ACTIVITY THEORY IN STUDYING INNOVATIONS: THE INTERCONNECTED PHASES OF ACTIVITY SYSTEM

Tsoghik Grigoryan

Higher Colleges of Technology, United Arab Emirates

Nairi Babayan

Al Dhafra Private School, United Arab Emirates

This article presents the Activity Theory (AT henceforth) as a research framework and discusses the core disciplinary authors and models through qualitative and quantitative studies conducted from 2004 to 2016. It then moves on to discuss the AT from its digital perspective and concentrates on the AT in studying technological innovations and its theoretical implications.

Keywords: Activity theory, Research framework, Conceptual framework, Innovation, Digital perspective.

Introduction

“Activity Theory or Cultural-Historical Activity Theory is a cross-disciplinary framework for studying how humans purposefully transform natural and social reality, including themselves, as an ongoing culturally and historically situated, materially and socially mediated process” (Roth, Radford and Lacroix 2012, p. 1). Enrenched in the dialectal psychology, it transcends traditional dichotomies of macro and micro, thought and action, intervention and observation, qualitative and quantitative by integrating three perspectives: the objective, the ecological and the sociocultural (Engestrom 1999).

AT was founded by Soviet psychologists Vygotsky, Lurija, Rubinstein and Leontev in the 1930s. Their idea was that activity was a fundamental philosophical and psychological concept because it was the essential notion in any viable philosophical anthropology. Hence, the statement that humans were active creatures was not to be simply registered as an empirical observation. It was never denied by any philosopher that humans act. Yet, it was a statement about the very nature of thought and its behaviour on the world. The Soviet scholar who developed this idea was Vygotsky who initially illustrated it in a form of a basic triangle, which consisted of a subject, an object and an artefact. However, he laid bare what he argued as then a problem in psychological investigation that limited experimental research to reductionist laboratory studies separated from the contexts of human lives (Barab, Evans and Baek 2004).

Vygotsky’s theoretical endeavour, later, was linked and elaborated by the Finnish scholar Engestrom, who added societal and contextual dimensions to Vygotsky’s model and “[broadened] the process by linking the idea of activity systems to concept of context, stating that contexts are activity systems” (Engestrom 1993 in Esch and John 2004, p. 56). The main concept of this approach is that the individual actions occur in relation to three factors: the available tools, the community and the labour
distribution in that community (Figure 1). As figure 1 explains, the subject implements a tool to perform cognitive functions and cannot directly act on the object. The unit of analysis in AT is the concept of object-oriented, collective and culturally mediated human activity system. According to a leading theorist in AT, Nardi (1996), “Activity Theory focuses on practice, which obviates the need to distinguish ‘applied’ from ‘pure’ science … where understanding everyday practice in the real world is the very objective of scientific practice” (p. 45).

It is by amending and extending Vygotsky’s and Leontiev’s theories in a way this paper sketches that we can argue for the fruitfulness of AT. In this complex task possible debates with other school of thought should be faced and welcomed. Jonassen and Murony (1999 in Liaw and Huang, 2014), explain that, “When analysing human activity we must examine not only the kinds of activity that people engage in, but also who are engaging in that activity, what their goals and intentions are, what objects or products result from the activity, the rules and norms that circumscribe that activity, and the larger community in which the activity occurs” (p. 4).

Activity Theory in Qualitative and Quantitative Paradigms

The AT has been used as a framework in several studies in the field of education. However, this framework is mostly found in the qualitative research paradigms. Esch and John’s (2004) qualitative study, “New Insights into Foreign Language Learning and Teaching” is one of them, where the authors examine a case of a peer-revision in a Spanish foreign language writing course. This action research is an example of AT analysis of educational innovation designed and implemented by the language teachers themselves. The study firstly saw a challenge in the AT use, as it required teachers to conceptually step out of their technology-centered conceptions of educational practice, think out of box, and consider the classroom practices as activity systems. The issue with ‘centering’ approaches, such as student-centered or technology-centered, is that human activity involved with other people and artefacts is mediated in multiple complex ways. Those ‘centering approaches’ may disguise significant importance of ‘non-centered’ figures and aspects in educational settings, such as educational orientations, artefacts or even
classroom configurations. All of these may be vital in researching and developing educational practices. The study came to conclude that the AT bonds social practice and human consciousness, and that it has a huge effect when applied to technology and pedagogy. The study states that the AT recognizes individuals and purposeful activities as focus of analysis and key to innovations. This is a framework that stresses human activity, which is mediated by mediational means at hand, communities related to action, the spoken and unspoken rules and division of labour in these communities, and the object and outcome of the considered activity system.

