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Creative Pedagogy: Objective Foundations and Impact of the Intelligent Project

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Abstract
The quest for consensus on creativity poses significant challenges for educational practitioners, grappling with intellectually elusive concepts lacking unified and exhaustive definitions. Undoubtedly, this can impede the adoption and practical implementation of any creative pedagogical approach. The study asserts that the intelligent project aims to establish an intellectual, organizational, and technical framework conducive to pedagogical creativity, elucidating simplicity amidst the apparent complexities of learning issues. Thus, the objective is to address pedagogical creativity as a societal concern, exploring the intellectual tensions surrounding its integration within the learning paradigm. This research endeavors to address this issue while encouraging exploration beyond the traditional boundaries of the creative process. Moreover, it strives to analyze the pivotal role of the intelligent project in the success of each creative pedagogical approach. The study's methodology transcends mere descriptive analysis to embrace a pragmatic approach grounded in an objective assessment of tangible reality, employing multidimensional reasoning. It concludes that promoting creative pedagogy necessitates assuming increasingly tailored roles to meet intellectual, organizational, technical, social, and cultural demands. Consequently, the intelligent project emerges as a pivotal mechanism to achieve this transformative objective.
Keywords: Complexity, creativity, creative pedagogy, intelligent project, organization

ملخص
إنّ البحث عن توافق حول الإبداع لا يخلو من تقديم جملة من الصعوبات للفواعل البيداغوجية، فكيف باستيعاب مفاهيم فكرية يظهر أنها لم تستقر بعد على معنى موحد شامل. ولا شك أنّ هذا من شانه أن يضع عقبات أمام كل مقاربة بيداغوجية إبداعية وإمكانية تطبيقها الميداني. تنطلق الدراسة من فرضية أساسية تفيد، أنّ المشروع الذكي يساهم في توفير حاضنة فكرية، تنظيمية، وتقنية للإبداع البيداغوجي، ويساهم في كشف المعنى البسيط في التعقيد الظاهرة للمشكلات التعليمية والتربوية. ومن تمّ تهدف إلى التعامل مع الإبداع البيداغوجي باعتباره مشكلة اجتماعية، تقف على تجاذبات فكرية حول شروط ومتطلبات تفعيلها في معادلة التعليم والتعلم، وعلاوة على ذلك، تسعى لتحليل الدور الحيوي للمشروع الذكي في نجاح كل نهج تعليمي إبداعي.منهجية الدراسة تتخطى مستوى الوصف إلى مقاربة براغماتية تستند على قراءة موضوعية للواقع الملموس مع استحضار منطق متعدد الأبعاد، وقد انتهت إلى أنّ البيداغوجيا الإبداعية تستلزم ضرورة لعب ادوار جديدة بأبعاد تتجه أكثر فأكثر لتكون بواجهة فكرية، تنظيمية، تقنية، اجتماعية وثقافية، ولسوف يعمل المشروع الذكي كأداة احتواء لها.
الكلمات المفتاحية: تعقيد، إبداع،إبداعبيداغوجي،مشروع ذكي، تنظيم.

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Introduction

The quest for a precise definition of creativity in the field of pedagogy and education proves to be fraught with considerable challenges for both teachers and learners. This is especially true when it comes to grasping intellectual concepts that still lack a unified and comprehensive meaning. Undoubtedly, these constitute major obstacles to any innovative pedagogical approach and its practical implementation.

This concise presentation reflects the inherent challenges of understanding creativity within the context of learning and teaching. It also brings to mind a study conducted by Labelle (2001), highlighting stylistic variations in perceptions of creativity among teachers and students. This underscores the urgent need for a framework capable of embracing the apparent complexity of creativity from various perspectives, before considering any new pedagogical approach.

In the realm of educational theory, the challenge of creativity lies not merely in assimilating its facets but in providing them with a robust framework. Our inquiry thus gravitates towards an innovative project approach, envisaged as a fluid, adaptive system navigating the complexities inherent in creative dynamics. This methodology responds to the multifaceted nature of creativity, intersecting realms of socio-cognitive, psycho-pedagogical, and emotional-environmental domains (Puozzo, 2016). The project's significance is underscored within pedagogical discourse, particularly as it resurges alongside renewed interest in its potential to foster interactive, cohesive environments conducive to profound knowledge construction.

The concept of the intelligent project as a creative approach inherently presents a complex social issue, encompassing philosophical, organizational, cultural, and technological dimensions. It sparks intellectual debates on the conditions and requirements for its implementation in the realm of teaching and learning, implicitly underpinning a scientific understanding. This reflection leads us to pose the following question: What are the essential objective conditions required to realize a creative pedagogical approach, and what specific role does the intelligent project play within this framework?

The primary objectives of this research are threefold. First, the study aims to advance the discourse on creative pedagogy by investigating the objective conditions required for an innovative approach within a project-based learning framework. Second, it seeks to elucidate the role of the intelligent project in the construction of meaning and the stimulation of creativity within the teacher-learner dynamic. Third, this interdisciplinary research endeavors to propose a novel model by addressing the challenges inherent in creative pedagogy, thereby providing a fresh perspective for those engaged in pedagogical creativity.

