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Activity systems analysis: A maze worth exploring

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Abstract

This paper seeks to reflectively discuss my use of Cultural Historical Activity Theory (CHAT) as a theoretical framework for the first time in a local case study. The study aimed to explore language teachers’ practices and challenges in the process of using videos as instructional tools at a language bridge program. Data included interviews, class observations, and document analysis. Using CHAT as the theoretical basis of the study, Activity Systems Analysis (ASA) was utilized to analyze the data. However, this was not an easy task for a beginning researcher. This reflective account will discuss how I attempted to understand CHAT and use ASA for my small-scale case study.

1. Introduction

While there are a lot of books and articles (theoretical and empirical) that share a thorough understanding and/or an expert critical review of Cultural Historical Activity Theory (CHAT) and Activity Systems Analysis (ASA), very few seem to highlight how this theory can be approached by beginning researchers in their attempt to understand CHAT and apply it to their studies. I believe there is a need to share such accounts for any theory, in general, to break the ice between beginning researchers and educational theory, and more so for CHAT given how overwhelming, at best, it

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might seem for early researchers who are considering it as a possible theoretical basis for their studies.

This paper seeks to reflectively discuss my use of CHAT as a theoretical framework for the first time in a case study. The study aimed to explore language teachers' practices and challenges in the process of using videos as instructional tools at a language bridge program. Data included interviews, class observations, and document analysis. Using CHAT, I was able to develop data collection tools and mercilessly poke at the data as I tried to understand them and present my findings in a form that made sense to my readers and me. At the risk of exposing my limited beginning understanding of CHAT, I intend to showcase this journey and reflect on how I attempted to (and struggled to) utilize CHAT for the first time in my educational research.

In the following sections, I will take you through the journey of using CHAT in my study, reflecting on my experience as a beginning researcher with the theory during my case study. In Phase 0, I provide a brief overview of my understanding of theory in general and its role in research before starting this journey. In Phase 1, I discuss my attempt to understand CHAT and the difficulties I faced as I tried to learn more about it. Phases 2 and 3 reflect the actual research project and highlight how I used CHAT to structure the study and analyze the data. The last phase will be focused on how CHAT was used to report my findings in the written report and offer a reflective account of the experience in general. It is important to note, however, that the narrative is presented linearly only to make it easier to follow, and not to reflect the nonlinear and iterative process of understanding and using the theory.

2. Phase 0: Understanding theory

Before joining the Technology-Enhanced Learning (TEL) and E-Research doctoral program at Lancaster University (LU), I understood research to mainly be an attempt to answer a valid and original research question by: a. surveying the literature, b. formulating my research question(s) c. collecting data, and d. analyzing/reporting data. While I knew about theories and their importance in education, I did not realize how important it is to utilize theory in my research. This was partly due to the fact that at that time, as noted by Bennet and Oliver (2014), "mostly, [learning technology] research has focused on matters of practical implementation and design, largely driven by 'common-sense' assumptions about what technology can achieve, or -for many decades- by hype and excitement rather than evidence or theory" (p. 179). My limited understanding of theory's role in research

was also partly due to my understanding that theory either covers a firmly established phenomenon that needs no further research, or highlights complex and abstract concepts that cannot be applied to case studies or small-scale research studies like the ones I do. While this view is indeed adopted by some (Hammersley, 2012), I learned that theories can go beyond that to a more approachable "level of theory" as Tight sees it. He notes that there are different "levels of theory" (grand, middle-range, and micro) which are different "according to the level of analysis at which they apply and the scope of their ambitions" (2012, p. 274). In other words, theory can cover those grand abstract concepts, and it can also be less general and more "empirically grounded and corrigible but of general validity" (p. 275). This means theories can be relevant and applied to small case studies; they can be challenged, and they can even be further developed or contextualized by any researcher (whether the outcome is valid/reliable/... or not, that is another issue). It is worthy to note, however, that developing theories is not very common in TEL research. Echoing Ashwin's (2012) findings, Hew et al. (2019) found in their analysis of educational technology research that when theory was explicitly used, very few offered contributions to develop theories, suggesting that "many educational technology studies tend to focus on theory exemplification rather than theory advancement" (p. 976).

My newly found understanding of theory allowed me to see and understand it in a new light: theory can offer me "the ability to explain and understand the findings of research within a conceptual framework that makes 'sense' of the data" (May, 1997, p. 28). Tight (2012) explains, "data can be used to test/refine/develop theory, and theory can be employed to interrogate data, to organize/explain/order it" (p. 281). In light of this view, many scholars and educational researchers have highlighted the important role of theory in educational research (e.g., Bennett & Oliver, 2011; Bligh & Flood, 2017; Hew et al., 2019; Tight, 2004; Trowler, 2012). Although Tight (2004) and Trowler (2012, 2016) argue that even "a-theoretical research", or research that lacks explicit mention of theory, is to an extent guided by "some theoretical perspective in mind" (Tight, 2004, p. 399), they both express the need for researchers to be explicit and clear about the kind and degree of involvement a theoretical perspective(s) has in educational research.

