How Youth Construct Learning Trajectories in the Digital Age?

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Abstract: People living with decentralization of knowledge and high connectivity. Digital media has changed how we learn and the settings in which learning occurs. Nowadays, we have the opportunity to experience many different experiences through the media and social networks, especially youngers. Although formal spaces are still the main reference for the learning process, the relevance of non-formal and informal spaces cannot be ignored, as well as the amount of learning that is being learned and the nature of this learning. This paper presents an ongoing research which will seek to understand how young people recognize and construct their learning trajectories through digital spaces and what metrics are valid to outline how knowledge moves between these spaces. The research method is qualitative in nature and will be supported in longitudinal studies, which will be the basis for interpreting models capable of representing such paths.

1 INTRODUCTION

The education model as we know it has been facing the great challenge of developing new skills so that young people may be able to establish a new relationship with knowledge, increasingly affected by the pace of change and the pervasive use of technology. Being able to continually update what we know and what we can do, will be something essential in the future. To ensure the arc of lifelong learning it is necessary to revisit the concept of learning.

The type of learning that will define the 21st century is not only associated with the knowledge we acquire but also with the contexts of learning, due to the necessity to better understand in which settings learning has occurred. Contexts allow people to develop a meaning for things, understand the relationship between school content and the world as well as engage with the learning process. In this scenario, the use of technology has been responsible for the construction of a new culture. In digital world, people learn to observe and experiment, learn what they are willing to learn, are guided by their passions and recognize the collective as an important resource to the process of producing new knowledge (Thomas and Brown, 2011). People take greater control of their learning process alone when they are motivated by interests and when they have the resources needed to enable them achieve their goals. The existence of these conditions provides an environment so that they can develop their intelligence (Gee, 2013).

The digital era has been marked by decentralization of knowledge and high connectivity. Technology has changed the equation of what it is learned, how we learn it and the settings in which it occurs. Young people end up engaging in a special way with different kinds of learning through participation in communities of practice, social networks, the use of games and other media. Thus, although the school is still the main reference of the learning process, the relevance of these other areas cannot be ignored, as well as the nature of what young people are learning. In digital spaces young people are free to imagine, create and take part in flow experiences which put them in contact with states of frustration and epiphany, important factors for engagement and self-regulation.

Trying to understand what learning represents in these new spaces, what is its nature and how it manifests itself, many scholars have been trying to understand the principles behind the process of learning in the digital age as well as the cultural and behavioral aspects that emerge from this intense interaction of young people with technology. Ethnographic studies of M. Ito, set in the universe of social networks, suggest genres of participation. At first, young people seek to discover the meaning of being with other people, later on they try to

understand the environment they are using, and finally they experience how to use the resources that the environment provides so that the process of exploitation gets deeper (Ito, 2010). Young people's practices and behaviors in this new culture show that they are able to develop multiple identities from different domains, especially when they are in situations that allow them to exploit opportunities and deal productively with failure. Similar to the attitude of a scientist before the failure of a hypothesis, it is essential that the learner has available space for experimentation and hypothesis testing with a chance to receive feedback on the spot, and, thereafter, she may reflect, share, create, rework and retest. And in this kind of knowledge production that Seely Brown calls tinkering, the learner is able to develop multiple identities in the spirit of "I am what I create".

When young people use technology, they take control of what they learn and develop a natural process to progress in this way. This reflects a process of paradigm break, in which the idea that learning occurs predominantly in pre-defined space and time is being replaced by another one, which recognizes the existence of a fluid process that occurs in multiple places, times and circumstances which invite people to explore, learn and develop yourself. The diversity of digital spaces constitutes a network capable of enhancing the intellectual development of people and a complement to formal education. Although many things about culture, practices and behaviors of young people in the world of technology are being unveiled, we still know a little about how young people create learning cycles and routes between spaces mediated by technology.

