Ricerche di Pedagogia e Didattica – Journal of Theories and Research in Education 18, 1 (2023). ISSN 1970-2221.

How to engage imagination in the classroom: Issues of educational design

Alessandro Gelmi
Libera Università di Bolzano/Bozen

Abstract

Critical reflection on Piagetian ideas in education has had significant consequences on the understanding of imagination. Within the post-Piagetian shift, Imaginative Education (IE) theory has provided a cultural-historical perspective on teaching and learning in school contexts. The theory clarifies the benefits of teaching activities that can stimulate imagination and link it to curricular themes. From these premises, it also provides educational principles for organizing teacher training programs.
However, this article argues that IE still needs to be articulated from an instructional design perspective. Activity Theory, particularly its applications to Constructivist Learning Environments, is identified as a framework for organizing the classroom as a system in which imaginative activities enhance and support the co-construction of knowledge. This approach to IE can also show how several aspects of contemporary debates on teacher education can be enriched or critically reconsidered when approaching them with the goal of engaging imagination in the classroom.

La riflessione critica sulle idee di Piaget in campo educativo ha avuto conseguenze significative sulla comprensione dell'immaginazione. Nell'ambito della svolta post-piagetiana, la *Imaginative Education* (IE) ha fornito una prospettiva storico-culturale sull'insegnamento e sull'apprendimento nei contesti scolastici. La teoria chiarisce i benefici delle attività didattiche che stimolano l'immaginazione e la collegano ai temi curricolari. Da queste premesse, fornisce anche principi educativi per l'organizzazione dei programmi di formazione degli insegnanti.
Tuttavia, questo articolo sostiene che l'IE deve ancora essere articolata dal punto di vista della progettazione didattica. La Teoria dell'Attività viene identificata come un quadro di riferimento per organizzare la classe come un sistema in cui le attività immaginative migliorano e sostengono la co-costruzione della conoscenza. Questo approccio all'IE può anche mostrare come diversi aspetti dei dibattiti contemporanei sulla formazione degli insegnanti possano essere arricchiti o riconsiderati criticamente se affrontati con l'obiettivo di coinvolgere l'immaginazione in classe.

Parole chiave: creativity; imagination; Imaginative Education; educational design; teacher education

Keywords: creatività; immaginazione; Imaginative Education; progettazione didattica; formazione insegnanti

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

1. Introduction

There is no need for original theoretical contributions to clarify why the development of imagination should be considered an essential element of educational practices. In the critical rethinking of the Piagetian paradigm that has characterized educational research from the end of the last century to the present, one of the most significant prospective turns has precisely concerned the meaning and role of imagination in learning and development processes.

In this transition, various contributions from developmental psychology (Harris, 2000), cultural-historical psychology (Smolucha, 1992), and philosophy of education (Egan, 2002) have progressively challenged the Piagetian conception of imagination as merely anti-realistic, a-logical, egocentric and as a typical expression of the intellectual immaturity of childhood (Piaget, 1962).

Vygotsky's works offer a sound synthesis of this post-Piagetian turn (Vygotsky, 1960, 2004). In his texts, creative imagination is intended as a higher psychological function that connects not only with emotions but also with intellectual functions. It is directly connected to meaning making because it allows one to transcend what is perceived, reshape what is already known, and open a space of novelty, possibility, and creative expression. A paradigmatic example of creative imagination can be found in children's play when they immerse themselves in fictional or narrative worlds and use what they know and see to recreate them. In adolescence and adulthood, this ability is linked to abstract and conceptual thinking and is required in every cultural production of humanity, from scientific research to artistic expression.

At the current state of research on imagination in education, therefore, new contributions are required not only to increase the theoretical and empirical rationales in support of the new paradigm (Khun, 1970) but also and above all, to order and consolidate the philosophical and scientific legacy already accumulated. Concretely, one can work toward this general goal from at least two perspectives.

On the one hand, there is a need to analyze why, in the current state of research, imagination should constitute an essential element of educational design and practice, as well as of teacher education and professional development.

On the other hand, one has to reflect on the concrete conditions needed to design learning activities and environments that can engage the imagination and realize its educational potential.

This paper will directly address both of these goals, focusing on formal education in school contexts. In doing so, we will move within the unified theoretical framework of Imaginative Education (IE) developed by educational philosopher Kieran Egan. The theory has addressed both aspects with a systematic, coherent, and original perspective, and it still has the potential to be further developed.

2. Imagination in education: Why?

2.1. Imagination and the aims of school education

Regarding the meaning of imaginative thinking, Egan's work fits squarely into what we have introduced as a post-Piagetian perspective turn.

IE refers mainly to Vygotsky's description of "creative imagination" as a meaning-making function, in opposition to Piagetian and Freudian models that depict it as irrational, a-logical, autistic, and satisfaction-oriented (Gajdamaschko, 2005).

A first characteristic aspect of the theory, however, lies in its heterogeneous and interdisciplinary roots, which enable it to develop an orderly synthesis of the diverse research traditions that have shown theoretically and empirically how imagination is relevant to learning and development.

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

The distinct areas in the post-Piagetian literature on creative imagination are associated in Egan's work with three fundamental purposes of education in modern Western societies: *platonic*, *naturalistic*, and *socialization*. These three orientations are still central to the contemporary debate in the philosophy of Education (Lani, 2016), and IE offers an original, meta-theoretical perspective on their possible integration.

According to IE theory (Egan, 1997), education can be aimed at three primary philosophical purposes.

It should provide learners with a proper set of values and skills to become responsible members of society and face societal demands and challenges.

It should share advanced knowledge with learners so that they can acquire what is regarded as culturally and scientifically relevant about reality and develop a critical attitude towards existence. In this sense, each school has to be inspired by a *platonic* pedagogy.

It should not be too intrusive and follow *nature's guidance* in at least three main directions: learners should be allowed to express and nourish their inclination and interests with tasks/experiences appropriate to their cognitive stage of development; they should discover and mature their personality globally and holistically (body, cognition, emotion, spirituality are all valued and connected one to another); they should obtain general skills about knowledge acquisition (e.g., self-motivation, curiosity, reflexivity, explorative and constructive attitude) so that they can *learn to learn* and be autonomous in their life-long process of development.

Let us move from the assumption that we should realize and integrate these three main goals because each one of them grasps some fundamental aspect of what education should be. We may sound intuitive and maybe also trivial, but our demands would be too demanding.

None of these aims is logically implied and fulfilled by the realization of the others. We are more likely to generate impasses or tensions when we try to connect them, both theoretically and practically: they can be in contradiction. Even when this is not the case, they do not naturally emerge one from another, thus requiring choices of priority that have no apparent reason to be solved in one way or another.

If we do not want to simplify our initial assumption and discard one or more of the three ideas, we need a shift in perspective. Our struggle is not with the answers (e.g., the compromises we could find between socialization, platonic approach, and natural development) but with the question. We should frame the problem differently to find a theory of learning that does not start from one idea, regarding it as the leading efficient cause from which everything else derives. We should consider each one of them as legitimate final causes that are logically and practically bound together by another force responsible for individual, social, and cultural development. According to IE, this force is what we call imagination.

2.2. Imagination and cultural mediation

In IE, another central aspect of Vygotsky's developmental psychology is implied: creative imagination develops via internalization from social interaction mediated by cultural artifacts (Vygotsky, 1978). To analyze the role of cultural mediation in IE, one must remember that the theory is conceived as an original form of recapitulation theory. It distinguishes different *ways of understanding* that have appeared and developed throughout human history through specific Cognitive Tools[i] (hereafter, CTs) (Egan, 1997) (Figure 1).

