

Articles

Connectivism in phenomenological-pragmatist tradition

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Abstract

The theoretical study aims to analyse the theory of connectivity which George Siemens came up within 2004 and which became a basic impulse for the development of online education in the form of MOOC. Siemens itself refers in its article to the traditions of constructivism, network theory or chaos theory. Other studies about connectivity continue in this line. However, the study draws attention to the fact that the approach has distinct phenomenological – pragmatist roots, which allow it to be interpreted in a new and more profound way and perhaps even to develop based on a deeper foundation than that offered by Siemens' grasp.

Keywords: Phenomenology; technology in education; connectivism; pragmatism; MOOC.

Konektivismus ve fenomenologicko-pragmatistické tradici

Abstrakt

Cílem teoretické studie je analyzovat teorii konektivismu se kterou přišel v roce 2004 George Siemens a která se stala klíčovým impulsem pro rozvoj online vzdělávání ve formě MOOC. Sám Siemens se ve svém článku odvolává na tradice konstruktivismu, teorii sítí či teorii chaosu. V této linii pokračují také další studie, které se tématu konektivismu

věnují. Studie ale upozorňuje na skutečnost, že teorie má zřetelné fenomenologicko-pragmatistické kořeny, které umožňují ji nově a hlouběji interpretovat a snad i rozvíjet na základě hlubších základů, než jaké nabízí původní Siemensovo uchopení.

Klíčová slova: fenomenologie; technologie ve vzdělávání; konektivismus; pragmatismus; MOOC.

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Introduction

The emergence of pedagogical theories is generally a complex and often long-term process. For example, if we look at the history of constructivism, as the dominant pedagogical theory today, we could say that it has been forming for almost a century (Troelstra 2011; Golinski 2008). At the same time, pedagogical theories never emerge in a vacuum; they are always a reaction to others (in the case of constructivism it is a reaction to cognitivism and behaviourism, to define oneself against naturalistic and objectivist approaches) and to current social problems and environments (which is especially evident in Montessori pedagogy).

In our study we want to focus on the analysis of the emergence of one of the new pedagogical theories, namely connectivism (Goldie 2016; Bell 2011), which defines itself (already in its constitutional text) against constructivism, cognitivism and behaviourism, probably the three most critical pedagogical theories of 20th century. At the same time, it seeks to respond to significant societal changes related to the development of new approaches in the natural and technical sciences (chaos theory) and the development of the Internet and its impact on society (Duke, Harper & Johnston 2013; Pettenati & Cigognini 2007).

The author of connectivism, George Siemens, defines it negatively – as a theory working with other starting points and concepts than constructivism, behaviourism, and cognitivism (Siemens 2017). However, our study raises a different question – what thought traditions could be found in connectivism? By default, there is a discussion about whether the differences between connectivism and constructivism (especially in its socially understood variant) are so large that it is possible to talk about its independence at all.

However, the study goes in a different direction and tries to point to the roots that are related on the one hand to pragmatism (Dewey, Lakoff and Damasio), such as the American approach and Heideggerian phenomenology (Heidegger, Arendt, Patočka, partly Floridi) on the other. These roots have never been explored in connection with connectivism, although it can be shown that they represent an exciting clump

of thought that can help both to understand connectivism and its more profound elaboration. The phenomenology of the Heideggerian species and pragmatism can be effectively linked, as I have shown in my book (Černý 2020).

As we will show in the following chapters, from pragmatism, connectivism can take a relationship primarily to benefit – in education. There will probably never be a consensus on what belongs to the primary curriculum and what does not. It will not be possible to define suitable procedures and concepts in advance, to teach individual problem-solving procedures. What will decide and the real quality of education will be the ability to work more in-depth with knowledge, integrate it and, above all, use it in the situations in which we find ourselves daily (Haack 1976, Spitzer 1996)?

The second important concept associated with pragmatism is the question of corporeality (Šíp 2013), which is essentially unresolved in connectivism and is one of the topics that will require further research in the future.