After learning about the importance of theory, I struggled with figuring out how I can apply this understanding to my own research—What if I break it when I use it? Where can I find an approachable yet solid resource to guide me? I found my answer in studies that analyze the use of theory in educational research. These articles were useful because

they highlight a list of possible ways to use theory and/or how other researchers or PhD candidates have used theory in their studies (e.g., Ashwin, 2012; Bligh & Flood, 2017; Tight, 2004; Tight, 2014; Trowler, 2016)¹. Different scholars and researchers report these uses differently. For example, Trowler explains that theories can serve different functions, including: “classification; depiction; explanation; prediction; contextualisation; and guidance.” (2016, p. 5). Ashwin (2012) categorizes theory use into three areas: conceptualizing the research aims, analyzing the data, and discussing the results. He further categorizes each use into spectrums ranging from no use to full engagement. Bligh and Flood (2017) adopt Hammersley’s categorization of theory functions in their analysis: “normative, hypothetical, abstracting, contextualising, explanatory, predictive and paradigmatic” (p. 129).

Reading these different yet similar ways of conceptualizing theory use helped me realize that I do not need to go wild (critique or develop) with theory use from the first time I use it. Even if I was an early researcher, I can use theory in my research to guide the design of my study and/or the analysis of my results. Reading these discussions of theory use also helped me become aware of non-effective ways to use theory in my research. This includes the mere presentation of one or a few theories in the literature with a neutral voice, “without a discussion of how they were related to form a position” (Ashwin, 2012, p. 948). Trowler (2016, p. 11) also cautions that researchers need to ensure that the adopted “theoretical approach is fit for the purpose for which it is intended” and is consistent with other decisions made in the study, including methodological choices.

After becoming familiar with why and how theories can be used in my studies, the next step for me was to, I thought, “quickly grab one that worked for me.” To my unpleasant surprise, one cannot find a comprehensive list of educational theories on google, jstor, amazon or the app store. Instead, I had to read extensively and critically, looking at four areas suggested by Tight (2012): “themes or issues”, “methods or methodologies”, “theories”, and “levels of analysis” (pp. 1-11). Critically examining an article this way helped me understand how different areas of a study complement/support each other. However, I quickly faced another challenging speedbump: there are so many theories, and they all sound great! Which one should I use? For each research project, the more I read into the topic I chose, the more reference

lists lured me in, the more interesting studies I found, and the longer my “theory options” list became. It seemed endless. It was also more challenging to realize that while, for example, the Unified Theory of Acceptance and Use of Technology (Venkatesh et. al, 2003) was great for my first research assignment, it did not go well with my other case studies (different topics/focus); the theory was not comprehensive enough for my varied research interests/choices, so I had to go through the same cycle again for each research project. While it was exciting to learn about more and more educational theories and models, it was disappointing to not be able to expand my understanding of one theory by using it in different studies/different angles. I remained at level 1 with many theories (or level 0.5 depending on the theory) instead of reaching beyond that with one or two theories. I desperately needed a theoretical perspective that is comprehensive enough for me to utilize in different studies, allowing me to develop a deeper (and hopefully critical) understanding of it each time. Luckily, I stumbled upon CHAT in a course led by Brett Bligh, an Activity Theorist, who provided us with a number of theoretical perspectives to explore at the beginning of the course.

3. Phase 1: Understanding the theory

When I first read about CHAT in Bligh and Flood (2017), there was an undeniable spark. I found that CHAT is a theoretical framework that allows researchers to analyze a social activity at a certain point in time through a thorough examination of different elements which are assumed to always be present/connected in any human activity. As explained by Kaptelinin & Nardi (2018), “by framing human–technology interaction within a larger context of purposeful human activities, the theory makes it possible to reach a deeper understanding of technology and its meaning for people” (p. 3).

