Human Geography trains diverse perspectives on global development

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Abstract

Purpose – Education for equity in global development and cultural diversity calls for professional capacity building to perceive diverse perspectives on complex procedures of globalisation. The discipline of human geography is such a “provider of perspectives”. The purpose of this paper is to propose a historic series of how theories of geography and human development have emerged.

Design/methodology/approach – This paper contributes to education and training by proposing a historic series of how theories of geography and human development have emerged.

Findings – The outcomes of this analysis of geographic paradigms offer options for the management of multicultural education in development. A critical synopsis and a combination of various paradigms on global development seem most promising for a holistic and comprehensive understanding of globalisation.

Research limitations/implications – In particular, recent developments in human geography exhibit rapidly changing paradigms (ironically called “the Latin America of sciences”) and are hence difficult to systematise.

Practical implications – Spaces are understood to be communicational spaces, the substrate of which is enabling communication technologies. The theoretical contemplations of this paper permit to design learning environments, learning styles and related technologies.

Social implications – Perception and understanding of contradicting theories on global (economic and human) development facilitate education fostering multiple cultures of understanding. The author’s own professional experience shows that only esteem for all paradigms can provide the full picture. Success means “collective production of meaning”.

Originality/value – Understanding history frees us to reach future consensus.

Keywords Multiparadigmatic, History, Geography, Global development, Paradigms, Education

Paper type Research paper

Introduction

By showing and enumerating various, often divergent paradigms of global development – mostly from the fields of (human and economic) geography – this paper provides tools to better understand conflicting approaches to multiculturality, globalisation and related technological case studies (Durakovic et al., 2012). Geography may be the science that is most inclined to take a multiparadigmatic stance; hence this paper will employ the historic cascade of geographic paradigms to provide a theoretical basis for multicultural and multiparadigmatic education and learning.

This text proposes the following broad definition of geography: geography provides views and perspectives. Traditionaly, this is made true by “mapping” in the strict geodetic sense; however, later on geography expanded to perceive social issues and functionalities as well (Agnew et al., 1996; Ahamer, 2010b). Human geography provides perspectives on human development while using a multiparadigmatic approach.
According to Gebhardt et al. (2007, p. 82), a paradigm is a model of thought, a myth or constituting content to which any narratives implicitly refer.

With the aim of providing a theoretical basis for multicultural learning, this paper tries to contribute to all four layers of the “pyramid of science” (Figure 1).

**The perspective of human geography**

Within this paper “mapping” is understood as (spatial) pattern recognition. For this purpose it provides concepts of space developed during the history of geographic thought and available in geographic literature.

“Mapping” in its historic genesis meant to take a standpoint that is principally inaccessible for humans (e.g. the “bird’s eye view”, at left in Figure 2) above a plain in order to overcome all perspective-bound limitations and all perspectival preferences so that ideally a “perspective-less” image of reality may be produced.

In reality, social, medical and other aspects can be perceived (centre and at right in Figure 2); and especially when it comes to processes, a multitude of perceptions is possible.

**What geography means**

In this paper, taking a geographical perspective is usually understood as using a spatial vantage point. For the targets of a journal on multicultural learning, we try

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**Notes:** The example of a hiking tour from Tajikistan’s capital Dushanbe (at left in the background, source: Google Earth) to a famous waterfall (at left in the insert, Ahamer et al. (2010) in a social group of colleagues (symbolically mirrored at centre in the author’s photo during a rest break) is physically measured by speed (at right: blue line with car travel, then hike), elevation (brown area) and impacts the heart rate of the author (red line; GPS-equipped measurement device: Polar, 2009)
to increase the degree of complexity of this definition towards understanding on three levels (Figure 3, Ahamer, 2012, p. 178).

We start out with the first and second level. Important contributions to the discussion of geographic theories include Geography – A Global Synthesis by Peter Haggett (2001, p. 10) who encourages us to:

[... ] leave the straitjacket (of geo-localisation, i.e. the 1st level of facts) [... ] and to concentrate directly on the relationships (i.e. the 2nd level of functions in Figure 3) between man and the environment on the spatial consequences and the resulting regional structures on the earth’s surface.

The very fundamental geographic example of “Geography on the beach” was authored by Haggett (2001, p. 27) and is outlined again by Borsdorf (1999, p. 15).

Geography has a bearing on “spatial-temporal procedural patterns” (Borsdorf, 1999, p. 17f); the question of “where and when” directly leads to the question of “why”. A comprehensive collection of paradigms in geography stem from Abler et al. (1971), entitled “Spatial organisation – the geographer’s view of the world”. As a conceptual basis for geography as such, Borsdorf (1999, p. 27) lists eight scientific concepts: empiricism, neopositivism/critical rationalism, (traditional) hermeneutics, critical theory/(critical) hermeneutics, structuralism. These concepts also occur in other disciplines such as history, sociology, psychology, economics, evolution, and may consequently be of general relevance. By far the most comprehensive book in the German language encompassing the highest number of geographic approaches and geographic perspectives is “Geography” by Gebhardt et al. (2007).

“Temporal development and evolution leads to spatial patterns”: having conceived this key idea, one of the bases for the importance of the space-time theme in modern geography becomes clear (GIScience, 2011). Hägerstrand (1978) developed space-time geography and concentrated on the process of spatial diffusion (according to Haggett, 2001, pp. 31f, 506ff).

Very importantly and helpfully, the French sociologist Lefebvre (1991, cited in Hubbard et al., 2002, p. 14), author of La production de l’espace, (The Production of Space, Lefebvre, 1974a, b) suggests that there are three complementary levels which seems a very appropriate place to sum up and conclude this theoretical introduction. Lefebvre’s concept of space includes:

- spatial practices;
- representation of space; and
- spaces of representation = representational space.

