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Personal Learning Environments for Overcoming Knowledge Boundaries between Activity Systems in Emerging Adulthood

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Summary

In this paper we suggest a possible answer to the question on why Social Network Systems (SNSs) are important for bridging social capital and for knowledge construction during emerging adulthood. We argue why web social artefacts 2.0, and particularly those defined as Personal Learning Environments, which consider also SNSs, could be more effective than web artefacts 1.0, such as those defined as Virtual Learning Environments (mainly represented by classical web platforms and web forums), for overcoming knowledge confines between activity systems during transitions in emerging adulthood.

This theoretical route starts with the definition of emerging adulthood as a period broadly located between adolescence and adulthood in which individuals are faced with many types of transitions. A fundamental aspect of such a transition period is the personal network of relations, and in particular the concept of bridging social capital formed by networks of weak ties. Researches on the use of web technologies in emerging adulthood are also discussed, as the results show the importance of these tools for maintaining and reinforcing bridging social capital. The conclusions derived from this theoretical route emphasise the relevance that web artefacts 2.0 have, in particular SNSs, providing emerging adults with many possibilities and support in:

- maintaining and developing their social capital;
- constructing a knowledge background that could help them during transitions through different activity systems.

These conclusions also lead towards a new conception of eLearning strategies employed in contexts such as universities, characterized until now by a heavy use of web artefacts 1.0 in which students play a passive role. We believe more flexible eLearning systems, such as SNSs, should be taken into consideration, since they are more likely to meet the needs of today's emerging adults in terms of information and knowledge.

Keywords: Personal Learning Environment, Social Network Systems, Informal Learning, Universities, SNS, bridging social capital, adulthood transitions, emerging adults, Cultural Historical Activity Theory

Introduction (the problem)

During the last two decades, educational, learning and work contexts have been strongly modified by technological innovations (e.g., the increasing importance of web communication for managing activities and connecting people within and between groups, associations and organisations). In this context, which is characterized by short terms of reaction to environmental changes, by inter-organisational mobility, and by weak connections between individuals and organisations in which they operate, a greater flexibility in the use, in the transfer, and in the integration of personal knowledge and social competences is required.

In this scenario, transformations also concern processes connected to knowledge acquisition and construction in the direction of a greater complexity. As a matter of fact, the rapidity of the knowledge evolution, transfer, and obsolescence increasingly tends to break the sequential nature of traditional learning and work systems (these models are based on the transmission of repetitive knowledge and competences isolated by contexts, the acquisition of behavioural schemes or movements automation) that nowadays seem to be obsolete and involved in marginal professional contexts.

Since these culturally driven changes (which are typical of the so-called industrialized countries) involve all contexts of human life, they could represent an even more critical factor during transition periods in which persons pass from a well known and well managed situation to a new, unknown situation. In such transition periods, the passing from a situation to another (e.g., from school to university, or from school to work contexts) implies leaving a network of relations and a system of knowledge for encountering new ones, which are typical events characterizing the life period called *emerging adulthood*. In light of these observations, what could be the role and the function of ICT and, in particular, of web artefacts during such transition periods?

Emerging adulthood and transitions

Arnett (2000; 2006) defines the years from the late teens through the twenties (we could roughly demarcate this period between ages 18-25) as "emerging adulthood". He describes this period as characterized by many important changes and transitions that prepare individuals for entering adulthood. Thus, Arnett proposes to insert a new period situated between the period of adolescence and that of adulthood in the already existent theories on human development. He derives his proposition from many evidences provided by studies conducted in western industrialized countries, where emerging adulthood appears as a period characterized by a certain degree of independence from social roles and from normative expectations since individuals have "left the dependency of childhood but they are not yet entered the normative responsibilities of adulthood" (Arnett, 2000, p. 469). Thus, in Arnett's perspective, emerging adulthood is a time in which individuals explore a variety of possible directions in many fields of their life, such as love, work and worldviews.

An important element outlined by Arnett (2000) is that emerging adulthood is a period that is be most likely to be found in industrialized or post-industrial countries. The reason, according to the author, is to be found in the high level of education and training required for entering the information-based professions, which, also determines a postposition of marriage and parenthood after the end of schooling. However, the increasing globalization, the growing integration of developing countries in the global economy, and the increasing availability of technology in such countries determines a progressive pervasiveness of emerging adulthood on a worldwide level.