What first seemed undeniably attractive about CHAT was its ability to demonstrate the complexity of human *activity*, a teaching activity in my case, in a unique and organized manner using an *activity system*. An activity system model (ASM) visually highlights several important factors that play a crucial role within an activity. These factors are continuously shaping and being shaped by all other factors within the activity, hence the double-sided arrows in Figure 1. The model in Figure 1 was proposed by Engeström as an extension of Vygotsky’s concept of mediated *action* (the top triangle) and Leontev’s identification of “object-oriented *activity* [as opposed to goal-oriented action] as the unit of analysis” (Yamagata-Lynch, 2010, p. 21). In this model, Engeström emphasizes “the societal and collaborative

¹ Another very valuable resource is a recent webinar by Bligh (2020) about theory. I did not have access to it in my early journey, but I sure wish I did. I cannot recommend it highly enough for early and veteran researchers.

nature of [one's] actions" (1999a, p. 30), which highlights the "collective nature of human activity" (Yamagata-Lynch, 2010, p. 23). In short, an ASM felt like a golden opportunity to alleviate two dilemmas I normally faced in my research: a). finding a way to identify and connect dots scattered all over the data and b). explaining the messy and multi-layered data (I almost always end up with) in a meaningful and organized manner.

Figure 1. Engeström's activity system model

Another aspect to admire about the model is its non-restrictive understanding of research contexts. Most importantly, it "avoids a techno-centric angle" (Murphy & Rodríguez-Manzanares, 2014, p. 28) without completely dismissing it. The theory also allows for researchers to consider a subject's account of the context without dismissing "the system view" (Engeström & Miettinen, 1999, p. 10) allowing for, as Stetsenko and Arieviditch (2004) eloquently describe, "explicating the principal ontological unity of inter-individual and intra-individual processes as being mutually dependent poles on the continuum of purposeful transformative practice and as both having a specific place and role within this practice" (p. 476). Applying this understanding to my research study meant that while I pay close attention to my participants' practices and beliefs, I can also factor in how the system (administration, culture, teaching norms, etc) affects their choices. Other theoretical models like TPACK, which is a common framework used in TEL research (Wu, 2013), fail to acknowledge this dichotomy: structure vs agency.

The theory also encourages researchers to account for historicity which calls for constructing one's understanding of an activity on its historical development within the given context (Engeström, 1999a). Nunez (2014) notes, "the

understanding of local history is the understanding of the accumulation of its concepts, means and practices through time" (p. 43). I strongly believe that what we do (and who we are) now is a result of such accumulation of past experiences and adopted perceptions —It felt like CHAT and I started completing each other's sentences. I also believe that the need for fully utilizing historicity in case studies makes insider research, a concept that is debated by many researchers (e.g., Greene, 2014; Mercer, 2007; Unluer, 2012), an added advantage.

I also appreciated the fact that although an activity system assumed the existence of certain dynamics within an activity, it did not presuppose how these dynamics would play out (or not). It gave me guidance, but it also gave me the ability to let the data speak for itself in an organized manner. In Trowler's (2014, p. 17) terms, CHAT seemed suitable to "inform research design" without forcing "the findings [to] simply confirm the theory." Additionally, these dynamics are expected to be in a state of continuous transformation which is represented by contradictions and the nested nature of activity systems. As explained by Engeström (1999a), CHAT assumes that "human activity is endlessly multifaceted, mobile, and rich in variations of content and form" (p. 20). This expectation allows researchers to report human activity without the danger of ignoring its continuously evolving reality.

However, that undeniable spark started to slowly fade when I tried to connect the theory to my own research context/problem. Understanding the different elements of an ASM and how they could be manifested in my research context or case study was not an easy task. What felt like love at first sight quickly turned into doubt and regret. This sense of organization turned into what felt like unnecessary layers of burden as I attempted to connect all the scattered dots into an activity system: how could I force this sense of organization onto a messy research context/problem? How could I break down what seems like one big solid chunk of data? And, if I actually did manage to identify the different elements (poles), would I be able to see the connections CHAT assumes exist between all these different elements? I tried to read as many resources and studies as I can, but it was even more confusing to see the different terms and acronyms that were used to refer to what seemed to be the same concept: Activity Theory, Cultural Historical Activity Theory, Activity System Analysis, and Activity Systems Model.

At first, I blamed my impulsive nature and my love for arrows, and partly my course instructor, the Activity Theory expert. However, true love always finds a way. After reading what felt like a million and one articles and chapters, and

a generous illuminating reply from Bligh (personal communication, February 2, 2018) answering my questions, I developed what I hope is a clear understanding of the terms, clear enough to get me started. This understanding can be summarized as follows²:

- Activity Theory (AT) is a term often used to refer to the whole concept or theory in general; however, when used along with CHAT, AT distinctively refers to what is referred to as the first generation of the theory: Vygotsky's mediated action concept, which is often represented by a triangular model and referred to as the first generation of the theory.
- Cultural Historical Activity Theory (CHAT) is used to identify Engeström's adaptation of AT. This adaptation is also known as the second generation of the theory. In his adaptation, Engeström added the social dimension that surrounds an activity. At first, I missed the cultural part of the name, and I struggled as I tried to find connections between CHAT and a cognitive-based understanding of learning (Passey, 2013). Bligh (personal communication, February 2, 2018) clarified that CHAT "comes from a more sociocultural background alongside other frameworks like distributed cognition and situated learning that are more about artefacts and action and their relationship to psyche." Realizing this refocused my analytical lenses to a more socially- and culturally-oriented view of my research studies. Although I still believe in the importance of appreciating the cognitive psychology side of learning, I now view it as a set of *rules* or *artifacts* that mediate a learning activity, which is situated in a broader social and cultural context.
- An activity system model (ASM) is the visual representation used in CHAT to represent an activity (the unit of analysis) with seven of its elements: subject, artifact, object, outcome(s), rules, community, and division of labor (see Figure 1).
- Activity systems analysis (ASA) is the process of using an ASM to guide the process of building and analyzing a case study. ASA represents one of many ways that researchers have used in AT-based research, such as the Change Laboratory (Bligh & Flood, 2015).

² I would like to note that these explanations are based on my understanding as a beginning researcher of what is a complex and highly debated theoretical perspective. Although this understanding was based on extensive reading, there are more layers and sides to the theory that are not discussed in this article.

After reaching this understanding of CHAT, I was confident that I want to build my case study on CHAT and use ASA as its main method of data analysis (analytical framework).

4. Phase 2: Structuring the study

As can be seen, with such a detailed representation of human activity, CHAT lends itself to case studies (Yamagata-Lynch, 2010, p. 79). However, while CHAT seemed a suitable choice for my case study about the experiences of language teachers using videos as instructional tools, I was not sure how to do that. With different ways to use theory, as discussed earlier, I needed to decide how CHAT will be used in my study. I found Bligh and Flood's (2017) analysis of how AT has been used in higher education research helpful. In their analysis, they found researchers utilized AT for different purposes; the most common were abstracting, explanatory, and contextualizing. That is, many AT studies mostly utilized the theory to code their data and categorize results, to explain their findings, or to address the contextual elements surrounding the study. While these uses were surely on my list, I wanted to go a further step with CHAT and use it to help with formulating research questions and data collection tools as I wanted to be able to map my instruments to the a). research questions and b). theoretical constructs adopted in my study. This kind of use is what Bligh and Flood (2017) found to be less common in their analysis.

For my study, the focus was on learning more about: What are the experiences of language teachers in using videos as instructional tools at a language bridge program? However, if left at this level, this research question is very broad to answer in a case study. Basing my study on ASA helped me narrow it down in a more constructive and manageable manner. I used the main constructs or elements in an ASM to help me formulate three sub-questions:

- RQ1 What is the *object* of the teaching *activity* into which videos are being integrated?
- RQ2 How do teachers identify and appropriate videos for their teaching activity? (this covers *artifacts*)
- RQ3 How is the use of videos affected by the social dynamics of the wider teaching and learning activity system? (this covers *roles*, *community*, and *division of labor*)

Creating suitable data collection tools was another roadblock. My struggle at this stage was mainly because I had to figure out: How can I create a comprehensive data

collection tool (or tools?) that can cover all the elements in an ASM using interviews? What kind of questions should I be asking? How can I ask my interviewees about CHAT without confusing/overwhelming them with the theory?

Thankfully, Mwanza's (2002) eight-step model and Marken's (2006) adaptation of it answered these questions. They formulated questions in basic terms that can help researchers collect a comprehensive set of data for ASA. Their questions helped me further understand how an ASM can be applied to my study and how data collection questions can be phrased in accessible terms. However, I could not take them as is and use them in my study. I felt they were detached from my research aim, too vague or broad. Accordingly, I developed a set of interview questions that comfortably matched ASA and my research topic/questions. Inspired by Mwanza's and Marken's models, I managed to avoid the need to mention the theory or any odd terminology that might confuse my participants. The questions were:

1. How would you describe your teaching style?
2. In your opinion, how useful are videos for learning purposes? —how would you convince a new teacher to use videos?
3. In what ways or for what reasons do you use videos in your classroom? —learning purposes? Examples?
 - Can you give some examples?
 - Are they used with other tools? Are your lessons mainly based on videos? Or are videos used as supplementary tools?
4. What rules dictate the way you use videos in class? —What kind of considerations or restrictions do you keep in mind when planning for using videos in class?
 - If I'm a new teacher, what do's and don't's would you share with me?
5. When using videos in class, what do you expect your students to do? What are their *roles*? —These may vary depending on the kind of activities you use.
6. How do your students feel about or react to using videos as teaching/learning tools? —what do you think they expect from you or from videos in class? Do you think they can or know how to create videos?
7. How does the use of videos affect, change, and/or amplify (?) your role as a teacher?
8. If you were to teach the same content in a different context/culture, do you think you would use videos differently? —please explain.
9. What do you think is the most effective use of videos

for instructional purposes?

