1. Introduction

The establishment of a theoretical framework to guide, inspire and frame educational research is of utmost importance and can allow for a rigorous examination of a phenomenon under investigation (Savin-Baden & Major, 2013; Hennessy et al., 2019). Despite this, in their editorial for the 50th Anniversary volume of the British Journal of Educational Technology, Hennessy et al. (2019) and other scholars (e.g., Bennett & Oliver, 2011; Hew, 2019) argued that the adoption of theoretical frameworks in Technology Enhanced Learning (TEL) research is sometimes weak or almost absent. For example, several studies focus on the design or practical implementation of educational technologies without grounding their findings in particular theoretical perspectives or by using theories vaguely and conducting superficial analyses (ibid.). Such approaches to research can restrict the opportunities to expand knowledge in the field. Therefore, there is a need for theoretically informed and thoroughly framed TEL research to enhance practice.

In this commentary, I discuss the value and application of Activity Theory (the focus of this special issue) in TEL research. I draw from my own experience in using the third generation of Activity Theory, also known as Cultural-Historical Activity...
Towards a polyfunctional use of cultural-historical activity theory in technology enhanced learning research

https://doi.org/10.21428/8c225f6e.291cef39

Theory (CHAT), as the main theoretical framework to underpin my research. My goal is to showcase its polyfunctional use within my research project’s lifecycle. By combining insights from the literature and my observations, I also provide reflections on CHAT’s application in the TEL domain that may be useful for both newcomers and more mature adopters of CHAT.

The aim of the research I will draw upon was to examine how educators and digital learning professionals (e.g., learning designers/technologists, media producers) work together to make decisions when they design for credit-bearing online learning in university settings. Specifically, it investigated the design processes they follow, the factors that influence their design decisions, and the nature and rationale behind their pedagogic choices. A multiple case study was employed as the overarching methodology with data collected from seven design teams (“cases”) across six UK-based universities. Five out of the six selected design teams were based in research-intensive universities, while one was in a post-92 teaching-focused university. Data were gathered through multiple methods and at different design phases. One-to-one semi-structured interviews with educators and digital learning professionals in two phases (before and after the design of online modules) and non-participant observations of design meetings were conducted to capture participants’ insights. Relevant documents (e.g., design documents, learning and teaching strategies) were also analysed as secondary evidence sources.

Engeström’s (1987, 2001) CHAT1 was seen as the most suitable theoretical framework to guide this research. This is because my aim was to explain the nature of design activities and decisions of those involved through their multiple perspectives and traditions and within their broader sociocultural contexts (e.g., rules, mediating artifacts, community, as show in Figure 1). CHAT successfully captured the new ‘rule’ introduced to the educators’ activity by their institutions; this requires them to work with digital learning professionals, rather than in isolation as in their past well-established university learning design activities. This new rule for collaboration between educators and digital learning professionals throughout an extended period (from four months to over a year) was established by university management for the design of pedagogically sound online learning and teaching. Design for online learning and teaching was seen as a new activity for the academic communities (of the selected universities) who had no or very limited prior experience in online learning contexts and the potentially new educational possibilities it might offer (Bayne & Gallagher, 2021). To this end, interdisciplinary collaboration for online learning design has been seen as a promising strategy for combining relevant expertise and encouraging the design of innovative and robust online programmes (Burrell et al., 2015; McInnes et al., 2020).

Although the purpose of this account is not to explain the application of CHAT in detail, Figure 1 provides a visual representation that maps out the components of the two interacting activity systems to support the readers’ contextual understanding. This representation was constructed to guide the initial phase of my research while I was engaging with the literature and doing preliminary data analysis. However, as it will be discussed in the next parts of this commentary, CHAT was not used instrumentally to define my approach to data analysis, and thus, there was no intention to overemphasise on its representational dimension while analysing each case study.