Of course, emerging adulthood seems to be a period characterized by many important individual and social changes, since emerging adults "are no longer in secondary school but are pursuing a wide variety of different combinations of school and work" (Arnett, 2006, p. 119). As Arnett (2000) underlines, the choices of emerging adults with respect to work and education are focused on trying out various possibilities that would help them in being prepared for different kinds of future work. This means that knowledge and competences encountered and constructed during these various educational and work experiences are seen as very important for future work lives. They are important also as far as changes in worldviews are concerned, since entering a new context, such as college, university or workplace, means also being exposed to a variety of different worldviews that would influence and change initial ones (Perry, 1999). From this point of view, we would like to emphasise the importance of integrating and bringing with us such an ensemble of knowledge, competences and practices during emerging adulthood for coping with the transition between school and work or between school and university, considering the contemporary dynamic knowledge society we have previously depicted.

During emergent adulthood many individuals carry out their college course and attain the level of education and training that will open the doors for their adult work lives (Chisholm & Hurrelman, 1995), but this could also involve many residential changes, such as leaving home for some work opportunity, entering college, graduating, and entering the professional workforce, or, moving back into parents' home as well (Goldscheider & Goldscheider, 1994). Such residential changes are likely to cause a loss of connection to friends, and to disrupt the maintenance of relationships between people in emerging adulthood (Cummings, Lee & Kraut, 2006). Following the suggestion of Paul & Brier (2001), we can speak of friendsickness not only for defining the distress determined by the loss of connection to old friends during the emerging adulthood transition when it comes to moving away to college, but also for better underlining the need of being able to maintain connections with previous networks of relation during this life period, while still being open to new experiences and relationships in current geographical contexts (Steinfield, Ellison & Lampe, 2008). For instance, several studies show that developing and maintaining friendships during emerging adulthood influences the identity formation, the well-being, and the development of long term relationships such as romantic or family relations (Connolly, Furman & Konarksi, 2000; Montogomery, 2005).

Maintaining and developing bridging social capital by means of web technologies during emergent adulthood

The importance of friendship maintenance in emergent adulthood can be seen from two complementary perspectives that allow us to introduce the core of this theoretical discussion (Steinfiled, Ellison & Lampe, 2008). On the one hand, developing and maintaining relationships is important for generating social capital and also for psychosocial development in emerging adults. From this point of view, and taking into account the previous considerations about transitions and residential changes during emerging adulthood, we can easily understand the important role played by SNSs in developing and maintaining relationships that would otherwise be lost. On the other hand, there is also growing evidence that the use of SNSs may be associated with the sense of self-worth and also with other measures of psychosocial development.

The term social capital could be broadly defined as the amount of resources accumulated through relationships among people (Coleman, 1988) or, more specifically, "the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu and Wacquant, 1992, p. 14). Social capital can be conceived at two different levels with respect to a focus on the entire community or on the individual (Steinfiled, Ellison & Lampe, 2008). For instance,

- by considering the community level, social capital is connected to some positive social outcome like public health, lower crime rates, and more efficient financial markets (Adler & Kwon, 2002);
- by considering individual level, there is evidence that social capital is related to career advancement (Burt, 1997) and organisational success (Nahapiet & Ghoshal, 1998), and to some indices of psychological well-being such as self esteem and life satisfaction (Bargh & McKenna, 2004; Helliwell & Putnam, 2004). Furthermore, the literature on the field shows that young people with higher social capital are also more likely to engage themselves in behaviours that lead to better health, academic success, and emotional development (Morrow, 1999). As Ellison, Steinfield and Lampe (2007) point out, social capital allows persons, on an individual level, to draw on resources (useful information, personal relationships or the capacity to organise groups) related to other members of the network they belong.

A second important distinction is introduced by Putnam (2000), who proposes two different forms of social capital:

- the first, named *bonding social capital*, is likely to be representative of emotionally close and tightly-knit relationships, typical of the family or of the "close friends circle";
- the second, named *bridging social capital*, derives from the influential work of Granovetter, and it is connected to the definition of weak ties commonly used in social network analysis for defining connections that principally provide useful information and new perspectives but not emotional support.

