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Post-humanist principles to research the networked learning

Alexandro Escudero-Nahón

Profesor investigador de la Universidad Autónoma de Querétaro
alexandro.escudero@uaq.mx

Abstract

«Networked learning» is a concept whose purpose is to define an emerging research field charac-terized by the transversal and ubiquitous presence of technology in education. However, it lacks explanatory force because it is pinned to the anthropocentric principles of modern humanism. Such principles consider technology and «the human» as ontologically different areas and they place the human being at a central and ruling position. In this text, I present an ontological and epistemological post-humanist restatements of the actor-network theory (ANT) that allow an original definition of networked learning. This network works because different human and non-human agencies associate and continue performing their functions. As soon as they stop operating, the network disappears. There could be knowledge but not learning before and after the network. The purpose of educational research is to track down how learning networks originate, how they strengthen, how they associate to other networks and how they disappear.

Keywords: post-anthropocentrism; educational technology; actor-network theory (ANT); educational research.

Principios poshumanistas para investigar el aprendizaje en red

Alexandro Escudero-Nahón

Extracto

El «aprendizaje en red» es un concepto cuyo propósito es definir un campo de investigación emergente caracterizado por la presencia transversal y ubicua de la tecnología en la educación. Sin embargo, carece de fuerza explicativa porque está sujeto a los principios antropocéntricos del humanismo moderno. Dichos principios consideran la tecnología y al «ser humano» como áreas ontológicamente diferentes y colocan a este en una posición central y dominante. En este texto se presenta una reformulación ontológica y epistemológica basada en los principios poshumanistas y en la teoría del actor-red (*actor-network theory* [ANT]) que permite una definición original del aprendizaje en red. Esta red funciona porque diferentes agentes humanos y no humanos se asocian y desempeñan sus agencias específicas. Tan pronto como dejan de funcionar, la red desaparece. Podría haber conocimiento, pero no aprendizaje, antes y después de la red. El propósito de la investigación educativa es rastrear cómo se originan las redes de aprendizaje, cómo se fortalecen, cómo se asocian a otras redes y cómo desaparecen.

Palabras clave: posantropocentrismo; tecnología educativa; teoría del actor-red (*actor-network theory* [ANT]); investigación educativa.

Summary

1. Introduction

The transversal and ubiquitous presence of digital technology in educational processes has caused the creation of a wide area of study known as educational technology and, since two decades ago, a great deal of research has been done multidisciplinary and interdisciplinary (Gros, 2012). The analysis categories used to cover this field of study are varied; for example: e-learning, personal learning environment, virtual learning environment, technology-enhanced education, networked learning, among others (Hsu *et al.*, 2012; Hung, 2012).

The concept of «networked learning» is particularly interesting because it refers to technical and human connections that the students carry out to obtain good academic results in a highly technological study environment. This concept is not original, yet useful. In fact, regardless of the historical period, people have always created a web of connections to learn. However, it was only possible to consider it until digital technology allowed certain unusual connections that overcame temporal and physical limitations to access new sources of information and new learning references (Jiménez, Bustamante y Albornoz, 2015; Pedersen, 2010).
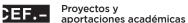
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The limitation of the concept «networked learning» is not related to the idea of the connections a person creates to learn, but to the ontological and epistemological principle of the words «learning» and «network». The concept «networked learning» was heir of the ontological and epistemological principles of modern humanism, characterized as anthropocentric and dichotomous (Pedersen, 2010). For that reason, the concept of «networked learning»:

- Accepts technology, education and human beings as autonomous and different-to-each-other´s areas (Jiménez *et al.*, 2015; Thomas and Buch, 2013).
- Urgently places the learner in the center of the education process and raises him over the rest of non-human elements which participate in education (Carlson, 2015).

The previous information makes the concept useless to study emerging educational models and practices, distinguished to be highly mediated by technology, where a steep

prominence of non-human elements operate without a center nor periphery, that is, as a network (Knox, 2016; Minerva, Biru and Rotondi, 2015). For example, some emerging educational scenarios are (Rivas and Delgado, 2016):

- **Gamification of education.** Refers to the tendency to fusion learning with videogames logic. Some innovations benefit from the potential of videogames in order to apply it to learning experiences (Wesley and Barczak, 2010).

- **Learning in the cloud.** Refers to a generalized tendency to integrate different types of innovations, among which mass open online courses (MOOC) (Scopeo, 2013); digital content platforms, where tutorial videos have a massive boom (for example, TedTalk, 2016); and language learning platforms, stand out (Christensen, Johnson and Horn, 2008).