2. The value of CHAT: Advocating for a ‘polyfunctional’ use

The overarching aim of my research was to enable a holistic understanding of online learning design practice in higher education (people, processes, pedagogy) by including both educators’ and digital learning professionals’ voices in a single project, instead of producing a clear set of rules or disentangled factors that explain success or failure. CHAT aligns well with this vision as it examines human activities as systemic and socially situated phenomena (Nardi, 1996). Therefore, it can recognise the social nature of design (Conole, 2015; Bennett, Lockyer & Agostinho, 2018) where more than one actor group (represented by the collective subjects of each activity system in Figure 1), is involved to shape learning design decisions (the ‘shared object’ in Figure 1) such as in this commentary’s illustrative case. This is key, especially in our era where more and more diverse actors; including those that are university-based (e.g., students, learning designers, leadership, administrators), industry-based (industry experts, OPMs), and with national and global reach (e.g., policymakers, professional and government bodies) are involved and/or influence universities’ design activities. Being part of systems theories that embrace complexity, CHAT examines the dialectic relationship between the defined activity systems and their contexts (Crawford, 2006). This relational and context-dependent view is vital, as it goes beyond approaches that provide deterministic interpretations of phenomena (Yamagata-Lynch

---

1The key characteristics of the three generations of activity theory and thus, how core concepts evolved to the third generation (CHAT) that this commentary draws upon, can be found in papers within this special issue and in Papageorgiou (2022).
et al., 2015), such as by discussing the factors that influence design decision-making in a narrow and isolated fashion (Sannino & Engeström, 2018).

CHAT can add value to TEL research as it goes beyond troubling dualisms, including between the individual and collective, material and mental, structure and agency, and praxis and theory (Roth & Lee, 2007; Nicolini, 2012). For example, it relates individuals or groups, such as educators or digital learning professionals’ practices and actions with community members, institutional rules and mediating artifacts to explain their design decisions and their underpinning. It also reduces the dualism between agency and structure. CHAT views agency and structure as being in a dialectical relationship based on which the one presupposes the other. In other words, structures shape people’s practices, and people’s agency reproduces, establishes, or transforms structures. This is significant to avoid uncritical claims that may privilege one over the other, particularly in my research which involved actors with different skills, roles and motives within different universities. CHAT also discourages researchers from taking a solely techno-centric position (Murphy & Rodríguez-Manzanares, 2008) without, however, ignoring the role of technology, which is key in TEL.

In this commentary, I draw the readers’ attention to—and make a case for—a polyfunctional use of CHAT to support robust investigations within the TEL domain. As Bligh and Flood (2017) suggest, ‘polyfunctionality’ means that a theory has multiple roles throughout a study’s lifecycle. By embracing this principle of polyfunctionality, I used CHAT to inform my research in diverse ways; starting from my study’s conceptualisation to its research design, and finally the theoretically informed interpretation and scholarly discussion of findings (see Figure 2 for a summary).

2.1 Study conceptualisation

CHAT played a key role in my study’s conceptualisation. The examination of theoretical constructs within CHAT, including interacting activity systems, historicity, multivoicedness, boundary crossing, contradictions, possibility of expansive learning and knotworking⁶, supported me in apprehending the complexity of the phenomenon I chose to investigate. For example, the construct of multivoicedness recognises that every activity consists of individuals that have their own experiences, viewpoints, personality traits, roles, and interests that they bring into the activity (Engeström, 2001). It, therefore, draws attention to these

