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# Foundational concepts in Cultural-Historical Activity Theory: A missing opportunity to address challenges in pharmacy practice

Ivana Guarrasi [a], Nick Hopwood [b,c], Andy Blunden [d], Daniel F.B. Wright [e,f,g], Megan Anakin [e,*]

[a] Department of Communication and Media, Minnesota State University, Mankato, USA
[b] School of International Studies & Education, University of Technology Sydney, Sydney, Australia
[c] Department of Curriculum Studies, Stellenbosch University, Stellenbosch, South Africa
[d] Independent Scholar, Melbourne, Australia
[e] The University of Sydney Pharmacy School, Sydney, New South Wales, Australia
[f] Department of Clinical Pharmacology & Toxicology, St Vincent's Hospital, Sydney, Australia
[g] St. Vincent's Clinical School, Faculty of Medicine, University of New South Wales, Sydney, Australia

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ABSTRACT

This commentary outlines the theoretical underpinnings of Cultural-Historical Activity Theory (CHAT) and demonstrates its application to pharmacy practice. CHAT offers a comprehensive framework to address the complex challenges faced by pharmacists in an ever-evolving healthcare environment. CHAT provides pharmacy researchers with a different way of approaching and addressing practice research problems that appear to be resistant to traditional methods that may focus on cause and effect. This commentary introduces five of CHAT's foundational concepts: learning, activity, systems, culture, and change. CHAT emphasizes collective learning and the transformative potential of viewing contradictions within pharmacy practice as opportunities for innovative solutions and systemic change. By applying CHAT, pharmacists are encouraged to engage in the holistic examination of their work environments to address persistent problems and concerns. An application of CHAT in pharmacy is provided through an example where tensions arising from the introduction of electronic patient records and electronic prescribing systems were examined. This analysis shows how systemic contradictions can be leveraged to enhance pharmacist practice. A CHAT-informed solution differs from offering recommendations that involve individual-focused training to one that encompasses a wider professional development approach. By focusing on expansive learning and the co-creation of new practice models, CHAT provides a robust theoretical foundation for rethinking pharmacy practices in response to the complexities of contemporary healthcare.

## 1. Introduction

Cultural-Historical Activity Theory (CHAT) provides a unique framework for understanding and addressing the current challenges pharmacists encounter in their work. Pharmacists provide medicines-related services to people aimed to ensure the safe and effective use of medicines.[1] They are challenged by the number of medication options and types of services they can offer to people in their communities.[2,3] They must embrace new technology in their workplaces.[4] Each of these challenges brings both intended and unintended consequences. For instance, pharmacists adapting to new technology such as electronic patient records may face reduced patient contact, altered professional identities, and strained interprofessional relationships.[4] These consequences also pose further challenges to pharmacists such as how to integrate this new technology into their daily workflow, how to manage disrupted interactions within interprofessional healthcare teams, and how to maintain patient-centered care. To address this complexity, CHAT offers a comprehensive framework to understand and transform the interconnected elements within the entire system of pharmacy practice rather than addressing isolated issues. CHAT provides pharmacy researchers with a different way of approaching and addressing practice research problems that appear to be resistant to traditional methods that may focus on cause and effect.

Importantly, using CHAT involves pharmacists in addressing the

* Corresponding author. Sydney Pharmacy School, The University of Sydney, Sydney, New South Wales, Australia.
*E-mail address:* megan.anakin@sydney.edu.au (M. Anakin).

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challenges they encounter in their work. CHAT emphasizes collective learning and the development of innovative solutions that go beyond individual knowledge.[5–9] It encourages viewing challenges and contradictions within the pharmacy field as opportunities for transformative change, focusing on systemic principles such as non-maleficence and beneficence. Applying CHAT involves a deep commitment to exploring its core concepts of learning, activity, systems, culture, and change in a holistic manner. This approach may challenge traditional views by prioritizing qualitative, systemic change over quantitative metrics, and by valuing uncertain and evolving paths over fixed outcomes. Valuing uncertainties allows for greater adaptability and responsiveness to dynamic, real-world contexts. By prioritizing an evolving process over predetermined results, this approach creates space for learning, collaboration, and growth, which can lead to more sustainable transformations. For pharmacy educators, practitioners and researchers, embracing CHAT means engaging with a set of ideas that foster a radical rethinking of professional practices to better adapt to the evolving demands of the field.