- **Hybrid learning.** It combines face-to-face education with virtual modalities. For example, «inverted class», «learning virtual environment» or «learning management systems». Some studies agree that this is the most relevant tendency for the future in education (Johnson *et al.*, 2016; Rivas and Delgado, 2016).

- **Integral systems of educational services.** According to the *50 Educational Innovations in Latin America. Graduate XXI: A Map towards the Future* report (Rivas and Delgado, 2016), this tendency is configured by integral devices in pedagogical support, whose purpose is to offer integrated assistance to schools. The students pay a monthly fee and that payment gives them the right to access a package of services which include textbooks, exclusive access to educational sites, management systems, forums and Web 2.0 for teachers, parents and students, pedagogical advice, continuous evaluation of students, and equipment.

- **Adaptive learning.** It is the least developed tendency so far, but it promises to make the potential of education by means of technology happen, because it uses artificial intelligence to custom learning. Due to the fact that student´s interaction with knowledge produces an enormous quantity of data, predictions about its future educational practice can be made, and personalized learning sequences on digital platforms can be created (Rivas and Delgado, 2016).

With this overview, educational research has the challenge to overcome the modern humanist vision, which entails «networked learning», and redefine this analysis category with the purpose of explaining the relationship of educational technology in learning processes. This text presents some post-humanist ontological restatements and some epistemological restatements of the ANT to prove that it is possible to overcome the anthropo-

centric and dichotomous principle of modern education, redefine the «network learning» concept and state an inductive research process, capable of tracking down the origins of learning networks, how they get strong, how they associate to other networks and how they disappear.

2. Anthropocentrism and dichotomy: problems of modern humanism

Modern humanism emerged in Europe in the 17th century. The first records of the «humanism» date back to the latin word «*humanitas*». In this period, the concept referred to a distinction between the culture and education that a free man should receive and which was not inherent, in any way, in the «barbarian human» (Arbea, 2002).

Through history, the concept changed to different types of humanism, like the classical, medieval, illustrated, existential, etc. (Echeverría, 2006; Kakkori and Huttunen, 2010), all gave four features to «the human» (Espinosa, 2016; Knox, 2016):

- Essentialism.
- Universalism.
- Autonomy.
- Transcendence.

Indeed, humanism is an explicit or hidden distinction, the human makes of himself based on a supposed essential condition, which separates him and makes him different, better and more important than non-human entities.

The real modern humanism emerged in the 17th century in Europe. Contrary to classical and medieval humanism, this type of humanism was insufflated by illustrated thinking and a particular optimism on the human being´s rational faculty. Therefore, the modern project was based on the account and promise that science and technology dominion would free humankind of pre-modern atavisms (Dolphijn and Van der Tuin, 2011).

Modern humanism founded its ontology on a treacherous synecdoche (Weaver, 2010). By postulating that «the human side is the measurement of everything», in other words, by using a part to represent the whole, an anthropocentric world was created that, by definition:

- Is hierarchized, because it overestimates «the human» agency and despises the «non-human» agency.

- Separates ontology from epistemology, separating he who knows, from what he knows, and with what he knows.

- Divides and classifies knowledge disciplines according to an anthropocentric study object, in other words, it assumes «the human» is a subject of study with well defined attributes and substantially different to the «non-human».

In order to keep the human at the top of this symbolical ordering, humanism had to turn to a double ruse: first, the argument indicates that «the human» kept a disruptive relationship with the «non-human» due to its rational character, and all complexity of the world was simplified in these two categories (human/non-human); second, this symbolical ordering involved judgment and evaluation of the importance of one category over the other. Thus, critics of modern humanism assure that their ontology and epistemology, are based on an binary symbolical ordering (St. Pierre, 2013).

Modern educational theory inherited modern humanism and, therefore, its starting point was always a provincial paradigm that placed «the human» in the center as an only cognitive subject, with well-defined essential attributes, separated from what he learns and from the things he uses to learn (Snaza and Weaver, 2015). Also, certain topics caught the educational theory's attention, which had always reduced the complexity of the field of study to dichotomies and added more value to, for instance, culture rather than nature; the subject, rather than the object; education, rather than technology; etc. (González, 2015).

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The previous information influenced educational research since the 18th century in at least, three issues (Law, 2004):

- It was assumed that only the human being, and no other being, could be a cognitive subject.

- It was assumed that the «non-human» would only have the possibility to be cognoscible subjects.

- Due to the fact that science and technology were only available to an essential, universal, autonomous and transcendent human, it was logical that only one method was recognized to produce valid knowledge.