Concepts of space
The concepts of space presented in geography stem from paradigms varying from natural to social science: the initial concept of space as geographic (geodetic) space unfolds into a multitude of social and philosophical concepts. The literature analysed
on the following pages deals with integrative views, human geography (including social geography, economic geography, political geography, geography and history, social production of space, philosophy of space and time) and also briefly with GIS (geographic information systems and science: physical views, physio-geography).

Obviously and historically, the first frame of reference was “objective”, geometric, physical, astronomic, geodetic space (Hund, 1972), the so-called “container space” welcoming any object or event to localise in it.

In such early times (based on Kant’s understanding) space was understood as objective, but there seemed to exist no “homo geographicus” (Latin: geographic human, a term coined with allusion to the “homo oeconomicus”, the economic human) who would cognise perfectly well anything about space. Humans perceive only part of spatial reality, namely as a function of their attention, interest, present events, social factors – which is called “selection” and leads to a different “assessment”. The resulting behaviour in space is a function of the subjective perception of space’s structures (Borsdorf, 1999, p. 79).

Starting from this definition, the network-like interdisciplinary structure of geography (Borsdorf, 1999, p. 51) extends inter alia to the Munich based social geography and to a perception-oriented approach (i.e. the third level of functions in Figure 3).

Apart from topographic space, temporal, functional, state spaces and social spaces are also included in the present text. As a classical example of a state space, remote sensing refers to feature spaces (e.g. different channels with different wave lengths), or to property spaces (Barton, 1955). Another example from classical geography might be the wind drift maps or ocean drift maps which essentially use arrows for depicting movements, speeds, streams and vectors (Trenberth, 1995 in Ahamer, 1997, p. 174).

What else does the approach of geography comprise? Essentially, geography offers an artificial view of reality. On the meta-level, geography provides perspectives (Ahamer et al., 2009). In this paper, “perspectives” as an objective of cognition (third level of perspectives in Figure 3) are placed into the larger context of the history of science.

Geographic paradigms

What geography may map

Present-day concepts in human geography consider space as perception and construction: Gould and White (2002, p. 1) refer to the sensed, perceived physical landscape. The basic environmental perception is the effect of distance on movement (Gould and White, 2002, p. 2); this leads them to focus on social proximity versus physical distance and further on maps of space preferences. For them, relative location is “accessibility” (Gould and White, 2002, p. 5).

Is there a “structure of spaces”? As a follow-up to this question, the “act of mapping amounts to cognising and representing the structure of space”. According to Gould (2000, p. 153ff), a key term is connectivity which is describable in a behavioural space by a behavioural matrix, representing a matrix of perceived proximities, i.e. intensities of interaction. Gould’s (2000, 164ff) social map is less questioned but structurally similar to concepts of a dynamic social space as conceived by Hellinger’s (2000) family or systemic constellations. While his therapeutic method occurs autopoetically in the geometric space of a seminar room (Ahamer and Purker, 2011) and is claimed to reflect and materialise analogous relationships in the social space, Gould’s experiment deliberately occurs in the social action space. In both cases, “social space” allows social actors to walk through a “social landscape”, while acting socially. In this context,
Gould defines a “measure” or metric, i.e. a distance, in his type of social space: in a paper he writes the names of individuals at a distance indicating how well they interact with each other. This means that Gould’s measure for such a sociogram is the coherence, value and density of their interaction (Ahamer and Purker, 2011, p. 161). In a psychological sense, similar live sociograms are created by family constellations.

One of the most distinctive descriptions characterising the common geographical approach is Tobler’s (1970) “First Law of Geography”: adjacent locations are similar (adjacency implies similarity). Spatial autocorrelation seems to have been found to constitute a fundamental property of geographic space.

In a different approach, the geographer Unwin (1992, p. 1) addresses how “knowledge” (perspectives, visions) is produced by different societies and how specific societies produce knowledge. He refers to geography as a “socially constructed discipline” and suggests that what a society accepts as being truthful statements is the result of a series of interactions between social, political, economic and ideological interests. His book The Place of Geography is “designed as a historically oriented reflection on the emergence of contemporary geography, which seeks to reveal the underlying connections that exist between knowledge, power and human interest.” In this volume, Langthaler et al. (2012) provide a critical evaluation of “knowledge for development”.

**Integrative views of geography: a history of geographic thought**

The timeline and the history of geography might start out with the early history of geography (Hard, 1973, pp. 290-3; Bartels, 1970; Abler et al., 1971, p. 70). The following subchapter attempts to provide a historic overview of paradigms:

- From antiquity (Strabo, Ptolemy) to 1800 (according to Wright, 1926, cited in Agnew et al., 1996, pp. 25-36): “Where” questions are in the foreground, the target is to produce a map. “Geography means to know the map”. This form of geography’s utility peaked around 1500-1800 (Abler et al., 1971, p. 70).
- Galileo Galilei essentially opened up the medieval space by utilising the telescope as a basis for an experimental method instead of relying on scriptures (be they classical, biblical or revealed otherwise); this is the core of Galilei’s and Copernicus’ revolution.
- For philosopher Immanuel Kant (1724-1804) the categories of space and time already represented the fundament for cognition. The same was the case for the physics-oriented concept of space with Lagrange and other (mostly French) mathematicians (Hund, 1972). In such understanding, “only space and time enable access to the world” (Gebhardt et al., 2007, p. 32). In this tradition, social geography deals with the concept of space as such. Kant has conceived space as resulting from the spatial relations of individuals (which by the way is astonishingly similar to modern sociologists saying that structures are generated by social practice). Emphasising spatial relations as constituents for space was very prominently suggested by Haggetts’s (2001, p. 27) “geography on the beach” and highlighted by Bailey (2009) and MacDonald (2003).
- Descriptive, taxonomic, (regionalistic) period of history: 1800-1950: questions of “what is where?” are in the foreground, e.g. spatial distributions of soil, plants and animals. Carl Ritter (1779-1859) produced 20 volumes of “Erdkunde”, Friedrich Ratzel (1844-1904) wrote his book Anthropogeographie in 1882; he was influenced
by Darwin and Bismarck (Knox and Marston, 2008, p. 72). Ratzel in turn influenced Richthofen’s physical geography and Haushofer’s concept of “geopolitics” in the 1920s (with deplorable political consequences) and later, in the Anglo-Saxon countries, Ellen Churchill Semple (Haggett, 2001, p. 364) and Ellsworth Huntington (1876-1947) (Knox and Marston, 2008, p. 73; Dorn, 1991, p. xviii) claimed the existence of an environmentalist superiority of the white race. Evidently, such a concept is not appropriate for us.

• Such a geo-deterministic phase (Hard, 1973, p. 292) means: geography acts as the main descriptor of relations (Gebhardt et al., 2007, p. 70). A British representative of geodeterminism is Halford J. Mackinder (1861-1947) who saw the steppe as the pivotal area in Eurasia and hence the geographical pivot of history; he deterministically separated land power from sea power (contemporarily we might conceive an additional antagonising “virtual power” in Cyberspace). This approach could be called “geopolitics” from the British point of view, complementing Haushofer’s view. Such an unnecessarily strong overemphasis of environmental (i.e. geographically driven) determinants on (economic, social and cultural) development was later softened by the so-called stop-and-go determinism (Haggett, 2001, p. 363), its most widely known representative being Griffith Taylor (1880-1963).

• Possibilistic phase: Lucien Febvre (1878-1956, see Hard (1973, p. 161)). The possibilistic revolution around 1900 in France (Hard, 1973, p. 293) and this paradigmatic transition is embodied by the multifaceted personality of Paul Vidal de la Blache (1845-1919) and his key concept of “genres de vie”. Emphasis was laid on the liberty of humans and on the wide scope of their possibilities. Synthesising “landscape”, “regional studies of wholeness”, a culture ecological and historically-genetic analysis was considered a geographic task. Such a paradigm led to the emergence of cultural geography (Knox and Marston, 2008, p. 319f) and the notion of cultural landscape (Carl Sauer, 1899-1975). Hans Bobek (1903-1990) suggested a stepwise theory of integrations (in German: Integrationstufenlehre) (Knox and Marston, 2008, p. 321; Wardenga and Weichhart, 2006, p. 12; Weichhart, 1999, p. 69).

• After First World War, a shift from regional geography (idiographic, i.e. describing individual case studies; in German Länderkunde) to landscape science (nomothetic, i.e. positing general laws; in German Landschaftskunde) began, and led to the emergence of landscape ecology and social geography during 1950-1960 (Bobek, Hartke).

• During 1920-1930, Walter Christaller and Hans Bobek established a structural-functional economic and social geography. Spatial sciences during 1950-1960 analysed regularities in spatial patterns (of human activities): “The explanation of classes of events by demonstrating that they are instances of widely applicable laws and theories” (Hubbard et al., 2002, p. 25).

• History of spatial economic modelling: The major purpose of locational theory (Knox: 71) is to put location into economic theory. The perception of, e.g. mercantile and industrial landscape in the 1970s led to generation of a theory of space including a more severe methodology for general and thematic geography.
After the 1980s, the “quantitative revolution” (Harvey) was leading to an analytical and theoretical geography (in Germany: functional phase: \( y = f(x) \) (a parameter \( y \) is a function of a parameter \( x \), mostly space), Hard, 1973, p. 293).

Behavioural social geographic phase (Munich School: Ruppert, Hartke): basic functions of living (in German *Daseinsgrundfunktionen*, mental maps, 1960-1970: behavioural geography (Hubbard et al., 2002)).


Quantitative and analytic-scientistic phase: \( z = f(x, y) \) – where \( x, y \) are geographic coordinates and \( z \) any property (Hartshorne, 1939 in Agnew et al., 1996, p. 390), statistical geography: Duncan (Haggett, 1990, pp. 43, 91, 115).

Park (1926) cited in Ley (1980) in Agnew et al. (1996, p. 193): reduce all social relations to relations of space (as did Christaller) and it would be possible to apply to human relations the fundamental logic of the natural sciences, consequently David Harvey’s geometric science of spatial relation. Agnew et al., 1996, p. 200: Ley: Marxian structuralism: David Harvey and Manuel Castells. Ley (in Agnew et al., 1996, p. 203) “the agents of the historical process are not persons but abstractions”; wants to find the equilibrium of how much “development” is structurally caused, the relations of productions. People simply play the roles ascribed to them, not by themselves or by any other people but by the functional necessity of a structural logic. For Ley (Agnew et al., 1996, p. 204) “the denial and suppression of the subjective is an epistemological error”. Ley in Agnew et al. (1996, p. 205) holds that geographic facts are not fatalistically predetermined; they are the outcome of both constraint and choice of processes of negotiation by geographic agents. Is the modern individual’s authenticity not merely a reflection of his or her environment? (Agnew et al., 1996, p. 209).

Geography is a science where the object (i.e. worlds, reality) is more important than the methodology (unlike in, e.g. physics, economics); hence geography necessarily experiences a continuous methodological discussion and a sequence of methodological turns.

