

EXPLORING THE SHARED PRINCIPLES OF MONTESSORI PEDAGOGY, THE CPA APPROACH, SOCIOCULTURAL THEORY, AND ECOLOGICAL TEACHER AGENCY: A CONCEPTUAL ANALYSIS

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Abstract

This paper presents an analysis of Montessori pedagogy, Concrete-Pictorial-Abstract (CPA) method, Sociocultural theory, and Ecological teacher agency by identifying common themes. From an analysis of each of these different, yet related frameworks, the author is then able to identify the role of different educational settings and their participant's frameworks. This paper identifies the relation of structuring educational settings that are highly participatory, offer a great deal of flexibility, and are designed to be meaningfully engaging, as well as the role of the educator as a facilitator. This paper relies on the analysis of the existing theories, and draws their study in relation to theories that are largely constructed, elaborated, and proposed within the academic scope of sociology and educational psychology. The author finds that Sociocultural theory and pedagogical agency are largely concerned with the role of the social and cultural milieu and the educational and pedagogical practices of the educator. The author of the paper explains the range of social and cultural structures of flexible educational settings. The paper relies on the existing theoretical frameworks and suggests new, flexible, educational meanings to teaching. This does encourage the author to integrate many frameworks, as they concern teaching and learning.

INTRODUCTION

Research on education has shifted, focusing more on active learning engagement and on students as active agents engaging with their environment and constructing their own meanings and less on information receptiveness as a passive activity. Among other things, Montessori pedagogy, Concrete-Pictorial-Abstract (CPA) approach, Sociocultural Theory, and Ecological Teacher Agency can enrich an understanding of the learner-teacher-environment triad. Montessori pedagogy has a keen focus on the learner, fostering independence through the use of hands-on materials, and includes an emphasis on the

environment (Marshall, 2019). Likewise, the CPA approach has an emphasis on learning as moving from concrete experience, to pictorial, to the abstract, wherein learners are provided opportunities to develop a deeper level of understanding as a result of more adequate and varied representation (Fyfe et al., 2019). Both emphasize the learning process and the necessity to be actively involved and engaged.

Sociocultural Theory explains learning in the context of social interaction, the use of cultural tools, and the nature of cognitive development with the aid of social support. Learning occurs in social contexts, and teachers and peers can aid

the construction of knowledge through their interaction with others (Daniels, 2020; Schunk, 2020). Some concepts such as the Zone of Proximal Development and scaffolding show the role of instructional support for learners to develop new and complex ideas. Concerned with the above, Ecological Teacher Agency views teachers as active professionals who make decisions from the knowledge, belief, and experience they have, along with the educational context they are in (Biesta et al., 2019; Priestley et al., 2022). This view recognizes that the practices of teachers derive from not only personal and individual capabilities, but from social, cultural, and structural contexts as well.

Despite the fact that Montessori pedagogy, the CPA approach, Sociocultural Theory, and Ecological Teacher Agency, have been discussed extensively, and separately, as educational theories, there is limited exploration on the principles these frameworks connect. Exploring these theories together can provide new perspectives on learning, social interaction and the environment, and the role of the teacher in educational practice. Hence, this paper aims to locate the common principles of these four perspectives and analyze how their combination can provide a richer understanding of teaching and learning. This study will identify the shared principles to inform the ongoing research in creating teaching frameworks that are responsive to the context and that allow the learning environments to be adaptive to the teaching.

Background of the Study

Modern educational theories and pedagogy work to understand both the ways children learn and how best to support those learning processes. Contemporary education integrates many factors into the learning process. These elements help make the learning experience deeper and more meaningful through the construction of knowledge. Montessori pedagogy relies on self-directed learning, self-sufficiency, and hands-on learning while the Concrete-Pictorial-Abstract approach depends on beginning with concrete experiences and gradually moving to the pictorial and, finally, to the abstract (Fyfe et al., 2019;

Marshall, 2019). Both approaches value the construction of knowledge through the presence of the learner.

Sociocultural Theory asserts learning is a social practice and extends into the realm of Vygotskian theory. In its many modern adaptations, it continues to value learning and the importance of social interaction, and instructional support from within the learner's zone of proximal development (Schunk, 2020; Daniels, 2020). Likewise, Ecological Teacher Agency argues teachers do not simply implement reforms passively, but rather, act within the bounds of their professional judgment and the situational context (Biesta et al., 2019; Priestley et al., 2022). All of these address learning as the result of interaction and connection of learners, teachers, and resources.

Overlap is seen among Montessori pedagogy, CPA, Sociocultural Theory, and Ecological Teacher Agency in several areas including learner autonomy, active engagement, the environment, and teacher as facilitator. While these originate from different theories, they have implications for the development of both learners and teachers. This study aims at analyzing the common elements of these four theories through a conceptual analysis.

