Activity Theory as a Pedagogical Foundation for Educational Models

Heriberto Rodríguez Frausto[1]; Federico[2]; Tzitzi[3]; Paul[4]

[1]Universidad Autónoma de Zacatecas
[2]Universidad Autónoma de Zacatecas. Zacatecas, México
[3,4]Instituto Edisson. A.C. Guadalupe, Zacatecas. México

Abstract

The search for robust pedagogical foundations has intensified as education systems confront rapid technological, social, and ecological change. Contemporary literature increasingly understands a *pedagogical model* as a system of theoretical premises that organizes a curricular approach and is embodied in the interactions between teachers, students, and the objects of learning, functioning as a guiding framework for reflective and purposeful teaching practice (Chatez, 2025; Silva Frasseto et al., 2022; Vásquez et al., 2024). At the same time, cultural–historical activity theory (CHAT) has consolidated as a major framework for analysing and transforming learning in complex social practices (Roth & Lee, 2007; Sannino et al., 2009). This essay proposes that the core principles of activity theory— (1) activity and consciousness, (2) object orientation, (3) the hierarchy of activity, action, and operations, (4) mediation, (5) internalization/externalization, and (6) development—can serve as a coherent pedagogical foundation for educational models. After clarifying the notion of a pedagogical model as an educational strategy, I outline the historical and conceptual background of activity theory (Vygotsky, Leontiev, Engeström) and then systematically examine how each principle can be translated into design questions for curriculum, teaching, assessment, and institutional organization. The argument is that an activity-theoretical pedagogical model reorients education from the accumulation of decontextualized competencies toward the collective transformation of socially meaningful activity systems. This reorientation has implications for teacher education, curriculum design, and research, particularly in fields where practice, knowledge, and social responsibility are tightly interwoven. The article concludes by highlighting the potential and challenges of adopting activity theory not merely as an analytical lens but as a generative framework for educational design.

Keywords: Pedagogical Models, Activity and Consciousness, Object Orientation, Hierarchy, Mediation, Internalization, Development.

I. INTRODUCTION

Educational systems are being pressed to respond to rapid technological, social, and ecological change while also addressing enduring questions about relevance, equity, and the formation of professionals. In this context, the articulation of explicit pedagogical models has gained renewed importance. Recent literature treats a pedagogical model not as a single method but as a coherent configuration of theoretical premises that organizes a curricular approach and is enacted in the relations between teachers, students, and the objects of learning (Chatez, 2025; Silva Frasseto et al., 2022; Vásquez et al., 2024). As design frameworks, pedagogical models can stabilize a shared orientation to practice, make underlying assumptions available for critique, and support iterative improvement across programs, courses, and classrooms.

At the same time, many educational reforms remain vulnerable to fragmentation: they foreground techniques or competencies without a sufficiently robust account of how learning is produced in historically formed, socially organized practice. Cultural–historical activity theory (CHAT) offers a powerful alternative by taking activity—collective, object-oriented, and mediated by cultural artefacts—as the unit of analysis for understanding and transforming learning (Roth & Lee, 2007; Kaptelinin & Nardi, 2006; Kaptelinin, 2012). From Vygotsky's account of tool- and sign-mediated development (Vygotsky, 1978), through Leontiev's analysis of object orientation and the hierarchy of activity, actions, and operations (Leontiev, 1978), to Engeström's activity-system model and the theory of expansive learning (Engeström, 1987, 2014; Sannino et al., 2009), activity theory provides conceptual

resources that connect classroom events to broader institutional, cultural, and historical dynamics.

This essay argues that six interrelated principles of activity theory—activity and consciousness, object orientation, the hierarchy of activity, action and operations, mediation, internalization/externalization, and development—can be translated into a coherent pedagogical foundation for educational models. The argument proceeds by first clarifying the notion of pedagogical model as an educational strategy, then outlining the historical and conceptual background of activity theory, and finally reformulating each principle as a set of design commitments and questions for curriculum, teaching, assessment, and institutional organization. In doing so, the paper positions activity theory not only as an analytical lens but also as a generative framework for designing educational models oriented toward the collective transformation of meaningful activity systems.