10. How would you describe your expertise in using and creating videos?
11. Are you familiar with edpuzzle.com —a tool used to add questions within a video example. [explain if not known] Would you be interested in using it?

As you might have noticed, some of these questions were problematic. For example, using “rules” was not a great idea, and I realized that during my interviews. That is why I adapted on the go and added “considerations or restrictions,” but these were still a bit overloaded probably. Another example is question 7. It was also overwhelming and could be broken down into more sub-questions or reworded.

Although it took some time and a few versions, mapping these questions to an ASM was a very helpful step that made data analysis less intimidating and more accessible (see Figure 2). You will notice that because I was at a beginning stage with the theory then, I did not realize that this blank template was missing two important constructs: actions and contradictions, so I did not even consider mapping them to instruments or even worrying about them at this stage (as also can be seen in my RQs). This proved to be a source of struggle later. This is why I believe the current state of ASM can be further improved to be more comprehensive or representative of activities. Although Bligh and Flood (2017) explain that this model “is widely used for conceptualising the activity level within the theory, whether for analysing a single ‘system’ or interactions between several” (p. 130), I believe the default or basic ASM should visually, even if briefly, account for two other important elements that exist within every activity: actions and contradictions. . If contradictions can be added at a later stage to an ASM, there should be a way to note their existence in a blank ASM (see Bligh & Flood (2015) for a clear account on how these different contradictions can be added to an ASM). As for actions, they are “sustained human effort” (Bligh & Flood, 2017), which mean they represent the micro (individual) level within an activity: the macro (societal) level of the model. However, actions denote a crucial element that can determine the progress of an activity or lead to contradictions. They are deliberate and time-bounded, and they can, through a process of externalization, become an activity and vice versa (Bligh & Flood, 2017). Concealing such an important element without which an activity cannot exist makes the model as it stands incomplete, in my view.

—At this stage, you might see why I would think that CHAT and I have become best friends by now, but I was mistaken.

Figure 2. Instruments mapped to CHAT constructs

5. Phase 3: Analyzing the data (ASA)

After collecting my data through semi-structured interviews, a few observations, and materials from the shared resource bank, I printed some blank ASMs (see Figure 3) on A3 paper to start the process of building my case study's ASM. I thought to myself, "I just need to identify the different elements using the instrument ASM. How difficult can that be?" —Very, I found out later.

Mapping the questions to an ASM was surely a helpful starting point for me, but it did not guarantee a smooth ride. Given that CHAT already provided me with concepts to look for, my initial round of coding was deductive utilizing the elements of an ASM as my codes/themes. However, when I started data analysis, I realized that it is not an easy task. Although I had understood what these constructs mean, applying them to my data was much harder than anticipated; as I coded the data, the boundaries between different ASM elements became blurry and some of them were difficult to grasp.

The following subsections will highlight these struggles for most elements: how I understood and used them, and then how I eventually developed my understanding of each element for future studies. Also, although I tried my best to discuss these elements separately, I have to admit that the

process was not as straightforward as it is presented here. Throughout the process of analyzing the data, I kept moving items, which I identified from the data, back and forth between different poles because my understanding of each pole, in general and in relation to my study, kept expanding and developing.

5.1 Subject(s)

When I first started the analysis, I did not think twice about the subject. I believed the subject was identified and controlled given the nature of my study: language teachers (as opposed to having administrators or teachers from other domains). Looking back, I believe I could have spent more time addressing the subject element due to the nested nature of activity systems; "activity systems are interconnected and part of a network of activity systems that comprise larger activity systems" (Zhao, 2015, p. 113). The subject for an activity is the outcome of a subject-producing activity system. This means each one of my subjects was unique in ways that cannot be ignored and will most probably lead to different versions of the same activities. Due to word count and time limitations, it could not have been possible to dedicate and report a different activity system for each participant. To address this problem, I could have utilized my participants' different backgrounds (educational, cultural, technological, etc.) as conceptual artifacts that mediate their attempt to

Figure 3. A blank activity system model used in initial stages

accomplish the object of the activity.

5.2 Artifacts

Identifying artifacts, in specific, was a great struggle. In CHAT, mediated action is a central principle that highlights the mediating role artifacts play throughout an activity. Two main features of artifacts in CHAT stood out to me. Firstly, artifacts mediate human activity “includ[ing] tools and signs, both external implements and internal representations such as mental models” (Engeström, 1999b, p. 381). Also, artifacts can also be mediated by human activity and hence “carry with them a particular culture—a historical residue of that development” (Kuutti, 1996, p. 11), which contributes to a better understanding of the historical and cultural development of the activity in question.