---

⁶ For a detailed account on these constructs’ operationalisation within my research see Papageorgiou (2022).
socio-culturally diverse and potentially complementary perspectives among participating individuals which can bring challenges and confusion, but also drive innovation (Engeström, 2008). This construct was vital in my research context as it offered a new, fine-grained appreciation of the diversity of participants and their communities. CHAT’s triangular representation functioned as a useful heuristic to contextualise my research (e.g., locate the subjects and objects within context and structure). I followed an iterative process where I initially used the literature I had reviewed, to map the activity components and, in this way, define my study’s boundaries (use of the literature to define the reasons for, and role of, CHAT in my research). Through this process, I was also motivated to go back to the literature to deepen my understanding of existing knowledge and gaps in specific areas (using CHAT to shape the literature review and inform the study’s aims and design). Consequently, the stance I adopted encouraged a bi-directional relationship and communication between the literature and CHAT which was constructive when conceptualising my study. For example, I was enabled to problematise the positioning of key actors or subjects within activity systems based on their roles, historical activities, and the structural contexts they belong to. The value of CHAT for complexity apprehension, contextualisation and problematisation was realised from the initial phases of my study, but importantly it was sustained throughout the research lifecycle (e.g., research design, analysis and interpretation of data, reporting).

In the conceptualisation stage, I was also faced with the dilemma of which generation of Activity Theory would be the best fit for purpose. This was an important decision to make as it would define the unit of analysis and the conceptualisation of ‘agency’ in my research. Despite the vision for investigating collaborative design where the subjects typically have a shared object and the activity is well-defined (second generation), I chose to employ the third generation. In practical terms, this meant that the focal point of investigation in my research was two interacting activity systems with the shared object to design high-quality online learning: one focused on educators (or an academic team) and the other on digital learning professionals, along with their associated contexts. This choice was based on the reviewed literature which demonstrated varied and emergent forms of working relationships between educators and digital learning professionals (e.g., collaboration, but also service and/or support provision) (Richardson et al., 2019; Halupa, 2019). In addition, researchers (e.g., McKenney et al., 2015; Bennett, Agostinho & Lockyer, 2017) have discussed several differences between the two groups (e.g., teaching respon-
sibility, use of visual and technology mediated approaches to learning design). The decision for the conceptualisation of the two interacting activity systems was also confirmed and further developed based on the empirical insights emerging from a pilot case study (full scale) I conducted before recruiting the other cases. The pilot study showed for example, the unequal contribution of educators and digital learning professionals in decision-making, and some key differences in the way these two groups approached design. Consequently, placing educators and digital learning professionals into one activity system (second generation) might have failed to account for relationships between the activity systems’ components that are critical and could bring new insight to advance the field.

### 2.2 Research design

CHAT is in alignment with the epistemological stance I adopted in my research which was rooted in social constructionism. In brief, based on social constructionism, knowledge is seen as relational, and meaning is dependent on human constructions based on their conscious engagement with the world (Berger & Luckerman, 1966). It suggests an indivisible and interactive relationship between the human experience (subject) and the object and posits that knowledge and meaning-making are socially negotiated and constructed (Crotty, 1998). This organic alignment between my epistemological positioning and CHAT meant that there was a good ground for its use. Importantly, CHAT informed several methodological decisions, including the design of my overarching research strategy and the development of data collection instruments. First, by employing a multiple case study methodology which was the best fit to address the research aims and questions, I was aware that it is vital to clearly establish a unit of analysis (Stake, 1995; Yin, 2018). As discussed earlier, the unit of analysis was defined based on CHAT and was the interaction between two activity systems working towards a (partially) shared object (online learning design). Second, key constructs of CHAT including historicity and the possibility of expansive learning gave rise to a multi-staged and multi-method research design to capture the practices of its subjects in more than one way, and over time while the activity is in motion and evolving (Sannino & Engeström, 2018). Third, CHAT constructs also acted as sources of inspiration for the design of a few questions within the interview protocol and the design meeting observation guide (e.g., contradictions with past activities, level of contribution of participants with different roles, the role of mediating artifacts). Therefore, it guided a range of decisions and set the stage for the investigation of theoretically pertinent aspects that would have potentially been examined more superficially or remained invisible.