From phenomenology, it is possible to take over the relationship to epistemology – namely, that knowledge is never a finished matter, but something that is gradually revealed and shown – reveals. The truth is not predetermined in either phenomenology or connectivism, but something that happens through our activity. This feature is essential for connectivism and its more profound understanding, and Siemens and other authors have not been able to work significantly with this feature.

There are two other significant topics in phenomenological-pragmatist. Above all, a positive attitude towards science and technology, which is, after all, the concept on which connectivism is based (including the bold thesis that inanimate AI systems can learn), but also the absence of the distinctive feature “either-or” (Arrow 2019) – online or offline, man or machine, knowledge or competence. This framework seeks to show that these categories can only be meaningfully considered in the context of the continuum.

All of these features are something that connectivism implicitly works with, but usually cannot sufficiently elaborate and analyse. The aim of this study is, therefore, to open a field of research and discussion in this area, which would make it possible to make connectivism a genuinely robust and well-thought-out pedagogical theory.

Our study will proceed in three steps – it will offer a description of the intellectual background of connectivism and its principles. In detail and depth of description, this is probably the most detailed insight in the Czech environment. The third part (Chapter 4) will focus on the analysis of the phenomenological-pragmatist roots of this theory.

The authors of the theory of connectivism emphasize entirely different ideas than phenomenology and pragmatism – the same constructivism, network theory or chaos theory. In this study, however, I show that it is these two lines of thought that are wrongly neglected in the considerations of connectivism. Connectivism is a controversial educational theory that, in my opinion, requires a more in-depth theoretical examination.

George Siemens first formulated the principles of connectivity in 2004 on his blog (Siemens 2004), then published an article in 2005 (Siemens 2005, 2017) in the *International Journal of Instructional Technology and Distance Learning*, which also became a key publishing platform for connectivists. Siemens, together with its collaborators Stephan Downes (today probably the last traditional activity connectivist), Rita Kop and David Cormier (a man who uses classroom connectivity ideas) developed the first cMOOC course (in 2008).¹ This course was based on the idea that each student would go through specific general topics, process them on their blog, and at the same time comment on and follow the work of their classmates – learning has lost the structure of power hierarchy and distributed. (Ebben & Murphy 2014, Clarà & Barbera 2013, Downes 2008)

In this course, the teachers were able to create a platform linking thousands of students who were not exposed to any barriers to entering the course. Learning in such a conceived network had to be necessarily open and distributed, and feedback from other people, both students and non-students, represented a fundamental turning point in how people imagine functional educational courses.

In its paper, Siemens described both the starting points that led to the need to come up with a new educational theory and also to articulate the points that connectivist learning must meet clearly. What should be emphasized before delving into the actual description is the fact that connectivists do not claim to be the only possible form of education or always a valid form of learning. For example, the most prominent Czech connectivist Bořivoj Brdička attributes efficiency to the so-called traditional methods on the lower floors of Bloom's taxonomy of educational goals but considers them unsuitable for higher floors. (Brdicka 2008)

Below, I will follow in this study the Siemens as mentioned above paper (Siemens 2017), in order to outline the fundamental structures of Siemens considerations. If the study is more concise than a systematic interpretation would require, it is because Siemens itself is very economical, so many of its ideas may be shaped more deeply than it does in the text itself.

¹ There are two basic types of MOOC courses. cMOOCs are originally aimed at groups of people who do not know each other but who can interact and interact with each other, partly influence the content of the course. The critical learning activity takes place in a shared portfolio environment. xMOOCs are courses we know from platforms such as Coursera, edX or FutureLearn – built on a pre-defined structure that will allow thousands or tens of thousands of students to study simultaneously. Such teaching must also be adapted, for example, to assessment methods or communication.