Problem Statement

Montessori pedagogy, CPA, Sociocultural Theory, and Ecological Teacher Agency, when studied individually in disparate theories, do not reflect their importance in education. To a greater extent, teaching and learning as processes are effective when these theories complement and build on each other. Fragmented research has focused on the importance of these theories individually and has neglected their conceptual and foundational links.

Understanding of the interaction between learner-centered practices, representational learning, social opportunities, and teacher agency has largely been neglected. The aim of this study is to respond to this lack of research and provide understanding of the common ideas of these four theories, and enhance the comprehension of

their importance and relevance to modern education.

Research Objectives

The goals of this research are to

1. To Present the basic philosophies of Montessori pedagogy, the CPA approach, Sociocultural Theory, and Ecological Teacher Agency.
2. To Demonstrate the similarities and common ideas of these four approaches to education.
3. To Describe the educators and learners as well as the educational settings within these four theories.
4. To Analyze how these perspectives aid the comprehension of teaching and learning practices.
5. To Develop an integrated conceptual framework combining the shared characteristics of these methods.

Research Questions

This study focuses on the following research questions

1. What are the principal components of Montessori pedagogy, CPA, Sociocultural Theory and Ecological Teacher Agency?
2. Among these educational frameworks, what principles are shared?
3. What are the definitions of learners, teachers, and learning spaces, as postulated by these theories?
4. What potential for improvement exists within Montessori pedagogy, CPA, Sociocultural Theory and Teacher Agency for the construction of a wider, more flexible framework?
5. What possibilities for educational theory and practice may stem from this integrated point of view?

Significance of the Study

This study aims to define a conceptual framework that incorporates four widely recognized theories of education. This study may offer a practical tool to those interested, including researchers, educators, and teacher educators, to use a wider

conceptual framework to develop learner-centered and holistic to education supportive environments. The study considers the significance of teacher agency and practice in the context of the teaching of learning and the adaptive nature of teachers' practice to learners' needs and the contexts in which they work. The incorporation of these frameworks may encourage researchers to explore other integrated approaches to teaching and learning.

LITERATURE REVIEW

Educational theories and pedagogies literature show an increased interest in active, social, and contextual learning. Contemporary educational research shows awareness of the fact that learners need to engage in meaningful experiences, receive the proper support, and be a part of supportive learning environments. This awareness has led to pedagogies of a learner-centered nature, which deemphasize the teacher as the focus of the classroom and promote the learner as the active participant in the construction of learning (Schunk, 2020). Montessori pedagogy, the Concrete-Pictorial-Abstract (CPA) approach, Sociocultural Theory, and Ecological Teacher Agency, within this framework, provide different theories for the study of the learners, the teachers, and the educational environments.

Montessori pedagogy is founded on the need for learners to be independent, be involved in hands-on learning, and be involved in self-directed learning. Montessori pedagogy also includes the notion of the required environment. Montessori pedagogy continues to develop the cognitive, social, and emotional expressions of children. The latest research on Montessori pedagogy suggests that children develop learning autonomy through the purposeful activities and the carefully devised learning structures (Marshall, 2019; Lillard, 2021). The same is true of the CPA approach in that the development of learning activities is built on the construction of learning through concrete, pictorial, and abstract learning experiences. Research shows that this framework in learning enables advanced thinking in the construction of learning, particularly in mathematics through the convergence of pictorial

activities and the use of symbols (Fyfe et al., 2019; Carbonneau et al., 2021).

Sociocultural Theory accounts for learning as a socially mediated process and emphasizes the role of interaction, cultural tools, and social collaboration. Recent educational research inspired by Vygotsky explains how scaffolding, dialogue, and teacher presence help nurture learners' thinking skills (Daniels, 2020; Sannino, 2022). Furthermore, Ecological Teacher Agency states that through their judgments and experiences, teachers construct the settings of their practices, and respond to the social and institutional contexts. Research on teacher agency describes how the actions and practices of teachers result from the interplay of the individual and the educational context (Biesta et al., 2019; Priestley et al., 2022). These frameworks collectively address the need and importance of active participation, the role of the environment, the involvement of the teacher, and the creation of knowledge.

Even though notable research has been carried out on each of these frameworks, little has focused on analyzing the relationship between Montessori pedagogy, the CPA approach, Sociocultural Theory, and Ecological Teacher Agency. A joint study of these frameworks can shed light on the relationship between learning environments, teaching practices, and the development of learners. For this reason, this literature review seeks to identify the common theoretical starting points of the frameworks in question and investigate their integration in order to derive more useful teaching-learning theories.