Granovetter (1973; 1983) shows that weak ties are very important in many moments of human life, in particular during critical circumstances that can not be overcome through information and knowledge that are already known. From this perspective, individuals outside of the close friends circle could provide useful information and/or new action perspectives that are not redundant, such as those that could offer friends with which individuals already shared knowledge within a similar social environment. This is a typical aspect of the bridging social capital, i.e., the social capital strengthened by the creation of weak contacts with people that come from various and different socio-cultural and work contexts. Thanks to this dissimilarity, weak ties could play an important role by offering new information and knowledge that is not yet known and that could be very important for overcoming critical situations during transition periods, such as that of emerging adulthood.

Now, young adults that move to college or to a new workplace leave networks of social relations of their original environment (home, school, university) and, thus, they have an high risk of loosing important parts of their social capital. In human life, particularly during emerging adulthood, social networks are not a settled dimension that characterizes individuals; rather, they are a dynamic dimension constituted by relationships that are continuously formed and abandoned during transitions and residential changes that may affect social capital. Thus, at the same time, emerging adults have a double need:

- to create new networks of relation in the new context;
- to maintain ties with networks that they leave.

Given these premises, many researchers have studied and emphasised "the importance of internet-based linkages for the formation of weak ties, which serve as the foundation of bridging social capital" (Ellison, Steinfield & Lampe, 2007, p. 1146) and web technologies are thought to play an important role in connecting and maintaining connection to networks of friends during transitions in emerging adulthood. It is indeed quite obvious that Internet facilitates connections, allowing people to maintain and create relationships in an alternative and supplementary way. Studies show that internet communication is particularly useful for people having difficulties in forming and maintaining ties, such as those individuals with low psychological well-being, and that, by encouraging a self-disclosure, the internet communication allows people to create connections and interactions that probably would not otherwise occur (Bargh & McKenna, 2004, Tidwell & Walther, 2002). We could suggest the same not only as far as psychosocial barriers are concerned, but also with regard to physical barriers determined by dislocations. For instance, in a recent study, Cummings, Lee and Kraut (2006) underline the importance of email and instant messaging for college students in order to remain close to high school friends when they leave home for college. Subrahmanyam and colleagues (2008) propose a view in which web tools are thought as interaction spaces in which emerging adults co-construct their online environment that is psychologically connected to the offline one, an interesting perspective that is clearly in contrast to the idea that online and offline worlds are distinct (McKenna & Bargh, 2000; Turkle, 1995). Authors suggested many evidences and brought the result of their research for showing that emerging adults use web technologies, in particular online Social Network Sites (SNSs) such as MySpace, Facebook, LinkedIn and so on, for "bringing people and issues from their offline worlds into their online ones" (Subrahmanyam *et al.*, 2008, p. 421).
A concept that could depict the integration between online and offline world is that of *latent ties*, i.e., those specific types of online social linkages that are "technologically possible but not activated socially" (Haythornthwaite, 2005, p. 137). This concept is also connected to the idea that a *latent tie connectivity* could be a technological prerequisite for activating weak ties. Thus, SNSs are thought to play an important role in maintaining and augmenting bridging social capital since they allow users to stay in touch with diffuse networks of relationships that

represent a virtual space of potential resources upon which one might count. Especially for analysing this role of SNSs in maintaining contacts with social networks after physically disconnecting from them, Ellison, Steinfield and Lampe (2007) introduce the concept of *maintained social capital* as a dimension of "the ability to maintain valuable connections as one progresses through life changes" (p. 1146). Results of their study show that the use of the SNS they analysed, i.e., Facebook, helps students not only to maintain, but also to accumulate bridging social capital since it is a sort of web social environment that allows to stay in touch with weak ties in a cheap and easy way. At the same time, Facebook seems to facilitate the conversion of latent ties into weak ties since

- it allows students to access many personal information about others;
- it makes the personal network's wide range of individuals explicit;
- it represents a support for students who need to identify people who might be useful in a certain situation and, in this last case, it also represents a further motivation to activate a latent tie.

On the basis of the previous observations, and considering a Cultural Historical Activity Theory (CHAT) perspective, this proposal is intended to be a position paper in which we argue why web social artefacts 2.0, and particularly those defined as Personal Learning Environments (Attwell, 2007) which consider also SNSs, could be more effective with respect to web artefacts 1.0, such as those defined as Virtual Learning Environments (mainly represented by classical web platforms and web forums), for overcoming knowledge confines between activity systems during transitions in emerging adulthood.