1 Background of connectivism

Gonzalez (2004) describes that one of the critical features of the information society is the short time between the ingress of information and its obsolescence. He does not mean information of trivial nature, but scientific knowledge. Already in 2004, he claimed that the amount of knowledge had doubled in the last ten years. This means that the concept of a knowledge-based curriculum is unsustainable and needs to be replaced.

At the same time, it is possible to monitor trends that significantly influence the education process. People change disciplines, often working in completely unrelated sectors, to which education should also prepare. It should be noted at this point that Siemens did not have, for example, an analysis of Osborn and Frey on employment change (2013, 2017) or an idea that the phenomenon would be collectively referred to as Industry 4.0. (Demartini & Benussi 2017, Pfeiffer 2015, Benesova & Tupa 2017)

Technology is changing the way we think and behave, how we solve problems, and how we work with information. These changes are obvious and fundamental, and it is not possible to neglect them or to reflect them. At the same time, machines with artificial intelligence can solve some of the problems today. They also enter the educational landscape, which we must adequately grasp.

There is another fact with the previous two points; men and organization are intrinsically learning organisms, it is not possible to say that learning ends in school, but it is a lifelong process in which non-formal learning also plays an important role. (Tvenge & Martinsen 2018, Hecklau et al. 2016)

Based on these features, he then criticizes behaviourism, cognitivism and constructivism, which he considers to be the most common pedagogical theories and at the same time the theories that are unable to respond to the challenges of the contemporary world. According to Siemens, if we want to propose a new educational theory, we must take into account two phenomena – chaos theory and network theory – in addition to the phenomena described above. (Siemens 2017)

Chaos (Gutzwiller 2013, Prigogine et al. 1991) is something that he considers to be a vital topic of both natural sciences and social sciences. (Kiel & Elliott 1996) Modern mathematical approaches, as well as computer technology, have made it possible to think about it in a more differentiated way and to work more actively with the effects of applying this theory in different areas. First, chaos means a minimal possibility of predicting anything that happens in the system. Nothing (significant) could be predicted in a fully chaotic system. Today's society, with the massive advent of technology, contains just such signs of chaos.²

² Let us note two things in this place. First, chaos is something that is associated with a nonlinear dynamic structure. If we do not want the learning environment to be heavily regulated and planned, then there will be nothing left but a sense of chaos to be necessary. Secondly, it is a concept that goes entirely against the ideas that Comenius had about the meaning and structure of education. Floridi (2013) considers entropy, something that inherently accompanies chaos as an ontological evil. The purpose of cognition is to structure

To learn something in such a society, it is necessary for an element that is outside to do two things. First, it must be open to interactions, that is, in order to interact with the environment and change its structure based on that interaction. At the same time, chaos refers to extremely complex relationships, between phenomena, well described, for example, by the butterfly flap effect. It is not possible to predict the consequences of phenomena, but also to structure the world separately in advance.

Learning is – according to Siemens (2017) – a process of organizing information. This organization is not easy in that learning itself, by its very nature, presupposes the discovery of structures and bonds in a very complicated and complex world. The organization itself is an organism's process of learning, which openly enters into complex interaction ties with the environment and, on the basis of it, changes its internal structure. The second topic, which in his text as his thought starting point to the theory of networks, respectively their connection with theories of small worlds and weak links. Siemens states:

“Nodes that successfully acquire greater profile will be more successful at acquiring additional connections. In a learning sense, the likelihood that a concept of learning will be linked depends on how well it is currently linked. Nodes (can be fields, ideas, communities) that specialize and gain recognition for their expertise have greater chances of recognition, thus resulting in a cross-pollination of learning communities.” (Siemens 2017)

In other words, learning is a networking issue linking networks of varying size and structure into networks where information exchanges can take place. These information exchanges become more intense as the learning takes place. Elements that have a robust position in the network gain recognition from others because they have connections with the whole mean they have something to offer interactively.