II. PEDAGOGICAL MODELS AS EDUCATIONAL STRATEGY

➢ *What is a Pedagogical Model?*
Recent work on teaching and teacher education uses *pedagogical model* to name something more than a single method or technique. It is described as a system of theoretical premises that represents, explains, and guides a curricular approach, embodied in the interactions between teacher, student, and learning object (Silva Frasseto et al., 2022). In this sense, a pedagogical model includes:

- A view of knowledge and learning (epistemological assumptions);
- A view of learners and teachers (anthropological and ethical assumptions);
- A structuring of time, space, and roles in teaching–learning processes;
- A set of preferred strategies and forms of activity; and
- A pattern for assessing and valuing learning.

Systematic reviews of pedagogical models in areas such as ICT integration or English teacher education show that models function as design frameworks that articulate these assumptions in ways that can be implemented, studied, and iteratively refined (Silva Frasseto et al., 2022; Vásquez et al., 2024). Rather than being a script, a model provides a structured but flexible orientation to practice.

From another angle, Bolaños Chatez (Chatez, 2025) emphasizes that a pedagogical model can be understood as a *guiding framework for reflective teaching practice*: it makes visible the principles that underpin teaching decisions, enabling teachers individually and collectively to examine and transform their own work. This reflective function is crucial if models are not to become rigid prescriptions.

- *In Sum, We Can Define a Pedagogical Model as:*
A theoretically grounded configuration of aims, values, concepts, and patterns of activity that organizes the teaching–learning process and guides teachers' design, implementation, and reflection.

This definition already suggests why a theory centered on *activity* might be a strong candidate to undergird such models.

➢ *Pedagogical Models as Educational Strategies*
If a pedagogical model is a structured configuration of assumptions and practices, it is also an *educational strategy*: it orients how institutions and teachers respond to concrete problems and opportunities. Systematic reviews show that models are often crafted to address specific challenges — for example, integrating digital technologies, supporting collaborative learning, or promoting sustainability — by reconfiguring relationships between goals, content, methods, and assessment (Silva Frasseto et al., 2022; Vásquez et al., 2024).

- *As Educational Strategies, Pedagogical Models:*

✓ *Translate* abstract educational purposes (e.g., "critical thinking", "professional competence", "community engagement") into forms of activity, artefacts, and roles.
✓ *Coordinate* levels of design: institutional projects, curricula, courses, classroom practices, and individual learning trajectories.
✓ *Stabilize and communicate* expectations, making it easier for teachers, students, and communities to share a vision of good teaching and meaningful learning.
✓ *Serve as objects of collective inquiry*: they can be evaluated, critiqued, and redesigned.

However, many models are weak in three respects. First, they often treat learning as an individual cognitive process rather than a transformation of socially situated activity. Second, they focus on stable "best practices" instead of acknowledging contradictions and change as drivers of development. Third, they may not explicitly connect everyday classroom events with broader historical, cultural, and institutional dynamics.

Activity theory is attractive precisely because it offers a conceptual language for these missing dimensions.

III. ACTIVITY THEORY AS A FRAMEWORK FOR LEARNING AND PEDAGOGY

➢ *Historical Background*
Cultural–historical activity theory grows from the work of Vygotsky, Leontiev, and their colleagues in the Soviet Union. Vygotsky's foundational insight was that higher psychological functions are formed through social, tool-mediated activity: people use cultural artefacts (language, signs, diagrams, instruments) to regulate behavior, and these mediated processes are gradually internalized (Vygotsky, 1978). Learning is thus inseparable from participation in historically formed, culturally structured practices.

A. N. Leontiev elaborated this into a full *theory of activity*, arguing that human consciousness and personality can only be understood through the structure of people's real activities in the world (Leontiev, 1978). He proposed:

- That *activity*, not isolated mental states or behaviors, should be the unit of analysis;
- That activities are *object-oriented* — "what distinguishes one activity from another…is the difference of their objects", as he famously put it; and
- That activity has a *hierarchical structure* of activity (motive), actions (goals), and operations (conditions and routines).

Later, Yrjö Engeström extended activity theory into a framework for analysing and changing work and educational practices. His "activity system" model broadens Leontiev's subject–object relation to include community, rules, and division of labour as mediating elements, and he developed the concept of *expansive learning* — learning that transforms an entire activity system rather than merely acquiring new skills within it (Engeström, 1987, 2014; Sannino et al., 2009).