The evolution of learning activity systems from web 1.0 to web 2.0: the explosion of the Social Networking Systems

Given the previously sketched evidences, we can surely conceive Information and Communication Technologies (ICT), in particular web tools, as strategic artefacts that may promote new forms and models of learning and training, and the creation of flexible relational networks that may support individuals (students, workers, employees, etc.) in terms of information acquisition and knowledge construction. From the activity theory point of view (Engeström, 1987; Kaptelinin, 1996), web artefacts could be seen as instruments for mediating the relation between the individual, the community, and the object of activity systems in learning and working contexts. Differently from HCI cognitive perspective (fig. 1a), in which interaction between a human and a computer "is characterized by two information processing units which interact according to an alternate circuit of input and output" (Mazzoni, 2006, p. 163), the Activity Theory (AT) perspective (fig. 1b) contextualizes the interaction between human-computer within the activity system in which it takes place (Kaptelinin, 1996; Mazzoni & Gaffuri, in press).

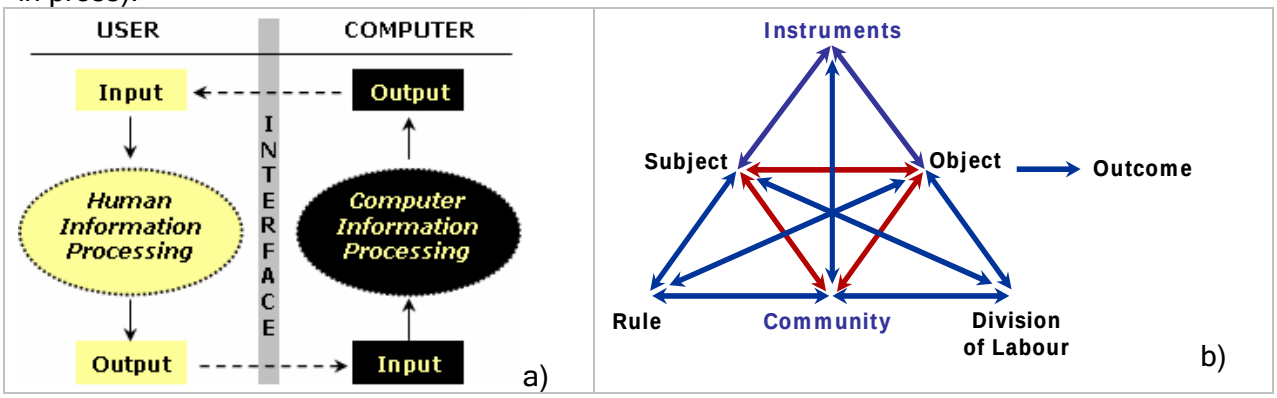

Figure 1: a) The human-Computer Interaction Model in the classical cognitive perspective and b) the Human Activity System representation (Adapted from the web site of the Centre for Activity Theory and Developmental Work Research - http://www.edu.helsinki.fi/activity/ - March, 29, 2009).

Being mainly focused on interaction itself, HCI model does not consider the context, and specifically the activity performed by the relation between human and computer. The latter represents instead the core of the AT model (fig. 1b), which represents all the relations between the principal entities of a human activity system (subject-object-community) and the mediation of these relations by signs/instruments/tools, rules and divisions of labour. We could further contextualize this model into a real activity, e.g., by considering a university course. Figure 2 proposes the activity system of a learning activity focused on a student (subject) that acquires knowledge about the Psychology of Education (object) for achieving his/her degree in Psychology (outcome).