Chaos theory and networked learning are not far-reaching elements – networks must arise in an environment that is chaotic, complex, poorly structured, and relatively fast-changing. The internal structure of individual nodes, as well as the entire system of links, is rebuilt. There is minimal stability in such an environment.

the world and reduce its entropy. Perhaps it could be beneficial – but here we will not elaborate further – to perceive both concepts as elements of „overlapping“ in the process of establishing a precise balance of the system.

Questions	Behaviourism	Cognitivism	Constructivism	Connectivism
How does learning occur?	Black box – observable behaviour main focus	Structured, computational	Social, meaning created by each learner (personal)	Distributed within a network, technologically enhanced, recognizing patterns
What factors influence learning?	Nature of reward, punishment, stimuli	Existing schema, previous experiences	Engagement, participation, social, cultural	Diversity of network
What is the role of memory?	Memory is hardwiring of repeated experiences – where reward and punishment are most influential	Encoding, storage, retrieval	Prior knowledge remixed to current context	Adaptive patterns, representative of current state, existing in networks
How does transfer occur?	Stimulus, response	Duplicating knowledge constructs of “knower”	Socialization	Connecting to (adding nodes)
What types of learning are best explained by this theory?	Task-based learning	Social, vague	Social, vague	Complex learning, rapid changing core, diverse knowledge sources

A table is comparing critical approaches in the four fundamental pedagogical theories of behaviourism, cognitivism, constructivism and connectivism. It points to the links between constructivism and connectivism. Taken from Giurgiu, L., & Bârsan (2015).

2 Principles of connectivism

Based on these considerations, Siemens constitutes what it calls as principles or principles of connectivism. It states in the preamble to those principles:

“Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements—not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing. Connectivism is driven by the understanding that decisions are based on rapidly altering foundations. New information is continually being acquired. The ability to draw distinctions between important and unimportant information is vital. The ability to recognize when new information alters the landscape based on decisions made yesterday is also critical.” (Siemens 2017)

If we remember what John Dewey writes about the situation, then we are in a similar context – we must be able to orientate and decide based on the information, be able to accept the consequences of our actions and continuously test it with experience. Knowledge as something placed outside of ourselves, having a networked and complex character also constitutes an essential prerequisite for being in the contemporary world.

“The aim of education, therefore, is not to find eternal truths that are necessarily written in the texture of the world, but to empower an individual to react in the changing reality as intelligently as possible, to be able to deal with the changing situations he goes through and model his life. Truths are versatile tools of our actions that lead to its cultivation.” (Šíp 2016, p. 144)

The present state of knowledge is, therefore, something that is not so essential. At the end of its paper, Siemens (2017) will say that piping is always more important than what flows through it, a concept that is opposed to the traditional understanding of school education. The call for the activity of critical connection building and reflection is also strongly supported and the pragmatic-phenomenological background as described above.

“Principles of connectivism:

- *Learning and knowledge rests in diversity of opinions.*
- *Learning is a process of connecting specialized nodes or information sources.*
- *Learning may reside in non-human appliances.*
- *Capacity to know more is more critical than what is currently known*
- *Nurturing and maintaining connections is needed to facilitate continual learning.*
- *Ability to see connections between fields, ideas, and concepts is a core skill.*
- *Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.*

Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision” (Siemens 2017).

Learning in this form is a network building process. Networks in which nodes are information sources in the broadest sense (in fact, they may be entire nested networks) between which connections are built. The more robust and more intense the network of links is, the better learning can take place. Knowledge itself is then fixed on this network because what used to right now do not have to pay. Therefore, every participant in the learning process should be able to work with information actively, i. e. to have information literacy.

It is at this point that one can see criticism of connectivism – it presupposes that all actors develop information literacy and ideally also the absence of disinformation or generally “bad nodes” (interestingly, it is the assumption that they were in the 60s–80s). In the 1990s, the fact that not all actors in the network have good intentions began to be gradually addressed). If information literacy is a necessity for learning, and if literacy itself is network-based learning, we get into a vicious circle from which it is difficult to get out.