### 2.3 Interpretation and scholarly discussion of findings

CHAT had an active role in the process of meaning-making. It provided a strong theoretical basis for the interpretation of findings and discussion of plausible explanations and therefore, had an explanatory power in my research. Many studies that use CHAT tend to largely depend on pre-defined categories based on CHAT’s core components and follow predominantly deductive approaches to data analysis (Bligh & Flood, 2017). This approach was not seen as productive in my research, as it would constrain me to analyse and code the data within neat dimensions that would not attend to the full complexity and richness that my research design had set up to capture. To this end, I followed a hybrid of inductive and deductive approach (Fereday & Muir-Cochrane, 2006). I started my data analysis by using a predominantly inductive analysis approach to organically uncover insights that were dominant, surprising, or important. In later phases, I employed a degree of deductive coding by using CHAT’s concepts and key areas of the literature. CHAT enabled a multi-level view and discussion of past, present, and future activity systems and their inter-relationships. This hybrid approach I took was fruitful as it allowed for a balanced and flexible view of data within their context and in relation to useful literature constructs. It is worth mentioning that given the multiple case study design of this research, I initially analysed data within each case study, treating each case as a whole study (Yin, 2018) which also aligns with CHAT and its context-based focus. In later stages, I conducted an analysis across the cases by combining and synthesising findings of the seven cases to strengthen the research (Stake, 2006; Yin, 2018). CHAT also offered a useful vocabulary, or otherwise a common language for interpretation, discussion and abstraction of key findings which was useful when trying to convey complex meanings (Bligh & Flood, 2017).

Although the purpose of this commentary is not to report findings from my research, I will provide an illustrative example that supports CHAT’s value during the interpretation process. My study’s participants accessed and were influenced by their exchanges with a wide range of different communities, networks, and peripheral actors (e.g., academic colleagues with recent online learning design experience, academic and digital learning professionals’ communities, students as user-testers, MOOC partners). Simply reporting on the contribution of each of these peripheral stakeholders would lead to a surface-level view. The interest in the interpretation was in the role of digital learning profession-
als and educators as boundary crossing agents, operating on a ‘connecting the nodes’ role during online learning design. They brought epistemically and socio-culturally diverse insights into their immediate collaborative design thinking space, by penetrating past practice boundaries to inform their decision-making. In some cases, the relatively fluid combinations of expertise, and the insights brought from loosely connected stakeholders were coordinated and negotiated by the study’s participants to inform decisions. Deeper interpretations were provided in relation to temporal perspectives (past, present, future), individual participants’ self-initiative, and case specific institutional structures and culture. Therefore, in this example, the constructs of multivoicedness, boundary crossing (Engeström, & Kärkkäinen, 1995; Akkerman & Bakker, 2011) and knotworking (Engeström, 2008) were used to attend to relationships and power dynamics between the different activity systems and their distributed components to enable meaningful interpretations.

3. Reflecting on limitations

Thus far, I have discussed the strengths and value of CHAT in my study which can also be applicable to TEL research more widely. Yet, it is equally important to acknowledge and reflect on, several limitations that have been expressed by scholars which are outlined in this section. A thoughtful consideration of these limitations would be key to taking informed and robust approaches to the adoption of CHAT.

3.1 Mechanistic application of CHAT: A weak understanding behind its epistemology?

Sannino (2011) argued that the mechanistic use of CHAT’s triangular representation has been common in empirical studies. This may reveal a weak understanding of the epistemology behind CHAT. Indeed, most of the TEL literature I reviewed, used CHAT as an analytical tool by employing deductive analysis techniques and fitting empirical data into pre-defined theory-driven components. Such a mechanistic use was also evident in Bligh and Flood’s (2017) review of CHAT in higher education, where 44 out of the 59 papers included, used it in such a way. Although researchers reported a positive experience from this use, as it allowed a theory-informed focus and organisation of complex data in digestible chunks, there is a concern about overemphasising the status quo (e.g., reproduction of similar accounts that weight CHAT specific components). By considering this potential limitation, in my research, I adopted a more open-ended hybrid approach to data analysis (as described earlier) which was fit for my study’s purpose. The contributions in this special issue have also offered interesting applications of CHAT that fall beyond the direct use of the triangle or using CHAT solely as a deductive analysis tool. This may reveal a move towards a deeper and more productive engagement of the TEL community with CHAT.