In each case, imagination links to language in a specific way, with an increasing level of complexity: somatic understanding is associated with proto-linguistic and embodied meaning-making processes; mythic understanding develops around cultural artifacts connected with oral language sharing; romantic understanding matures as a cause and consequence of literacy and a more explicit psychological and epistemological separation between the thinking subject and the vastness of the explorable world; philosophical understanding is expressed in the theoretical use of language and takes up and enriches the universal issues already matured in the mythic and

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

Romantic phases but in a conceptualized and systematic form; ironic understanding is connected to the reflexive use of language and is expressed in sensitivity to contradictions, the plurality of viewpoints and the structural inadequacy of thought and language in the face of the complexity of reality.
In any case, the theory does not introduce a rigid stage model, nor in history nor education, because each *way of understanding* remains when the others mature. Their development process is neither linear nor teleological, and each can (and should) evolve with the others. Different *ways of understanding*, with their specific CTs, could be mastered at different times or even neglected. Moreover, each could be adequate (alone or combined) for different experiences and learning processes.

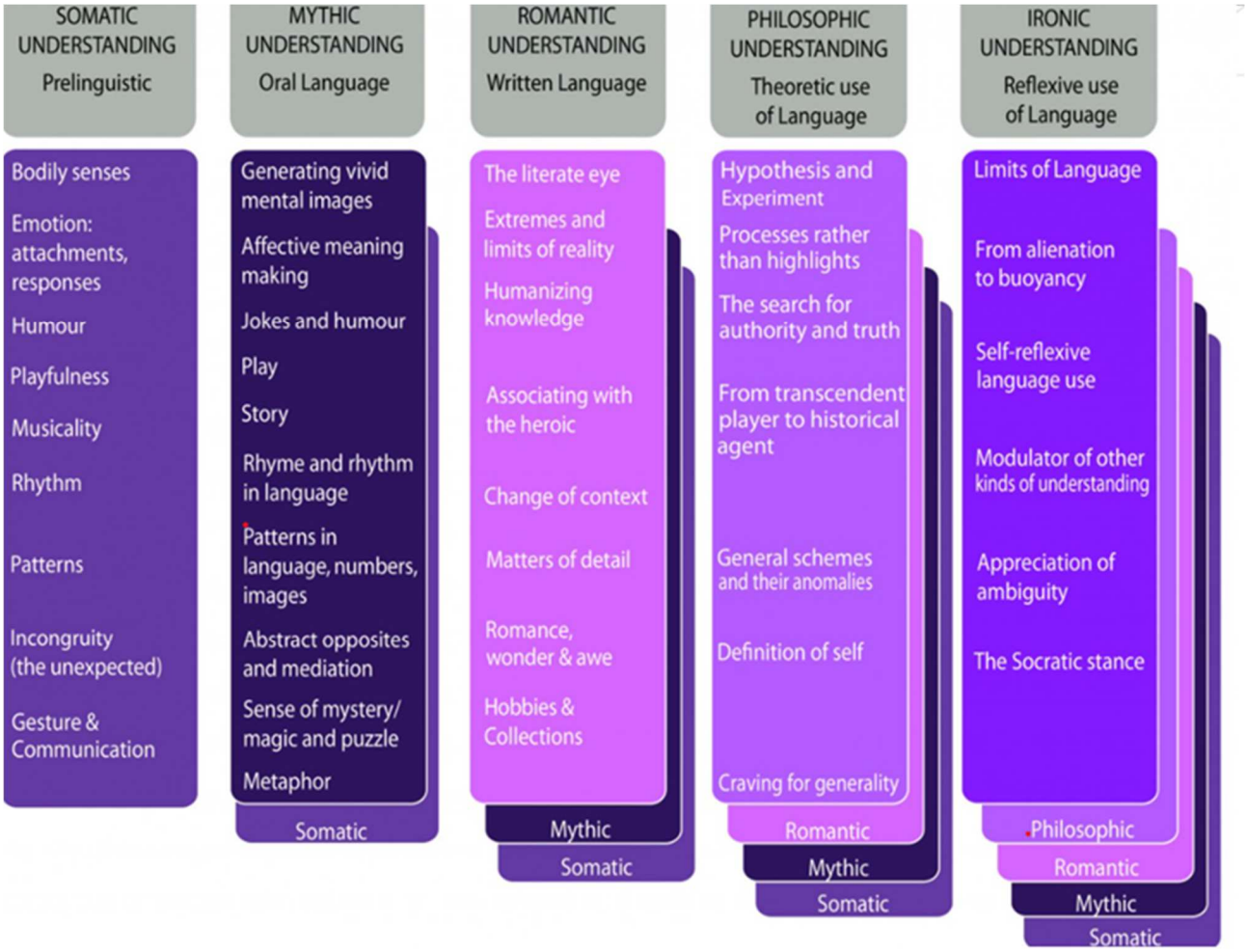

Figure 1. Ways of Understanding and Cognitive Tools. Source: http://ierg.ca/teacher-resources/planning-frameworks/#tab-id-5

According to this fundamental perspective, if we want to involve imagination in learning, we need to reflect upon the proper set of cognitive tools (Egan & Judson, 2016) to apply. Imagination must not be linked to socialization, knowledge construction, and individual development as if they were disjointed targets. However, its didactical potential emerges from the CTs in which these three instances are logically implied and connected.
CTs imply socialization because of their intersubjective nature. No imaginative collective enterprise does not pose social issues to face and reflect upon, even if they are not a specific target a priori imposed in the curriculum.

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

Platonic and naturalistic perspectives become two sides of the same process of knowledge construction. Every imaginative expression needs problems to face or material to transform, and with enough creativity, every curricular topic can absolve this function. On the other hand, this curricular content is mediated by imaginative practices and settings, allowing learners to explore, be active, find and value their interests, and express their unique needs and personalities.

3. Imagination in education: How?

3.1. The existing program and what is needed

However, IE's contribution is not limited to historical and philosophical reflection on the role of imagination in rapport with cultural and individual development. On closer inspection, the discourse on the fundamental ends of Education constitutes only the basic premise of the theory developed in *The Educated Mind*. One of the main interests of Egan's work and of the research groups[ii] that have developed it from the early 2000s to the present has, if anything, been to clarify the practical consequences of these general philosophical premises in teacher education and professional development.

According to this perspective (Chodakowski et al., 2010), teachers should develop and express their creative imagination as much as children because the connection between knowledge, CT, and socialization is not procedural and algorithmic: imaginative learning requires imaginative teaching.

This premise does not imply that IE promotes pure irrational improvisation. Teachers, through practice, observation, and reflexivity, should learn to find the emotional core of the content and should master the set of CT needed to express and shape it in an imaginative-provoking way.

The main interest of IE theorists and practitioners has been to clarify how easily it can be to trivialize this perspective. To focus instructional design and teacher training on the choice of CTs concerning curricular topics is not to adopt a merely technical and instrumental perspective, following an intellectualistic and procedural educational design model.

This point encapsulates IE's most original contribution to the landscape of educational design and teacher education at its current formulation state. (Re)imagining teaching from the perspective of CTs is a fundamentally human process that may require profound transformation processes in the teacher's system of beliefs, values, and habits (Larrivee, 2000). Which cultural and linguistic artifacts are best suited for establishing an imaginative connection with one's classroom and respecting its needs and motivations? How do we adopt them, and how do we present them to "make the familiar strange" (Miyazaki, 2015) and to address the relevance (Judson, 2017) of curricular topics? How and why do they personally affect those who are learning and teaching, and can they meet the ultimate purposes of school education?

These questions are central to teacher training and professional development programs inspired by the philosophical principles of IE. These are not questions that can be relegated to the technical choice of neutral instruments. Teachers' relationship with their values, culture, and imagery, and with the ones of their students, is involved here (McKenzie & Fettes, 2002).

From the perspective of educational design concerning teacher education, however, IE at its current state of development proves to be limited. Apart from the original reflection on the choice of CTs, and its implicit transformative bearing, more needs to be said about the concrete conditions to be taken into account to engage the imagination efficiently.