One of the controversial points of the text we analyse is related to an overly simplified and narrowed view of what constructivism is from which Siemens wants to differentiate itself in order to constitute its educational theory significantly. Siemens (2017) emphasizes that its approach to learning is different from constructivism because it assumes that there are no real structures in the world, while he assumes that they exist, are complex (and hiding) and can be described. However, is it enough to differentiate? Is this reading of constructivism the only possible?

Nevertheless, I believe that the idea that learning is linked to the creation of complex knowledge structures that must be dynamically presented and changed by self-organizing mechanisms based on information interactions with the environment is a central idea on which to build a large part of an adequate approach to education. Siemens points out that there is something similar to Moore's law for education (Meindl 2003, Mack 2011), the exponential growth of what one should learn to understand the world with the same understanding as to the generation before it.

The fact that the subject of education is not the facts, but the formation of the structure, because the facts are changeable and during school studies, a large part of them lose their validity (or at least meaning) is essential. It supports what we could call modern competence education. However, at the same time, it can be dangerous to completely abandon the factual basis, which can cause a complete breakdown of competence as such. Finding the right balance between the two approaches is an essential topic in the pedagogical debate, with the need to emphasize that connectivism is very unilateral on the side of competence.

Another essential feature of connectivism is that not only living actors are involved in learning. Conventional pedagogical theories focus on education as a process to which only humans are subjected, or, as in their vocabulary Průcha, emphasize the ability to learn in animals, but for quite a long time, inanimate systems, especially those used for their work artificial intelligence (AI). Today, this situation is changing somewhat, we find much room for programming (Ruthmann et al. 2010) and working with AI systems, in technical practice discussing data on which similar systems can be trained or on a broader discourse about whether AI will replace teachers. (Brdicka 2019, Schofield 1990, McLaren et al. 2011)

I think it is possible to go deeper here – systems with AI are primarily part of the knowledge networks as Siemens talks about them, information interactions with them,

in various forms, are part of our everyday lives, whether on social networks or in various dialogues systems, search engines or voice assistants. The practical implications of this phenomenon cannot be discussed in more detail in this methodological analysis. However, it is possible to say that there is a gradual reorganization of what are the critical components of the educational base that the educational system should reflect in some way.

However, the fact that they are learning and non-living actors still have two critical levels. The first is that they too are changing. They, too, are part of the dynamic ferment of the transforming network we create and thus further break the sense of security, as is sometimes literally framed by “good old England” or in the Czech environment of similarly utopian constructs such as “traditional school” or “traditional family”. The technology here serves as a strong accent that the emotional sediments are inadequate. The second dimension is also significant – because they can learn, they change the structure not only of themselves but of the whole network. This change in the knowledge landscape is fundamental and represents one of the most discussed issues of modern society today.

3 Phenomenological-pragmatic springs

In the previous parts of the study, we performed a thought reconstruction of the foundations on which the theory of connectivism is based. We followed the construction of the theory and the background. We now turn to the second task we set out in the introduction – namely, the analysis of common themes between phenomenology, pragmatism and connectivism. This section aims to offer specific common patterns that can be the subject of furthermore profound reflections. In the future, this will allow both a better grasp of connectivism as a research paradigm, as well as its deeper integration into the philosophy of education and its topics.

Based on the above considerations, it is already partially clear why I believe that connectivism, although it primarily refers to other thought traditions, will be close to the outlines of phenomenological-pragmatist pedagogy outlined above. I do not want to go into a detailed analysis here, but rather show what the essential common points of pragmatism, phenomenology and connectivism are.

First, it must be said that they have a common fundamental epistemic belief, namely the idea that one must abandon *veritas* in the sense of a firm and unchanging truth and lean towards *Ἀλήθεια*. (Heidegger 1993, p. 27) *Ἀλήθεια* is something that exists in the world that needs to be gradually sought and which in its complexity and complexity never reveals itself in its entirety, which is subject to transformation and certain processuality, both on the part of the person who recognizes, and also on the side of the object.