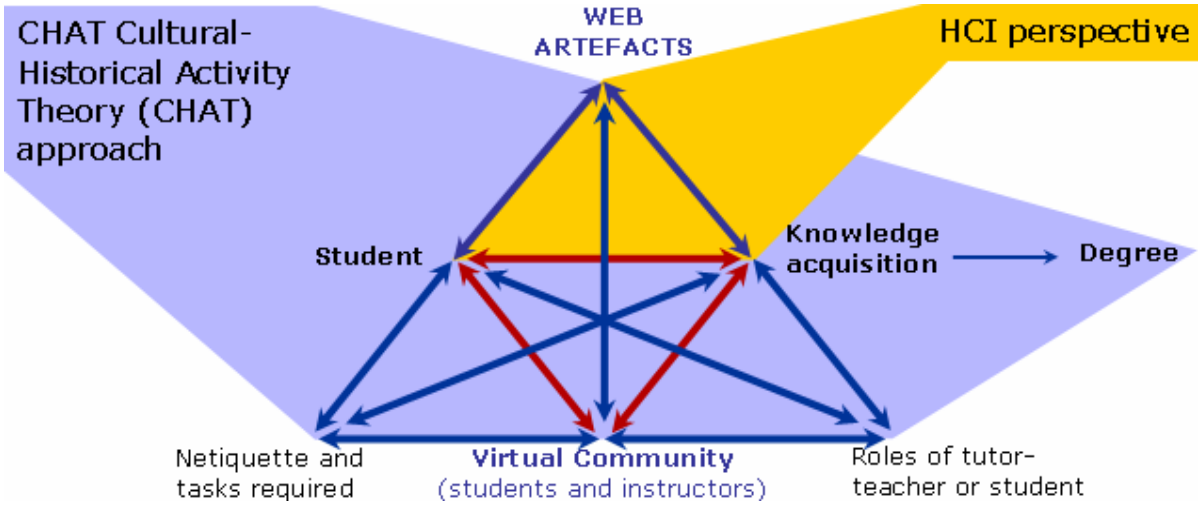

Figure 2: The activity system of a university course proposed in a blended-learning format.

The course is proposed in blended-learning format, so it is composed by face-to-face and distance lessons, these latter carried out by means of a web platform (web artefact). The student, however, is not alone: he/she is part of the community, which is constituted by the course students and instructors (teacher and online tutor). Thanks to the web platform, the community also expands beyond the time and space delimited by the face-to-face course (virtual community). The course requires the participation to all distance sessions, which involve learning materials uploaded by instructors, collective discussions on specific topics (by following the web forum netiquette), and tasks to accomplish (rules). Online sessions are also managed by an online tutor that activates and moderates web forum discussions. Face-to-face lessons are carried out by the teacher which also organizes the learning materials (to upload in the web platform) and tasks to accomplish. Finally, students have to participate both to face-to-face and online sessions (division of labour).

Even though figure 2 represents only web artefacts, many others artefacts are obviously involved in this activity, such as slides during face-to-face lessons, lectures proposed by instructors, etc.. Here we would like to draw attention on the potentiality of web artefacts, such as a web platform or a SNSs, in mediating the relation between the student and the knowledge acquisition process by means of a direct mediation (e.g., learning objects or hypertexts constructed/uploaded by instructors), and/or an indirect mediation (e.g., the construction of shared places for discussing with the community and sharing/constructing knowledge). The definition of "direct mediation" represents the classic research field of the HCI approach, whereas the Cultural-Historical Activity Theory (CHAT) perspective takes into account all the elements that characterize a specific activity systems.

Following the suggestion of Engeström (1987), since a university degree is based on many courses, we should rather speak of activity systems, each one representing a specific university course featuring specific rules, roles and a specific community, which, however, share the same outcome (the achievement of the university degree). The same community, the same division of labour, and the same rules characterize the whole faculty (fig. 3).