Wolfgang Hartke (1908-1997) emphasised “doing geography” (in German: “Geographie machen”) as a new concept, establishing a new cultural geography.

Action-oriented research, partly as opposed to a behavioural orientation: social constructivism (as opposed to critical rationalism), Benno Werlen’s “geography without space”. Plurality of concepts, post-modern, spatial planning (Borsdorf, 1999; Werlen, 1993). Borsdorf (1999): action is the production of space! (Werlen, 1987, p. 3). It is possible to act without space across a distance. Dissolution of space (de-anchoring). Social geography deals with the meaning of actions in space and for the purpose of societal constitution. The actors produce their own geographies; strong emphasis on the subject; this approach cannot explain responsibilities.

a non-deterministic sequence of stable development phases” (= in German “Formationen”) and breaks down with such developments.


- Perception-oriented approach. There is no homo geographicus who knows all reality, ecopsychology, Borsdorf (1999, p. 79); mental maps. Gebhardt et al. (2007, p. 591): mental maps show the “perception of distance”. Selective assessment of reality: a human reacts to reality as he or she sees it, not as it is. Behaviour in reality is a function of the subjective perception of reality. Hard (1973, p. 251): geography survives best if geography is able: (1) to cooperate in an interdisciplinary fashion (Weichhart, 1999; Wardenga and Weichhart, 2006) and (2) to invest specific perspectives.

- Post-structuralist perspective. Oriented to discourse (Aitken and Valentine, 2006, pp. 298, 303, 130), semantically-oriented: language constitutes the spatial. There is no meaning without space, meaning results from the relational play in space: “Linguistic turn”, e.g. Said (1978) in Agnew et al. (1996, p. 415).


- Bryson et al. (1999, p. 49): Analysis of discourse is discourse analysis of economy: Michel Foucault “linguistic turn”.


- A pluralism of methods can be observed, a myriad of meanings exist, there is no absolute or universal truth (geography becomes narrative): cultural turn (Gebhardt et al., 2007, p. 574), semiotic turn and linguistic turn in human geography that has always embarked on a hybrid approaches, in brief: a multiplicity of stories Aitken and Valentine (2006, p. 264): humanistic geographers are therefore interested in complex and dynamic wholes – experience, places, lifeworks. (Aitken and Valentine, 2006, p. 270): geography means people-centred methodologies, self-reflection and biographical strategies.

- To Hard, inquiry of what geography is, needs a universe of discourse producing a “plurality of geographies” (compare Ahamer et al., 2009, p. 313; Duraković et al., 2012: Figure 1). These geographies were often ordered along the metatheories of logical empiricism, critical rationalism, dialectic-hermeneutical inquiry, reaching into interpretative approaches of social philosophy (Hard, 1973, pp. 25–32).

According to Hubbard et al. (2002, p. 235) and as a conclusion to this loose enumeration, the following main questions for geographic research can be established:
Geography as a multiparadigmatic science

As has become evident from the above enumeration of paradigms, geography is “a multi-paradigmatic discipline” (Gebhardt et al., 2007, pp. v, 48) with very widely differentiated themes and methodologies. Geography is the “science of the entire world” with accumulated paradigms. “Geography being what geographers do” focuses on the “overarching functional relationships” among physis (nature), anthropos (human), economic and social aspects (Gebhardt et al., 2007, p. 48).

The author’s own professional experience shows that only “esteem for all paradigms” (= views, perspectives) can provide the full picture in the “macroscope” (Strobl, 2008). All the above-mentioned methods contribute to a “collective production of meaning” (Gebhardt et al., 2007, p. 181). Human geography is thus a multi-perspectivistic field (Gebhardt et al., 2007, p. 572ff).

Geography has undergone so many revolutions in the second half of the twentieth century that it was called the “Latin America among sciences” according to Blotevogel (Borsdorf, 1999, p. 94).

“The method of geography is something to be created and designed, not something that is fixed and predetermined” (Hard, 1973, p. 11). This horizon might lead some readers to believe in an ongoing creative evolution of geographic thought, in analogy to the theory of Kuhn (1962), presented in his book Structure of Scientific Revolution, see Gebhardt et al. (2007, p. 70).

History of economic geographies

After having studied the history of geography in general, the following subchapters deal with subdisciplines of geography. According to Krugman (1991, p. 1), economic geography means the location of “production in space” (Knox and Agnew, 1997, p. 9). Cyclical economic fluctuations, such as the cycles theorised by Kondratieff and Kuznets (one Kondratieff cycle amounts to two Kuznets cycles) explain merely a portion of economic patterns. The first industrial, or any subsequent boom became a victim of its own success, the “market became saturated”, which led to an understanding of the meta-patterns of any evolutionary economic, agricultural development.

Spatiality of change is explicitly included in Wallerstein’s “world systems theory”: geography deals with variability within a general context, hence the concept of core, semi-periphery and periphery (Knox and Agnew, 1997, p. 16ff). Geography is understood as the science dealing with such variability (core versus periphery within a general context). Immanuel Wallerstein (Knox and Agnew, 1997, p. 65) tries to understand the geographic path dependence of economic activities; “one cannot analyse social phenomena unless one bounds them in space and time”. Wallerstein (1984) sees the world as an evolving market system (Knox and Agnew, 1997, p. 20). The economic hierarchy of states is a product of the long-term economic cycles that dominate the dynamics of the system!
In this view, “underdevelopment is a direct result of the nature of spatial relationships” within the world capitalist system (dependency theory of development, Knox and Agnew, 1997, p. 84).