The significance of this study becomes evident when considering the complexity involved in integrating creativity within the educational context. It offers a profound understanding of the necessity for multidimensional change to effectively support and stimulate creativity in educational practice.

In this regard, the study argues that the intelligent project has the potential to provide an intellectual, organizational, and technological framework that fosters pedagogical creativity, while also uncovering the deeper meaning behind the apparent complexity of educational and pedagogical issues.

Literature Review

Creativity emerges in the contemporary educational landscape as a crucial variable in the equation of teaching and learning, pushing students beyond the traditional boundaries of education. The approach adopted must be situated within a dynamic of pedagogical and educational change (Bettayeb et al., 2023). Creative pedagogy thus becomes the essential fuel that drives curiosity, innovation, and intellectual flexibility. However, these pedagogical transformations cannot occur in isolation from the intellectual, organizational, and technical framework that encompasses them within the multiple dimensions of creativity.

At the intersection of pedagogy and creativity, the study unveils a significant reality: not only a decline in students' creative capacities but also an increased difficulty in effectively assimilating innovative pedagogical approaches (Lubart, 2003; Robinson & Aronica, 2013). This finding necessitates a redefinition of creative thinking as a capacity to function transversally, integratively, and interdisciplinary (Puozzo, 2016). Such a redefinition elucidates the inherent balances within the paradoxes of creative pedagogy, while underscoring the pivotal role of intelligent projects in fostering learners' self-esteem and self-confidence through the integration of personal projects within a collective dynamic (Beauvais-Chevalier & Bourret, 2018), within the context of a learning organization (Bettayeb et al., 2023). Additionally, a recent study published in the *Journal of Creativity* raises the issue of students' capacity to enhance their creative thinking by utilizing artificial intelligence tools, rather than merely employing them to obtain answers (Boulord et al., 2024; Habib, 2024;).

To gain a better understanding of students' perspectives on the use of AI in educational environments, Life Bloom Academy has also developed an interdisciplinary action research activity for middle school students, exploring the impact of AI on critical thinking and ethics. The project has assisted students in comprehending AI and its implications, focusing on both its potential and ethical issues (Caucheteux et al., 2024).

It is therefore imperative to achieve a sufficiently consensual convergence on the concept of creativity within the educational field while aligning with the broader context in which it is situated, particularly as reflected in the philosophical spirit that has shaped it. As Gasset(1937) pointed out: “Those who sincerely seek the truth should not limit themselves to a particular science, as sciences are interdependent and mutually supportive; they should rather focus on increasing the natural illumination of their work”(As cited in Morin, 2009,p. 73). Consequently, traditional school organizations, centered on the principle of specialization, represent the primary obstacle to creativity. In contrast, contemporary educational approaches place creative pedagogy at the core of the learning process, encouraging students to transcend traditional boundaries through curiosity, innovation, and intellectual development.

These observations highlight the necessity of integrating creativity, which can only emerge within a specific environment. Indeed, an individual becomes creative by mobilizing a range of diverse social factors (Filteau, 2010). It is well established that creativity involves transcending contradictions; it is primarily a renewed mode of perception that provides the individual with the sense that life is worth living. What opposes this mode of perception is a relationship of conformity and submission to external reality, where the world and all its elements are acknowledged only as objects to be adapted to and accommodated (Souvignet, 2023; Winnicott, 1971). Thus, creative pedagogy represents transcendence rather than mere conformity to the existing educational system.

Creative pedagogy demands a qualitative leap in the relationship between teacher and learner, revealing a complex and ambiguous combination that mediates the simplicity of the creative idea. To achieve a deep understanding of this advanced and creativity-rooted combination, the study adopts a convergence approach between the intelligent project, as an integrative system of intellectual, organizational, and technical support, and the model of creative pedagogy proposed by (Filteau, 2012). This convergence is by no means a descriptive and simplistic approach; rather, it highlights the need for a rigorous organizational methodology to establish a consensus on the nature of creativity and the methods for its implementation in the pedagogical process. Figure one provides an overview of this convergence.

