate the opportunities, limits, and implications of possible actions.

Thus, in the delicate process of translating knowledge, one cannot disregard the application of a method, which is fundamental in teaching/learning processes and which must therefore respond to the multiple and diverse realities of the students involved<sup>9</sup>.

<sup>6</sup> The risks associated with the climate crisis and the teaching strategies to be adopted in schools constitute a topic frequently addressed by *J-READING*; among the most recent contributions are: Hilander et al. (2023); Chang (2024); Ikonen and Tani (2024).

<sup>7</sup> A significant example of active and participatory pedagogy – developed through a dramatic and engaging journey through time – is offered by Lisetta Giacomelli and Cristiano Pesaresi in an article that, drawing on the symbolic and material meanings associated with the volcanic eruption of AD 79 in Pompeii, examines the levels of risk present in the metropolitan city of Naples. In light of its very high building and population density, the article considers the potential consequences in the event of a renewed phase of activity of Mount Vesuvius (Giacomelli and Pesaresi, 2025).

<sup>8</sup> Since language constitutes an essential element in geographical education, it is important that the use of the academic language of Geography does not create barriers to learning, especially for students with heterogeneous linguistic competences and for those learning in a second language (Heidari et al., 2024).

<sup>9</sup> In the journal of the Commission on Geographical Education of the IGU-UGI (*International Research in Geographical and Environmental Education*), numerous articles address pedagogical renewal, in engaging students with new content proposed by geographical research, such as those relating to the challenges posed by the uncertainties of the Anthropocene (Chang and Kidman, 2025; Kidman and Chang, 2025), those exploring the transformative potential of GenAI through observation of its impacts on curricula and assessment methods (Lee et al.,

From an initial approach in which knowledge consisted of the mental representation of reality and learning was transmissive, based on reception and assimilation (*Instructionism*), geography, like other disciplines, has gone through various pedagogical-didactic phases and theories, including:

- *Constructivism* (inspired by the thought of John Dewey, Jean Piaget, and Lev Semënovič Vygotskij), according to which the learner constructs knowledge autonomously and actively, becoming the protagonist of the learning process;
- *Social constructivism*, or dialectical constructivism (David Moshman), an evolution of the former, according to which knowledge construction occurs through shared learning within a social context;
- *Behaviorism* (John Watson), according to which learning is demonstrated by correct behavior in response to a given stimulus, later enhanced by Burrhus Frederic Skinner through positive reinforcement techniques aimed at shaping behavior;
- *Cognitivism* (Ulric Neisser), which considers the human mind as an information processor, receiving input primarily through sensory systems and direct experience, followed by the theories of Jerome Bruner, who focused on the mental processes leading to learning and on the importance of making content accessible according to different age groups;
- *Social learning theory* by Albert Bandura, according to which imitation and the conscious and personal reproduction of others' correct behaviors imply social interaction between observers and those observed.

Within a constructivist perspective lies *Problem-Based Learning*, which is particularly effective in the study of geography because, being connected to real-world problems related to the construction and protection of landscape and territory, it exercises critical thinking and enhances competences related to active

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2025), or those that reconsider the concept of sustainability in innovative ways through the use of integrative teaching methods.

citizenship, environmental education, development education, and intercultural education.

Also worth mentioning, due to their relevance for geographical education, are *Universal Design for Learning* (Anne Meyer and David Rose) and *Service Learning*. The former emphasizes the design of learning experiences capable of adapting to the needs of every learner, with the aim of supporting different intercultural perspectives, effective inclusion, and globalization understood as a value. The latter is an educational-experiential practice, rooted in the theories of John Dewey and Paulo Freire, based on education attentive to solidarity-based activities, with the aim of developing social responsibility while simultaneously acquiring practical competences that may prove useful in life.

In a geography didactics manual addressed to secondary school teachers, Daniela Pasquinelli d'Allegra (2026) provides a detailed overview of the methods used in schools, highlighting the aspects of greatest interest for the teaching of geography.

### 3.3 Why

The “Why” – that is, why one chooses to deepen one geographical content rather than another, to include some topics and neglect others – depends on a political-cultural choice whereby institutional bodies exercise various functions of public interest, such as providing an adequate educational offer and supporting processes of didactic innovation. It is worth recalling that geography, attentive to reading and evaluating both global problems and territorial realities at different scales, deals with highly sensitive topics<sup>10</sup>. Consequently, its teaching may be influenced (through curricular guidelines and the organization of disciplines within curricula) by inputs coming from political institutions.

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<sup>10</sup> Educational processes must encompass learning that takes place in the diverse life situations and territories in which each student's existence unfolds. Territory, in fact, plays a strategic role in the construction of educating communities, offering a real context for learning that is useful in promoting the rights of younger generations (Mazza and Zanolin, 2023).

Underlying all this, however, is the sociocultural context – local, national, and international – which defines the different criteria for interpreting space at school in the plurality of its physical and human dimensions<sup>11</sup>. For geography, a science that studies the processes of anthropization of planet Earth, attention to what happens from the nearby territory to the wider world is a constitutive principle.

Moreover, in a historical phase such as the present one – characterized by profound changes, numerous territorial conflicts, and growing inequalities – the choice of contents (that is, the “What”) is strategic, also with regard to possible future scenarios. In fact, these scenarios appear increasingly uncertain and contradictory compared to just a few decades ago, when, at the beginning of the new millennium, the world seemed oriented toward an unstoppable growth of economic and socio-cultural integration and connectivity.

Such a framework places renewed responsibility on geographical research and didactics to enhance their bodies of knowledge, which at school must be transformed (as already emphasized) into educational and didactic objectives through the progressive mastery of relevant skills. This must be done while considering that, in the educational process, it is necessary to foster growth not only at the cognitive and cultural levels, but also at the emotional and relational levels. It would therefore be appropriate to bring to the fore the values connected with education for the environment and territory, active citizenship, intercultural dialogue, and for peace.

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<sup>11</sup> At the international level, documents of high normative and value-based significance may be cited by way of example, such as the Universal Declaration of Human Rights (1948), the Convention on the Rights of the Child (1989), and the 2030 Agenda for Sustainable Development (2015).

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