CHAT refers to a strand of theory rooted in the work of Lev Vygotsky, Yrjo Engeström, and colleagues.[5–9] This theory focuses on learning as a means to transform collective activity. CHAT understands learning in relation to human interaction taking place in cultural and physical surroundings rather than viewing learning as primarily involving cognitive processes of individuals.[5] This commentary introduces five foundational concepts in CHAT: learning, activity, systems, culture, and change. Rather than providing a detailed theoretical account,[10,11] this commentary focuses on how these concepts can be applied in pharmacy practice contexts. Table 1 provides a summary that contrasts common and CHAT understandings of these concepts to show the value that a CHAT approach can bring to pharmacy research and practice.

## 2. Learning

Learning is often understood as an active process that occurs when an individual acquires new knowledge or develops new skills by participating in practice.[12,13] The newness here is for the individual learner: the knowledge and skills themselves were not new. Consider a pharmacist using a mnemonic to learn clinical reasoning skills.[14] Perspectives focused on an individual view approach see learning as something that happens inside a person.[15,16] Similarly, learning in the traditional sense can be measured on an individual level. In Nelson and Rhoney's study, quantitative results showed that students successfully applied targeted clinical reasoning skills to solve problems involving patients and their mediations therapy.[14] This approach to learning provides valuable insights into how particular pedagogical approaches might help individuals acquire specific skills in pharmacy. However, such approaches cannot deal with the learning that is required when the nature of pharmacists' work itself needs to change, such as with the introduction of new therapeutic services based in community care settings[1] or switching from paper-based to electronic prescribing and record-keeping systems.[4]

CHAT offers a different notion of learning. It is not about individuals gradually accumulating facts or skills, but rather about transforming collective activity.[5,6] CHAT views learning as something that happens among people as they interact with each other and with features of their environment. The term given to this transformation is *expansive learning*.[6,7] Expansion denotes movement into unknown terrain. Expansion includes the co-creation of new understandings, visions, and cultural artefacts to realise those visions. In pharmacy practice, this expansion might include developing novel services or ways of working interprofessionally to provide medicines therapy to people in the community or patients in hospital care.

## 3. Activity

Activity may be understood as participating in an event or practice. For a pharmacist, their activity is simply what they do at work. A pharmacist may consult with a person before recommending medicine for a minor ailment. They may perform a clinical check before filling a prescription. When at work, collective activity is often thought of as teamwork.[17] This teamwork involves how pharmacists work with colleagues from the same or different health professions.

Activity has a specific meaning in CHAT. An activity is an enduring and collective formation.[5,6,18] For pharmacy, this activity involves providing healthcare to people in their community. No person acting alone can achieve the aim of this activity. Activity requires multiple

**Table 1**
Summary contrasting common interpretations and CHAT understandings of five foundational CHAT concepts to show the unique value that a CHAT approach can bring to pharmacy research and practice.