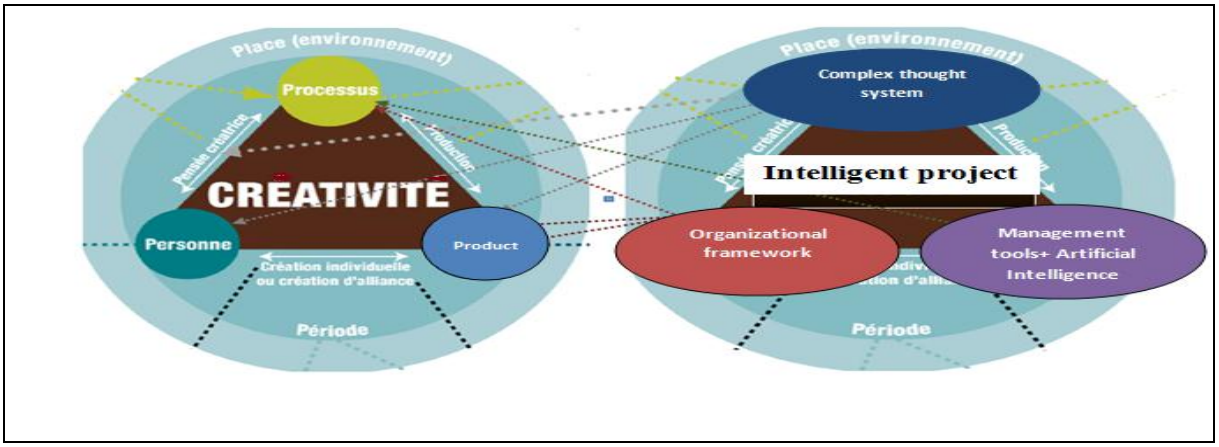

Figure 1. Convergence between intelligent project and creative pedagogy (Adopted from Filteau, 2012, p. 26)

The development and optimization of creative pedagogy require the active engagement of both teachers and students within the framework of the training and teaching project. This involves establishing an organizational framework that recognizes and values the contributions of each participant in the educational environment, as well as a technical framework for effectively monitoring and managing the educational process. A recent study by Isha Beaulé et al. (2024) confirmed the methodological importance of social, organizational, and technical dimensions in ensuring the sustainability of any educational project.

The philosophy of creative pedagogy and its underlying significance must be explored beyond the general concept of the intelligent project, due to the absence of precise and consensual methods for fostering creativity (Pinillos & Vallverdú, 2021). The intelligent project thus presents itself as a sophisticated organizational and technical framework, both adaptable and focused on a qualitative interaction between humans and machines. It can integrate interactions and anticipate possible events within the pedagogical process, thereby steering activities towards creative objectives. It is undeniable that the pedagogical process requires strategies that facilitate and stimulate creativity.

Methods and Materials

To achieve the objectives of this study, a systemic approach was adopted to examine the essential interactions within the context of pedagogical creativity in relation to the emergence of an intelligent project. This perspective leads to the conceptualization of pedagogical

creativity as the outcome of a learning process supported by an organizational and technical framework.

Systemic Analysis

The method begins with a systemic analysis, which includes the development of a conceptual model of pedagogical creativity. This model, inspired by the work of Filteau (2010) and the dimensions of the intelligent project, aims to identify and analyze the interactions among the different dimensions of the project, encompassing intellectual, organizational, and technological aspects. Additionally, an interaction mapping was established to represent the flow of information and the relationships between the various actors and elements of the intelligent project, thereby facilitating the evaluation of these interactions' effects on the creative process.

Organizational and Technical Framework

Regarding the organizational and technical framework, an evaluation of existing structures and practices was conducted to determine the most favorable conditions for creativity. Technological tools, such as project management tools (integrated engineering, project dynamics) and creativity techniques (creative learning spiral), were integrated to support the creative process and effectively organize pedagogical activities.

Pragmatic Approach and Multidimensional Logic

The pragmatic approach facilitated the collection of empirical data through case studies, direct observations, and a literature review to define terms precisely and avoid ambiguity. This data collection aims to objectively evaluate the impact of the proposed framework on pedagogical creativity. A pragmatic analysis of the data was then conducted to assess the effectiveness of the organizational and technical framework, with a focus on the tangible results obtained. Special attention was given to balancing clear presentation with a thorough exploration of concepts, ensuring a comprehensive understanding while avoiding superficiality.

Finally, a multidimensional logic was applied to coherently integrate the various dimensions of the intelligent project, providing a comprehensive overview. This approach allows for the consideration of diverse aspects of pedagogical creativity and the evaluation of their interactions. Through these tools and methods, an objective and rigorous assessment of how the intelligent project can foster pedagogical creativity was provided, adhering to scientific standards of analysis and presentation.

Results

This study focused on the interconnection between creative pedagogy and the development of an intelligent project while emphasizing the importance of creative thinking, organizational structure, and technical proficiency in the creative process. Crucial functions such as managing the creative process and evaluating creativity still largely depend on the contributions of teachers.

Creative Thought: A Complex Form of Thinking

The nature of pedagogical thought does not stray far from general thought when it strives to negate complexity. Historically, educational perception and practices have relied on a model of information transmission and a methodical dissociation of its elements, essentially denying the inherent complexity in the learning process. This paradigm is characterized by the pursuit of coherence and clarity, seeking to overcome contradictions and ambiguities, where

objectivity is upheld as the sole path to achieving educational objectives. This approach inevitably fosters fragmented conceptions of the relational dynamics among teachers, students, and their environment, reducing teaching to a set of laws and principles that limit thinking and stifle creativity.