The process of cognition is then the process of understanding the situation as a dynamically changing relationship, as a complex problem in which we have to navigate, in which many variables enter and in which it is not easy to know. There are educational procedures (in the context of connectivism, we could say that it is information literacy (Shapiro & Hughes 1996, Eisenberg et al. 2004) that can significantly speed up this process. However, the experience that constitutes through the inner rebuilding of the one who recognizes is time-bound, volatile, subject to some change.

For all three traditions analysed, it is essential that cognition is temporal and associated with the activity of the cognition. At the same time, this activity is something that dynamically represents the world in which cognition takes place. At the same time, it is clear that there is no sharp border between cognition and learning; they are interrelated and strongly interrelated. The connectivist educator Bořivoj Brdička even contemplates the 70:20:10 rule, which states that 70% of what we learn during informal education, 20% is non-formal and only 10% formal. (Brdička 2016) Apart from the fact that also determining percentages is a pure lottery, it is clear that informal learning and cognition are essentially identical processes, differing as much as what is an “object” (now it is obvious that it is not an object in the realistic sense of the word and that the process of cognition of this subject will change the inner structure of the person who cognizes).

Patočka's motto “phenomena appear gradually” is a methodological approach that can be applied in connectivism. Gradually, we gain more and more connections with a particular area, its complex connection and structure are always obtained in a specific process, which is dependent on the state of the rest of the network, and we never have the certainty of complete knowledge. Finding openness, that is, construction and exposing links in complex systems is one of the critical elements of the learning and cognition process.

Bergson (2003), when opposing association theories (Ghosh & Gilboa 2014, Herrmann & Searleman 1992) of the human mind or memory, argues that all connections should be equally strong, which is unsustainable in thought. Gradually, however, it turned out that just modified association theories represent the basic structure of a large part of creative techniques (clustering, mind maps, association series, etc.), and at the same time that they correspond in some respects to theories of how the brain works. Thinking is not only a complex process running in a particular centre in the brain, but also throughout the frontal lobe – is thus linked to nature. At the same time mirror neurons, which provide connection not only inside the cerebrum but also with the surroundings, are also actively promoted. The result is a complicated interaction that leads to self-organizing processes, but this is what connectivist learning theory is all about. This organizing structure is then a strategy of adaptation to conditions, as Damasio (2018, pp. 14, 19–22) illustrates in the examples of bacterial colonies (which at the same time shows in his book that this assumption is not an empty analogy but an adequate and reasoned thought lift).

When analysing the first two points of connectivism, it is clear that the idea behind pragmatism is described here – the ability to make adequate decisions is based on experience, strongly influenced by social ties, and at the same time linked to the accentuation of diversity. Knowledge is a complex structure of bonds, which in its manifestation only condenses at a certain point represents a fundamental concept of pragmatism. After all, the motto “learning by doing” is not a reference to anything else. In essence, learning is possible only by active activities in a specific environment in which the individual reflects extremely complex environmental influences and can perform a particular action. (Smart & Csapo 2007)

In a more metaphysical or abstract sense, Heidegger speaks about the issue of being thrown into the situation. (Heidegger 2018, p. 165-171) Nevertheless, is this perversion again not something Siemens recognizes in the general formulation of learning? Is not Patočka's thesis of caring for πόλις merely a manifestation of the need to understand the world in its complex and multilayered relationships? That πόλις differs from an individual or a circle of interest precisely because in its opposites it creates a shared space in which it is necessary to be able to orientate and share it? We believe that it is in such an analysis of πόλις that one can see the basis for the δημοκρατία that will appear in Greece in the middle of the fifth century.