These two concepts were not difficult to grasp, but the idea of having non-physical artifacts was new and, although convincing, difficult to clearly spot in my research context. I knew I had to adopt a different mindset that no longer limits tools to what can be seen: laptops, lesson plans, etc., but I did not know how to apply this newfound understanding to my context. Becoming familiar with two common ways of classifying artifacts was a great starting point. Firstly,

Wartofsky (1979 as cited in Cole, 1999) categorizes artifacts to distinguish between three ways of utilizing them in an activity: primary, secondary, and tertiary. While primary artifacts represent the actual tools that are “directly used” (p. 91), secondary artifacts represent the understanding of how primary artifacts should and can be used; “these artefacts are related to conventions, as in rules and norms” (Susi, 2006, p. 2211). Tertiary artifacts are “imaginative” (Cole, 1999, p. 91) in the sense that they “[mediate] the ways in which we perceive the world in a particularly powerful way, guiding and informing human imagination” (Cole, 2019, p. 303). Engeström (1999) also proposes another classification of artifacts in which he identifies four uses to guide the classification. He first explains that these uses “are in constant flux and transformation as the activity unfolds” (p. 381), meaning that a certain artifact can serve different uses within an activity. This understanding reflects one of the main principles in CHAT, “equilibrium is an exception” in any given activity system (Cole and Engeström, 1993, p. 8). These four functions are listed in Figure 4 which is adapted from Engeström (1999b). Engeström further cautions that, “there is nothing inherently fixed in an artifact that would determine if it can only be, for instance, a why artifact” (p. 382).

Figure 4. Types of artifacts (adapted from Engstrom, 1999b)

For this analysis, I only managed to see “time” as the only non-physical artifact in the activity system. I mainly focused on other more solid forms of artifacts: websites, department resource bank, software, devices in the classroom, delivery platforms, WiFi, and the actual video of course. As mentioned earlier, I believe I should have accounted for participants’ varied backgrounds and considered these as conceptual artifacts that participants utilize and develop throughout the activity. As well, I later (after the study) stumbled upon Susi’s (2006) mapping of both classifications into one table, which would have been very useful at the time. She also argues for expanding the classification by adding one more type: “where-from” artifacts which she defines as “experience-based knowledge of the past, why objects function or appear the way they do” (p. 2214). This added layer can help me in future ASM-based studies as I try to identify artifacts in instructional activities. A teacher’s experience as both a learner (in the past and now) and a teacher greatly shape their teaching approach, and can be classified as how artifacts that subjects use to “guide and direct” their actions and decisions as they complete the activity.

5.3 Object(s)

An object of an activity is the sought-after goal(s) “that motivate and direct activities, around which activities are coordinated, and in which activities are crystalized in a final form when the activities are complete” (Kaptelinin & Nardi, 2006, p. 66). However, as Kaptelinin and Nardi (2006) stress, activities do not happen in a vacuum; rather they are hosted in a social environment that can lead to “transforming both the subject and the object” (p. 67). I thought the object for my case study is controlled and defined by the research question. Since I mainly aimed to investigate how teachers use videos in class, I initially thought using

videos in class as the object. However, as I will explain later, I realized at some point that in order to use videos in class (activity), teachers went through various activities with 3 main objects: a. finding a suitable video, b. creating a video lesson, and c. delivering the video lesson.

Looking back, I believe that delivering the video lesson might not be the object of an instructional activity that utilizes videos. Rather, playing videos in class served the objects of: a. introducing the topic of a lesson, b. giving students a mental break, c. summarizing a lesson, and d. contextualizing language. That is why when contradictions presented themselves within the activity and led to not playing a video in class, these same objects were easily served using another kind of tool or activity.

5.4 Division of labor

Division of labor (DOL) was a difficult concept to grasp as well. At first, I was not sure how it differed from the community in my study. It helped to see how researchers have identified the division of labor in their studies, but reading Tolman’s (1999) understanding of it made it click: “No single individual carries out the activity required to satisfy his or her needs. Rather, the activity is divided into separate actions, each of which is then assumed by a particular individual in coordination with the others” (p. 72, emphasis added). This allowed me to see how an activity alternated based on the roles that were assumed by students: active/passive, or independent/dependent (on the teacher and/or class pace). At this stage, I made use of common educational concepts such as student-centered, group work, and whole class, and tried to view them from an ASM/DOL perspective.

That said, looking more into DOL now, I believe I missed an important aspect of DOL in CHAT: the vertical VS horizontal planes to it. As explained by Murphy and Rodriguez-Manzanares (2014), “the division of labor refers to both the horizontal division of tasks between individuals and the vertical division of power and status” (p. 39, emphasis added). Had I incorporated this view of DOL, I would have probably looked more into how tasks are vertically distributed among students at different stages of a video lesson as opposed to only investigating the horizontally distributed tasks between teachers and students.