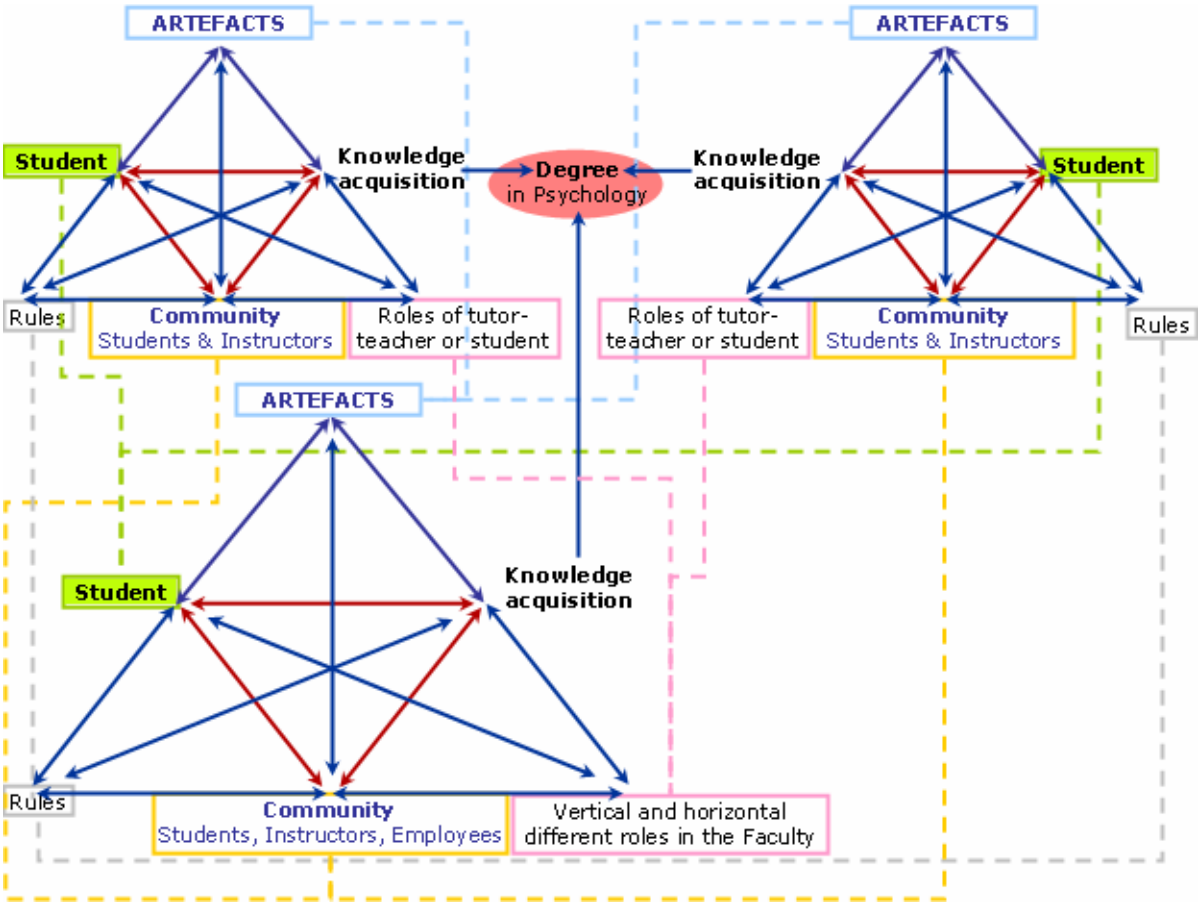

Figure 3: The activity systems of two university courses, related to the activity system of the faculty.

Figure 3 shows a typical complex activity system, composed by many other interrelated sub-activity systems. Individuals, however, should not be conceived of as parts of a single activity system (such as a faculty). Rather, they belong to multiple activity systems such as the family, university, work organisations, some free time associations and so on; thus, they are surrounded by multiple rules, roles, artefacts, but first of all, they are embedded in many and different cultural activity systems of knowledge, competences and practices (fig. 4).

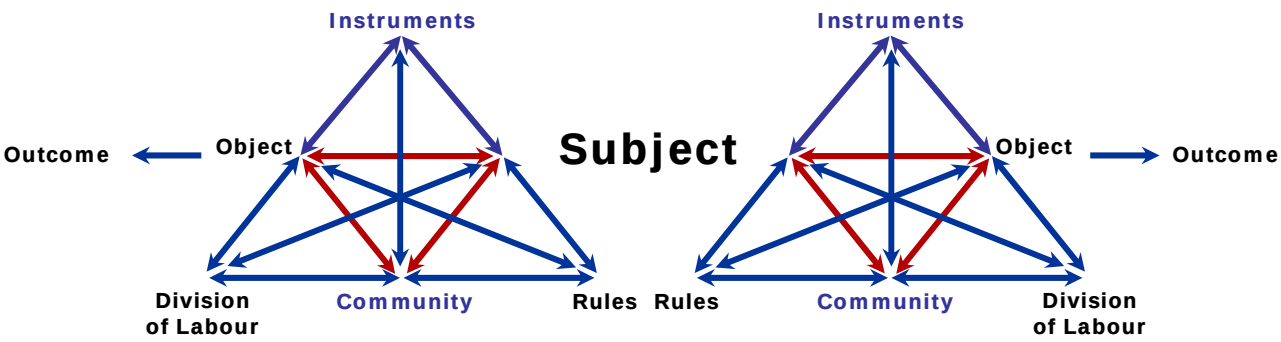

Figure 4: A subject that participates to two different activity systems.