It can be criticised that often economic sciences represent an extreme case of taking “data for granted and thus replacing the realistic view”. Traditional “growth theory” (Ahamer, 2008; Crang et al., 1999, p. 7) especially opposes this hubris pretending that the structures of economic (and civilisational) growth are known.

**History of developmental theories**

Developmental theories are discussed in more detail in Ahamer (2008, 2009, 2010a). Their interest is similar to the history of economics because they search for answers to the question: “where are economies rich and where are they poor?” which is a deliberate alteration of the title by Landes’ (1999) much discussed developmental book *Why Some Are So Rich and Some So Poor*.

In developmental economics, two main antagonistic paradigms span across a wide range of more differentiated understandings. In the order of their historical emergence, these two are:

1. the growth theory; and
2. the dependency theory.

(see symbolically in Figure 4), discussed in more detail in the course of the “Global Studies” curriculum (Ahamer, 2011; Ahamer et al., 2011a). A strongly and controversially discussed assumption for (1) is the “homo oeconomicus”, namely an idealised person acting according to the behavioural laws assumed in (neo)classical economics. As a footnote: it seems that (even) young cats strive for optimal social quality (e.g. maximum joy when play-fighting with each other), not for maximising their individual benefit (e.g. consisting in winning a played battle; for this purpose the stronger brother often intentionally succumbs to the weaker brother). It can be thus observed that young cats are ready to cede their individual benefit for another’s benefit, implying successful social interaction (here joyful game play). Furthermore, young cats (under normal nutritional circumstances) do not even strictly corroborate Brecht’s (1928, p. 67) hypothesis of “first feed, then ethics”, because after morning wake-up they first desire social contact and only second their feed.

The major theoretical perspectives in economic geography since the 1960s, according to Coe et al. (2007, p. 12f) follows the lines of the history of economy (e.g. Irving Fisher’s machine (Coe et al., 2007, p. 38). Marxist political economy since the early 1970s has focused on uneven development (Bryson et al., 1999, p. 9), searching for statistical laws of spatial distribution and for processes of uneven urban and regional development.

![Figure 4.](image-url)

The “magnetic field” of developmental theories evolves between (neo)classical growth theories and competing dependency theories, also called internal and external theories of development (Ahamer, 2010b)
The capitalist dynamic was seen to be heated as a result of Schumpeter’s “creative destruction”. In this context, the important author David Harvey wrote on Urban social justice in 1973.

As another example for (1), see in Figure 4 at left, location theory again perceives economics with a neoclassical approach. Representatives in Germany are Alfred Weber (1909) and August Lösch; in Great Britain and the USA: Brian Berry, William Carrison, Peter Haggett. This approach was adopted at the beginning of the 1990s by what economists referred to as “new economic geography” (NEG). New economic geography views economic processes as linked to social, cultural, institutional factors, at left in Figure 4.

Quite antagonistic to growth theories:

- development theories; and
- represent complementary views.

The theory of the modern world system (Wallerstein, 1984, at right in Figure 4) dealt with economic globalisation. In this view, world regions are linked up by “unequal exchange” leading to unequal development (Knox and Marston, 2008, p. 74). As an example, the core-periphery approach was taken by Krugman (1991, p. 89). The economic equilibrium theory allows for apparently consistent modelling, however, the state of spatial equilibrium is never reached (Knox and Agnew, 1997, p. 84). During the late 1960s until the early 1980s, a behavioural approach assuming bounded rationality allowed for model decision-making and resulting locational outcomes.

Bryson et al. (1999, p. 35) states: “economy is a function of power relations” and as a critique of the classical measure for economic level (Bryson et al., 1999, p. 46): “GDP does not contain informal activities”.

Agnew et al. (1996, p. 600ff) describe that David Harvey, in his view, states that “the geography of capital accumulation leads to annihilation of space by time” (which might be corroborated by the syndromes generated by financial markets in late 2011). He suggests (Agnew et al., 1996, p. 612) “a ‘spatial fix’ to capitalism’s contradictions:

1st contradiction: Space can be overcome only through the production of space (Agnew et al., 1996, p. 620).

2nd contradiction: The internal contradictions of capitalism can be resolved by a spatial fix, but in doing so, capitalism transfers its contradictions to a wider sphere and gives them greater latitude. Conclusion: The more fiercely capitalism is impelled to seek a spatial fix for its internal contradictions, the deeper the tension of overcoming space through the production of space becomes.”

Harvey (1973, 1989, p. 46ff) (followed by many other theorists), explains that the key defining feature of the new capitalism is “flexible accumulation”. In his seminal book “The condition of postmodernity”, the principal task of economic geography is seen as “understanding the geographies of global integration”. For Harvey (1989, p. 16), “postmodernism encourages the multi-perspectival, multi-dimensional and multi-vocal, but at the same time compels one to examine the positionality and authority of knowledge claims, whatever the voice”:

The cultural turn has introduced economic geography to a new set of qualitative methodologies, for example textural analysis, iconography, semiotics, ethnography, participant observation and action research, to name but a few. (Harvey, 1989, p. 17).
An eclectic collection of philosophical standpoints and social theories led to the so-called “cultural turn” (in geography or elsewhere) which was seen as a “danger of muddying the analytical waters” (Bryson et al., 1999, p. 14). In a similar vein, Daly (1991, p. 93) perceives:

We have moved from the metaphysical realm to the metaphorical: That is to say, we have moved from the idea that economic “truth” is discovered towards the idea that is made.

Summing up in more detail, apart from development theory (e.g. Rostow’s five stages of growth) there are three theories for the emergence and structure of the world economy (Knox and Agnew, 1997, p. 108):

1. long-wave theories (such as Kondratieff);
2. world system theories (Wallerstein); and
3. regulationist theories (Coe et al., 2007, p. 71).