One of the tasks of educational design theory should be to clarify the conditions needed to organize situated meaningful activities of learning (Jonassen & Rohrer-Murphy, 1999). As it is currently formulated and practiced, IE provides an original and profound philosophical description of the criteria that must be met for

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

teaching/learning processes to be meaningful and shows that imagination is essential to interpreting meaningfulness most richly and comprehensively. However, more specific needs to be added about designing learning activities and environments where this high and demanding meaningfulness can be concretely realized.
This paper aims to develop a model for translating IE into the language of instructional design and enriching its teacher education and professional development programs.
As a corollary to this primary interest, this paper also aims to revitalize and rethink IE within the contemporary pedagogical debate. On the one hand, an attempt will be made to enrich the academic language of IE, bringing out aspects not considered by theory or present implicitly in the creative solutions of those who have dealt with it so far on a theoretical and practical level. On the other hand, IE will dialogue with pedagogical and psychological theories to show how their questions and proposals can be enriched or rethought when imagination is engaged in school education.

3.2. IE, Activity Theory and Constructivist Learning Environments

The model for instructional design inspired by IE principles must adhere to two essential characteristics.
First, it must share the cultural-historical assumptions of the theory and propose a form of educational design focused on selecting and commissioning meaningful social practices from which individual and collective learning and development emerge. To assume an abstract separation between consciousness and praxis (Leont'ev, 1978) and to focus on the design of activities and goals disengaged from a concrete sociocultural context is to miss one of the fundamental philosophical assumptions of IE. Imaginative practices must be shared and mediated by common cultural artifacts to harmonize development and knowledge construction with socialization.
Second, it is necessary for the model not to be one-dimensional but to be designed to address the issue of systemic complexity explicitly. An inclusive meta-discourse on the ends of education, which aims to reconcile potentially divergent goals such as academic instruction, personal development, and socialization, can only result in an approach to educational design that directly addresses complexity (Baldacci, 2009). An analytical approach that focuses only on a few privileged dimensions, leaving the others in the background or not considering them at all, may lead to design outcomes relevant to one or more of the educational purposes taken separately. However, it hardly allows one to explicitly address the problem of their synergistic integration within educational contexts. From the point of view of teacher education, this implies that IE, among other things, requires a reflective mindset that is not only analytical but also able to capture complexity (Jay & Johnson, 2002).
A perspective that allows us to meet both these requirements is provided by Activity Theory (Leont'ev, 1974, 1978, 1981). This theory shares the same Vygotskian roots as IE concerning the role of praxis and mediating cultural artifacts in developmental and learning processes. It can also provide a functional development of Egan's original work from the perspective of systemic complexity.
In particular, in the present paper, we do not refer to the most recent developments in third- or fourth-generation Activity Theory (Engeström & Sannino, 2021), but we focus exclusively on the classroom system as an elementary unit[iii].
This second-generation model, moreover, is not considered here in general terms, as if to denote any activity system, but in its specific application to the design of Constructivist Learning Environments (CLESs) (Jonassen & Rohrer-Murphy, 1999). Indeed, this classical application of Activity Theory allows us to design activities and learning environments informed by the principles of educational socio-constructivism. As mentioned above, IE can be considered a specific implementation of this learning theory, in which imagination drives the active and collaborative construction of knowledge, skills, and competencies.

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

From this theoretical framework, the design of CLESs understood as activity systems, requires several fundamental components (see Figure 2).

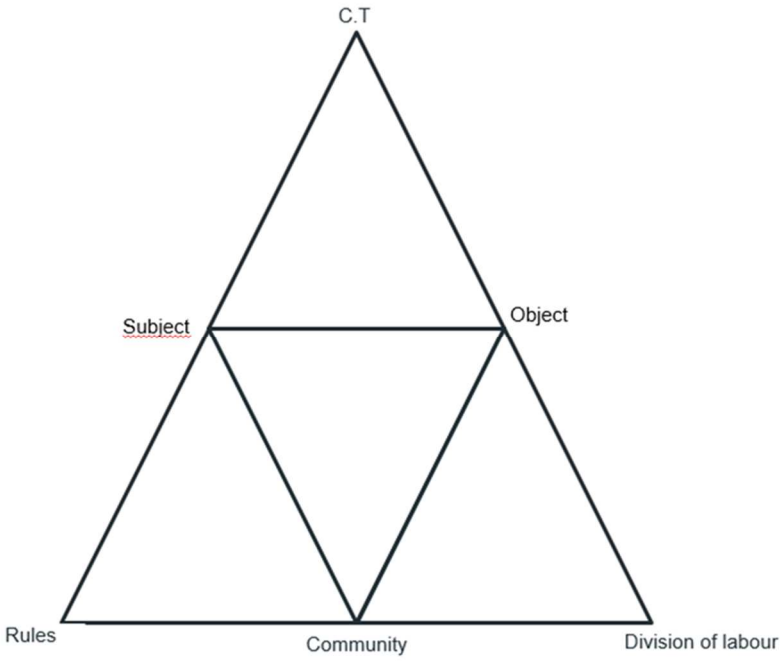

Figure 2. Basic scheme for the activity system.

The *object* cannot be reduced to the formal definition of teaching goals. However, it must respect its original meaning of problem space, which generates the driving motive for the contradictions and dynamism in the activity system. Technically, the object pole of the activity system takes into account both the leading motivations that drive individual and collective processes of learning and development and the actual object, whether physical or conceptual, which under this motivation is constantly manipulated, transformed, and rethought.
From the perspective of CLEs, this object dimension of the system concretely consists of a problem-project space that enables a multi-stage knowledge-building process. The problem presentation concerns the engagement phase, in which challenges, projects, and contradictions emerge that students can perceive as relevant and meaningful. In the successive phase of problem manipulation, students can express their motivations and interests and actively exercise their knowledge to address the problem/project they are engaging in. In the concluding moment of diversification, on the other hand, the group works on the representation and application of the knowledge to different contexts and situations. This phase aims to elaborate on the previous learning experience in the form of concepts or formal models and to work on the metacognition of learning processes. From a cultural-historical perspective, this stage leads from the abstract to the concrete and allows the development of theoretical knowledge (Davydov, 1982).
What has been said so far about imaginative thinking may be sufficient to intuit how relevant the IE approach is from this point of view. However, a more careful analysis is needed to treat the design of CLESs as activity systems focused on the development and instructional engagement of the imagination.
Concerning *mediation artifacts*, applying Activity Theory to CLESs requires different levels of mediation.
A central role is given to CTs. In perfect conceptual and terminological continuity with IE, teaching activities must focus on symbolic artifacts that enable learners to move actively and creatively in the problem-project

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

space. They are embedded in meaningful shared practices, enabling their gradual internalization, with significant effects on curricular learning and psychological development.

Surrounding these essential elements, however, are also two other types of tools without which the concrete design of CLES would not be possible.

On the one hand, physical tools bring with them all the problems and potentials of design related to the choice of materials, tools, objects, and the design of spaces (Cives, 2008). On the other hand, the tools of communication and collaboration concern the more general problem of the pedagogical stance that the teacher can assume, in the case of IE, to activate and nurture imagination in teaching/learning processes.

Activity Theory does not consider the *subject* in an individualistic sense. CTs do not mediate object acquisition only for a singular subject. The learning process unfolds within a system of activity, which enhances and promotes individual development through cooperation. From this point of view, applying Activity Theory to CLESs design is straightforward. What is required is the critical and systemic evaluation of rules (implicit or explicit), roles, and divisions of labor that enable instructional activities to be structured effectively.

A note, especially about IE, must be reserved for the concept of *community*. On the one hand, the term is to be understood narrowly, indicating the totality of students involved in the learning process. Teachers must reflect upon themselves as an integral and active part of the system, according to its rules and divisions of labor. On the other hand, in a broader sense and closer to the dialectical materialism of Activity Theory, the term refers to the sociocultural context in which the class system is embedded. The most current formulations of this sociocultural approach to educational research (Hedegaard, 2022) work on three levels: the individual plane of personal motivations and capabilities; the plane of activity systems (e.g., classrooms) that belong to different educational contexts or institutions (e.g., the family environment, school environment) and which act simultaneously on individuals, and influence each other indirectly; the broader and more general plane of the sociocultural system taken as a whole of different traditions and value perspectives, from which arise expectations, orientations, and pressures on educational systems. In the case of the IE, it is necessary to reflect on the relationship between the design of environments and activities based on creative imagination and values, demands, and rules that individuals, other educative systems, and the social and political context inevitably convey.