5.5 Contradictions

Identifying contradictions was the most exciting part of the process (partly because of the cool arrows but mainly) because CHAT views contradictions as “the driving force of change” (Murphy & Rodriguez-Manzanares, 2008, p.

443) and “important, not in and of themselves, but because they can result in change and development” (p. 445). Contradictions are “always present although not always perceivable” (Nunez, 2014, p. 70). In fact, identifying these contradictions and resolving them is a guiding principle for the Change Laboratory (CL). Bligh and Flood (2015) explain that CL is “an intervention-research methodology where people work together in a structured and cyclical way to envisage new activity in their organisation” (p. 141) as they are guided by the researcher to engage in “explicitly re-imagining activity itself, and by doing so expanding the object of activity” (p. 149).

In addition to their transforming capabilities, contradictions can also be inhibiting and lead an activity to crash. My struggle with contradictions was due to the fact that they are multi-leveled, in a 2D kind of way. One dimension of it is the different kinds of contradictions based on the number of elements involved. Engeström (as reported in Bligh & Flood, 2015) classifies artifacts into four types. This typology is based on the kind of activity elements that are involved:

- primary contradictions happen within an element
- secondary contradictions happen between elements
- tertiary contradictions happen between varieties of the same activity system
- quaternary contradictions happen between different activity systems

Bligh and Flood (2015) depict these contradictions in very clear manner in their article. The other dimension highlights the varying effects contradictions can have on an activity. A contradiction can be fatal and cause an activity to break leading a subject to abort the activity; a contradiction can cause an activity to transform by modifying one or more poles in an AS; and finally, a contradiction can lead to creating new artifacts, objects, roles, communities, or divisions of labor to facilitate the activity. Stetsenko and Arievidt’s (2004) also argue that subjects are also affected by such changes and transformations. They explain, “by contributing to historically and culturally specific practices, the individual self gradually evolves to embody these practices and the latter begin to saturate and subsume all individual expressions and modes of action” (p. 496).

To encourage participants to highlight these contradictions, I had asked them about the challenges they face when using videos for instructional purposes. I thought all my contradictions would be in that part only, but as I went through the data, I found that participants had shared their struggles throughout the interviews, often in indirect ways.

For example, one participant was explaining why she avoided using long videos in class, “If it’s a long video, and they do not understand the language or there isn’t something interesting happening in the video, you would find them within the first five minutes distracted on their phones.” It took me a long time to realize that this is a contradiction (an issue that did not allow the subject to achieve the object as planned), and even after I did identify it as a contradiction, another difficulty was trying to: a. figure out which elements of the activity system were causing this kind of disruption, and then b. evaluate the effect of this disruption: did it completely inhibit the activity? Did it encourage the teacher to transform the activity and find other ways to achieve the object? Or did it lead the participants to abandon the use of videos altogether? Going back to the example, the teacher saw a learning value in this video (the video abided by language learning rules), so in theory playing this video should accomplish the object of the activity. However, learning or classroom norms (another set of rules that govern the classroom) undermined its value and forced the teacher to eliminate the option. This is a primary contradiction that occurred within an element (rules). The effects of this contradiction varied depending on various factors: participants (subject), learning objectives (rules), and time (artifacts).

5.6 Other analysis revelations

Finally, the structure of an ASM forced me to come out of my “common sense” box. Being an insider, the activity that I was researching was second nature to me. In other words, my insider understanding of the context and the activity acted as a double-edged sword. On the one hand, it allowed me to ask about issues I know are important but often go unnoticed such as rules that are implicitly imposed on the activities in question. On the other hand, when participants shared their experiences with me, they seemed to mainly focus on their artifacts and struggles (contradictions) which could be due to their understanding of how TEL research quests are designed. They also left out some details about objects, community and division of labor because of the assumption that I knew them and there was no clear need to highlight them. Mercer (2007) highlights such a conundrum in her discussion of insider research. She believes, insider researchers “have to contend with their own pre-conceptions, and those their informants have formed about them as a result of their shared history” (p. 13).

Acknowledging my insider curse/privilege was the first step to overcoming the difficulty it has caused and utilizing the power it offers. I started by looking at my own practice, considered myself a demo participant. First of all, as I reflected on my own practice, I noticed a few subtle elements

The diagram illustrates the relationships between five components: Artefacts, Subject, Object, Rules, and Community. The components are arranged in a triangular layout, with solid black arrows representing primary interactions and dashed blue arrows representing secondary or feedback loops. Red dashed circles with arrows highlight specific feedback loops.