| Concept | Common understanding | CHAT understanding | Value of CHAT approach to pharmacy practice research |
|---|---|---|---|
| Learning | Learning involves how individuals acquire knowledge or learn skills. | The focus is on how learning happens among people, creating new knowledge, and transforming practices into new forms. The term expansive learning is used by CHAT scholars to denote this collective and transformative emphasis. | CHAT enables pharmacy researchers to explore learning by reshaping the possibilities of how work can be done. |
| Activity | An activity might be a task such as answering a telephone call. An activity might also involve participating in an event such as making a decision in a multidisciplinary team meeting. An activity might be performed alone or involve teamwork. | Activity means an enduring collective effort oriented to a shared motive. A motive represents an objective situation, which everyone wants to achieve. In pharmacy, this motive can be to provide optimal medicines therapy to a person. | CHAT allows pharmacy researchers to move beyond examining immediate goals to address long-term historical reasons for practice that bring individuals and collectives into a system of relations. Activity is not confined to operational teams but allows relationships to be emphasised. |
| Systems | Systems are composed of inputs, processes and outputs. Systems may also refer to organisational structures. | Systems represent how activity is influenced by rules, stakeholders, roles, tools used, and outcomes. Systems are not defined by organisational boundaries or structures (see Fig. X) | CHAT provides a radically different understanding of systems because they are tied to shared motives. This understanding enables pharmacy researchers to identify systemic contradictions that can be used to design novel solutions. |
| Culture | Culture is the intangible context and influence on how people behave and interact such as 'workplace culture'. Culture is also used to describe a person's ethnicity. | Culture is the medium of all human activity. Artefacts from culture medicate how people undertake any activity. | CHAT can help pharmacy researchers recognise the importance of the artefacts used in practice (e.g., prescription forms, medication guidelines, standards of professional practice) and how they might enable or constrain how work is done or the activity of providing people with optimal medicines therapy. |
| Change | Change involves adapting to new ideals or circumstances. Change can also refer to the spread of innovation. | Change is a transformative process towards an unknown destination. | CHAT is a means for pharmacy researchers to understand and promote change when the endpoint is not known and obvious solutions are not available at the outset. |

people, each performing different roles. For pharmacists, these roles can include prescriber, medicines provider, clinical checker, therapeutic decision-maker, and medicines counsellor. The activity also requires people who manufacture and consume the medicines. This activity is never finished, so it is not the same as a task performed by an individual pharmacist or a team. A doctor may prescribe a medicine, and the pharmacist may provide medicine and counsel a person about how to take that medicine safely, however, the activity of providing healthcare continues daily and will be continued by health professionals in the future. Importantly, the connection among people in activity is not co-presence or working simultaneously. The connection is a shared motive.

The concept of motive is central to activity in CHAT. In CHAT, motive is not how much a person is motivated to do something. The motive of the activity is an objective situation or aim shared by multiple people.[5,6] In CHAT, this motive develops as people engage in activity, and in this commentary, it is called the *object-motive*. Consider the activity of providing healthcare to people in a community setting. A person feels ill and makes an appointment at their local community health centre. The doctor may ask the person about symptoms of their illness, focusing tasks involving diagnosis and prescription. The pharmacist may process the prescription and communicate with the person about possible side effects, perhaps determining optimal dosage and developing a monitoring plan. The person takes the medicine as advised by the pharmacist. The doctor, pharmacist, and person are involved in healthcare activity. They perform different actions, none of which can satisfy the object-motive alone. However, together they work towards achieving this object-motive: to support the health of people in the community. This collaborative effort is how CHAT brings individuals and collectives into a special kind of relationship, a relationship that has important implications for understanding long-standing complex problems that appear to be resistant to change in healthcare.

## 4. Culture

The idea of a workplace culture is likely familiar. Culture often connotes an intangible influence on how people behave and interact. In pharmacy, professional practice standards are used to delineate expectations and responsibilities for professionally acceptable behaviours.[19] In a community pharmacy setting, workplace culture might be supportive where seeking help from colleagues is encouraged. Workplace culture can also be profit-oriented where filling as many prescriptions as possible each day is the priority. Other pharmacy workplace cultures may be characterised as innovative, customer-focused, hierarchical, risk-taking, or corporate.[20] Each workplace culture involves different sets of formal rules and informal norms that influence how work is done.