However, what may be perceived as a questioning of the innovative capacity of contemporary students finds its explanation in dysfunction or impasse within the global system of thought. Modern education seems to be caught in a cycle of knowledge reproduction rather than creation. The findings of the Congress of Social Sciences and Humanities held in Doha in 2019 perfectly illustrate that investigating the same subject within the same paradigm, despite the diversity of scientific, technical, and experimental disciplines, often leads to surprisingly similar results, sometimes bordering on redundancy. The true significance of creative pedagogy emerges beyond this impasse, by recognizing the imperative need to renew the conceptual framework that governs our thinking.

The essence of creativity truly emerges in the materialization of ideas and images that arise from the mind, underscoring the significance of the personal dimension in the creative process. Yet, it is crucial to recognize that creativity is not simply a sudden burst of inspiration affecting certain individuals, but rather a deeply embedded manifestation shaped by the social context from which the creative individual derives their substance.

Hence, the intelligent project emerges as a socially intense system, capable of providing an environment conducive to the flourishing of creative pedagogy. By redefining traditional frameworks and methods, we can hope to overcome current obstacles and foster a true renaissance of innovation in education.

It is therefore crucial to understand creativity from a deep philosophical perspective. Creativity is not limited to the act of creating something from nothing but also encompasses the ability to compose something new from preexisting elements. From this viewpoint, creativity is linked to an individual's capacity to imagine and conceive a set of deficiencies which, once perceived, give birth to the creative idea.

Creativity thus becomes both self-awareness and awareness of the problem, facilitated by emotional interactions with the latter. This is highlighted in the study by (Verzatet al., 2016), the findings of which are summarized in the following figure:

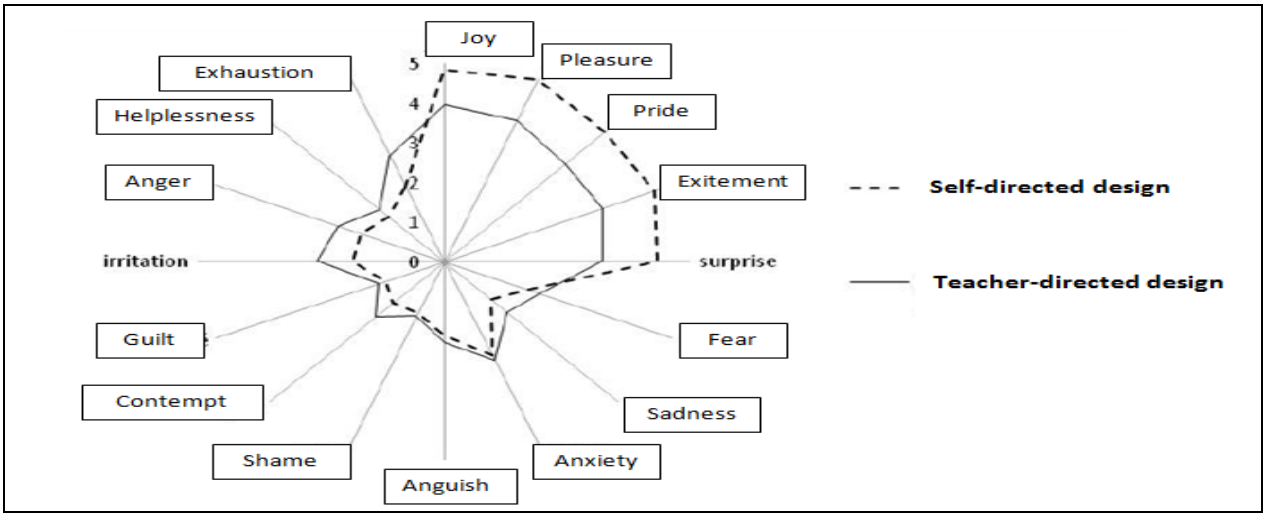

Figure 2. Emotions expressed by students according to the pedagogical approach (Adopted from

Verzat et al., 2016, p. 44)

From the emotional system, we can only retain the observation that there may be a strong connection between the mode adopted in the pedagogical process and a set of emotions that stimulate creativity (joy, desire, pride, excitement, surprise, tension) and others that inhibit it (fear, anger, fatigue, helplessness, guilt, indifference).

We must also relate this reality to one of the main characteristics of the project by imposing an irreversible temporality (as illustrated in Figure Three), where emotions blend with the necessity to create knowledge. Knowledge multiplies inversely proportional to time based on the large number of options available to students at the beginning of the pedagogical project. These options decrease as the student's knowledge level increases, thereby increasing the chances of transformation into a creative idea.