But in the understanding of Coe et al. (2007, p. xix), economic geography is distinct from developmental geography. To him, there are two perspectives on economic geography: political economic perspectives (after the 1970s) and new economic geography perspectives (Coe et al., 2007, p. x).

Bryson et al. (1999, p. 10) identifies four components of economic orthodoxy, i.e. neo-classics:

1. Universalism (one size fits all approach to poverty).
2. Economic rationality always prevails (homo oeconomicus exists).
3. Competition and equilibrium (market mechanism finds optimal efficiency).
4. Laws and principles steer economic processes.

In order to condense it all into a paradigm of economic geography, Bryson et al. (1999, p. 11) coin the expression that “economic geography is space, place, scale” (where “space” might be understood as provider of the occasion for localisation). However, the author suggests that readers might wish to conceive: “important truths are very badly localisable but small truths are easily localisable”. There might be a principal trade-off between relevance and ability to generalise versus locability and concreteness in our spaces of understanding. It may not be easy to localise Einstein’s law of “E = mc²” anywhere in this universe, unlike geological faults and volcanoes. Hence, paradigms even within the natural sciences can be quite controversial, much like the resulting conviction of “what does scientific quality mean”.

As a possibly suitable solution to this dilemma we might conceive: both the geographic context and the functional context are necessary, namely to an extent appropriate for the respective issue.

In the next step of deliberation, we use the word “space” to describe not only geographic or economic spaces but any such (social) spaces.

Space in the history of human geography
Looking at social sciences from the “outside”, Agnew et al. (1996, p. 7) diagnose a considerable “geographical turn in the social sciences” which consistently complements the many turns in (human) geography and underpins the diagnosis by Gebhardt et al. (2007) that “geography became a theory exporting science” recently. A very helpful

In order to start at first with a calm look at the turbulent history of thought in human geography, Gebhardt et al. (2008, p. 28) provide a well-structured and stringent list of succinct definitions of several types of spaces including:

- absolute (mathematical) space (compare Kant);
- geodetic space (GIS, astronomic space);
- space as a container with a metric (compare French mathematised understanding of physics, e.g. Lagrange);
- relative space (social and economic approach); e.g. Haggett’s “geography on the beach” uses the degree of connectivity;
- relative experience (constructivism); and
- cognitive space: behavioural sciences, regarding values and perceptions.

John N. Nystuen (in Agnew et al., 1996, p. 590ff) provides an “identification of some fundamental spatial concepts”, namely space conceived as:

- “distance” (ordinal or metric);
- areal differentiation: concept of spatial interaction;
- isotropic plane in the sense of Hägerstrand;
- abstract space (Agnew et al., 1996, p. 593);
- distance measure (“spaces” result from assigning properties to a measure of distance);
- a measure that can be asymmetric (e.g. one-way streets);
- systemically effluent from the so-called triangular inequality; and
- connectivity (adjacency, contiguity), necessitating interaction (Agnew et al., 1996, p. 596).

Nystuen concludes his theoretical analysis by extracting the following terms defining the concept of “geographic view”:

- direction or orientation;
- distance; and
- connection or relative position.

Timespace geography and web didactics

If understood on a meta-level, Torsten Hägerstrand’s time-geography (Agnew et al., 1996, pp. 637, 644) fits well into globalisation and web-based didactics, not only because he describes procedures in space-time, but also due to his choice of vocabulary, namely “synchronisation and synchronisation” (ethymology: khronos from Greek: ὀ χρόνος: time; khōros with long o from Greek: ἡ χώρα: land, (empty) space; ὀ χώρος: estate, landscape; distinct and not to be confused etymologically with khōros with short o: ὀ χώρος choir, dance). Intentionally choosing the latter for vocabulary, the “choreography of existence” recalls the musical notation invented in (Ahamer, 2011b) to symbolically depict whether or if students are at the same point in the state
space of learning, gaming and understanding. This means, as is often mentioned in this
text, that by sharing space or time (or rather transformed space and time), entities have
an option to interact, filling the statement “to have the same location” with meaning.
Such may serve as a pragmatic but powerful definition of space with a view to web
didactics, using a functional method of definition that conceptually starts from scratch.

According to the Encyclopaedia Britannica (2011), Torsten Hägerstrand conceived a
“locational or spatial analysis or, to some, spatial science.” He wrote in an article on
“diorama, path and project” (Hägerstrand, 1982, p. 323):

The concept of path (or trajectory) was introduced in order to help [us] to appreciate the
significance of continuity in the succession of situations. We have to keep in mind that it
refers not only to man but to all other packets of continuants which fill up our world
(Agnew et al., 1996, p. 650; Ahamer et al., 2009, p. 302; Kraak, 2009).

Such a basis, applied to timespace geography, dwells on the century-long conviction
that “natura saltus non facit” (nature does not make (unattended, unannounced,
inexplicable) jumps) which is as perfectly in line with differential calculus, gradualism
and determinism as it is in natural philosophy – and as debatable. The “diorama”
approach (diorao in Greek: διορα is to look through, to see clearly, to notice) means
to him “a portrait of the grand situation” (Agnew et al., 1996, p. 655), just as publicly
known from museums of natural history.

Regarding the history of human geography, Derek Gregory states (Agnew et al.,
1996, p. 212): “Postmodernism is, in a very real sense, “post paradigm”: that is to say
post-modern writers are immensely suspicious of any attempt to construct a system of
thought which claims to be complete and comprehensive.” In contrast to classical
science, it rejects the notion that social life can be explained in terms of some “deeper
structure” (postmodernism is similar to poststructuralism) (Agnew et al., 1996, p. 214).
Such a post-modernist approach even interferes with the strategy of detecting “paths”
in the process of globalisation.