In CHAT, culture is a central and essential concept.[21] Culture is central because it is infused in all activity, rather than simply serving as a background or context. Culture is essential because action and interaction are forms of culture themselves. Consequently, the way pharmacists work to provide healthcare is mediated by cultural artefacts that change over time. *Cultural artefacts* are created and reused by people when they interact with each other and the features in the world around them.[5,9] These features include physical resources as well as concepts and ideas, which establish the norms of behaviour that guide activities. In pharmacy, cultural artefacts can include medicines, prescription forms, electronic patient records, medication guidelines, drug therapy plans, and the green pen that may be used to write pharmacist notes on patient records. Cultural artefacts also include concepts such as medication adherence[22] and patient-centered care,[23,24] and ideas about behavior represented as standards for professional practice.[19]

## 5. Systems

Pharmacy researchers may use the term system when describing healthcare. Here, system generally refers to an organized and interdependent set of components, practices, or structures designed to deliver pharmacy services effectively.[25,26] In CHAT, the concept of *system* is linked to that of activity. Activity systems can be represented as a set of specific interrelated features, where each connects to others through bidirectional arrows to indicate their dynamic interaction.[6,7] Fig. 1 provides a hypothetical example of a pharmacy activity system involved with community healthcare.

Across the centre of the triangle in Fig. 1, there are three interlinked elements. *Subject* refers to the people pursuing the activity, in our example, pharmacists in a community healthcare setting. The *object-motive* is the focus of their efforts: providing community healthcare. The *outcome* is the result of that activity, which would be a healthy community made up of people who are healthy because they take their medicine properly. This dynamic relationship among three elements might be considered in simple terms: pharmacists who are doing the work, the goal for their work, and the consequences of that work. The top of the triangle, *cultural artefacts* are shown to emphasise that they mediate how the subject and object-motive interact.

The bottom of the triangle comprises three elements. *Rules* refers to formal regulations and expectations as well as informal norms and habits. Rules can include registration requirements and defined scope of practice for each health profession. Rules can also include the tendency for pharmacists to seek advice from colleagues or refer to a medication guideline when providing a medicine that they dispense infrequently. *Community* refers to the wide group of stakeholders vested in the activity. Community includes colleagues, patients and their families, drug companies, and other services that provide healthcare. *Division of labour* refers to the roles enacted by different members of the activity system. In one healthcare setting, doctors may be the prescribers and pharmacists may be the medicines providers. In another setting, doctors and pharmacists may work together to determine the best medicine therapy for a patient. The division of labour requires an understanding about the responsibilities for the work done and if roles are unique to one profession or if they overlap.

CHAT encourages a holistic and dynamic approach to thinking about a system, oriented to changing relations between the elements.[27] A change in one element can have ramifications across the whole system. It is also important to note that activity systems do not exist in isolation. Activity systems may be embedded in and be influenced by other systems. Health care may be influenced by political, legal, and economic activity systems.

## 6. Change

In healthcare, pharmacists may experience change unidirectionally from policy to practice. Change can involve technological advancements,[4] adjustments to policies and services,[28,29] and individuals altering their behavior.[30] An example of a directive approach to change might involve appeals for pharmacists to embrace clinical decision-making in their practice.[31–33] Change might also involve the healthcare system adapting to new circumstances, such as providing services to address chronic diseases in rural community settings[34] or balancing workload with providing new pharmacy services.[35]

In CHAT, change is approached holistically. *Change* involves a qualitative transformation of the entire activity system rather than incremental adjustments.[5,6] Such transformative change might involve drawing on innovations from elsewhere but goes beyond replicating or adapting them to the local context. CHAT is oriented towards change where neither the destination nor the pathway to it are known in advance.[6] These two unknowns enable new solutions to be created that may not be predicted in advance.

CHAT's approach to change stems from identifying and addressing contradictions in activity. Contradictions are expected to develop in activity.[36] Rather than being unwelcome problems, CHAT seeks them out as driving forces for change. Contradictions can occur within and between elements of an activity system, between established and new object-motives in an activity system, and between activity systems.