As previously underlined, at the same time individuals are faced with many transitions in their lives, particularly during emerging adulthood, thus they move through various activity systems. During these passages, emerging adults continually create and lose relations, particularly those defined "weak ties". This means, at the same time, that they incessantly construct and update their bridging social capital. As Wenger (1998) points out, during transition periods (such as,

e.g., the transition from school to university, and from school or university to work contexts), individuals have to deal with different backgrounds of knowledge and competences that are demanded, on the one hand, by the activity system they are leaving and, on the other hand, by the activity system they are entering. This transition could be very critical for individuals since in most cases the gap between the background of knowledge and competences they possess, and the background demanded by the new activity system is very large. For instance, in the period of emerging adulthood everyone has experienced a critical difference in requests and in practices during the transition from an activity system, such as the school, to another one, such as the university, or from school to workplace.

Wenger (2000) suggests that boundaries between knowledge and competences delimiting different activity systems might be overcome by three types of bridges: persons, artefacts, relations. From this point of view, web social artefacts (such as web platforms or SNSs) could play a very important role as bridges for mediating knowledge exchange between different cultural activity systems. We could depict these web artefacts as social environments activated by persons for the mutual construction of relations, which may occur by means of the mediation of written text or spoken language. Web artefacts, however, are not to be understood as instruments that simply delimit a virtual social space in which exchanges/conversations/ discussions take place; actually they are one of the most important social contexts for constructing and sharing *boundary objects* (Star, 1989; 1998; Wenger, 2000; Tuomi-Gröhn & Engeström, 2003). According to Star (1989), boundary objects *sit in the middle* of actors characterized by divergent viewpoints, in which they play a specific role of coordinating their different perspectives for some shared purpose. In other words, boundary objects could be seen as something that allows to overcome the boundary between different activity systems such as school, university, and work organisations, by constructing some types of common zones between different actors and, thus, bridging the gap of knowledge and competences required by these systems. We could also envisage boundary objects as a sort of scaffolding for expanding knowledge and competences of individuals within and beyond their zones of proximal development [Vygotskij, 1978; Griffin & Cole, 1984) i.e., according to this perspective, the difference between their previous knowledge and competences, and the knowledge and competences required by their transition to a new activity system (e.g., from school to university or from school or university to work).

But now the question is whether all web social artefacts are equivalently effective for this function. In other words, considering the constant evolution of web social artefacts, which today are represented by the transit from the web 1.0 (and web communities) to the web 2.0 (principally Blogs, Wikis and especially SNSs), and on the basis of an AT point of view, which types of web social artefacts (and consequent web environments) could be more effective for overcoming boundaries and connecting different activity systems in emerging adults and, at the same time, reinforcing their individual social capital?

Learning objects (Wiley 2000), web forums, and web platforms are typical examples of web artefacts characterizing the e-learning 1.0, while wikis, blogs, and SNSs are more informal environments typical of e-learning 2.0. Web artefacts 1.0 are principally characterized by formal learning, i.e., structured courses, well organized and pre-arranged by instructors, in which students have to download/upload documents, accomplish predetermined assignments/tasks and participate in chaired on-line discussions. On the contrary, Web artefacts 2.0 are most likely characterized by informal learning (Attwell, 2007) which enables students to manage their personal learning space (normally a blog in which access permissions are set by students themselves), to construct their relational network (by inviting other students or accepting invitations), to propose their discussion groups (by selecting participants) and finally to choose the level of interaction they prefer with other students or with instructors. This latter could be a private one-to-one interaction (in which messages are read only by the receiver), a personal interaction (in which the message is posted in the personal area but it is public), an interaction with the personal network (constructing specific groups) or, finally, an interaction with the whole network, which normally occurs within a web forum. From this point of view, web artefacts 2.0 allow a role in the determination and delimitation of multiple levels of engagement in collective

activities, and multiple spaces for sharing and exchanging knowledge, that is more active than that permitted by web artefacts 1.0. This is particularly true for SNSs, i.e., those web artefacts "that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (Boyd & Ellison, 2007, p. 211).