In this research, we try to understand how young people construct their learning paths from the digital spaces they use and which metrics are valid to outline how knowledge moves between these settings. Studies of this kind are complex, especially because they require the researcher is immersed in the culture and daily life of the research subjects. This article presents the objectives of a program of research that has been initiated in Brazil, as well as its methodological design. As outcome we hope to create a narrative that shows how young people construct their learning trajectories, in which it is possible to identify the main stimuli that cause some young people follow some paths (and discard others) remain engaged and develop different degrees of reasoning skills and cognition to achieve their goals. We also intend to identify elements that can be used to measure how knowledge moves from an area of learning to another and to help young people to recognize their trajectories.

The paper is organized as follows: Section 2 presents the theoretical background underlying the research. Then, Section 3 presents related works and the research questions that will be addressed in the study. Section 4 presents the research methodology that will be used. Finally, Section 5 discusses the relevance of this study.

2 CONCEPTUAL BACKGROUND

The 21st century is marked by the influence of technology in the educational field so that the learning theories have been revisited. Most theories were developed in a time when knowledge production was slower and when people did not live with such high connectivity. Learning was not considered as a process that took place out of people.

But according to Siemens (2004), the creator of Connectivism, a learning theory for the digital age, learning is a continuous process that takes place in different spaces and it is governed by the divergence of views, the ability to create connections between several sources of knowledge and where the ability to access new information is more important than the current stock of knowledge. In this theory, learning is the process of creating networks, where nodes can be people (experts, teachers, classmates and communities), but also the technology itself. Here, the role of the educator is to create learning ecologies, form communities and leave students free to explore this environment.

Converging with this idea, new methodological concepts have been shifted from the use of technology as a way to reduce the costs of delivering content to another one which aims to establish a network of connections between knowledge, context, people and different types of media, making this network work as an enhancer feature and also as a facilitator of *situated learning* - which is that one which occurs when someone is able to understand the concept and establish meanings to it (Gee, 2010) - and *deep learning*, that represents a state in which the student is motivated to exert the necessary effort to learn (Schunk et al., 2008).

The holistic view of Connectivism converges with values and principles of Connected Learning from Ito et al. (2013), which emphasizes the design of learning ecologies as part of the instructional design. The Connected Learning approach recognizes the power of technology to scale, diversify, increase engagement and expand the range

of learning experiences.

Realizing the importance of networking in the construction of the learning process, it is also recognized that there are different spaces where learning can rise up. The horizontality of knowledge shall then be cut by experiences that arise within and outside the school and allow the transit of learning through the different areas young people occupy, whether physical spaces - such as school, community, church, or family - or virtual ones - like social networks, blogs, *YouTube* and games. This transversality has been kept in social relationships, academic orientation and communication infrastructure that turns learning into something connected to the real world.

People are increasingly learning in different settings. What we learn manifests itself through formal spaces which follow a rigid curriculum, the school for instance; through non-formal spaces where, although there is the structure, there is no obligation to follow a curriculum structure, being considered then temporary environments and situations, such as those related to dance, theater and sport. Finally, through informal spaces that represent contexts in which people engage by choice, in their own time and pace. In these contexts the learners make the schedule and decides the strategies they will use to learn. They are in control of the process.

Several virtual spaces have been presented as powerful learning environments. This tends to be the case of videogames. Squire (2006) has conducted investigations in this direction by studying the universe of games as learning spaces as well as Gee (2010) who studied the potential of the world of videogames for literacy and *situated learning*. Steinkuehler (2006) studied cognition and the universe of multiplayer games and more recently she has been conducting studies in programs outside the school that show that skills such as interpretation, synthesis and power of argument have emerged from the contact of young people with the media (Steinkuehler et al., 2012).

It has been clear that young people are going to build learning trajectories by using multiple spaces. In the educational context, learning trajectories characterize the actions and the reflection process of a person over a period of time. In this research, we take the concept of learning trajectories defined by Erstad et al. (2013), which refers to the ways a person goes through different situations over time. For us, exploitation of these situations which are motivated and established by the use of technology and media can initiate the development of competencies useful for discovering of new knowledge.