Gebhardt et al. (2008, p. 31) lays an emphasis on spatial interaction that might be
manifested by (material) flows which can be monitored and measured more
conveniently in order to characterise the underlying (spatial) dynamic interaction.

In the sense of “space time convergence”, travel times decrease with increasing
technological facilities, and this space-time convergence has an effect on perception
(Gebhardt et al., 2008).

In a general criticism of the classical European history of sciences, which in his view
has overemphasised history and humanities over (natural) science, the geographer
philosophy of the invisibility of space and time: Space was treated as the dead, the fixed,
the un-dialectical, the immobile”. “Time, on the contrary, was richness, fecundity, life,
dialectic”. “To recover from this historicist devaluation, to make space visible again as a
fundamental reference requires a major rethinking into a larger epistemology.”
He continues: “There are three overlapping spaces: physical, mental, social (the social
space is the one that allows and foresees interaction). Spatiality exists ontologically as the
product of a transformation process.” He adopts Henri Bergson’s “concepts of ‘time’,
namely ‘durée’ as opposed to ‘événement’ (Agnew et al., 1996, p. 633), the former being
the carrier of creativity, spirit and meaning”. The present text chooses to translate as
“effective time” (in German: Wirkzeit, wirkbare Zeit), in analogy, the spatial metric \( x \)
suggested in geography and GIS means the “effective spatial distance” (in German: *Wirkdistanz des Raumes*).

Very helpfully, and as an underpinning for the understanding of the present text, Soja (1989, in Agnew *et al.*, 1996, p. 633) concludes: “Spatiality is both outcome and medium for the social relation and social structure”.

Other helpful levels of understanding of space versus spatiality are (Hubbard *et al.*, 2002, p. 13):

- Space $\equiv$ absolute (Euclidic) space (Čapek, 1976, p. 113), a container of objects.
- Space $\equiv$ relative understanding, constituted by socio-spatial relations.

In the author’s view, the space-time issue is a “conclusion of geography in history”, it suitably prepares this paper’s own approach and at the same time opens a path to web didactics.

**Deliberations on “what is space?” with a view to e-learning**

As a rather aphoristic definition, Agnew *et al.* (1996, p. 516) see three principle episodes among many other conceivable ones in human geography:

1. Geopolitics and chronopolitics (imperialism).
3. Transition to new spaces (present times).

Regarding the third item, (Harvey, 1989, in Agnew *et al.*, 1996, p. 521) suggests the concept of time-space compression as one of the possible procedures for arriving at “new spaces”: “The door is opened to the possibility of many spaces, none of which may be said to be the sole cause of all others.” This multiplication of spaces includes metaphorical spaces (Smith and Katz, 1993), thirdspaces (Soja and Hooper, 1993) and imaginative geographies (Said, 1994).

In the view of the author, space separates individual humans and prevents them from interacting directly and physically. Space introduces privacy in our world as it prevents from interaction. “Space can be thought of as a provider of distance, hence difficulty for communication.” In this concept, “spatial distance is the inverse of likelihood to communicate”. Consequently, such a concept might be capable of uniting the scientific fields of (social) communication and of (geographic) space.

Explicitly, web-based learning overcomes such a barrier for communication.

As a conclusion to these above theoretical contemplations, the author posits three hypotheses:

$H1$. Space $=$ opportunity for processes.

$H2$. Time $=$ substrate to enact processes.

$H3$. To accelerate time means to facilitate learning.

In the above contemplation, time and space are complementary; they need each other for existing. Communication mediates. Consequently, the type of communication defines the type of metric of space and time.
There are additional suggestions on how to re-integrate space and time:

- From a dialectical standpoint, best expressed by Harvey: geographical difference cannot be expressed apart from the temporal dynamics of capitalism.
- From the standpoint of Hagerstrand’s time-geography (Haggett, 2001, p. 31): re-integrate through the medium of social action. Action produces a path and constraints are conditions for concrete social action.
- From a standpoint of everyday life: people do not experience space and time separately.
- From a technological standpoint: GIS can further integrate spatial and temporal information.
- From a systems analytical standpoint: over time, (i) physical and (ii) communicational structure building can be conceived.

In a speculative manner the following paragraph further pursues the above definition of “space” as constituting an “obstacle to the opportunity for communication”, and tries to apply it to early human history.

In a world of purely physical interaction (i.e. mainly without tools), as in prehistoric times, the effort to reach another individual is first proportional to the geodetic distance, and second to the relative penetrability of such locations which can be increased by rough surfaces (e.g. grassland versus shrubland), altitude differences, woods or waters. On the other hand, in a contemporary world where communication is largely operated by tools and technologies, the “communicative distances” to communication partners can be a modified geodetic distance (e.g. by vehicles) – leading to privileged veins of communication “paths”; but in a world of almost totally technology-based ways of communication, such as the telephone, broadcasting and internet, the geodetic distances are in no way any longer a constituent for a (similarly relevant) metric of space, as defined above through communication surmounting geodetic distances. Rather, the density and intensity of communication determines this type of space (the metric of which, by the way, has since the advent of mankind always been based on the reachability, frequency and depth of exchange, e.g. defined by the time elapsed until successful communication is achieved). One might call such a space “non-geodetic” space. In it, the superposition principle might no longer be available.