Across these developments, activity theory has increasingly been used in education to analyse classrooms, professional learning communities, curriculum reforms, and technology-rich environments (Kaptelinin & Nardi, 2006; Roth & Lee, 2007). It functions less as a set of hypotheses and more as a conceptual toolkit for understanding and redesigning human activity in context (Kaptelinin, 2012; Kaptelinin & Nardi, 2006).

➢ *The Six Principles*
Building on Leontiev and subsequent authors, Kaptelinin and Nardi summarize activity theory in terms of five interconnected principles: object orientation, hierarchical structure of activity, mediation, internalization/externalization, and development (Kaptelinin, 2012; Kaptelinin & Nardi, 2006). The present essay, following the list proposed in the question, expands this set to six by explicitly foregrounding "activity and consciousness" as the first principle.

- *These Principles Can be Understood as Complementary Lenses on any Human Practice:*

✓ Activity and consciousness – consciousness is formed and transformed in and through socially organized activity.
✓ Object orientation – activities are distinguished and motivated by their objects, understood as the meaningful problem spaces toward which they are directed.
✓ Hierarchy: activity, action, operations – activity is structured into goal-directed actions and condition-dependent operations.
✓ Mediation – tools, signs, rules, and division of labour mediate the relation between subjects, objects, and community.

✓ Internalization/externalization – functional shifts occur between external, material actions and internal, mental processes, and vice versa.
✓ Development – activities and their participants change historically through contradictions and expansive transformation.

Because these principles already include a concern with design (mediation), learning (internalization), and change (development), they are well suited to serve as the backbone of a pedagogical model.

IV. FROM PRINCIPLES TO PEDAGOGICAL FOUNDATIONS

In this section, each principle is recast as a set of design commitments and questions for educational models. The aim is not to prescribe a single "activity theory model" but to show how CHAT can ground different models that nevertheless share a common structuring logic.

➢ *Activity and Consciousness: Learning as Transformation of Participation*
The first principle holds that consciousness is not a private, pre-given mental realm but develops in and through participation in meaningful activities (Leontiev, 1978; Vygotsky, 1978). Thinking, motives, and identity are shaped by what people actually do with others, in historically formed practices.

- *Pedagogical Foundation*
An activity-theoretical model treats learning as a transformation of how learners participate in socially significant activities, not merely as changes in test scores or isolated cognitive skills. Educational goals are framed in terms of:

✓ Becoming able to take part in particular communities of practice;
✓ Acquiring new motives (e.g., care for animals, responsibility for public health, engagement with communities); and
✓ Expanding the horizon of what actions and futures seem possible.

- *This Has Several Strategic Consequences:*

✓ Curriculum as organized activity systems. Instead of structuring curricula primarily by topics or disciplines, an activity-oriented model organizes around forms of practice (e.g., "community disease surveillance", "designing sustainable production systems"), within which disciplinary contents are functional tools.
✓ Learning outcomes as changes in agency. The model emphasizes learners' growing capacity to initiate, coordinate, and reflect on activity, rather than only to reproduce given procedures.
✓ Teacher role as organizer of collective activity. Teachers are designers and leaders of joint activity systems, not just transmitters of content.

- *Design Question:*

What socially meaningful activities do we want learners to be able to participate in and transform, and how will we see their agency and consciousness developing within those activities?

➢ *Object Orientation: Designing Meaningful Objects of Learning*

For Leontiev, the object of an activity is its true motive; activities are defined and distinguished by their objects (Kaptelinin, 2012; Leontiev, 1978). Engeström further describes the object as the "raw material" or "problem space" that is worked on and transformed into outcomes (Engeström, 1987; Kaptelinin, 2012).

- *Pedagogical Foundation*

A pedagogical model grounded in object orientation treats the *object of learning* not as a list of topics but as a shared, evolving problem space situated in real social and material conditions. For example:

✓ In health education, the object may be "reducing the incidence of zoonotic disease in this community".
✓ In engineering, "designing low-cost, low-carbon technologies appropriate to local conditions".
✓ In language education, "using English to participate in international scientific collaboration".