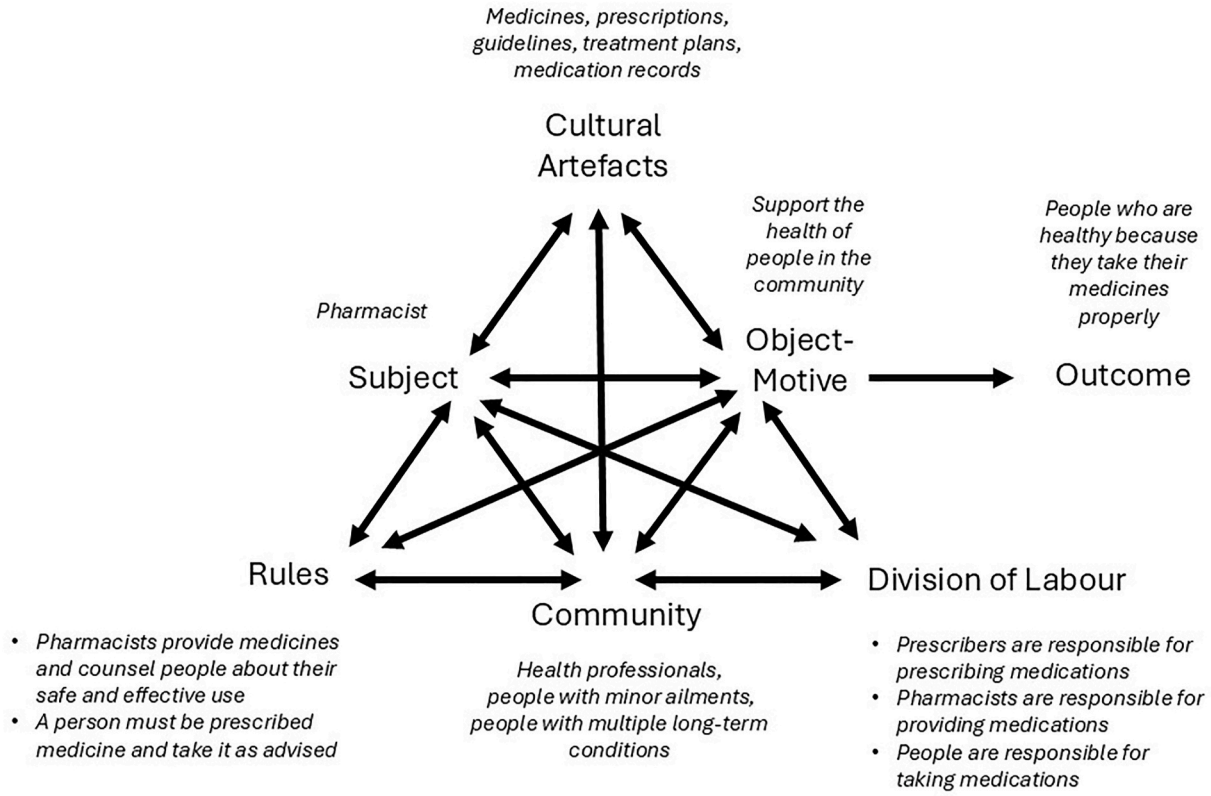


**Fig. 1.** Hypothetical example of pharmacy activity system in community healthcare setting showing bidirectional relationships among the elements in the activity system.

The schematic presented in Fig. 1 can be used to identify contradictions and visualise their influence throughout the activity system.[6] To illustrate a contradiction within an element of an activity system, imagine a conversation between a pharmacist, who wants the patient to take a medication as prescribed, and a patient who does not think that they need the medication or who takes their medicine irregularly because they are concerned about the risk of side effects.[37] Once aware of this difference, the pharmacist might counsel that person about medication adherence. This counselling might help the person understand medication risks and benefits so understand the importance of taking their medicines as scheduled maintain their health. This difference can be understood as a contradiction within a cultural artefact: the meaning of medication adherence.