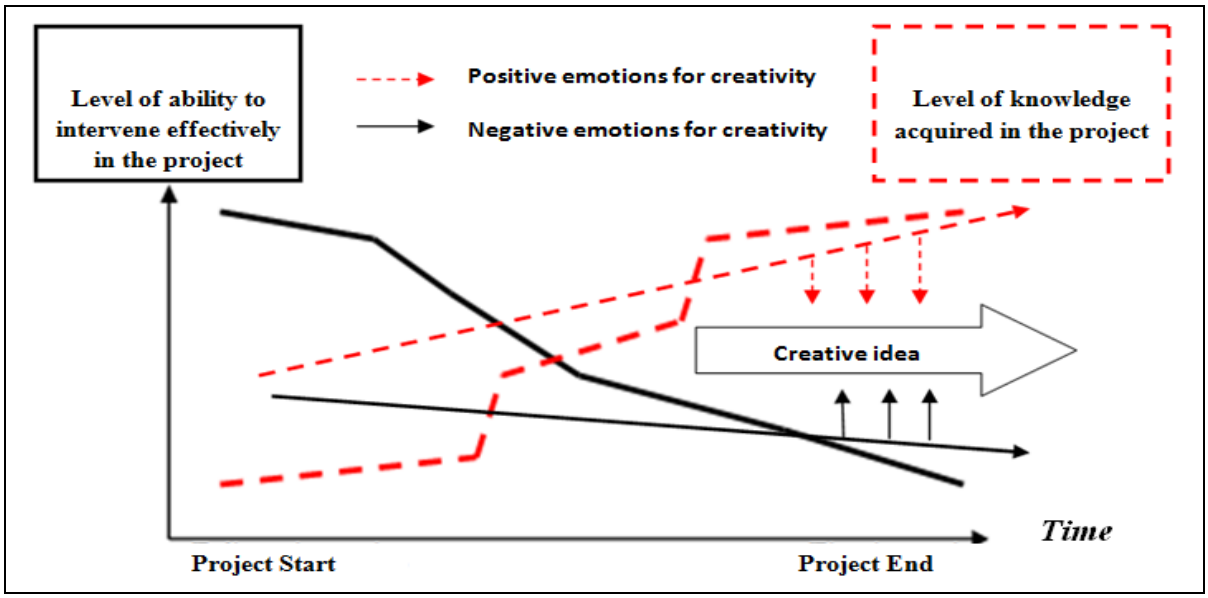

Figure 3. Complex combination in an irreversible temporality
(Adapted from Giard& Midler, 1996, p. 4)

It will become evident that the intelligent project, particularly when associated with artificial intelligence tools, essentially constitutes a conceptual model based on the synthesis of multiple variables and data derived from the educational environment specific to the teacher-student relationship. There is almost unanimous consensus around the idea that creativity is the result of a unique combination leading to remarkable outcomes. Concurrently, artificial intelligence tools enhance combinatorial capabilities from a cross-sectional and interdisciplinary perspective, transcending and surpassing the organizational boundaries of the educational institution.

The Organizational Inclusion of Creative Approach: A Systemic Analysis

Creative thinking merely reiterates, in a new form, a complex combination of knowledge, ideas, perspectives, emotions, attitudes, and behaviors within a context of systemic interactions aimed at achieving exceptional results. These interactions do not arise spontaneously but within a consciously and intrinsically organized framework. It appears that creative pedagogy seeks to transcend dominant technical logic to embrace complexity by

integrating creative thinking, constraint management, decision-making, foresight, and project management (Didier & Bonnardel, 2020).

It is crucial to note here that creativity is not an inevitable outcome whose content can be predicted, but it can nevertheless be structured to increase the likelihood of its emergence, as evidenced by numerous concrete examples.

A study conducted by Amabile (1988) with 120 researchers and technicians working in research and development across 20 different sectors asked them to describe a creative event and a non-creative event, while independent observers coded the interviews. The analysis of these interviews revealed three fundamental components of individual creativity, regardless of the sector:

1. Domain-relevant skills: technical knowledge, specialized skills.
2. Creativity-relevant skills: complex thinking, open-mindedness, perseverance, risk-taking, expertise, a certain form of constructive disregard, and social competence.
3. Intrinsic motivation: determined by the motivations that drive the pursuit of an activity, such as the love of challenge and exploration.

These three components can only be united under the aegis of a role that symbolizes a set of behaviors, situations, motivations, and goals expected of a particular person or group within a global system. This cannot be anticipated in an effective creative pedagogical approach without a facilitating organizational framework that charts a clear path for each actor within a logical and intentional sequence. The absence of a detailed vision of the creative process in the mind of the teacher or educator often leads them to overlook important aspects of the creative process from the student's perspective, a gap that also applies to the student when lacking clear guidelines to understand their role and the expectations imposed on them (Gosselin, 2006; Marceau, 2012).

From this perspective, it becomes essential to conceptualize the framework of the teacher-student relationship, encompassing the global system, context, inputs, outputs, actors, environment, problem, choices, and temporal framework. Indeed, creative pedagogy is not limited to a routine teaching process but rather emerges from the interactions and conscious emotions that shape the intellectual and material conditions necessary for each actor's contribution. By co-creating these conditions, they also foster the emergence of creativity. A visual representation of this idea can be seen in Figure Four.