- Artefacts** (top):
 - Websites — *YouTube, ISLCollective*
 - Department resource bank
 - Time
- Subject** (left):
 - Language teachers with different tech expertise
- Object** (right):
 - Find a suitable video
- Rules** (bottom-left):
 - Student background
 - Learning outcomes
 - Classroom norms
 - Institutional rules
 - Cultural rules/norms
- Community** (bottom):
 - Colleagues
- Division of labour** (bottom-right):
 - Teacher
 - Colleagues

Interactions are labeled with letters in blue boxes:

- (a) Feedback loop from Object to Artefacts.
- (b) Feedback loop from Rules to Subject.
- (c) Feedback loop from Subject to Artefacts.
- (d) Interaction between Subject and Artefacts.
- (e) Interaction between Object and Artefacts.
- (f) Interaction between Subject and Object.

Firstly, I was able to identify themes to look for in my data. These themes form my first round of coding, which was followed by a couple of rounds that were led by themes inspired by the data. Secondly, it also helped me realize that up until this point, I never clearly and specifically identified: what is the activity that I am looking into? As I explored the process that led up to using videos in class, three separate activities stood out: a. using videos in class, b. searching for videos, and c. preparing videos for class. One might argue that two of these activity systems can be seen as actions supporting one main system. However, I chose to view and report them as separate activity systems because each one of these activities portrays different, albeit minor, dynamics and contradictions that have noticeable effects on the final product of the system. That said, with time, I agree that experienced teachers will most probably approach activities A/B as actions because, as explained by Bligh and Flood (2015), “through mediated processes of internalization and externalization, activities become actions, objects of previous activities become mediating artefacts, and so on” (p. 148).

The beauty of using ASA, for me, is mainly due to its ability to organize my findings in a way that readers can follow, after you explain the theory behind it of course. Although arriving at my final ASMs was a very long and exhausting trip, the outcome was worth it. I had a visual outline that guided me through the process of reporting my findings. After introducing each ASM (see Figure 5 for an example), all I needed to do was to go through each element and explain: a. how it was defined in my case study, b. how I arrived at this definition, and c. give examples and quotes if needed. Then, I explained what kind of contradictions teachers faced and how they eventually dealt with them (their effect on the activity system). The biggest struggle when doing this was word count. It was impossible to abide by the word count limit, go through each CHAT element in detail, and highlight the contradictions that exist within these activities. I was forced to limit my report to two kinds of contradictions (elementary and secondary) only.

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lenge to that practice” (Bligh & Flood, 2017, p. 149, emphasis in original). I believe given that this was the first time to utilize this theory, I could not have integrated the theory in any other. I have to admit that had I been introduced to the theory when I first started doing research, I would have most probably looked the other way after finding it intimidating and overwhelming. From a first glance, the theory forces you to consider so many factors and assumes correlations that could seem overwhelming for a beginning researcher. However, after experiencing firsthand how messy, at best, analyzing a research problem or certain context can be, I have developed a sense of appreciation for anything (theoretically solid) that can add much-needed organization to data analysis and/or data collection, something CHAT can

surely offer. I believe that an ASM is one of the most appealing aspects of CHAT as it allows for a visual and clearer understanding of the complexity and multidimensionality of human activities. However, as discussed throughout, now I believe that a few changes can help add much-needed clarity to the current model of the theory, for beginning researchers at least. Firstly, actions are an important element of activity system analysis because “actions are not fully predictable, rational, and machine-like” (Engeström, 1990a, p. 32). They are also “constantly generated” within an activity system, and they have the capability of transforming the object of the activity system (Engeström, 1990b, p. 381). It is true that Engeström (1999a) cautions against limiting an analysis “at the level of actions”; however, he does call for a “move from the analysis of individual actions to the analysis of their broader activity context and back again” (p. 32, emphasis added). Additionally, as explained by Bligh and Flood (2015), “through mediated processes of internalization and externalization, activities become actions, objects of previous activities become mediating artefacts, and so on” (p. 148). This implies that actions can turn into activities if a contradiction presents itself forcing the subject to reconsider a certain action, for example. Hence, there is a need, I believe, to visually highlight actions in an ASM, even if only in an abbreviated form. Since Vygotsky’s original model of subject-artifact-object is in fact the individual level of the activity, I suggest adding actions to the model by identifying the top part with an action marker somehow.

7. Concluding remarks

In this reflective account, I sought to share my attempt at using CHAT as a theoretical framework to guide a small case study about teachers’ instructional use of videos. With beginning researchers in mind, I tried to explain how my understanding of theory, in general, and of CHAT, in specific, has

developed throughout the research process. By sharing this experience, it was my intention to share an honest account of how beginning researchers might struggle with grasping and applying CHAT in their own research, and hopefully to encourage fellow beginning researchers to explore the maze of CHAT and Activity Systems Analysis.

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