It is important to note that this type of contradiction can also impact community health. The way people take their medicines can influence the incidence of infectious diseases in the community because people may hold many different understandings about medication adherence.[38] For a person taking several medicines, they might crush up a long-acting tablet to make it easier to swallow but not realise that this changes the rate of delivery of the medicine into their body. The cultural artefact has been altered, therefore the person's ability to maintain their health has been disrupted. As a community, these differences can contribute to unwanted antimicrobial medicine resistance[39] and other negative impacts on the cultural artefacts designed to maintain health.[40,41]

It might be tempting to view CHAT as a tool to address local difficulties or contained problems in an instrumental or technical way. However, CHAT developed through a commitment to ethics and a politics around equity. This commitment means that using CHAT is more than generating technical solutions, but rather having broader issues in mind. One issue might centre on the ethics of care and involve equity of access to medication for vulnerable or disadvantaged populations.[40,41] Pharmaceutical practices are deeply intertwined with local and global power dynamics that involve health practices and policies.[42] Socio-political factors heavily influence the pharmacy practice, which operates within a complex network of ethical, economic, and social forces that shape both the production and distribution of drugs.[43] CHAT also offers powerful and novel ways to accomplish meaningful social change.

## 7. Application to pharmacy practice research

A worked example illustrates how foundational CHAT concepts can be applied to studying pharmacy practice. In this example, pharmacists encountered tensions created by a change to mediating artefacts in a hospital workplace.[4] Focus group interviews were conducted with pharmacists eight months after electronic patient records and an electronic prescribing system were introduced. The authors wrote, "The implementation of electronic prescribing systems has changed workflow and pharmacist practice so dramatically that those who have limited or no prior experience of paper systems have struggled to develop the skills necessary to undertake patient-centered care.".[4(p750)] Among the findings reported, the authors noted that this change in how pharmacists recorded information altered their interactions with staff and patients in the hospital. Pharmacists worked with electronic patient records away from the bedside, which they felt diminished their relationships with patients due to reduced contact with them. However, due to shared computer stations, pharmacists reported quicker verbal exchanges with doctors which they felt enhanced interprofessional communication. Notably, this change created a disparity in patient interaction. Senior pharmacists increased their rounds to engage with patients, whereas junior pharmacists found it challenging to initiate contact with patients without the physical prompt of paper-based patient records. The altered interactions with staff and patients are shown from the perspective of the pharmacists in the activity system in Fig. 2.

To advance the findings of Burgin and colleagues,[4] a deeper exploration of systemic contradictions could enhance their practice recommendations beyond identifying tensions in the work environment of pharmacists. Three of their recommendations are probed more deeply.