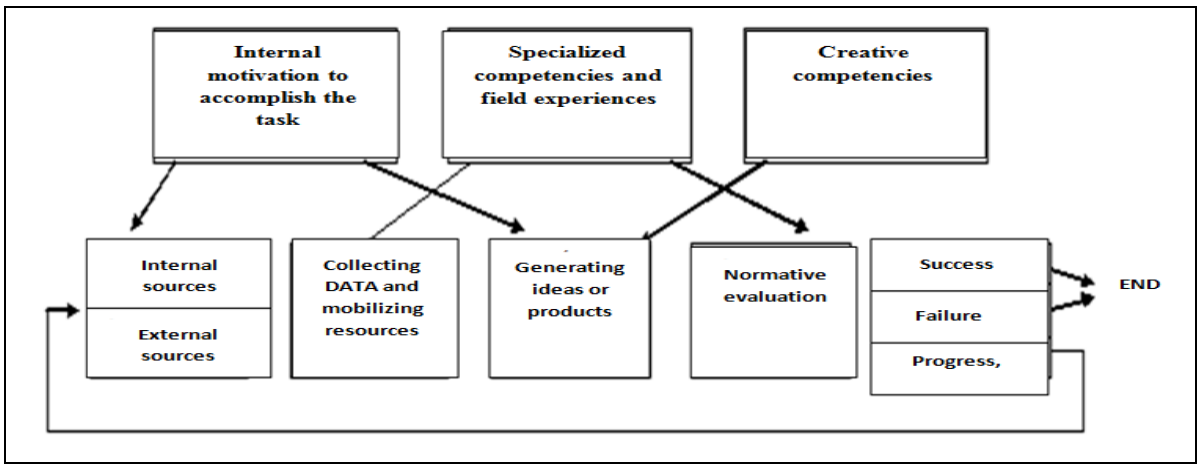

*Figure 4.*Model of creativity components (Adopted from Amabile, 1988, p. 126)

The law of pedagogical creativity is therefore an essential condition for the dynamics of the teacher-student relationship, and the effectiveness of creative action in this context fundamentally rests on the ability to establish connections between ideas and organization. This dynamic of connection will necessarily include the issue of defining the roles assigned to each participant. In the absence of an interactive framework around a specific pedagogical problem, social and psychological motivations often find refuge outside the tensions that generate creativity. It is well known that the first act of an intelligent project is the formulation of a provisional organization guided by the completion of its internal elements and its interaction with the environment, where the implicit meaning assumes, in any creative pedagogical approach, the existence of a renewed, interactive, and flexible organizational model.

The Technical Inclusion of the Creative Approach

For value creation to be possible, a transformative context must be present, where initial perceptions formulated around a specific problem and available options transform into potential applicable solutions. Bonnardel (2009) highlighted the association between students' creative abilities to generate new ideas and the use of a variety of design-specific constraints. These constraints present intellectual challenges that must be addressed, as the goal is no longer merely to manipulate a set of information and scientific knowledge, but to uncover the underlying essence.

Thus, the creative act is configured as a transformational framework within which the pedagogical problem evolves through a logical sequence articulated with the main stages of project management methodology. Amabile (1988) defined this framework in five successive stages: problem or task formulation, preparation phase, idea generation, validation of potential solutions, and finally, the completion of the process.

During the conceptualization stage of the problem or task, it is crucial to precisely define the problem. This requires the pedagogical team to deeply analyze the situation and comprehensively understand its aspects while maintaining a balance between guiding students to understand the problem and giving them space to formulate their ideas. This thorough analysis helps to direct efforts towards creative solutions and determine the appropriate direction for the pedagogical project.

On the other hand, during the preparation phase, the team must acquire the knowledge and resources necessary to address the specified problem. This preparation involves gathering and organizing information and knowledge, which is essential to strengthen the process of idea formulation and the generation of creative solutions.

As for the idea formulation phase, it constitutes a dynamic and interactive process guided by a specific objective to achieve. This stage contributes to enriching ideas and generating new concepts while promoting collective reflection and intellectual collaboration, fundamental elements of creativity. However, it requires a certain level of intellectual maturity among members of the pedagogical team (Ohmae, 1991). It is essential in this context to master the art of choosing the right moment, as a creatively high-quality idea may prove untimely for solving a specific problem at a given time. Therefore, to foster creative thinking, it is crucial not to neglect or dismiss ideas that initially seem disconnected from the initial context.

As for the phase of evaluating potential solutions, it focuses on assessing and selecting relevant solutions, where the teacher serves as the ultimate judge of proposals. This phase

marks the culmination of the creative process, shaping a final product that realizes the aspirations of the pedagogical intervention.

Finally, the outcome represents the final product of the creative act, concretely materializing the innovative and creative solutions developed during the management process of the pedagogical project.

The initial accumulation of knowledge, ideas, and diverse viewpoints within the context of the pedagogical project truly occurs only in an environment that allows sufficient time for creative reflection (Sternberg & Williams, 1996). This cannot be fully achieved within the strict school or even university framework; however, within the context of project engineering, a solution to this problem can be found, particularly concerning integrated engineering, which acts as an organizational structure to control the technical aspects of designing and developing new products with renewed features. This evolution can be observed through the diagram below, illustrating new ideas compared to traditional project engineering (Imoudache, 2017).