Results of an interesting research about the use of Facebook in university students show that SNSs are important for developing and maintaining relationships during residential change since these types of online networks provide both the technical and the social infrastructure for maintaining lightweight contact with many former friends and acquaintances and, at the same time, for being open to new potential friendships that can be developed from latent ties (Stenfield, Ellison & Lampe, 2008). Furthermore, the possibility of learning information about a latent tie (Haythorntwaite, 2005) represents a sort of "impulse" for engaging in a new interaction. As a matter of fact, the student may rely on much information about the others, such as the potential commonalities and the relationship status, and this could lower the fears of rejection. In their study, Subrahmanyam and colleagues (2008) report that emergent adults spent much of their time on reading and writing comments and also on responding to messages/comments, but they also surfed the pages/profiles of their friends for being informed about their new contacts and events of their life and, in general, for keeping track of them.

These results point out that web artefacts 2.0 are supportive for the students' everyday activities, in particular for maintaining and developing bridging social capital. This aspect determines also important positive consequences to emerging adults. On the one hand, it increases the range of opportunities that students may have during this critical period, which is rich in transitions, and, on the other hand, it allows students to have a virtual space for sharing and exchanging information, and thus for developing and constructing those backgrounds of knowledge that could help them in overcoming boundaries of different activity systems. Since SNSs are typically characterized by relations, and, only in a second step, by discussions, which instead represent the main principle at the basis of web communities in which participants often discuss with someone that, in most cases, they do not know, these tools seem to offer a dynamic and customizable social space in which weak ties may be maintained and developed with a degree of involvement that is not as high as that requested in face-to-face relations. For instance, the possibility to monitor information about friends, track their activities, events and friendships simply by surfing on the net allows emerging adults to have a constant way to stay in touch with them, to be informed about new opportunities, new events, and to be involved in a co-construction of informal knowledge without being forced to contact or meet someone directly. Nowadays, SNSs represent the easiest way to keep in touch with others and to reinforce the bridging social capital of emerging adults by means of simple mouse-clicks.

Conclusions

In this paper, we suggest a possible answer to the question on why Social Network Systems (SNSs) are important for bridging social capital and for knowledge construction during emerging adulthood. We started with the definition of emerging adulthood, a period that characterizes human development after adolescence and before adulthood, and we emphasised that it is a time in which emergent adults are faced with many types of transition. A concept that is fundamental during transitions is the network of relations upon which one may count. Bridging social capital formed by the network of weak ties is particularly significant in this context. We also presented some research showing that the use of web technologies in emerging adulthood is positively connected to maintain and reinforce bridging social capital. Starting from this theoretical background, we proposed its integration within a Cultural Historical Activity Theory perspective for showing the important role SNSs nowadays play for overcoming knowledge boundaries of different activity systems during emerging adulthood transitions.

Finally we concluded that web artefacts 2.0, in particular SNSs, provide emerging adults with many possibilities, e.g., to actively manage their personal network of contacts and relations, to

be informed about new opportunities, events, and information, and to co-construct knowledge taking into consideration both formal and informal processes. Thus, SNSs represent web artefacts that support emerging adults in:

- maintaining and developing their social capital;
- constructing a knowledge background that could help them during transitions through different activity systems.

This conclusion underlines the importance of a new conception of e-learning strategies in learning contexts such as university. Till now, these contexts have been characterized by a heavy use of web artefacts 1.0 in a sort of vertical and fixed proposal of e-learning environments in which students had a passive role. We suggest that an e-learning perspective 2.0 should take into consideration new and more flexible social web environments, such as SNSs, in order to be able to meet the needs of today's emerging adults in terms of information and knowledge. We also believe that this could be the only way for being more effective in pursuing the aims of the Lifelong Learning Programme of the European Union, i.e., *to contribute, by emphasising the need for lifelong learning, to the development of the Community as an advanced knowledge society, with sustainable economic development, more and better jobs and greater social cohesion. … to foster interaction, cooperation and mobility between education and training systems within the Community, so that they become a world quality reference*.

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