A very interesting study is Grigoryan’s (2016) “Using Learner Corpora in Language Teaching”, which used AT to look at different ways of learner corpora practices in L2 students’ vocabulary development and practice. It took its mediating tool to be the corpus analysis toolkit called Antconc. The study successfully used the AT as its theoretical framework and analysed the results through that theory.

Another qualitative study that took the AT as its theoretical framework is Kim’s (2013) “Activity Theory Analysis of Second Language Motivational Self-System: Two Korean Immigrants’ ESL Learning”. The study looked at two Korean immigrants’ ways of L2 learning motivation in Toronto and developed a theoretical triangulation of Dorneyi’s (2005, 2009) L2 motivational self-system through the lens of Vygotsky’s AT. The study suggests that L2 motivational self-systems can be effectively analysed through an AT perspective which offers a conceptual framework between subjects, mediational tools and communities. Consequently, the AT analysis showed that one of the study participants was able to transform her L2 environments into meaningful affordances, because her belief, which became her mediational tool, revealed equally conductive relations with rest of the elements in the AT system under consideration. The AT analysis of the second participant revealed that his incapability of creating affordances for his belief functioned as mediating tools to intervene his relations with situations and disturb the formation of affordances.

Applying explanation of the activity to pedagogy enables specific activity system analysis to function as units of examination (Nussbaumer 2011). A vivid example of this is Beatty and Feldman’s (2012) study called “Viewing Teacher Transformation through the Lens of Cultural Historical Activity Theory,” which describes a teacher professional development (PD) program and classroom teaching practices as two interconnected activities. The study came up with the AT model of three stages of the same teacher PD program called TEFA to look at it from the perspective of an object, a tool and a transformed system.

The AT from its digital perspective is represented in Sam’s (2012) study entitled “Activity Theory and Qualitative Research in Digital Domains,” which provided a conceptual framework to study the nexus of people, digital mobile technology and online community. The study touches upon Prensky’s (2012) Digital Native and Digital Immigrant Concepts, and calls in to explore online communication historically and in context. The study suggests using this framework not only for holistic understanding of interactional digital systems, but also as a means to design better activities which may help people to accomplish their outcomes.

Another important study in the field of education is Lee’s (2011) “More than Just Story-Telling: Cultural–Historical Activity Theory as an Under-Utilized Methodology for Educational Change Research” which explored several areas where educational innovation research often faces big challenges. This study looked at the AT from two perspectives: AT as being psychological framework that considers human cognition linked with artefacts, and AT as Practical Intervention Methodology that looks into learning within educational communities.

The book called “Transformation of Learning: Advances in Cultural Historical Activity Theory” (2010), authored by leading theorists in the field, Oears, Wardekker, Elbers and Veer, highly stresses Galperin’s influence in the future path of the Cultural Historical Activity Theory. It details the unique input by Galperin with a tight relevance for today’s research on cultural dimensions of human development, which is the central question of this approach.

Similar study on the other paradigm of the enquiry is Liaw and Huang’s (2014) quantitative study, “Investigating Learner Attitudes Toward e-books as Learning Tools: Based on the Activity Theory Approach,” which developed a research model based on the AT to understand learner attitudes towards
e-books of two different screen sizes. The study claims that screen size can affect students’ perceived self-efficacy and suggests conceptual research model based on the AT approach. Based on the quantitative technological perspective of the AT, the study adapted Engestrom’s model and renamed rules into control of learning, community into context of learning and division of labour into communication of learning. In doing so it followed suggestions of such authors in the field as Barab, Evans and Baek (2004), Sharples, Taylor and Vavoula (2005). The study came up with 15 hypothesis and a questionnaire, which covered nine factors. The AT quantitative data analysis suggested that learner characteristics have more predictive value than environment factors on learner satisfaction with and perceived usefulness for e-books as learning tools (p.17).