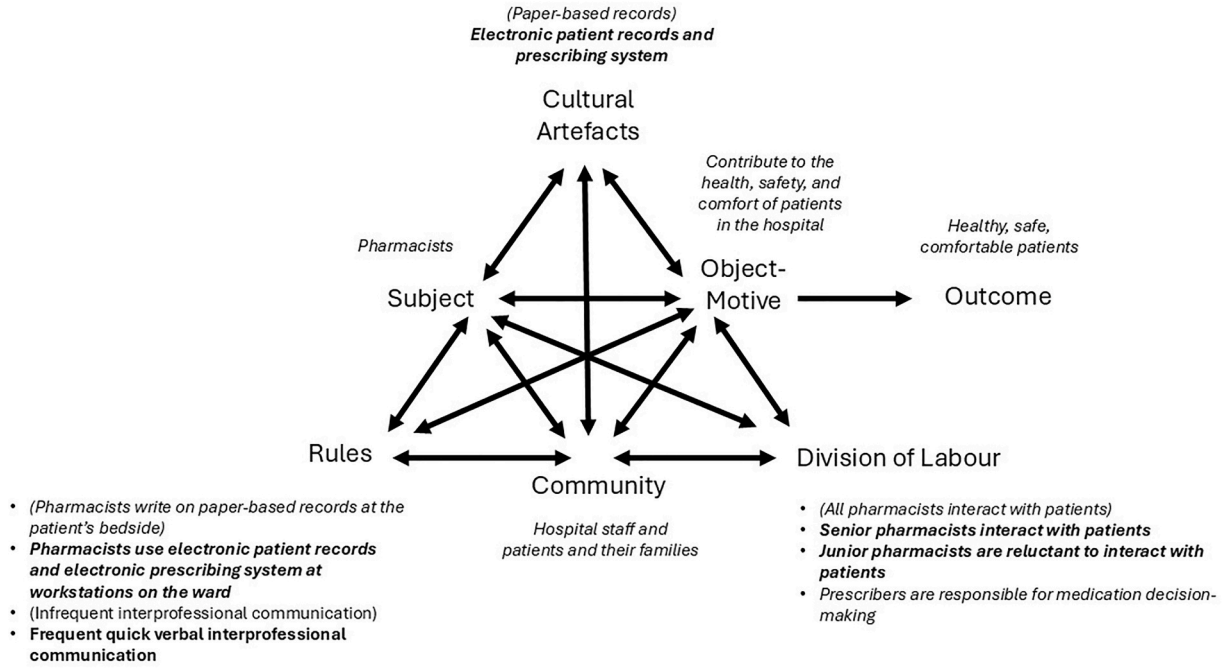


**Fig. 2.** Schematic of key elements in the pharmacy activity studied by Burgin and colleagues[4] showing disruptions due to changes in the cultural artefacts, rules, and division of labour with initial state in brackets and new state in bold font.

Instead of broadly advocating for more support and training, a CHAT-based approach suggests examining specific systemic interactions and workflows that create challenges in adopting new technologies like electronic patient records. This approach involves identifying how roles and responsibilities might shift or be redefined in the transition from paper to digital, ensuring that technological tools enhance rather than complicate patient-centered care. For pharmacists, this shift might involve becoming integrated into clinical care teams rather than performing their duties independently. This shift might also allow new avenues for all pharmacists to interact with patients in ways that had not previously been considered.

Rather than implementing new practice models with a top-down approach, CHAT encourages a participatory design process. By involving pharmacists, doctors, and nurses in co-creating solutions, the resulting practice model would be more likely to address the real-world complexities of their work environments and foster ownership and engagement across professional boundaries. This co-creation means that the activity system framework shown in Fig. 3 would consider