3 RELATED WORK

The discovery of learning paths is an area of research that has been explored for quite some time. The area of mathematics, for instance, has been able to study sequences of activities and stimuli that are effective for guiding children through their levels of thinking and skills. The researches in this area have guided the conduct of teachers and the reformulation of pedagogical practices (Simon, 1995) (Simon et al., 2010).

Nevertheless, in the case of technology usage, young people have control over what they learn and how they learn because they are free to make choices based on what looks interesting to them. Unlike formal education, which can have more control over the development of such trajectories, it's a reverse path when this construction occurs in the digital world. We do not define the paths that the young people will take. They do. And, what do we know about the connections that are established when young people use media? How do the knowledge and skills that have been developed move between spaces that constitute young people's daily lives? How do they perceive their learning process stood before the power of technology? How do these experiences affect their learning in formal education environments?

Some studies have been conducted in the attempt to understand this dynamic. The studies of the research group Connected Learning have concentrated on non-formal learning spaces, although one of its observations have lately turned to the experimental school Quest to Learn (Salen et al., 2011). Six case studies have been reported in recent years and they have demonstrated the application of the principles of Connected Learning approach to learning spaces such as libraries, communities of practice and programs aimed at integrating young people with industry professionals (Connected Learning n.d.).

The group has been able to investigate daily practices that constitute the biggest stories arising from online contexts. However, Ito et al. (2013) emphasize that there are few studies that investigate in a systemic way how the knowledge transfer between formal education and other contexts that connect people's lives occurs. As well as the National Research Council (cited in Ito et al., 2013) highlight, when it refers to the lack of studies of systematic nature of these forms of learning

mediated by technology and the requirements that have been put for learning to occur.

There is a great interest in exploring and analyzing other types of learning beyond that one which occurs mainly in schools because learning does not end when young people leave the school space. On the contrary, learning is extended and encouraged when they make massive use of technology to establish a relationship with the world they live in.

In order to understand the concept of learning in the 21st century it will be necessary to dive into young people's daily life, their attitudes and into the new meanings that have been created. As Eickelmann et al. (2013) said, it is necessary to develop new conceptions of learning, considering the different locations and contexts involved in this process. Erstad et al. (2013), in turn, also claim that the biggest challenge we have today is finding ways to interpret the interconnections between the different worlds that young people experience in their daily lives. In the studies they have been conducting with the Learning Lives approach, the author and his colleagues have tried to illustrate some circumstances that exemplify the existence of connections and boundaries between young people's practice and the skills they transfer between spaces. Sefton-Green (2013) also reinforces that we know very little about how young people can circulate through informal experiences as well as those that happen at home or at school.

Thus, in the attempt to contribute with the research on learning in the digital age, the research that has been conducted intends to address the following research questions:

Research question 1: How do young people establish their learning trajectories when using digital spaces?

Research question 2: What measures can be used to model the way in which knowledge moves between the spaces?

4 RESEARCH METODOLOGY

In order to identify attitudes, experiences and meanings, the method of this research is qualitative in nature. Thus, we assumed an interpretive epistemological position In the belief that reality is socially constructed, we assumed that knowledge can only be understood from the point of view of individuals who are directly involved with the study of the phenomenon of interest.

4.1 Research Design

The case study will be used as a methodological approach of investigation in this paper to offer a deeper understanding of how and why certain phenomena occur. A case study with multiple cases will be used. In this research, the researchers will accompany young Brazilians who are attending high school and who have a daily intense contact with media and technologies. The investigation will examine the daily lives of individuals when they are in their learning spaces to understand the phenomenon of interest. Besides, it has the intention of creating models that reproduce learning pathways constructed by the subjects.