In the texts by Arendt (2007) or Sokol (2000), it is possible to trace very similar methodological structures outlined by Siemens. They are based on an effort to gather essential phenomena, information and resources, as specific network nodes, which can be synergistically connected to the system, which makes it clear that the whole is more than a simple sum of its parts, they are what is essential for a large number of phenomenologists. These connections, the ability to integrate different directions illuminating the reality, are one of the primary methods of work for the phenomenological tradition and it is not surprising that the approach chosen by Siemens will gradually build on it.

So far, I have not touched on the assumptions on which Siemens is based. They also have strong phenomenological – pragmatist roots. They are fundamental findings of science (chaos theory and network theory) that need to be considered in the social sciences and humanities. Siemens does not construct an ideal thought space detached from reality, it uses the knowledge of modern science and evident facts in the world (short half-life of information, information explosion, presence of machine learning, etc.) and builds on it to respond to it. Education is a program to balance the dynamic environment with the individual. It is not possible to layout and plans it (Dewey 2001, p. 392), to combine reliable learning outcomes and forward content.

Tomáš Halík emphasizes (Halík in Strakatý, 2019) that as his intellectual program, he chooses to elaborate on the idea of Pope Francis that “the church should be like a field hospital” (Glaser 2013). the needs of the world and not just be concerned with self-containment. However, Halík goes further and says that all cultural and moral institutions, including schools, are to perform this task. This combination of phenomenol-

ogy and pragmatism in the metaphor of education as a field hospital is, in our opinion, crucial. It removes the dualist position of “either-or” in the discussion of whether content or competence – both necessary for a field hospital to function, must have shared know-how, knowledge and knowledge to enable it to heal and at the same time be capable of changing dynamically, of learning, to change, depending on the conditions in which they are present. The specificity of the field hospital is that there is only a minimal background and that (as is often said in marketing terms) the only certainty is the certainty of change.

Another metaphor that can be used to change educational reality is the famous story from Eric S. Raymond’s *Cathedral and Bazaar* (2008), which talks about two models of software development. We can think of it as a cathedral, then we develop it with long-lasting versions, in professional, well-organized teams, with little chance of proceeding differently from the plan. The cathedral is a long-standing reputable building with an excellent cost for many years to come. We know that we will not want to change or tear it down in the years to come. This model is very well applicable to the situation of the school environment in the classical concept (in a specific ideal type).

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In his interview for *Reflex*, Tomáš Halík emphasizes (Strakatý, 2019) that as his intellectual program, he chooses to elaborate the idea of Pope Francis that “the church should be like a field hospital” (Glaser 2013). The needs of the world and not just about self-containment. Nevertheless, Halík goes further and says that all cultural and moral institutions, including schools, are to perform this task. This combination of phenomenology and pragmatism in the metaphor of education as a field hospital is essential. It removes the dualist position of “either-or” (Sip 2019) in the discussion of either content or competence – both necessary for a field hospital to function, must have shared know-how, knowledge and knowledge to enable it to heal and at the same time be capable of changing dynamically, of learning, to change, depending on the conditions in which they are present. The specificity of the field hospital is that there is only a minimal background and that (as is often said in marketing terms) the only certainty is the certainty of change.

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David Cormier applies the principles of connectivism to the school classroom and uses other metaphors, namely the growth of the rhizome. (Cormier 2008, Biossola et al. 2017) Emphasizes, first of all, that it is the community that forms the curriculum. It is a follow-up to Thomas Luckmann and Peter Berger, who combine the construction of knowledge with the social aspect of the perception of reality. (Berger & Luckmann, 1999) The one who creates the meaning and structure of cognition is not a pre-existing matrix or form, but social interaction. It is a community of students who, according to their interests, builds a curriculum that grows like a rhizome (hence the well-known concept of rhizomatic learning). Cormier adds: *"If the community recognizes a given bit of information as useful, or if it proves to be useful for something else, it can be recognized as knowledge. The community thus has the power to create new knowledge in the given context, the nodes connected to the rest of the network."* (Cormier in Zavřel 2011)

I would like to mention another important feature of connectivism, namely that *"learning can be carried out in non-human entities as well."* (Siemens 2017) Here three important facts must be kept in mind. First of all, Dewey (1923) already points out in his text *Democracy and Education* that man can also be connected with machines, that his being has the character of connecting with people, but overall with the environment that surrounds him. Heidegger, on the other hand, is more sceptical of building a clear gap between being and existence, with being belonging only to humans. At the same time, however, it emphasizes the role of technology in the process of uncovering. However, for him, technology is always just a tool used by man, not an (at least partly equivalent) learning partner.