- *Object Orientation Implies:*

✓ Shared, explicit objects. Students and teachers co-construct a clear understanding of what problem space they are working on, why it matters, and for whom.
✓ Integration of knowledge and values. The object embodies not only cognitive challenges but ethical and political stakes (e.g., justice, sustainability).
✓ Continuity across levels. Institutional mission, program outcomes, and classroom activities are aligned through nested objects of activity.

- *Design Questions:*

✓ What are the central objects of activity in this program, course, or learning sequence?
✓ How are these objects rooted in real practices and communities, rather than being purely school-internal?
✓ How are the objects made visible, discussable, and revisable with students?

➢ *Hierarchy: Activity, Actions, and Operations in Curriculum Design*

- *Leontiev's Hierarchical Model Distinguishes:*

✓ Activity driven by motives (e.g., protecting animal and human health);
✓ Actions directed toward conscious goals (e.g., diagnosing a disease, designing a research project); and
✓ Operations that adapt to conditions (e.g., using specific software, following laboratory safety routines) (Kaptelinin & Nardi, 2006; Leontiev, 1978).

- *Pedagogical Foundation*

This hierarchy offers a powerful lens for aligning curriculum and classroom practice:

✓ At the *activity level*, a pedagogical model specifies the overarching motives: what kinds of professionals and citizens learners are being prepared to become.
✓ At the *action level*, it defines sequences of learning tasks with clear goals that contribute to those motives.
✓ At the *operations level*, it identifies the routines, techniques, and automatisms that need to be mastered to carry out actions effectively.

- *Implications Include:*

✓ Coherence across scales. Teachers avoid designing actions (assignments, projects) whose goals are disconnected from the overarching motives of the educational project. Conversely, institutional rhetoric about "critical thinking" or "social responsibility" must be linked to concrete sequences of actions in courses.
✓ Rethinking "basic skills". Operational fluency (e.g., statistical procedures, software use) is valued, but always in relation to actions and motives; this discourages empty drill and encourages embedding skill practice in meaningful projects.
✓ Flexible operationalization. Because operations depend on conditions, teachers can adapt tools and techniques without losing sight of higher-level aims.

- *Design Questions:*

✓ What are the central motives (activity level) that structure this educational model?
✓ How are these translated into sequences of actions with clear goals for students?
✓ Which operations can be routinized or automated, and which require conscious control and reflection?

➢ *Mediation: Artefacts, Rules, and Division of Labour*

Following Vygotsky, activity theory insists that human action is mediated by tools and signs (Vygotsky, 1978). Engeström's activity system model extends mediation to include not only instruments but also rules and division of labour that shape the subject–object–community relation (Engeström, 1987; Kaptelinin, 2012).

- *Pedagogical Foundation*

Mediation provides the conceptual basis for the design of learning environments:

✓ Tools and artefacts. Textbooks, conceptual diagrams, laboratory equipment, software, simulations, and digital platforms are not neutral; they selectively amplify and constrain ways of acting and thinking. A pedagogical model must specify what kinds of artefacts are central, how they are introduced, and how students appropriate and transform them.
✓ Language and discourse. Terminology, genres of writing, and patterns of classroom talk mediate how students relate to knowledge and to each other. Activity theory highlights that learning to participate in

disciplinary and professional discourses is not secondary but constitutive of the activity.

- ✓ Rules and norms. Assessment criteria, participation rules, ethical codes, and implicit expectations mediate subject–community relations. They can support or undermine motives (e.g., a grading system that rewards individual competition may contradict collaborative, community-engaged aims).
- ✓ Division of labour. Roles of teachers, students, technicians, community partners, and digital agents structure participation. For example, in technology-rich learning environments, the division of labour between human teachers and digital tools must be intentionally designed (Dolata et al., 2024).

- *Design Questions:*

- ✓ Which mediating artefacts are central in this model, and what forms of thinking and acting do they invite or discourage?
- ✓ What rules and norms are needed to sustain the desired forms of activity, and how are contradictions between official rules and actual practices handled?
- ✓ How is the division of labour organized so that students can gradually assume more responsibility and agency?