3.2 Perceived overemphasis on the ‘collective’ and inadequate operation of power and agency

Despite the identified strength of CHAT to work across divides as discussed earlier, one of its key criticisms has been that it overemphasises collectivity over subjectivity (Sannino, 2011). Researchers have argued that the dominance of the collective may prevent researchers from accounting for or conceptualising the role of individuals’ emotions, cognition, and motivation (Fanghanel, 2009; Pratt et al., 2015). Privileging the ‘collective’ may lead to a reductionist view of individuals’ needs and identities within an activity. In my research, I considered this criticism and I deliberately attended to the individuals’ subjectivities as emerging in my study’s contexts, examining them against relevant literature. This approach proved to be useful.

The adequate operation of agency and power within CHAT has also been questioned by some scholars (Trowler & Turner, 2002). In my research, I provided an explicit definition of ‘agency’ as expressed by the latest publications of key authors (e.g., Haapasaaari et al., 2016; Sannino & Engeström, 2018; Engeström & Pyörälä, 2021), to support my work. I also placed sufficient attention to the notion of ‘power’ guided by the construct of vertical division of labour within CHAT and other relevant insights from the literature which proved to build a good ground for my research. Therefore, a transparent articulation of both agency and power within individual research contexts can be enhancing.

3.3 Perceived challenge of dense terminology

Scholars in this issue (e.g., Bligh & Moffitt, 2021; Clifford, 2022) posit that CHAT’s “dense terminology” can be “unforgiving on newcomers” (Bligh & Moffitt, 2021). Anecdotally, this also holds true for several fellow TEL researchers from my network who attributed their challenge in connecting with CHAT’s complex and philosophical principles as the primary barrier to using it in their projects. TEL research is highly interdisciplinary and researchers that work within the field have diverse backgrounds (e.g., education, computer science, engineering, and psychology) (Scanlon & Conole, 2018). To this end, researchers enter the field...
having varied prior epistemic knowledge, beliefs, and exposure to ways of thinking and doing which may impact the way they engage with CHAT.

My personal experience has been different to the above position. My journey towards the adoption of CHAT in TEL research was gradual, and I was able to connect with its constructs and epistemology in a somewhat effortless way. This may be due to my background in learning sciences. I started having a genuine interest in, and engagement with, the sociocultural aspects of education from my very first years in higher education. The work of key theorists including, but not limited to, Lev Vygotsky, Karl Marx and Jean Piaget that relate to CHAT, was an essential part of my first degree in Early Childhood Education. Thus, I had invested time and effort to build an understanding of and apply core principles of these theorists’ work in my practice. In my master’s degree, I used for the first time the first generation of Activity Theory (based on Vygotsky’s work) for investigating classroom-based social interactions and discourse mediated by technology which enhanced my experience and knowledge. When investigating more complex activities with multiple actors involved, as in my PhD project (described in this commentary), the third generation was more suitable. Having built a historical understanding over time, I was in a good position to make sense and embrace the latest iterations of CHAT and its theoretical constructs in a new research context. However, this is only my journey, and researchers with a similar background to mine may be able to relate to it. To return to the scholars’ concerns, are the conceptualisations and terminology of CHAT in their current state accessible to TEL researchers interested in exploring its utility, as well as the audience of the TEL scholarship? If not, how could it become more accessible? Would a simplified expression of CHAT’s key tenets support more productive directions of use, or is this complexity that adds to its value? These are questions that the key thinkers of CHAT and our research community could consider going forward.

4. Envisaging the future

CHAT has been successfully used for many years in diverse disciplinary contexts for the examination and support of multivoiced and complex human activities and learning processes. This special issue has showcased applications of CHAT and the Change Laboratory intervention in various research settings and provided a rich picture of their value within TEL research. I joined this scholarly conversation by offering my reflections based on my research and existing literature. I highlighted CHAT’s ‘polyfunctionality’ power within the research lifecycle and outlined some limitations for consideration.