Luciano Floridi systematically analyses changes in the information environment related to the ability of non-living actors to make information interactions in it. He believes that we should replace the notion of man as a privileged actor in the field of information interactions with information – an entity capable of processing information, regardless of whether it is a human, another biotic system or even a machine. Naturally, Floridi's conception of connectivism is true that even non-living actors can learn to be part of information networks. Maybe it goes even further – all entities known as *infor*³ have a typical environment in which they move, and together they change and modify their network of relationships. (Floridi 2014)

On the contrary, what is absent from the pragmatist or phenomenological tradition in connectivism is the relation to corporeality. There is no bridge anywhere near

³ Infor is any entity capable of processing information. It can be a human, machine or biotic system.

Siemens that could link his educational theory to the problems of the body. This is due, firstly, to what traditions it defines, namely to cognitivism, constructivism and behaviourism, which it does not consider as physically anchored. At the same time, we may say that this is perhaps a step that is understandable concerning the attempt to connect artificial systems and man. The issue of corporeality is discussed in AI, but at the same time, it is not easy at all. At the same time, we must emphasize that the paper itself is a schedule or outline rather than a truly systematically sophisticated concept of thought. This combination of sketchiness and following the educational tradition applied in e-learning thus leads to the absence of reflection of one's own body. In doing so, we can say that connectivism directly encourages thinking of different models of the expanded mind that could be developed in some way with the ideas of corporeality.

Conclusion

The study clearly shows that connectivism, as an educational theory constituted in response to modern technology and a rapidly changing world (Bauman 2013), can also be perceived through the lens of phenomenology and pragmatism. On a relatively small scale, we have outlined some possible common themes. It is the reflection on Siemens' principles of connectivism (Siemens 2017) that we consider to be one of the critical challenges that research poses for us. Siemens offers only theses very briefly, which we must further analyse in order to think more broadly in the field of the philosophy of education. I believe that since Siemens itself opposes constructivism, it is a more appropriate way to reach for other philosophical starting points, i.e. phenomenology and pragmatism. However, we respect the fact that existentialists could also bring exciting results.

Even though Dewey's pragmatism originated from the beginning as a pedagogical theory, working with the concept of experimental schools, in Europe, its truly more comprehensive implementation never took place. It is almost unknown in the Czech Republic (Šíp 2016). Also, the applications of the phenomenological philosophy of education are more academic (in our country, especially with Sokol, Palouš, Patočka or Hogenová), than that they could translate into the natural form of the curriculum in schools. Connectivism has this ambition (for example, Cormier (2008)). The combination of these thought traditions can, therefore be exciting and essential in terms of application and research.

I believe that this study has made two significant findings, which have not yet occurred in the current research:

1. Connectivism is convincingly based on the ideas of phenomenology and pragmatism. These roots are at least as strong as the apparent inspiration from the

constructivism that Siemens acknowledges. The unclear problem is why neither Siemens nor its successors explicitly claim these traditions.

2. It is undisputed that the phenomenological-pragmatist tradition may, in the light of the above, constitute a unique key to the hermeneutics of all connectivism. We are providing connectivism with something that, according to critics, is lacking – a solid theoretical foundation and at the same time, the ability to interpret a broader spectrum of phenomena.

Although this study could not be exhaustive or systematic, I believe it can serve as the first step towards systematic research and publication in this area.

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