➢ *Internalization and Externalization: Trajectories of Learning*

Vygotsky famously argued that higher mental functions appear first on the interpsychological plane (between people) and only later on the intrapsychological plane (within the individual) (Vygotsky, 1978). Activity theory generalizes this as a continuous dynamic between *internalization* (appropriating socially mediated forms of action into inner planes of regulation) and *externalization* (materializing inner processes in external actions, artefacts, and texts) (Kaptelinin, 2012; Leontiev, 1978).

- *Pedagogical Foundation*

An activity-theoretical model of pedagogy treats learning as a movement along and between these planes:

- ✓ From external to internal. Learners first participate in externally structured, shared activities (e.g., guided laboratory work, co-writing reports, simulated clinical decision making) where tools and partners scaffold performance. Gradually, responsibility for regulation and planning shifts inward.
- ✓ From internal to external. Learners must repeatedly externalize their understanding in new forms: explanations, designs, diagnoses, plans, interventions. These externalizations are not just signs of learning but instruments for further development, because they make contradictions and gaps visible to self and others.
- ✓ Pedagogically, this means:
- ✓ Design of learning sequences. The model anticipates trajectories that move from modelling, to joint activity, to supported independent performance, to creative reorganization and teaching others — echoing, but deepening, familiar scaffolding ideas (Engeström, 2014; Vygotsky, 1978).

- ✓ Assessment as mediated externalization. Assessment tasks are treated as carefully designed externalizations that make inner development visible and open to feedback, rather than as purely selection devices. Portfolios, concept maps, protocols, and case analyses are examples.
- ✓ Attention to affect and identity. Internalization is not only cognitive but also involves the appropriation of motives, values, and identities; likewise, externalization can be risky and emotionally charged. This calls for supportive, dialogical assessment cultures.

- *Design Questions:*

- ✓ How are learners initially drawn into shared activities where tools and partners mediate performance?
- ✓ What opportunities do they have to externalize emerging understandings in multiple, progressively more demanding forms?
- ✓ How do assessment practices support internalization and externalization rather than interrupting them?

➢ *Development: Expansive Learning and the Dynamics of Contradiction*

Development, in activity theory, is not simple linear growth but a qualitative transformation of activities driven by internal contradictions — historically accumulated tensions within and between components of an activity system (Engeström, 1987, 2014; Sannino et al., 2009). Engeström's theory of *expansive learning* conceptualizes learning as collective efforts to reconceptualize the object of activity and reorganize the system around it.

- *Pedagogical Foundation*

A developmental principle implies that a pedagogical model must itself be *historical and revisable*, and that learners should be involved in confronting and working through contradictions. For example:

- ✓ Contradictions as starting points. Curriculum design begins from real tensions: between academic knowledge and community needs; between assessment regimes and collaborative work; between technological possibilities and ethical constraints.
- ✓ Learning cycles. Programs incorporate cycles of inquiry where students and teachers analyze their own activity systems, identify contradictions, envision expanded objects, experiment with new practices, and reflect on outcomes — echoing change laboratory and formative intervention approaches (Engeström, 2014; Sannino et al., 2009).
- ✓ Institutional reflexivity. The educational model is not taken as fixed. Data from practice (student work, community feedback, teacher experiences) are used to iteratively redesign structures, rules, and mediating artefacts.

- *Design Questions:*

✓ What contradictions characterize the current activity systems in which learning is embedded (classrooms, programs, institutions, communities)?
✓ How can the model incorporate deliberate cycles of expansive learning, rather than treating contradictions as mere "problems" to be suppressed?
✓ How does the institution commit to the historical development of its own pedagogical model?

V. A SCHEMATIC ACTIVITY-THEORETICAL PEDAGOGICAL MODEL

Bringing these principles together, we can sketch the outlines of a pedagogical model grounded in activity theory. The point is not to provide a finished template but to show how the principles can structure design work.