Modern humanism proved its inconsistencies. From the 18th century, mankind has caused an unprecedented historical worldwide pollution and inequality, to the point of considering the

influence of the human over the world as a new geological era that threatens, ironically, the survival of our species: this is called «Anthropocene» (Morton, 2013).

Therefore, since mid 20th century, the disillusionment over modern humanism became relevant in post-modern speech, whose labor was the deconstruction of all narratives produced by the european modernity. An impetus to create ontological and epistemological restatements emerged in order to lead educational research through other paths to overcome modern research, which was considered deductive and positivist. The main character of this ontological and epistemological upheaval is post-humanism.

2.1. Post-humanist ontological restatements

Post-humanism thinking is composed of various theoretical-conceptual tendencies, which purpose is to point that the harmful anthropocentrism, on which all damage against mankind, nature and things was justified, and that has also influenced the principles of educational research, must be overcome by a different definition of «human being» (Weaver, 2010; Braidotti, 2013; Wolfe, 2010).

These tendencies can be classified in four areas: «critical post-humanism» questions the primacy of rational and autonomy as the basis for an allegedly archetypical human being; «anti-anthropocentric post-humanism» takes the human off the center and questions his privilege over other life forms; «transhumanism» seeks for an improvement of human condition through a scientific and technological enhancement; and «analytical post-humanism» is a field of study on science and technology that stresses on human and non-human relations as part of a network (Skågeby, Mattias and Rahm, 2016).

Overall, post-humanism has detected that, because the narrative of modern humanism is still dominating the technology and education speech, both are taken as autonomous areas, as different ontological worlds (Thomas and Buch, 2013). That is because modern thinking is dichotomous and, no matter how complex the elements of education scenarios are, they are given well-defined limits, as well as essential attributes, and are reduced to dichotomies in negative relationship; for example: «object-subject», «mind-body», «human-non-human», «environment-person». These dichotomies, however, always value in a negative way one of the concepts. Thus, for instance, «object», «body», «non-human» and «environment», have been considered underestimated concepts by educational research, against their opposites: «subject», «mind», «human», and «person».

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When post-humanism advocates to break that dichotomous vision, it introduces the possibility of a complex thinking which:

- Accepts that education scenarios are composed by different elements dissimilar to each other.
- Those elements do not possess any essential attribute prior to the scenario where they take place; they are hybrids, produced precisely that way due to their multiple associations.

Hence, the artifactual and simplified sense of educational technology is overcome, only referring to the tools used to teach and learn; and a more complex educational version of technology is built, including all the «human» and «non-human» elements in dynamic processes (DeLanda, 2006; Usher and Edwards, 2005). Post-humanist thinking is useful to surpass the burdens caused by modern humanism because it proposes new onto-epistemological principles:

- To de-centralize «the human» and place him at the same level of importance than the «non-human» (Wolfe, 2010).
- To accept that «the human» and «non-human» constitute the world, interdependently constituted, and, therefore, their agencies are equally important in the complex and multiple situation of reality (Braidotti, 2013).
- To stop assuming that the one who knows is invariably a «human being», and is different to what he knows, and the things through which he knows may be underestimated (Snaza and Weaver, 2015) (table 1).

Table 1. **Ontological principles of modern humanism and post-humanism**

Modern humanism	Post-humanism
Anthropocentrism: it centers the human being and wishes to control, through science and technology, the non-human, located in the periphery.	Decentralizes the human and places him at the same level of importance of the non-human.
Dichotomous thinking: it organizes reality symbolically with simplified dichotomies where one of the pairs necessarily subordinates the other one.	It accepts that the human and non-human constitute the world; and both constitute each other interdependently; therefore, their agencies are equally important.
The cognitive «subject» is always human and approaches «objects» of study that have well-defined and essentially different limits to those of the human.	The human being does not hold the prerogative of learning, is not different to what he knows, and the things through which he knows are a condition of possibility for learning.

Source: own elaboration.

From a post-humanist perspective, it can be said that the «non-human» has always been a condition of learning possibility, and not only accessory of this process. This forces the building of a new epistemological account for the study of emerging education scenarios, characterized by being ebullient of heterogeneous elements and which keep different connections among each other, like software, social networks, hardware, internet signal, artificial intelligence, augmented intelligence, internet of things, management learning platforms and the human beings, as well.

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2.2. From anthropocentric epistemology to networked learning

From the second half of the 20th century, the demise of modern and positivist vision in social sciences caused different theoretical and conceptual restatements. One of the most relevant was the bifurcation experienced by traditional sociology, with the emergence of the «sociology of associations» (Devenin and Henríquez, 2011). This proposal forcefully argued that traditional sociology had been undermined in the capacity to tackle, describe, and explain its objects of study because it assumed that society exists in itself, in an essential manner.