All these elements, distinguished analytically so far, are indeed interconnected in the complex reality of the classroom. Thus, *dynamics* and *context* are also essential aspects of CLES design from the Activity Theory perspective. According to the first concept, the design focus should not be located in the elements separately taken but rather in their systemic connection and, thus, in the dynamic process in which they condition and influence each other. The second refers to the necessarily situated and contextual character of development and learning processes that emerge from the activity system. Activity Theory critically rejects the idea of an immediate and linear transposition of design solutions, however sophisticated and reflective they may be, outside their original context. Understanding what this means in the case of CLESs centered on imaginative activities requires further work on developing IE.

Based on this framework and the open questions that emerged from it concerning IE, it is possible to work on the model for educational design and teacher professional development that we set as our goal.

To comply with the philosophical assumptions of IE, we have chosen to proceed with an expository order that captures the design elements of CLESs as activity systems concerning the three primary educational purposes that Egan's theory aims to realize and integrate into school contexts.

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

3.3. Imagination in CLEs as an activity system- socialization

How to organize the design of imagination-based learning environments and teaching activities to be relevant to socialization?

In the case of socialization, we need only draw a connection between IE and the 2nd generation of Activity Theory already introduced above (Figure 2).

What an imaginative teacher has to consider here, therefore, is the proper set of rules and roles (in which she is involved as well as learners) required to trigger and support collective creative cooperation (Fischer, 2004).

Much has already been considered here in the literature, and several existing models can fulfill the purposes and assumptions of IE. Of particular relevance is the tradition of research that has applied the cultural-historical perspective, sometimes referring explicitly to Activity Theory in general and disciplinary didactics. A concept relevant to IE, for example, may be that of authentic, collaborative activities around which a wide variety of design solutions have been developed to organize collective activities that enhance and promote the creative imagination of each individual (Polly et al., 2017).

What of significance can be added to these contributions is a general consideration of the specific potential of IE concerning this component of CLES design.

The first point concerns the object of the system and the foundational motivation that engages learners in the problem-project space and channels the dynamics of collaboration/conflict within the Activity System.

According to a more classic constructivist reading, the object in IE formal educational contexts can be understood, as mentioned, as a shared research operation (e.g., inquiry-based learning) or as a problem of collective relevance (e.g., project/problem-based learning). Eventually, IT can also be rooted in everyday tensions/difficulties directly perceived by the community. The originality of IE is limited here to the variety of *second stimuli* (Sannino, 2015) it can provide to convey curricular themes in an emotionally meaningful and intellectually stimulating form (Egan, 1992, 2013; Egan & Judson, 2016).

However, Imaginative CTs can also promote intrinsic motivation because of their playfulness (Vygotsky, 2004). Learners can exercise their imaginations in stories and play without an external reason. If the teacher is sufficiently creative, the intrinsic motivation of these CTs can be linked to any curricular content (Van Oers, 2015) or can be found and promoted in other more sophisticated and abstract ways of imaginative engagement. Relevant in this regard, for example, is research on sustained-shared thinking (Siraj-Blatchford, 2009). In these works, the philosophical concept of language play is used to reflect on the continuity between imaginative play and the more mature forms of creative collaboration and shared theoretical reflection that adults conduct together.

The second original contribution of IE at this stage of educational design concerns the development stages of knowledge-building activities within the problem-project space. When collaboration is organized, taking into account the free imaginative expression of each individual, the design opens up the possibility/need to enrich the presentation, manipulation, and diversification phases with a further moment of comparison. This ending phase is dedicated to an explicit and dialogical comparison between the different forms of representation/construction of knowledge derived from personal and individual meaning-making processes. The epistemic, metacognitive, and inclusive (Harwood, 2010) aim of this phase, which for other approaches may be only optional, is an essential component of the Activity System in the case of IE and reveals one of the most significant contributions of this theory to the design of CLES.

Finally, regarding CTs mediations, a contribution can be given here to distinguish their different functions in formal education contexts (see Figure 3).

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

- *CT as shared cultural practices*: these types of CT are "cognitive tools crystallized in culture" (Egan, 1992) which reproduce cultural-historical dynamics of mediation and define the context in which imaginative expression becomes concretely possible in teaching and learning and acquires significance for the people involved. They can be reduced to four basic dimensions. Narration and play are typical but not exclusive in the heritage of orality-based cultures. Thought-provoking dialogue/discussion and artistic expression/fruition are implicit at all levels with particular relevance to the theoretical and reflective use of language.

The concrete functioning of these CTs can then be enriched by other, more specific types of CTs:

- *CTs for emotional engagement*: as mentioned, imaginative activities are themselves emotionally relevant. However, specific CTs can be implemented to focus on certain kinds of emotional engagement that are considered functional for the learning process.
- *CTs for Knowledge construction*: some CTs can be provided to acquire and refine knowledge/skills/competencies through imaginative thinking (Fettes, 2010). More specifically, some of them work as order functions because they activate the imagination to analyze details, simulate and evaluate abstract concepts concrete functioning/meaning, or generate and verify hypotheses. Instead, others work as problematizing functions, either in a literal sense or in a humorous-ironic way, because they activate the imagination to reconsider what is known in an alternative way, open divergent spaces, and unforeseen possibilities, and explore ambiguities and contradictions.

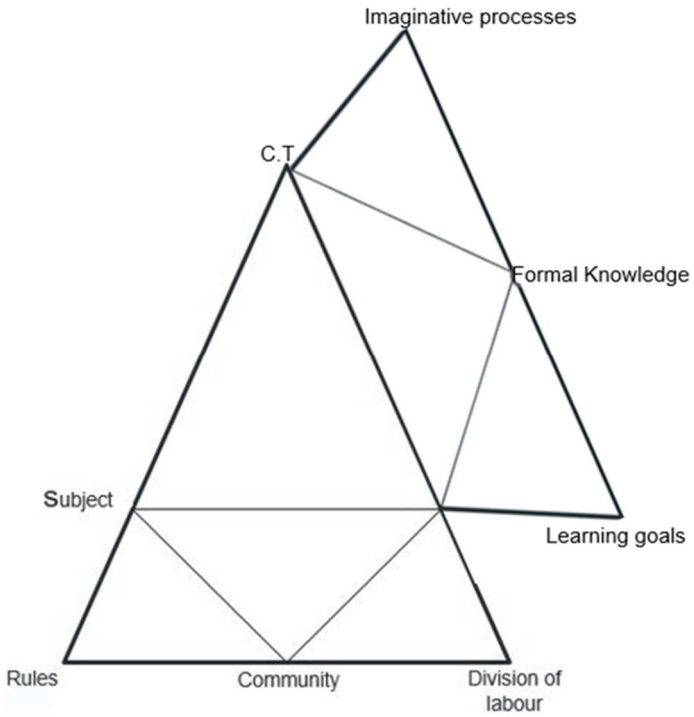

Figure 3. The second-generation model is expanded to consider academic knowledge and skills.

How do design imagination-based learning environments and teaching activities to make them effective in achieving academic knowledge and skills?

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

For an imaginative CT to be appropriately designed, we need to consider the epistemological roots of the discipline(s) involved in teaching. What are their core concepts? Which skills do they require/enhance? What languages are they based on? Is there a logical order to organize their content? (Illeris, 2018).

These aspects are already considered in the existing literature on IE. However, specific attention to the structure of learning activities needs to be added (see Figure 3). In particular, we must consider two additional dimensions necessary for the concrete functioning of an imaginative CT in formal education settings: the analysis of imaginative processes involved in learning and the definition of specific learning goals.