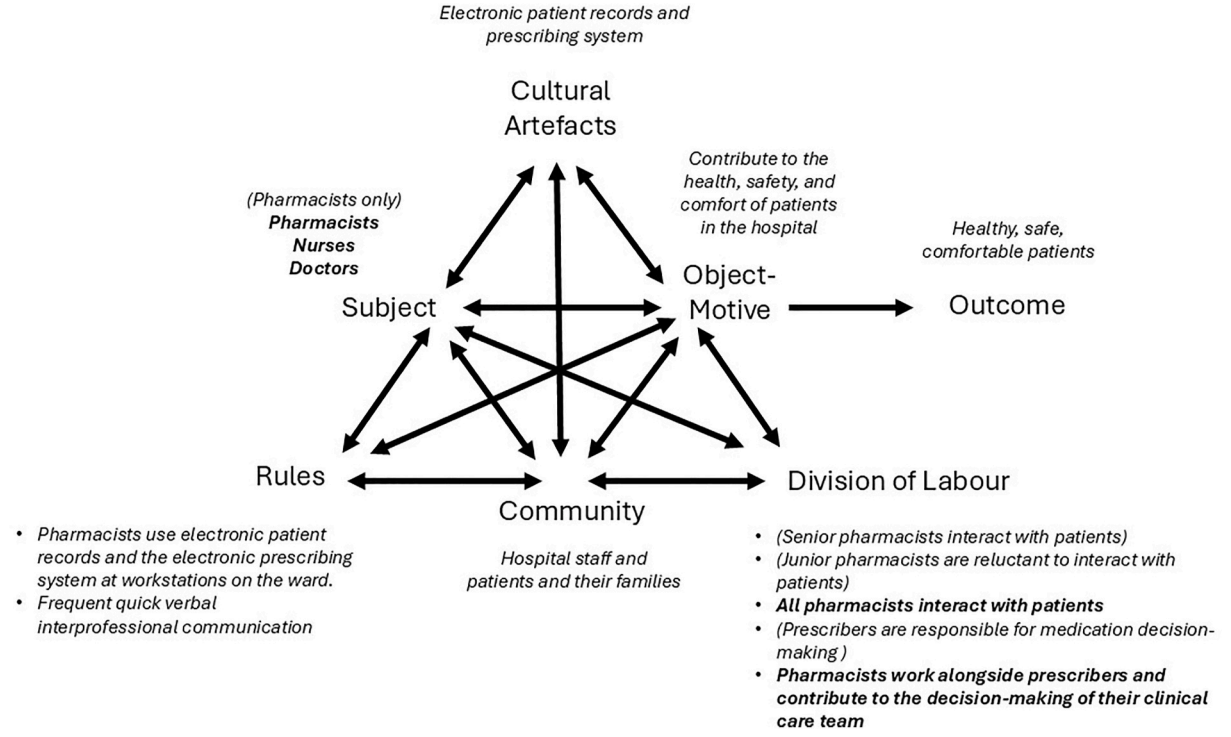


**Fig. 3.** Schematic of key elements in the pharmacy activity studied by Burgin and colleagues[4] showing a possible future state if the cultural artefacts and rules have been adopted and the subject and division of labour are altered further with the current state in brackets and a possible future state in bold font.

pharmacists together with doctors and nurses as subjects to acknowledge the collective problem-solving effort.

The suggestion to develop negotiation and communication skills of individuals could be expanded into fostering an environment of continuous professional development and interprofessional collaboration. This expansion would not only build skills and confidence among junior pharmacists but also strengthen the entire pharmacy team's ability to adapt to changes and manage contradictions that arise from new practice requirements and technologies. This expansion involves a shift from generic to contextualised solutions. The focus is on examining systemic contradictions as a driving force for change rather than generating solutions are focused on training individuals where the problem is centered on what individuals do not know or cannot do.

## 8. Conclusions

Pharmacy researchers are encouraged to use CHAT as a framework to address challenges they encounter in their work because it can help them to enhance their practice, improve patient outcomes, and adapt more effectively to the dynamic healthcare environment. CHAT can enable pharmacists to embrace systemic learning and change by seeing new technologies and practices not just as challenges to their individual competence, but as opportunities for expansive learning within the entire pharmacy team.

Pharmacists can transform collective activity through shared problem-solving sessions and interdisciplinary team discussions, to foster a deeper understanding and integration of new workflows and technologies. CHAT can help pharmacists to foster collaborative relationships by actively participating in actively participating in work oriented around a shared object-motive with healthcare colleagues. This shared sense of purpose involves not only understanding each other's unique contributions but also working towards a common goal: to enhance patient health outcomes.

Practical strategies can involve developing and strengthening interprofessional relationships by participating in joint training sessions and regular communication to ensure that each team member is aligned with the collective objective. CHAT enables pharmacy researchers to engage in a participatory design process strengthened by distinctive concepts. When new systems or technologies are introduced, all stakeholders can be involved in the design and implementation process. This participatory approach ensures that the systems developed are well-suited to the real-world complexities of pharmacy practice and that all team members feel ownership for the new practices, leading to smoother integration and less resistance to change.

CHAT enables pharmacists to develop and use cultural artefacts effectively, whether they are physical tools like electronic health records or conceptual tools like medication adherence strategies. CHAT assists with recognising how these artefacts can alter interaction within healthcare teams and with patients to impact healthcare delivery.

Pharmacy researchers can use CHAT's framework to identify and understand contradictions within the pharmacy practice. Contradictions may involve discrepancies between current practices and new requirements or between different team members' approaches to patient care. Addressing these contradictions directly can drive innovative solutions and improvements in practice. CHAT encourages ongoing education and professional development within the pharmacy team to adapt to changes and manage new technologies effectively. By embracing CHAT, pharmacists can grow professionally and help create a more collaborative, innovative, and patient-focused pharmacy practice.

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## CRediT authorship contribution statement

**Ivana Guarrasi:** Writing – review & editing, Writing – original draft, Conceptualization. **Nick Hopwood:** Writing – review & editing, Writing – original draft, Visualization, Conceptualization. **Andy Blunden:** Writing – review & editing, Conceptualization. **Daniel F.B. Wright:** Writing – review & editing. **Megan Anakin:** Writing – review & editing, Writing – original draft, Visualization, Conceptualization.

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