According to this critique, traditional sociology would have caused, at least, two undesired effects:

- Accept as an explanation what should be explained and confused the cause with the effect: the result was a shortfall in the explanatory capacity (Pignuoli-Ocampo, 2014).

- Assume that society essentially exists, therefore, it tried to describe the features of that social «substance» and lost the capacity of reaction before the dynamism of the object of study (Latour, 2013).

In contrast, the « sociology of associations» offered a theoretical-conceptual scaffolding which revitalized social studies: the ANT (Latour, 2007, 2008, 2009). The ANT consolidated in the eighties in the 20th century; since then, it is a referent for the studies that take seriously the role of non-human and technological elements in social life (Jackson, 2015). The ontological principle of ANT is that society itself, does not

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exist; at least, not as an essential substance where social things happen (check the irony); it is also not, an homogeneous context; not even as a prerogative of human beings over the non-human (Latour, 2013). On the contrary, society is a movement, an assembled process, a circulating flow that makes multiple agencies interact, while it also requires those agencies to keep various heterogeneous elements properly associated. The «social» is, actually, elements associated as a network (Harman, 2009).

Thus, the epistemological principles of ANT are relevant to restate one definition of «networked learning». Contrary to other network definitions, ANT postulates a performative, not ostentatious, attitude to the network; a hybrid attitude of the elements that constitute the network; a wide conception of the word agency; and the importance of the non-human elements to guarantee the persistence of the network (Latour, 2005):

- **The network is performative, not ostentatious.** One network is such, as long as the elements that constitute it carry out their agencies; as soon as those agencies cease operating, the network disappears. Therefore, none of the network elements flaunts to themselves, essentially, none of the agencies.

- **The network is hybrid.** If the human and non-human elements manage to strongly associate, they create hybrid unities susceptible of being analyzed as «almost human» elements or «almost non-human» elements.

- **There are multiple agency types in a network; not all of them performed by the human being.** The importance resides on the fact that they are issued and immediately received by the network elements. In other words, an agency is not only the ability the network elements have to generate transformations, but also the ability they have to receive those influences, just like a moving target.

- **In order for a network to be strong, it must necessarily guarantee their agencies persistence.** The non-human elements are fundamental to comply with that purpose. That is why, the importance of human and non-human elements is symmetrical in the network, because its value resides not on its human condition, but on their ability to guarantee that nothing threatens the right operation of the agencies.

The concept «networked learning» can substitute the idea of the human being centered in the learning process, and everything else placed in the periphery, with a notion of performative network. Consequently, «networked learning» may be defined as: learning is in itself, a working network. «Networked learning» requires the correct association of different elements and human and

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non-human agencies. This network has no essentialist character; it will exist as long as its human and non-human elements appropriately fulfill their agencies. «Networked learning» is performative and the network disappears in the moment the multiple agencies cease to operate adequately. Prior to a learning network, there will be knowledge, in a certain way, correct; yet, there will be no learning. Learning cannot be considered as the result of a process. There will be knowledge, in a certain way correct, when the network disappears; however, there will be no learning. Once again, learning is, in itself, a working network. When the networked learning is powerful, it is capable of assembling itself to other networks and stay there for a long time; it may get stronger. When a learning network is powerful, it seems to influence and transform almost everything.

If educational research accepts the idea that associations create «the social», and not vice versa, then it would be able to address the learning process as a network. In addition, it would be able to track down associations created by the human and non-human elements in the network. Its explanatory force and its reaction ability to current education scenarios would improve (Echeverría and González, 2009). Thus, a horizon of conceptualizations that could account for the emerging actors that constitute educational technology would occur. Therefore, the purpose of educational research, from this perspective, is to track down how these networks originate, stabilize, persist and disappear (Escudero-Nahón, 2016).

3. Educational research objectives

3.1. To inductively track down multiple agencies

Positivist research, which prevailed in educational research until the second half of the 20th century, had the purpose of verifying hypotheses. That is why, most of the studies were performed with the hypothetical-deductive method, which accurately defines a study problem, builds a dense theoretical framework with pre-defined analysis categories, and designs ultimate instruments to collect data before entering the field of study (Hernández, Fernández-Collado and Baptista, 2010).

According to different emerging research proposals based on ontological and epistemological restatements previously described (Fenwick and Edwards, 2010, 2011; Fenwick, Edwards and Sawchuk, 2011; Law, 2004), there is no unique method to study educational phenomena as a network. These proposals share the fact that they do not design a rigid and strict research method before entering the field of study (for example, the network), but strengthens the method along the study.