About the first point, IE provides a synthetic definition of *imagination* that works on a general level to show its potential in teaching and learning. However, it needs to be analytically articulated when it comes to specific didactical planning. What is needed here is a conceptual analysis process that can distinguish the specific forms in which imagination works. We adopt here a multidisciplinary taxonomy, which integrates models from analytical philosophy, neurobiology, and cognitive psychology (Abraham, 2016). This model can distinguish at least three forms of imaginative processes that share a common neurobiological structure and imply the general ability to transcend what is evident in order to create new meaning (Kind & Kung, 2016):

- *Imagery-based imagination* produces quasi-perceptual states to simulate objects and situations that are not present or to transform their features virtually.
- *Intentionality-based imagination* projects the self in spaces, times, and perspectives different from the practical present, triggering a whole set of memories, emotions, and imagery perceptions.
- *Generative imagination* creates new connections on an epistemic and conceptual level so that already possessed knowledge can be reorganized and linked to new data to discover and create.

At this point, the issue for an IE teacher is clear: which kinds of imagination are implied (or how different forms are connected) when we mediate the object of learning with the chosen CT? Which one is more effective in didactical terms according to the learning topic and its epistemological and sociocultural features?

Secondly, in formal education contexts, it is possible to define the learning goals that one would like to reach and then compare them with the learning outcomes that emerge from the activity system.

To link the epistemological and cultural-historical foundations of the disciplines with the shared problem space, one must first consider what disciplinary or interdisciplinary skills/knowledge/competencies are likely to be developed in solving the problems or carrying out the activities linked to the object of the activity system.

Teachers should also consider the characteristics of the learning community concerning its collaborative/conflictual dynamics and learners' actual and potential capabilities. Imaginative activities should be chosen and constructed concerning the zone of proximal development and can also be helpful to explore the individual and collective limits of the zone itself. A paradigmatic example of this can be found in the literature about pretend play in educational settings. Adults' engagement in children's play, or by extension in any other shared imaginative practice, can interact with their spontaneous meaning-making efforts and thus acquire relevant information about their knowledge, skills, and competencies (Hakkarainen & Bredikyte, 2008).

3.4. Imagination in CLEs as a system of activity-personal development

How to design imagination-based learning environments and teaching activities to support personal development?

Vygotsky's original insights about adult-children relationships in learning processes can be integrated into the design perspective of Activity Theory. How are learners involved in cultural mediation practices? What should teachers do to support their imagination and engage it in learning?

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

According to the literature on creative education, teachers, in general, should follow some fundamental pedagogical principles to organize learning environments that support free expression and strengthen creative collaboration: they should abandon strict penalization of errors, be open to dialogue, provide students with active listening, stimulate, and support divergence, and encourage active exploration within an emotionally safe space (Glăveanu et al., 2020).

However, this attention to communication and collaboration tools can further differentiate. Various pedagogical stances are also possible within this general framework. According to this paper's general purposes, we introduce three general metaphors.

- Gift pedagogies: in this case, the teacher is responsible for the creative act (e.g., they create a story with an intuitive and powerful metaphor about the content or organize a structured role play to trigger specific discussions). Thanks to teachers' creative engagement, learners' imaginations are activated, inspired, and linked to the learning topic. This is the most classical and intuitive approach in IE and every form of creative pedagogy (e.g., storytelling, gamification). It allows teachers to focus on specific details in the content, to make them more intelligible and engaging, and act as role models for imaginative and emotional involvement in learning.
- Creative Pedagogies: learners creatively engage with the CT (e.g., they generate metaphors on the content, create stories, and pose puzzling problems). This perspective focuses on the creative exploration of the curricular content and the emotional involvement associated with creative expression. Unlike more radical versions of student-centered, hands-on, or self-directed pedagogies, from which IE firmly distances itself (Egan, 2002), the teacher should not be a mere facilitator of completely autonomous and spontaneous learning processes. Instead, their educational design should focus on the most effective conditions and stimuli to engage learners in epistemically rich and meaningful creative experiences. This perspective also opens up another incomplete aspect of IE in its original formulation: the assessment issue. Through this pedagogical stance, activities designed for learning/teaching processes could also provide a contextualized and personalized observation of progress and difficulties. By acting as an observer of free and spontaneous imaginative processes, the teacher can obtain relevant information to define the proximal zone of development, as said above, and assess the learning process in the making. This consideration does not resolve the tension between summative and formative assessment (Fleer, 2015). Nevertheless, it offers an original perspective to rethink it from the perspective of students' imaginative and creative involvement.
- Synergetic Pedagogies: teachers and learners share the creative and imaginative dimension of CTs at the same level. This can happen either because it addresses a problem/project for which neither parties do not know the solution in advance or because it involves the development of an innovative product that requires the convergence of everyone's skills. An original and innovative example of this approach can be found, for example, in the literature on playworlds, which describes narrative pretend play in which adults and children participate on the same level, as actors and as authors (Ferholt et al., 2021). Also, dialogic pedagogies could be further investigated to show how imaginative tasks and stimuli can open a space of collective inquiry in which learners and teachers collaborate (Miyazaki, 2019).

The concrete application of these pedagogical principles brings two additional aspects of educational design (see Figure 4).

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

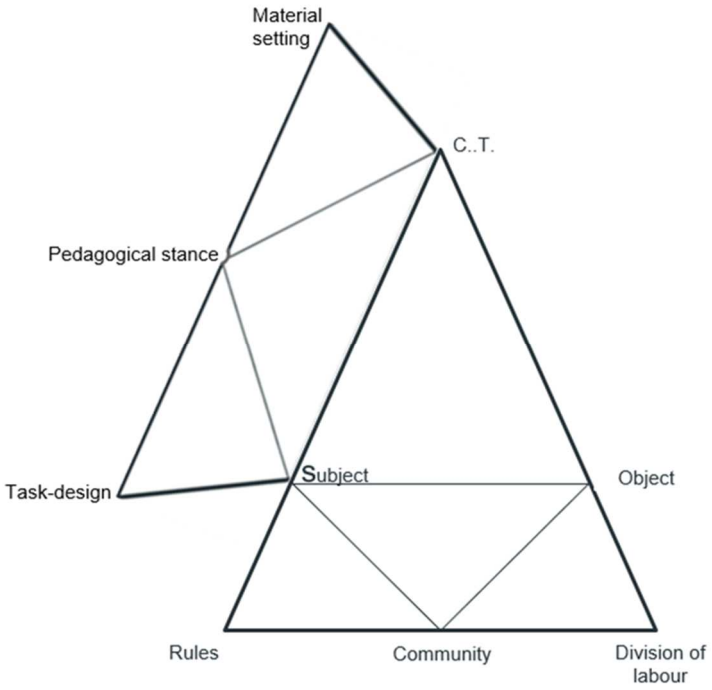

Figure 4. The second-generation model is expanded to consider teachers' pedagogical positionality in relation to students' imaginative engagement.

The first dimension concerns the physical tools of CLES and their *material setting*. According to cultural-historical studies on creative imagination (Glăveanu, 2015), in line with the outcomes of cognitive psychology (Taylor, 2017) and philosophy of mind (Kind & Kung, 2016), imagination's development depends on the conceptual and material resources available and on the opportunity to use them at times and in the ways most suitable for free experimentation. According to the different types of pedagogical mediation adopted, how should space be organized? What role is played by materials and instruments in the different forms of imaginative expression within the activity system? (Lillard, 2013).

From the perspective of IE, this aspect of design can be declined in different approaches. It is appropriate to speak here of a gradual continuum generated by two complementary orientations.

On one extreme, didactic activity can be based on the peculiar characteristics of a source object or material. In this case, what triggers the movement of imagination through the mediation of CTs, are precisely the properties and characteristics of the object or objects considered. A relevant example of this type of IE orientation can be found in its object-based applications in the context of museum education[iv].

At the opposite extreme, however, is a teaching attitude that focuses imaginative processing on cultural artifacts of a symbolic nature, for which the physical and material components of design remain relevant only as instrumental supports that can hinder or benefit the abstract movement of imagination. In practice, these approaches mainly accompany applications of IE for the philosophical and ironic mode of understanding developed with older students (Egan, 1997). However, this kind of approach is also crucial in the context of early childhood education. Indeed, the ability to look at objects according to the meaning (Vygotsky, 2004) rather than according to their immediate perceptual properties is one of the main reasons why pretend play contributes to conceptual thinking and language development in early childhood.