➤ *Core Dimensions of the Model*

- Epistemological dimension. Knowledge is understood as historically and culturally mediated tools for transforming real objects of activity, rather than as neutral representations. Learning implies gaining access to, and transforming, these tools in practice (Kaptelinin & Nardi, 2006; Vygotsky, 1978).
- Axiological dimension. Values are embedded in motives and objects of activity: care, justice, sustainability, professionalism, and community responsibility are not "add-ons" but intrinsic to what counts as good activity. Educational aims are thus framed in terms of the kinds of activity systems and futures learners are invited to co-create (Sannino et al., 2009).
- Methodological dimension. Teaching–learning processes are organized around joint, object-oriented activities (projects, investigations, interventions) where students and teachers engage with communities, artefacts, and problems over time. Methods such as project-based learning, inquiry, case-based learning, and simulations are chosen and combined according to their fit with the activity system, not as isolated techniques.
- Organizational dimension. The model includes explicit design of mediating structures: time (longer units for sustained activity), space (labs, field sites, online platforms), community relations (partnerships with workplaces and communities), rules (assessment policies, participation norms), and division of labour (roles for students, teachers, professionals, digital tools).
- Evaluative dimension. Evaluation is framed as multi-level analysis of activity systems: assessing learners' participation and transformation, the effectiveness of mediating artefacts and rules, and the development of the educational model itself. Mixed methods (qualitative and quantitative) are used to trace developmental trajectories.

VI. IMPLICATIONS FOR EDUCATIONAL DESIGN AND RESEARCH

➤ *Curriculum and Program Design*

For curriculum designers, an activity-theoretical foundation encourages starting from the objects and motives of professional and civic practice, then working backwards to identify necessary knowledge and skills. Programs are built around core activity systems (e.g., "collaborative diagnosis and intervention in animal health", "managing sustainable production chains"), with spiraling opportunities for students to engage these activities at increasing levels of complexity and responsibility.

- *This Approach Supports:*

✓ Integration of disciplines around shared objects;
✓ Authentic assessment, since student work can be evaluated in terms of its contribution to real or realistically modelled activities; and
✓ Stronger alignment between institutional mission and classroom practice.

➤ *Teacher Education and Professional Learning*

Adopting an activity-theoretical pedagogical model has profound implications for teacher education. Teachers need to learn to:

- Analyze their own classrooms and institutions as activity systems;
- Identify contradictions and design interventions (e.g., changing assessment rules, reorganizing group work, introducing new mediating artefacts); and
- Engage in collaborative inquiry with colleagues and communities.

Research shows that activity theory has been fruitfully used to structure such professional learning environments and "change laboratories", where practitioners collectively analyze and redesign their work (Engeström, 2014; Sannino et al., 2009). A pedagogical model built on these principles thus doubles as a framework for ongoing teacher development.

➤ *Educational Research*

Finally, an activity-theoretical foundation encourages educational research that is:

- Contextually rich, tracing how learning unfolds in real practices;
- Interventionist, where researchers and practitioners co-design changes in activity systems; and
- Developmental, following longitudinal trajectories rather than only short-term outcomes.

Roth and Lee (Roth & Lee, 2007) argue that activity theory has already shifted educational research in these directions, but that its potential is far from exhausted. Viewing pedagogical models through activity theory can contribute to more rigorous, conceptually coherent studies of innovation in areas such as technology integration,

sustainability education, and community-engaged learning (Dolata et al., 2024; Silva Frasseto et al., 2022; Vásquez et al., 2024).

VII. CONCLUSION

This essay has argued that the six principles of activity theory—activity and consciousness, object orientation, hierarchical structure, mediation, internalization/externalization, and development—provide a robust foundation for constructing pedagogical models understood as educational strategies. Grounded in the cultural–historical tradition of Vygotsky, Leontiev, and Engeström, activity theory reorients pedagogy toward the analysis and transformation of socially situated activity systems, offering conceptual tools to align aims, curriculum, methods, and assessment.

Treating these principles as design heuristics does not yield a single, uniform model. Rather, it supports the creation of context-sensitive models that nevertheless share a deep structure: they focus on meaningful objects of activity, connect micro-level tasks to macro-level motives, foreground mediation and participation, and embrace contradictions as drivers of expansive learning and institutional development.

For educational systems seeking to move beyond narrow competency lists and fragmented teaching, an activity-theoretical pedagogical foundation can contribute to more coherent, reflective, and transformative educational models. The challenge is not merely to *apply* activity theory but to engage with it as a living, evolving framework, co-developed with the very communities of practice that education aims to serve.

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