Since it is intended to identify patterns, ideas or hypotheses to support the existing knowledge base, the case study is exploratory. The study will be conducted in a longitudinal way so that it will be possible to analyze changes during the process of data interpretation. The longitudinal design allows the subject to be investigated several times. Thus, the data can provide greater accuracy in the analyses which are related to changes that may occur over time.

One of the used techniques of data collection has an observational nature. Questionnaires and interviews will also be conducted, as well as ethnographic methods. The research subjects will be followed throughout the year. The process of analyzing the information will happen through an iterative cycle that alternates data collection and interpretation. Several criteria will be used to select the sample of subjects, which adds value to the process of capturing meanings of the phenomenon that has been studied.

4.2 Analysis and Synthesis of Data

In order to properly deal with the wealth of information that will be collected, we will use techniques from Grounded Theory as a means to accomplish the analysis and synthesis of data. The Grounded Theory is a suitable research method to identify a recurring pattern of behavior in the subjects of the research (Glaser, 1998). Thus this method requires the researcher to let go of preconceived ideas so that the focus is kept on the construction of a theory and not in explaining other existing ones.

However, in this ongoing work the researchers have a base of theoretical assumptions (which were mentioned in Section 2) as well as in hypotheses (presented in Table 1). Nevertheless, even if our

objective of is the understanding of a particular case, the use of Grounded Theory techniques is justified by the interest in systematizing the process of data analysis and, before the exploration potential of the method, it is possible that in the end of the research a narrative is constructed (as a "local theory") capable of adding value to researches in this area.

Table 1: Research hypotheses.

Hypothesis 1: The situated learning occurs with the existence of learning trajectories.
Hypothesis 2: When a process of knowledge transference between learning spaces happens, the deep learning is taking shape.
Hypothesis 3: Young people are able to recognize what they are learning and when they are transferring knowledge from one space to another.

Triangulation is one of the strategies that will be used to enhance the internal validity of the study. Triangulation schemes of multiple methods and multiple sources will be adopted.

5 RELEVANCE OF THE RESEARCH

The ability of young people to collaborate, to see the technology as a resource to create meanings for educational content and to develop skills so that they may be able to solve problems, has motivated researchers to understand the dimension of the concept of learning in this century.

In order to understand the digital culture and young people's practices, we need a strong immersion in their context so that we can understand how the processes, experiences and decision making are experienced and understood also in informal learning environments. There are still not much published research about new ways of learning which consider ecological and connected approach. Furthermore, the replication of studies in multiple cultural, social and economic scenarios will strengthen the knowledge base in this field. Such studies conducted in countries like Brazil may provide important findings.

In the global scenario, this study will be important to increase the body of knowledge on the pathways, decisions, skills and attitudes that young people take when they are engaged in the learning process. The research aims to identify evidences which show how young people perceive their own learning and how they transfer it between the spaces. This student-focused measurement strategy also shows to be a promising method in the field of assessment of learning. The identification of patterns and the perception of attitudes and meanings will also be important to understand the relationship between learning contexts elements.

Regarding the Brazilian scenario, the use of technology in education is still very much driven by the instrumental view or how to build something that can make the learning process funnier, which is configured in a superficial strategy almost always doomed to failure. Most teachers who adopt the technology do it sporadically through limited and distant forms that allow the students' understanding as well as specific practices of everyday life and school activities (Junqueira 2009). As Bonilla (2012: 77) has pointed out, despite the presence of technology in schools, there is no strengthening of digital culture, as it requires a strong immersion in context so that processes, experiences and decision making are widely experienced and understood, making sense of the practices, either social or pedagogical ones.

Thus, it is perceived that there is to some extent a state of disregard. Whereas in Brazil technology has been present in schools for almost 30 years, it is necessary to advance research in this field, mainly because it may be possible to see through quantitative research that young people consume technology outside the school in a very different way than it occurs within school. However, more investment needs to be made in qualitative research that can influence education policies which value the intellectual potential of young Brazilians. After completing the literature review, the research is at the stage when the first instruments of data collection are planned as well as the selection of samples of the participants.

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