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

The structure of the activity is also something that requires more detailed analysis. In the communicative relationship with the learner, what questions/challenges/suggestions should be posed by the teacher to trigger imaginative processes and connect them to learning goals?
Different *task design* principles can be considered depending on the types of imaginative processes involved in learning. (Abraham, 2016)

- Imagery-based. Quasi-perceptual generation processes can be supported both by using perceptual/aesthetic inputs (Corni & Fuchs, 2020, 2021) as well as by indirect verbal triggering as in guided imagery (Bagley & Hess, 1987).
- Intentionality-based. The creation of fictional scenarios and contexts can be supported by specific requests/conditions/constraints (Karwowski & Soszynski, 2008). First, the fictional identification with exploratory agents allows learners' personal beliefs and interests to emerge and engage them in collective inquiry processes. Secondly, introducing events/agents/roles related to the learning topic can trigger meaning-making processes relevant to the didactic purposes of the activity because the curricular topic becomes a relevant component of the imaginative construction.
- Generative. Training programs for creativity assessment developed by cognitive psychology across the second half of the XX century provide general task design principles that can be re-evaluated within a sociocultural approach. They are not considered here as individual decontextualized techniques but as conditions of creative expression situated in collaborative practices. Moreover, going beyond a rigid mechanistic application, they are not introduced as heuristics to train/measure creativity but as open inputs for collective inquiry that catalyze a flexible and personal approach to knowledge. The different types of programs share common basic principles (Osborn, 1963; De Bono, 1992; Eberle, 1996; Guilford, 1967; Root-Bernstein, 1999):
- Goal orientation. Creative activities are triggered by the presentation of starting elements that must be completed and combined to achieve a final goal. An example is provided by open mathematical problems whose solution is constrained to the use of specific starting data or theorems alone (Pitta-Pantazi et al., 2022).
- Eccentricity. Creative activities are triggered by associating divergent elements that have to be logically connected. A classic example can be identified in the playful association of semantically distant terms, such as the *fantastic pair* devised by Gianni Rodari (Rodari, 2001).
- Creative disturbance. The activity is enriched by constraints/challenges that encourage a flexible and divergent approach (elimination or addition of elements, context variations, qualitative alterations of inversion or replacement, quantitative alterations of increase or decrease). Generative "what if"-questions to trigger counterfactual thinking or conceptual blending can provide a relevant example of this approach to task design (Pramling et al., 2019).

The different principles can be integrated and sustain both problem-solving and problem-posing processes.

3.5. Beyond static-dynamic analysis and contextuality

Finally, as presented in the general introduction on CLES design within the Activity Theory framework, issues of dynamics and contextuality must be considered from the perspective of IE (see Figure 5).

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

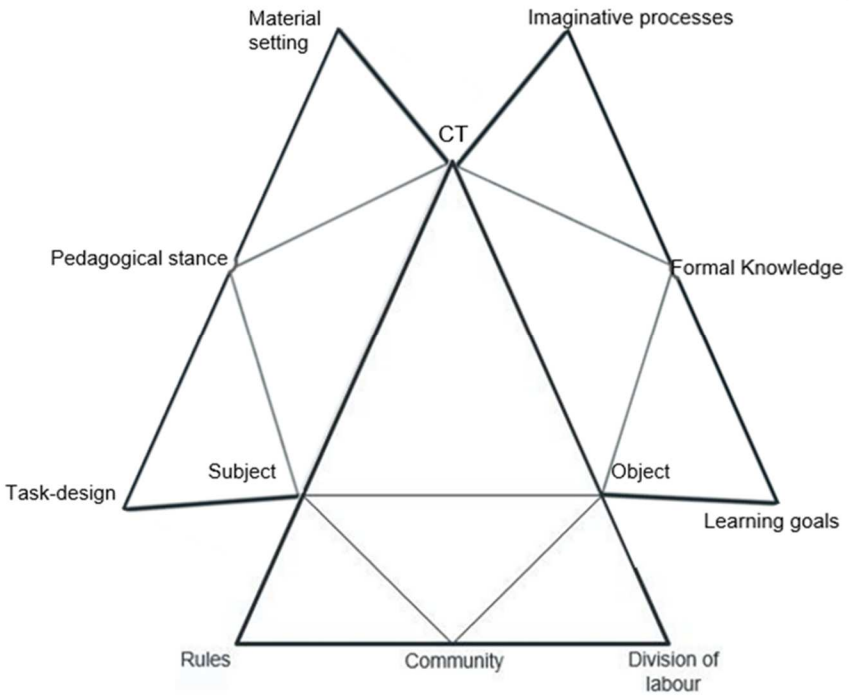

Figure 5. The elements need to be interconnected within a dynamic system.

Concerning the first point, as mentioned, the design required by a comprehensive philosophical perspective such as that of IE cannot disregard systemic complexity. In this, the focus on the dynamic element introduced by Activity theory significantly contributes to the aims of this paper. However, again, imagination opens original perspectives that fall significantly on educational design and teacher professional development.

As the Activity System develops around imaginative dynamics, the goal of design cannot include the mere determination of a functional structure. Instead, the structure should remain open and flexible and relate dialectically with the creative agency of the actors involved in the System (Sannino, 2022). In fact, from the perspective of IE, the design of CLES based on entirely pre-determined activities, however rich and meaningful, should not be accepted nor be taken as ideal. On the contrary, this scenario betrays the philosophical premise of the theory because it does not allow academic instruction to be enriched and enlivened by learners' and teachers' personal engagement. The design goal to be set according to IE is to work at the dynamic balance between the pre-determined elements of the system and the unpredictable emergence of individual and collective meaning-making processes fueled by imagination. The very need for structure concerns precisely the conditions to be put in place so that the imaginative involvement of human beings living and expressing themselves in the classroom can be as spontaneous, personal, and unpredictable as possible.

From the point of view of teacher education, this means that in addition to transformative learning and analytical and systemic reflexivity, professional development required and supported by IE also includes flexibility of thought and improvisation skills. For students' imaginative contributions and the teacher's creative intuitions not to be lost nor ignored, or repressed, unpredictability and variety should be valued as relevant sources of authentic learning (Fried, 2005). In addition, imaginative teachers should refine their *pedagogical tact* (Van Manen, 2016) to handle the emergence of alternative paths toward pre-determined goals and activities or an even more radical and profound questioning of the entire learning/teaching process (Lorenzoni, 2014).

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

The second issue, that of the contextuality of design, also needs to be explored further if one connects it to the philosophical premises of IE.

Sticking to the narrower sense of *community*, Activity Theory can apply directly to imagination based CLES. Design solutions devised for a specific classroom cannot, in principle, be transferred linearly to different contexts or even to the same context considered at a different time in its developmental history. The movement and development of individual and collective imagination are expressed in rhythms and languages that do not lend themselves to abstract modeling.

This consideration requires a critical evaluation of the model proposed in this paper. To address this issue, we propose an open and flexible reading of the generalizations introduced so far. What is relevant in the model outlined are mainly the questions with which teachers can be supported in a critical and systemic reflection about imagination and educational design. On the other hand, the available alternatives presented in response can be neither definitive nor exhaustive. The very logic of IE requires teachers and learners to be involved in original and personal acts of creative expression, and thus, they can benefit from guidelines only as long as they are left free to twist them. More than anything else, one can think of the contribution of the present work as a platform for dialogue, around which IE theorists and practitioners can draw on a shared conceptual grammar to compare and contaminate the creative outcomes of their research and teaching activities. As an implicit condition of this open dialogue, the same questions and models accepted as standard references always remain, in principle, modifiable and negotiable.

Instead, the broader sense of *community* opens up a field of critical reflection in which IE can add an original perspective concerning Activity Theory's premises of dialectical materialism. Suppose one expands the contextuality of educational design to the set of rules, values, and expectations that act in and around the classroom due to its connection to other educational systems and society as a whole (Hedegaard, 2014). In that case, one must also consider a potentially critical aspect, namely the subversive potential of imaginative activities. From the earliest form of pretend play to the most sophisticated levels of ironic understanding, imagination allows rethinking what is seen and what is known differently (Egan, 1997). Within this virtual space of possibility, human beings learn to reshape and criticize reality, which only sometimes leads to a harmonious integration with their social and cultural context.