Hence, the manner of generation of “space” has not changed in principle, but the shape of the result has. “Any space is determined by its means of communication”. In our century, several authors have suggested that we mainly live in a communicational space and have postulated that (additional) space is generated by additional communication technologies. This leads De Blij (2009, p. xi) to state “the world is flat”.

In the early days of human ontogenesis, spaces were so strongly “hardwired” that these counted as “really real”. Examples are tactile spaces for protozoa; walking spaces, seeing spaces, hearing spaces for higher animals, spaces of physical battles for earlier civilisations, cultural and religious spaces for all civilisations, long distance weapons spaces for recent civilisations, ICT spaces for the most recent decades, and possibly spaces for instantaneous communication (cf. EPR paradoxon, etc.) in the future.

At any rate, independent of the concrete naming of the described effect by different authors, we may speak of a “spatial transition” that adds to the list of other
civilisational transitions such as population transition, etc. This is a crucial point in the present text and this contemplation might be complemented by a “temporal transition” to be described in more detail later.

In brief, the theoretic contemplation above suggests (the sign: = means “is defined by”, as in mathematics):

\[ H4. \] Space: = separation of possibilities for communication.

Consequently, and inversely, eliminating such a “spatial” separation (i.e. juxtaposition in such space) enables communication (e.g. by learning technologies based on the internet).

Quite practically, destruction of such spaces may occur among others:

- In everyday life through information and communication technologies (ICT) such as the internet; as examples, see the Arab Spring movements; or by e-learning strategies: what an implementation of de Chardin’s (1955) noosphere (\( \ddot{o \nu \nu \sigma } \) or \( \ddot{o \nu \nu \tau } \): the mind in Greek).
- In quantum mechanics through instantaneous information transfer across large distances as described by Einstein \( \text{et al.} \) (1935) and often reconsidered as EPR paradoxon (Moser, 1996, 1999).

GIS provide “world views”

In this sense, GIS facilitate the exchange of views (to the extent that these are space-related and geo-referenced, hence localisable) which is a necessary pre-condition for dialogue which in turn promotes scientific evolution, or at least is hoped to promote cultural evolution at the same time. In the understanding of this paper, GIS (\& virtual globes) act as providers of world views, they facilitate and enhance discussion of individuals’ world views (and thus might even contribute to “speeding up” evolution), at least technically, but also conceptually from an optimistic point of view, by deepening one’s understanding of opponents’ views. From the perspective of GIS proponents, geo-referencing may represent a common denominator between and among individuals who want to exchange world views, e.g. for planning, which unequivocally means Public Participation by GIS (PPGIS, Jekel \text{et al.}, 2010; Ahamer and Purker, 2011).

A speculative future

The above definition of space \((H4)\) allows for a highly speculative deliberation in the following paragraph: to the extent that communication between humans is enabled more and more, and as a tendency becomes pervasive, the notion of “space” becomes void. According to Renard (2003), the “dissolution of space” takes its “place”, i.e. occurs. The ultimate and universal conclusion might be: In our era of the internet, e-learning and social networks we see the principal annihilation of physical, geodetic space (in its main function as a barrier to communication) or also “space” viewed and conceived as accessibility, resulting in the emphasis on spatial diffusion (Knox and Agnew, 1997, p. 66). As one conceivable socio-political consequence, the importance of area-oriented nation states (i.e. clusters in the geo-space) might vanish over the next few decades or in a more distant future, and will be replaced by clusters in the cultural, communicational and ethical spaces, i.e. those people who interact based on a similar philosophy of life, similar set of values, shared constituent myths and technological facilities.
Consequently, the classic notion of “property” and “wealth” could vanish (by itself, autopoietically, not by external “revolution”) and be shifted into communicational “potency” – the one who shares most, best, and most suitably will be considered the richest, in continuation of the present-day Google and Facebook economy, striving for a nonmaterial, information-related objective. Present success stories of values created by openly accessible information resources on the internet attest to the fact that this future has already begun. Secluding fences are no longer the symbol of the type of wealth that becomes most prevalent but “sharing” is: the one who shares most is richest (in esteem – a new metric in human space). Communicational wealth in the space of flows (Castells, 1996) and “optimal flow” as psychological experience (Csikszentmihalyi, 1990) might take a more important place.

Summing up the last subchapters, it can be said based on the above historic and mathematical deliberations that:

- “Space” may well be defined as a function of communication options, where “distance” is a measure based on (communicational) occurrences in a functional space. In this sense, \textit{space is an opportunity for processes to occur}.

- “Time” may be defined as a function of change processes (e.g. learning processes); in case of complex systems these may often proceed in a self-generating (i.e. autopoietic) evolutionary way. In this sense, \textit{time is a substrate to enact processes}.

\section*{Conclusions}

Geography witnessed so many revolutions in the second half of the 20th century that it was called the “Latin America among sciences” according to Blotevogel (Borsdorf, 1999, p. 94). Human geography is thus a multi-perspectivistic field. A “geographical turn in the social sciences” consistently complements these many turns in (human) geography and underpins the diagnosis that geography has recently become a theory exporting science recently. Hence it appears justified that the present attempt to provide theoretical underpinnings to “multicultural education” makes use of the discipline of geography.

The method of geography (and analogously of developmental science and multicultural learning) is \textit{something to be created and designed}, not something fixed and predetermined.

\textit{Space and time} in the classical understanding can largely be \textit{transcended} by (web-based) learning technologies, if suitably designed, implemented, and enacted.

The present paper has attempted to provide some theoretical deliberations that can further serve to design \textit{learning technologies for multicultural understanding of global development} with a view to global equity.

In the understanding of this paper, successful learning means “collective production of meaning”.

Successful global development is “growing jointly in mutual esteem”. Esteem is the currency of future.

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