Looking at the future applications of CHAT in TEL research, is it still fit for purpose provided the rapid and continuous changes in the global, political, economic, and educational landscapes? Would it be a productive direction to simply add more activity systems into the equation (third generation rationale) to represent new partnerships, forces, and communities involved in an activity? Taking such an approach might not be sufficient or sustainable in some projects involving partnerships among multiple and different stakeholders, or in contexts which are under constant transformations due to macro-level phenomena including pandemics, financial crises and climate change. Arguably, these phenomena can influence human activities and the components within activity systems (e.g., objects, subjects, rules) in multiple and significant ways that should be thoroughly analysed and discussed. Indeed, during the Covid-19 pandemic, for example, we experienced and had to adapt to different ways of working (e.g., space, pace, conditions, interactions with different actors), learning and teaching (e.g., in multiple modalities such as hybrid and fully online). We also shaped our actions based on university, national and globally imposed rules that were developed to manage these emerging phenomena. However, the conceptualisation of these phenomena and the different levels of influence (i.e., local, regional, national and global) in activities are somewhat invisible or absent in the three iterations of Activity Theory (Engeström & Sannino, 2021). To address this limitation and better understand the underpinning, complexities, and potentials of multifaceted and emerging human activities, a fourth iteration is currently under development.

Through the fourth generation of Activity Theory, Engeström and Sannino (2021) aim to reconstruct the unit of analysis and the notion of agency to capture the increasing fluidity and instability of contemporary activities and make the interactions of diverse actors at multiple levels more explicit. Their attention is paid to the dynamic relationships between cycles of change happening within and across activities (ibid.). Initial efforts to conceptualise and apply this new development of CHAT have been made mainly on the topic of ‘homelessness’ in the context of analysis across a city municipality. This is a promising direction for Activity Theory. Yet, its operationalisation within the TEL domain, would be useful for researchers and practitioners who wish to consider its adoption in their contexts.
Towards a polyfunctional use of cultural-historical activity theory in technology enhanced learning research

https://doi.org/10.21428/8c225f6e.291cef39

References


---

4 This thesis is currently under embargo for publication purposes and will become publicly available within 2023.
Towards a polyfunctional use of cultural-historical activity theory in technology enhanced learning research

https://doi.org/10.21428/8c225f6e.291cef39

Open Access (CC BY 4.0)
© 2020 The Authors. This article is distributed under Creative Commons Attribution 4.0 International licence.

You are free to

• Share — copy and redistribute the material in any medium or format
• Adapt — remix, transform, and build upon the material for any purpose, even commercially.

Under the following terms:

• Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
• No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

The full licence conditions are available at: https://creativecommons.org/licenses/by/4.0/

About the author

Vily Papageorgiou is a Lecturer in Curriculum Design at the Surrey Institute of Education. She is the pedagogy lead for the delivery of key activities that form part of the Curriculum Design Review programme across Faculties at the University of Surrey. Vily also teaches on the PGCert in Learning and Teaching in Higher Education and is a personal tutor and mentor on the MA in Higher Education.

Vily holds a BA (Hons) in Early Childhood Education from the National and Kapodistrian University of Athens and is a Qualified Teacher. She has completed an MA in Learning, Technology and Education from the University of Nottingham and a PhD in Education from Imperial College London. Vily’s research interests include participatory approaches to learning design, digital and postdigital education, strategic pedagogical change, learning ecologies and sociocultural studies.

In the past, Vily has worked on large-scale interdisciplinary research projects including FP7, Erasmus+ and projects with industry partners in the domains of Technology Enhanced Learning, teacher training and health education. Vily’s professional experience also includes extensive interdisciplinary collaborative work with academic and professional staff colleagues for the design of innovative and robust online and blended programmes.

Email: v.papageorgiou@surrey.ac.uk
ORCID: 0009-0008-1254-2241
Twitter: @VilyPapa