Egan's theory, on closer inspection, constitutes a perfect example of how this pristine human capability can be cultivated in educational contexts precisely to best meet society's demands. Indeed, it could be argued that a form of schooling that is insensitive to the imaginative expression of students or, at most interested in the colonization of their imagery is mainly responsible for the ineffectiveness and generalized dissatisfaction with Western educational institutions (Fried, 2005).

On the other hand, imagination based CLES can easily open up spaces of conflict and laceration that IE prevents from being ignored or neglected. Indeed students, as a natural consequence of their imaginative engagement, can generate ideas that question more or less radically the way culture is shared and transmitted in school or even the ultimate aims to which the school itself, as a social institution, is expected to respond. In this sense, IE is an excellent reminder that, even in formal education, choices are not necessarily entrusted to teachers only. In Activity Theory terms, the object of learning can be identified by students themselves or can be the result of co-planning within another system of activity expressly directed to the political negotiation of education and its aims (Cole, 2022).

Nevertheless, just as naturally, teachers personally involved in an ongoing process of IE can also easily experience ruptures between their own criteria for educational design and intervention and the existing set of expectations, rules, values, and beliefs that revolve around the school system of which they are a part and which,

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

professionally, they represent. Moving consciously within these tensions cannot be optional for IE. Teacher education informed by this theory can also be seen as a challenge, or as an ongoing exercise, of active participation in the democratic development of school education (Biesta, 2015).

4. Conclusion

> Applying Activity Theory to analyze real-world situations with the goal of designing CLESs involves examining and processing several factors: the activity structures involved by the work; the tools, rules, and symbols systems that mediate that work; and the social and conceptual context in which that work occurs. (Jonassen & Rohrer-Murphy, 1999, p.78)

This article has reflected on these factors, and their dynamic connection, from an educational perspective that aims to engage and develop imagination. The result was an educational design framework that can also work as a platform for comparison and discussion for theorists and practitioners who consider imagination as a resource to be effectively engaged in formal educational systems. At the same time, this perspective on school education proved helpful in addressing several critical aspects of the contemporary debate about the meaning of instructional design and the role of teachers who are required to perform it.

[i] As Egan himself recognized (Egan, 2001), the term is problematic because it does not account for imagination's sociocultural and non-cognitive dimensions. The dynamic of development by internalization of social practices also needs to be captured by the term. The search for an expression, or at least a broader network of expressions, that can synthesize all these aspects in the context of Education, is still an open issue in IE research.

[ii] We refer specifically to the IERG Group, which later developed into CIRCE. For more precise references, see: https://circe-sfu.ca/ (Last accessed on 23/06/2023)

[iii] Naturally, it is possible to imagine further developments for multiple learning groups and school institutions taken as a whole. However, for this paper, which aims to create the first connection between IE and Educational Design through Activity Theory, it is sufficient to start from the classroom level, taken as a unit of analysis.

[iv] https://ashmolean.web.ox.ac.uk/files/learnpdfthinkofthepossibletoolkitpdf (Last accessed on 23/06/2023).

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

References

Abraham, A. (2016). The imaginative mind. *Human brain mapping*, *37*(11), 4197–4211. https://doi.org/10.1002/hbm.23300

Baldacci, M. (2009). La ricerca pedagogica e la logica della complessità. *Encyclopaideia: Rivista di Fenomenologia, Pedagogia, Formazione, 13*(26), 29-36.

Bagley, M. T., & Hess, K. K. (1987). *200 Ways of using imagery in the classroom*. Trillium Press.

Biesta, G. J. (2015). *Beyond learning: Democratic education for a human future*. Routledge.

Bland, D. (Ed.). (2016). *Imagination for inclusion: Diverse contexts of educational practice*. Routledge.

Chodakowski, A., Egan, K., Judson, G. C., & Stewart, K. (2010). Some neglected components of teacher education programs. *Action in Teacher Education*, *32*(5–6), 5–21. https://doi.org/10.1080/01626620.2011.10519470

Cives, G. (2008*). L'«educazione dilatatrice» di Maria Montessori*. Anicia.

Cole, M. (Ed.). (2022). *Education, equality and human rights: Issues of gender, 'race', sexuality, disability and social class*. Taylor & Francis.

Corni, F., & Fuchs, H. U. (2020). Primary physical science for student teachers at kindergarten and primary school levels: Part I—Foundations of an imaginative approach to physical science. *Interchange*, *51*(3), 315–343. https://doi.org/10.1007/s10780-019-09382-0

Corni, F., & Fuchs, H. U. (2021). Primary physical science for student teachers at kindergarten and primary school levels: Part II—Implementation and evaluation of a course. *Interchange, 53(2),203-236.* https://doi.org/10.1007/s10780-021-09424-6

Craft, A., Cremin, T., Hay, P., & Clack, J. (2014). Creative primary schools: Developing and maintaining pedagogy for creativity. *Ethnography and Education, 9*(1), 16–34. https://doi.org/10.1080/17457823.2013.828474

Davydov, V. V. (1982). Ausbildung der LerntatigkIEt [Development of learning activity]. In V. V. Davydov, J. Lompscher, & A. K. Markova (Eds.), *Ausbildung der Lerntatigkeit bei Schulern* (pp. 37-44). Volk und Wissen.

De Bono, E. (1992). *Serious creativity*. HarperCollins.

Eberle, B. (1996). *Scamper on: Games for imagination development.* Prufrock Press Inc.

Egan, K. (1992). *Imagination in teaching and learning*. University of Chicago.

Egan, K. (1997). *The educated mind: How cognitive tools shape our understanding*. University of Chicago.

Egan, K. (2002). *Getting it wrong from the beginning: Our progressivist inheritance from Herbert Spencer, John Dewey, and Jean Piaget*. Yale University Press.

Egan, K. (2013). *Imagination in teaching and learning: Ages 8 to 15*. Routledge.

Egan, K., & Judson, G. (2016). *Imagination and the engaged learner: Cognitive tools for the classroom*. Teachers College Press.

Egan, K., Cant, A. I., & Judson, G. (Eds.). (2013). *Wonder-full education: The centrality of wonder in teaching and learning across the curriculum*. Routledge.

Engeström, Y., & Sannino, A. (2021). From mediated actions to heterogeneous coalitions: Four generations of activity-theoretical studies of work and learning. *Mind, Culture, and Activity, 28(1*), 4-23. https://doi.org/10.1080/10749039.2020.1806328

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

Ferholt, B., Lecusay, R., Rainio, A. P., Baumer, S., Miyazaki, K., Nilsson, M., & Cohen, L. (2021). Playworlds as ways of being, a chorus of voices: Why are playworlds worth creating? The Playworld of Creative Research. *Cultural-Historical Psychology, 17(3)*, 95–103. https://doi.org/10.17759/CHP.2021170313

Fettes, M. (2010). The ties that bind: How imagination grasps the world. In M. N. Simonton (Ed.), *Engaging imagination and developing creativity in education* (pp. 2-16). Information Age Publishing.

Fischer, G. (2004). Social creativity: Turning barriers into opportunities for collaborative design. In *Proceedings of the eighth conference on Participatory design: Artful integration: interweaving media, materials and practices-Volume 1* (pp. 152–161). Association for Computing Machinery. https://doi.org/10.1145/1011870.1011889

Fleer, M. (2015). Developing an *assessment pedagogy*: The tensions and struggles in re-theorising assessment from a cultural–historical perspective. *Assessment in Education: Principles, Policy & Practice*, *22*(2), 224-246. https://doi.org/10.1080/0969594X.2015.1015403

Fried, R. L. (2005). *The Game of School: Why we all play it, how it hurts kids, and what it will take to change it*. Jossey-Bass.

Gajdamaschko, N. (2005). Vygotsky on imagination: Why an understanding of the imagination is an important issue for schoolteachers. *Teaching Education*, *16*(1), 13-22.