In fact, educational research carried out with these ontological and epistemological parameters seem to be a mess at the beginning. That is because interesting problems are covered, and these question different hybrid elements and their agencies. As it was mentioned

before, a powerful network gives the feeling of not having limits and influencing everything. Nevertheless, it is possible to track down the elements and their network agencies or, at least, the sediments of the activity.

The positivist deductive research tends to start by defining a study problem and certain hypotheses, verified through deductions based on previous analytical categories. Research here aims to start a diametrically opposing process. Inductive research enters the network thoroughly tracking an agency and, as the associations set with other network elements are identified, then (and only then), the building of analytical categories begins.

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This process of entering the network is inductive because it requires to stop the previously learnt analytical categories and because it does not have any instrument to obtain predesigned data (Clarke, 2009; Gibson and Hartman, 2014). If we accept the premise that no previously defined study objects exist, with intrinsic attributes or defined limits in a networked learning process, but the elements and their agencies are assembled instead, then it is possible to accept that network study objects are hybrid, contingent, contradictory, ambiguous and paradoxical.

In any case, the stress of this inductive process is not to verify the existence or absence of previously designed analytical categories, but to be sensitive to information that generates the elements activity and their network agencies. This sensitivity might be stimulated when trying to answer two simple questions: What is the main problem to install a learning network? How do the network elements try to solve that problem?

Traditional instruments and techniques to get information are still useful; however, now the purpose is to identify ambiguities, contingencies, paradoxes, controversies, etc., with which the network elements and agencies tend to behave. Deep interviews, informal conversations, focus groups, and others are very adequate techniques to obtain information about the human actors in a network; observation, immersion, multimedia registers, among others tend to be useful to register the non-human actor agencies (Fenwick *et al.*, 2011).

3.2. To build analytical categories in an abductive reasoning

An inductive process to collect and analyze data, like the one mentioned here, does not rule out an analytical categorization, it only stops the previously learnt analytical categories. This way, it is intended to stimulate the collection of unprecedented and original data. However, to build analysis categories with explanatory capacity in the network, it is necessary an

abductive procedure. Abduction is a way of reasoning that constantly generates and evaluates different and varied hypotheses with the purpose of giving sense to facts that seem to be puzzling. Locke, Golden-Biddle and Feldman (Locke, Golden-Biddle and Feldman, 2008) mapped it as it follows: if deduction proves that «something must be»; induction proves that «something works that way»; but abduction suggests that «something might be that way».

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Abduction is a mental process, which associates terminology that normally is not associated among each other. The intention is to constantly integrate and disintegrate explanations of an apparent puzzling phenomenon. Charles Pierce, in his studies on abduction, assured that the result of this mental process is the creation of an original order that can explain phenomena that was not defined that way previously (Pape, 1999; Reichertz, 2007).

Contrary to the deductive research method, which designs one hypothesis before jumping to the field of study, abduction constantly integrates and disintegrates different hypotheses using analytical categories built in the network to explain the problem (Dunne and Dougherty, 2015). The purpose of this procedure is to explain how the network elements and agencies associate to each other, how they keep working, how they assemble themselves to other networks, how they get strong and how they disappear.

4. Conclusions

«Networked learning» is a concept which purpose is to define a field of study for scenarios highly mediated by technology. However, this concept has some explanatory limitations because it inherited certain ontological and epistemological principles of modern humanism. This theoretical heritage has, at least, two conceptual burdens: the anthropocentric character and the reductionist dichotomy.

Ontological post-humanist restatements vanish those conceptual burdens and prove that «the human» and «non-human» should be equally important for educational research because both constitute the world. Besides, it is not possible to separate the one who knows from what he knows, or the things with what he knows. In other words, «the non-human» is a learning possibility condition and not only a learning accessory.

On the other hand, epistemological restatements of the actor-network theory show that society, itself, does not exist; but the association of human and non-human elements create societies. One of the most relevant associations to educational research is the process of assembling human and non-human elements to learn.

Therefore, «networked learning» can be defined as: learning is a working network. This network associates human and non-human elements and agencies. As long as these associations exist, the network will too. As soon as the agencies cease to operate adequately, the network disappears. Prior to a learning network, there will be knowledge in a certain way correct, but there will be no learning. Learning cannot be considered as the result of a process. There will be knowledge, in a certain way correct when the network disappears, but there will be no learning.

Therefore, from this perspective, the object of educational research is to track down how learning networks originate, how they get strong, how they associate to other networks and how they disappear.
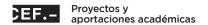
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