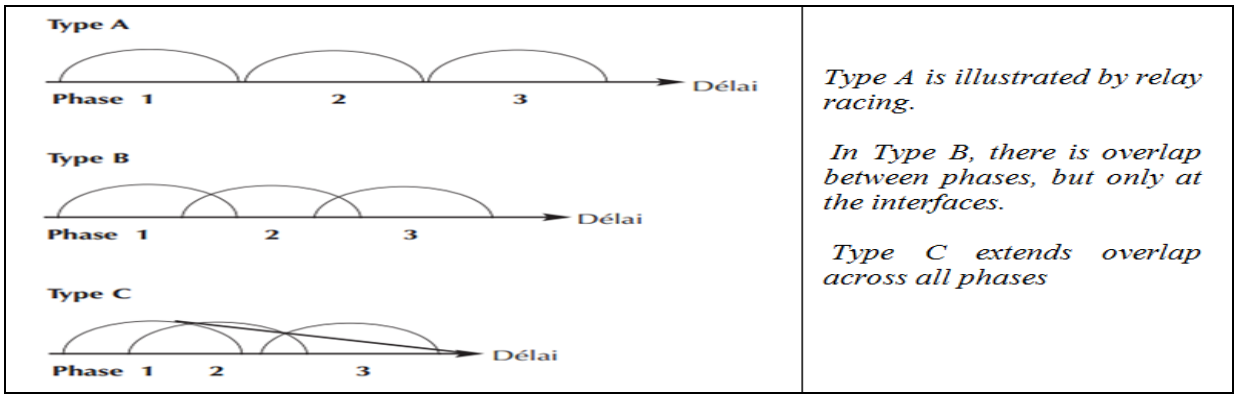

Figure 5. From sequential engineering to integrated engineering (Adopted from Garel, 2003, p. 86)

Regardless of the creative pedagogical approach chosen, the project engineering framework plays a crucial role in addressing the challenge of managing the multitude of interactions required for creativity, as well as effectively managing the temporal dimension by fostering convergence between different phases. However, all of this hinges on the pedagogical supervisor's ability to skillfully orchestrate the project.

Discussion

In a certain way, it is possible to identify an approach or model based on the objective conditions of creative pedagogy. This approach integrates modern concepts and the profound transformations occurring in education. However, according to Lin (2011) and (Bettayeb et al., 2023), there is little coherence among these approaches and strategies regarding the various aspects of stimulating creativity. Consequently, creative pedagogy must rely on an objective reading of reality and address fundamental challenges by emphasizing the relationship between creativity and the nature of thought in learners, the relationship between creativity and social and organizational aspects, as well as the necessity to keep pace with technological transformations, particularly artificial intelligence (Habib, 2024; Urmeneta & Romero, 2024).

Based on the study's hypothesis and the aspects related to creativity in its intellectual, organizational, and technological dimensions, a creative pedagogical framework is proposed

within the context of a comprehensive inclusion approach, referred to as an intelligent project. In this way, various challenges can be addressed without compromising the creative process.

The primary challenge lies mainly in integrating complexity within pedagogical thinking to stimulate creativity. The extensive exploration devoted to the issue of thought and ideas in the creativity equation, according to many researchers(Vuille et al., 2022), indicates that creative thinking is inherently complex and requires an equivalent level of complexity to be understood. According to Matlin (2001), it is an intellectual activity aimed at addressing complex problems.

This step is essential as it outlines a new conception of educational reality, asserting that knowledge acquired through interaction with the pedagogical problem surpasses that gained from mere quantitative reception of information. It implies that creativity in the relationship between teacher and learner must integrate complexity, in line with the requirements of complex thinking as defined by Morin (2009) and Genelot (2017). This approach emphasizes the articulation between global aspects and details, the necessity to move beyond restrictive thought frameworks, and the stimulation of imagination and reflection in the learner. It is also crucial to foster social relationships and intelligent systems, promote autonomy and responsibility in both teachers and learners, generate meaning and cultural values around creativity, and build the individual by recognizing that creativity emerges from the interaction between the individual and the pedagogical problem.

Thus, the intelligent project can be regarded as an open complex system (utilizing artificial intelligence tools) that conceptualizes creativity as a synthesis of contradictory elements and a restructuring of disparate phenomena to achieve an exceptional outcome (Ohmae, 1991). Consequently, creative pedagogy, if formulated solely from the perspective of either the teacher or the learner, can only provide a general indication of the path to understanding creativity while remaining distant from the inherent complexity.

The second major challenge concerns the ability to organizationally and socially frame the relationship between teachers and learners in each creative pedagogical approach. Despite the consensus among educators on the need to involve students in autonomous learning and to develop intrinsic motivation, the traditional approach continues to thrive and remains the predominant model in the field of education (Bourret et al., 2024). It has been established that the primary task of the intelligent project is to establish a temporary and targeted organization, conditioned by the completion of its internal elements and their interaction with the environment. This model entails, within each creative pedagogical approach, the existence of a renewed, interactive, and more flexible organizational framework.