Glăveanu, V. P. (2015). Creativity as a sociocultural act. *The Journal of Creative Behavior*, *49*(3), 165-180. https://doi.org/10.1002/jocb.94

Glăveanu, V. P., Hanchett Hanson, M., Baer, J., Barbot, B., Clapp, E. P., Corazza, G. E., ... & Sternberg, R. J. (2020). Advancing creativity theory and research: A socio-cultural manifesto. *The Journal of Creative Behavior*, *54*(3), 741-745. https://doi.org/10.1002/jocb.395

Guilford, J. P. (1967). *The nature of human intelligence*. McGraw-Hill.

Hakkarainen, P., & Bredikyte, M. (2008). The zone of proximal development in play and learning. *Cultural-Historical Psychology*, *4*(4), 2-11.

Harris, P.L. (2000). *The work of the imagination*. Blackwell Publishing.

Harris, P. L. (2021). Early constraints on the imagination: The realism of young children. *Child Development, 92*(2), 466– 483. https://doi.org/10.1111/cdev.13487

Harwood, V. (2010). The place of imagination in inclusive pedagogy: Thinking with Maxine Greene and Hannah Arendt. *International Journal of Inclusive Education*, *14*(4), 357–369. https://doi.org/10.1080/13603110802504572

Hedegaard, M. (2022). *Learning and child development*. Aarhus University Press. https://doi.org/10.14393/obv3n3.a2019-51704

Jay, J. K., & Johnson, K. L. (2002). Capturing complexity: A typology of reflective practice for teacher education. *Teaching and Teacher Education*, *18*(1), 73–85.

Jeffrey, B., & Craft, A. (2004). Teaching creatively and teaching for creativity: Distinctions and relationships. *Educational Studies, 30*(1), 77–87. https://doi.org/10.1080/0305569032000159750

Jonassen, D. H., & Rohrer-Murphy, L. (1999). Activity theory as a framework for designing constructivist learning environments. *Educational Technology Research and Development*, *47*(1), 61-79.

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

Judson, G. (2017). Re-imagining relevance in education. In A. Kind (Ed.), *Creative Dimensions of Teaching and Learning in the 21st Century* (pp. 47–57). Brill.

Karwowski, M., & Soszynski, M. (2008). How to develop creative imagination? Assumptions aims and effectiveness of Role Play Training in Creativity (RPTC). *Thinking Skills and Creativity, 3*(2), 163–171. https://doi.org/10.1016/j.tsc.2008.07.001

Kind, A., & Kung, P. (Eds.). (2016). *Knowledge through imagination*. Oxford University Press.

Kuhn, T. S. (1970). Logic of discovery or psychology of research. In I. Lakatos & A. Musgrave (eds.), *Criticism and the Growth of Knowledge* (pp. 1-23). Cambridge University Press.

Illeris, K. (Ed.). (2018). *Contemporary theories of learning: Learning theorists in their own words* (2nd ed.). Routledge. https://doi.org/10.4324/9781315147277

Larrivee, B. (2000). Transforming teaching practice: Becoming the critically reflective teacher. *Reflective practice*, *1*(3), 293–307. https://doi.org/10.1080/713693162

Leont'ev, A. N. (1974). The problem of activity in psychology. *Soviet Psychology*, *13*(2), 4-33.

Leont'ev, A. N. (1978). *Activity, consciousness, and personality*. Prentice-Hall.

Leont'ev, A. N. (1981). *Problems of the development of the mind*. Progress.

Lillard, A.S. (2013). Playful learning and Montessori education. *Namta Journal*, *38*(2), 137-174.

Lorenzoni, F. (2014). *I bambini pensano grande. Cronaca di una avventura pedagogica*. Sellerio Editore.

McKenzie, M., & Fettes, M. (2002). *A case study of educational change: Egan's framework and the praxis of teaching.* Simon Fraser University.

Miyazaki, K. (2015). Let's make the familiar term "imagination" strange: Generating the world not there or exploring the real world. [Paper presentation]. *International Conference of Imagination and Education 2015,* Vancouver, Canada. https://ierg.ca/how-we-can-help/conferences/conference-archives/

Miyazaki, K. (2019). Dialogic lessons and triadic relationships among pupils, learning topic, and teacher. *Dialogic Pedagogy*, p. 7, A58–A88. https://doi.org/10.5195/DPJ.2019.239

Osborn, A. F. (1963). *Applied imagination* (3rd ed.). Scribner's.

Piaget, J. (1962). *Play dreams and imitation in childhood*. W.W. Norton.

Pitta-Pantazi, D., Christou, C., Demosthenous, E., Pittalis, M., & Shimoni, M. (2022). Nurturing mathematical creativity for the concept of arithmetic mean in a technologically enhanced 'personalized mathematics and mathematics inquiry learning environment. *ZDM–Mathematics Education*, *54*(1), 51–66. https://doi.org/10.1007/s11858-021-01308-4

Polly, D., Allman, B., Casto, A., & Norwood, J. (2017). Sociocultural perspectives of learning. In R. West (Ed.), *Foundations of learning and instructional design technology* (pp. 151-166). EdTech Books.

Pramling, N., Wallerstedt, C., Lagerlöf, P., Björklund, C., Kultti, A., Palmér, H., Magnusson, M., Thulin, S., Jonsson, A. & Pramling Samuelsson, I. (2019). *Play-responsive teaching in early childhood education*. Springer Nature.

Rodari, G. (2001). *Grammatica della fantasia*. Einaudi.

Root-Bernstein, M. (1999). *Sparks of genius: The 13 thinking tools of the world's most creative people*. Houghton.

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND

Sannino, A. (Ed.). (2015). The emergence of transformative agency and double stimulation: Activity-based studies in the Vygotskian tradition. *Learning, Culture, and Social Interaction*, 4(1), 1-3) http://dx.doi.org/10.1016/j.lcsi.2014.07.001

Sannino, A. (2022). Transformative agency as warping: How collectives accomplish change amidst uncertainty. *Pedagogy, Culture & Society, 30*(1), 9–33. https://doi.org/10.1080/14681366.2020.1805493

Siraj-Blatchford, I. (2009). Conceptualizing progression in the pedagogy of play and sustained shared thinking in early childhood education: A Vygotskian perspective. *Education and Child Psychology, 26* (2), 77-89.

Smolucha, F. (1992). A reconstruction of Vygotsky's Theory of Creativity. *Creativity Research Journal, 5*(1), 49–67. https://doi.org/10.1080/10400419209534422

Taylor, I. A. (2017). *Perspectives in creativity*. Routledge.

Thomas, N. J. T. (1999). Are theories of imagery theories of imagination? An active perception approach to conscious mental content. *Cognitive Science, 23(2),* 207–245.

Van Manen, M. (2016). *The tact of teaching: The meaning of pedagogical thoughtfulness*. Routledge.

Van Oers, B. (2015). Implementing a play-based curriculum: Fostering teacher agency in primary school. *Learning, Culture, and Social Interaction, 4(1),* 19–27. https://doi.org/10.1016/j.lcsi.2014.07.003

Vygotsky, L. S., & Cole, M. (1978). *Mind in society: Development of higher psychological processes*. Harvard University Press.

Vygotsky, L. S. (1997). *The collected works of L.S. Vygotsky*, vol. 1 (R.W. Rieber & J. Wollock, eds.). Plenum Press.

Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russian & East European Psychology*, *42*(1), 7-97. https://doi.org/10.1080/10610405.2004.11059210

Alessandro Gelmi è dottorando in Pedagogia generale, Pedagogia Sociale, Didattica generale e Didattica disciplinare presso la Libera università di Bolzano/Bozen e visiting research student presso la Simon Fraser University di Vancouver. I suoi interessi di ricerca riguardano i temi dell'immaginazione e della creatività nella progettazione didattica e nella formazione degli insegnanti, con particolare attenzione al contesto della scuola primaria.
Contatto: algelmi@unibz.it

DOI: https://doi.org/10.6092/issn.1970-2221/15976

(cc) BY-NC-ND