Literature is full of suggestions by educational theorists, such as Bonnie Nardi (1996), Jerome Bruner (2003) and others, on possible uses of the AT in educational theory, as well as in human-computer interaction design. As Koschmann (1998) explains, several publications encourage designers of computer-based artefacts to turn to the AT as a framework for analyzing user requirements. Consequently, Nardi (1996) represents an important point of entry for educational researchers in instructional technology and artefact design to investigate what the AT is and how the field evolves. It is approached differently in different studies. Its use and application is twofold regarding whether it is a theoretical concept or a methodology. The answer is simple as it is used in both ways and defined in a way, which embraces both conceptualizations. In all of its approaches, the AT is viewed by such educational scholars as David Bakhust (2009), Bert Van Oers (2010), and Timothy Koschmann (1998) as potentially fertile theoretical paradigm for research in education.

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Leontiev (1978) has defined three interconnected phases of activity system: operations, individual purposeful actions, and collective activities initiated by a social motive (Miettinen 2009), where operations presume machines and artefacts, individual actions presume mediating tools, and collective activities presuppose skills to develop innovations. Several studies followed this concept and used the AT as theoretical framework to explore innovations in different fields, including education. Two of these studies conducted through the AT theoretical framework on educational innovations were already discussed above from different perspective and are not referred to in this section (Esch and John 2004; Lee 2011). Three interesting studies are looked at in this section where the AT served a theoretical framework and helped to come up with detailed qualitative data analysis.

Russell and Schneiderheinze’s (2005) study, “Understanding Innovation in Education Using Activity Theory” describes a multiple case study research where teachers employed a constructivist-based learning environment that linked an innovated online educational technology with a unit design. This research is commendable in a sense it put on the top of the AT embedded triangle the innovation under consideration, whereas the middle triangle represented the subject action on the object. During the research, the innovation in the work activity system brought to an imbalance, which resulted in paradoxes between the nodes of activity system. As innovation is naturally contradictory and challenging, identifying those contradictions, as they appear on the way, is vital in determining the accuracy and demands of the changing system. This study solved the problem of contradictions in its innovative system by implementing a separate unit characterized as turning points and viewed them from different angles as separate activities. Besides, this study developed participant teachers’ AT graphical transformation models in sequence over the course of the research, which allowed identifying the paradoxes that arose in the activity systems of those teachers in the data collection phase.

Alike study worth considering is Khanova’s (2012) study entitled “Moving Courses Online as a Catalyst of Pedagogical Innovation: An Activity Theory Based View,” which suggests that online educational technologies can facilitate pedagogical innovations. Like Russell and Schneiderheinze (2005), Khanova (2012) constructed separate activity system diagrams for each faculty to explore specific elements that occur in transformation of the innovative teaching within and among their activity systems.
This study proved AT as an analytical tool for exploring pedagogical innovations and processes linking pedagogy and educational technology in the compound settings of educational institutions.

Another study that sheds light into the use of the AT in technological innovations’ field is Karasavvidis’s (2009) work “Activity Theory as a Conceptual Framework for Understanding Teacher Approaches to Information and Communication Technologies.” Using AT as its theoretical framework, this study explores teacher concerns about a technology oriented innovation. It is particularly interesting in its implementation of AT into the design and implications of innovative technology. Compared to the above mentioned two studies, this one is different with its large sample size for qualitative research, it being 51 teacher participants and 757 online messages to code and analyse. Though AT theoretical framework managed to serve the purpose of this qualitative study, it would have been better to try the AT from quantitative paradigm since the study decided to deal with such large sample sizes.

Because the activity of learning and its transformation have been vital in all times, it is no wonder that so many studies have been conducted on its nature, development and transformation. Aristotle advocated a theory of learning that we would call today learning by doing, which reverberated more than two millennia later in Dewey’s works and still remained in consideration after that. This paper is one of those attempts, which aims at exploring the field of language learning by looking at it from the activity system’s perspective of innovation.

Conclusion

The literature brought together different perspectives of the AT and discussed current models and theories representing it. However, it is still considered a theory in examination and is mostly applied in qualitative enquiries. Though there was only one quantitative study discussed in this literature review of AT theoretical framework, there is much empirical and theoretical support for the claim it can be successfully implemented in quantitative studies by such scholars in the field as Bandura (1986), Esch (2004), Lee (2011), Liaw (2014), Roth, Radford and LaCroix (2012). Since, there have been no large scale EFL studies conducted on mobile educational technology as language learning tools, nor ones with the AT framework in quantitative paradigm, it would be a big investment in the field to explore that gap.

References