The ability of the intelligent project to adapt to the cognitive contexts of both the student and the teacher relies on the capability to read and interpret complex changes in the educational environment. Artificial intelligence provides the opportunity to explore all possible connections between variables in a dataset and to reutilize them to foster creative thinking (Cornuejols et al., 2019). This enables the establishment of a priority system within the pedagogical process. This capacity is directly related to its impact on student concentration and the achievement of objectives set by the teacher, making the learner a central actor in the educational process (Malarewicz, 2019) within the framework of a collective intelligence system (Zara, 2008).

Such framing essentially constitutes a universe of useful information, where the cognitive contexts of the student are leveraged to foster creativity by controlling opinions,

attitudes, emotions, and various perceptions that guide educational behavior toward pedagogical innovation. It appears that artificial intelligence enables the teacher to supervise the cognitive structuring of the student or the environments in which the student operates, thereby influencing their ability to comprehend the creative pedagogical process(Romero et al., 2024).

The third major challenge concerns the technical aspects of creative pedagogy, where the intelligent project provides the opportunity to use a variety of tools to support the creativity of both teachers and learners. For example, Resnick's (2006) creative learning spiral, which aims to foster the emergence of ideas and projects in children, also appears relevant for highlighting creative dynamics and project dynamics at other stages of life and in different educational and pedagogical contexts (Bourret et al., 2024). The significance of the intelligent project lies primarily in its ability to provide meaning to the various actors involved in the pedagogical process and in its capacity to integrate rapid technological change.

Recommendations

A creative pedagogical approach within the teacher-student relationship necessitates assuming new roles across intellectual, organizational, technological, social, and cultural dimensions. An intelligent project will act as a dynamic intellectual catalyst, prompting the pursuit of valued human truths, uncovering structural educational gaps, and restoring clarity and balance in the teacher-student relationship. It will also contribute to overcoming challenges and managing constraints associated with the creative process. In this context, several recommendations emerge:

1. Activate social intellect in pedagogical approaches and foster openness towards others in children through transdisciplinary education.
2. Promote and value multidimensional and multipolar thinking, expanding beyond school curricula.
3. Use self-representations in students to identify their creative abilities.
4. Adopt artificial intelligence tools for intellectual, organizational, and technological facilitation of creativity.
5. Train teachers and students in project management and leadership methodology.

These recommendations aim to enrich and transform the educational experience, fostering an environment conducive to creative development and holistic learning. Creative pedagogy serves as an intellectual oasis where challenges meet opportunities for resolution. It is a realm where complexity is not only accepted but celebrated. Essentially, creative pedagogy is the language of ever-evolving innovation.

Conclusion

This study aimed to understand and establish the necessary conditions for effectively integrating creativity within a project-based learning framework. It sought to demonstrate that creativity, far from being spontaneous, emerges from complex social interactions between contrasting and harmonious elements. The central objective was to clarify the crucial role of an intelligent project in stimulating creativity within the teacher-learner relationship. By proposing an innovative model, this research highlights the importance of a multidimensional approach to

addressing the challenges of creative pedagogy and suggests a framework capable of sustainably supporting and enriching educational practice.

The proposed framework, referred to as the "intelligent project," is an innovative pedagogical model that synthesizes the intellectual, organizational, and technological dimensions of creativity within a holistic and inclusive approach. This framework is designed to tackle three primary challenges while maintaining the integrity of the creative process:

1- **Integration of Complexity into Pedagogical Thought**: The first challenge is to incorporate the inherent complexity into pedagogical thought, a crucial aspect for stimulating creativity. Drawing on the principles of complex thinking, the intelligent project conceptualizes creativity as a synthesis of contradictory elements, thereby enabling an innovative restructuring of educational phenomena.

2- **Organizational and Social Structuring of Educational Relationships**: The second challenge involves the organizational and social structuring of interactions between teachers and learners. The intelligent project offers a renewed and flexible organizational framework, capable of adapting to the specific cognitive contexts of students and teachers through the use of artificial intelligence, which supports creative thinking and fosters pedagogical innovation.

3- **Technical Aspects of Creative Pedagogy**: The third challenge addresses the technical dimensions of creative pedagogy. The intelligent project provides a range of tools to support the creativity of both teachers and learners, integrating the dynamics of creative projects across different stages of life and various educational contexts. Moreover, it accommodates rapid technological changes while providing meaningful support to the various stakeholders involved in the educational process, a perspective endorsed by (Boutinet, 2012; Huber, 2005). These authors highlight the capacity of educational projects to meet diverse student needs in terms of motivation, autonomy, collaboration, communication, constraint management, and orientation.

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Declaration of AI Refined

This research paper has undergone language correction using the AI-powered tools Grammarly and Scholar AI Chat to address grammatical, spelling, and stylistic errors. It is acknowledged that the use of such tools may introduce standardised patterns typical of AI-generated content. Consequently, a certain percentage of content may reflect AI-generated language structures. Yet, the intellectual content and the analysis remain entirely the work of the authors.

Statement of Absence of Conflict of Interest

The authors mentioned above hereby solemnly declare that they are not and shall not be in any situation that could give rise to a conflict of interest in what concerns the findings and recommendations contained in this academic article.

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