Montessori Pedagogy: Principles of Child-Centered Learning

There are multiple differing views when it comes to Montessori education. A view Montessori education upholds is that children learn best when they are allowed to be curious and independent. Encouraging this independence is manifested in students being able to choose their own activities and work and take charge of their own learning process. Deciding on their own how to engage with the numerous different

manipulatives around the classroom helps children learn. Children are able to work at their own pace and take charge of their own frustration because they can move on to a different manipulative or choose a different activity all together. Montessori classrooms are designed with this autonomy in mind. At the same time, the manipulatives help children work on their cognitive and emotional skills. Unlike other pedagogies, Montessori education is particularly unique because it is wholly focused on its students (Lillard, 2021).

Child centrism is the key principle in Montessori education. Montessori education says that children learn through doing meaningful work. Meaningful work is determined by the children themselves. This philosophy is also captured by the statement that Montessori classrooms are designed with the learners in mind. Montessori education also emphasizes independence and agency. Montessori education can also be placed alongside modern ideas of education. Montessori classrooms also use manipulatives to center the classroom around the children and to help facilitate the learning in a fun way.

The Concrete-Pictorial-Abstract (CPA) Approach in Learning

The Concrete-Pictorial-Abstract (CPA) Approach helps learners build their understanding of concepts through three stages of representations (Concrete, Pictorial, and Abstract). In the Concrete phase, students work with manipulatives. In the Pictorial phase, they represent their understanding visually. Finally, in the Abstract phase, they work with symbols and numbers. The CPA Approach promotes the movement from the practical to the abstract and helps students make the strong conceptual links needed to reduce their apprehension when faced with complex ideas (Fyfe et al., 2019).

Research also suggests that of the stages, the Pictorial phase proves to be the most beneficial for students in learning. The use of pictorial representations in learning allows students to visualize a concept that they are struggling to grasp, and, instead of focusing on memorization of steps, they are able to actively participate in

reasoning and problem solving (Carbonneau et al., 2021).

Sociocultural Theory and Knowledge Construction

The Sociocultural Theory of learning is based on Vygotsky's social constructivism. Communication, social interaction, and the culture within which the learner exists are the foundations of learning. The Scaffolding of the Zone of Proximal Development is also highly relevant, as learners are guided to Mastery of Concepts through the appropriate levels of support. (Daniels, 2020).

Ongoing studies continue to build on the concept that learning cannot be contained to the cognitive domain. There are social aspects to learning. Educators are tasked with establishing settings that promote collaboration, where students are able to articulate their ideas and problem-solve, while developing their

understandings via social exchanges. (Sannino, 2022). This type of thinking incorporates both Montessori and CPA approaches, as they both incorporate the need for learning to be participatory and for learning to be socially constructive and socially supportive.

Ecological Teacher Agency in Educational Practice

Ecological Teacher Agency seeks to understand the profession of teaching as an active, decision-making profession, based on the knowledge, beliefs, and experiences of the teacher, as well as the educational contexts in which the teacher works. In contrast to the belief that teachers 'implement' the curriculum passively, this lens views teaching as an active profession, in which, of necessity, the social, and educational contexts, as well as the demands of the school and/or institution, are considered (Biesta et al., 2019).

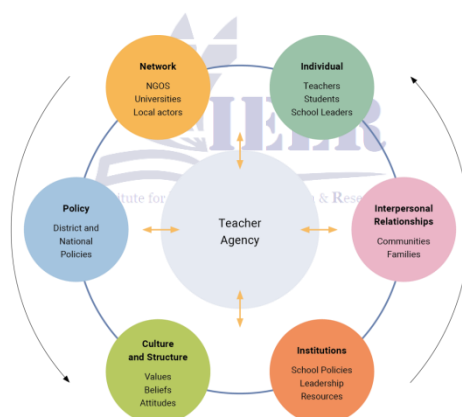


Fig 2.1 Ecological Teacher Agency in Educational Practice

Current conceptions of teacher agency emphasize the profession of teaching, in this case, good teaching, as the interaction of personal attributes and skills, within the context of the opportunities and/or limitations presented by the environment. Teaching with agency is illustrated by the intentionality of the teacher, as a means of addressing the needs of the learners, in the context of the environment, and through the adoption of flexible and adaptive teaching approaches (Priestley et al., 2022). This view aligns the work of Montessori and CPA, as well as Sociocultural Theory, in stressing the

importance of the teacher in the facilitation of the construction of learning and the development of the learner.

Common Principles Across Educational Perspectives

Montessori pedagogy and CPA, as well as Sociocultural Theory and Ecological Teacher Agency, regardless of their differing theoretical origins, have some common principles that are conceptually integrated.

Learner-Centered Education

Active learner involvement is a consistent theme throughout the four perspectives. Montessori education focuses on fostering learner independence and self-direction, whereas CPA is more about the construction of understanding through the use of gradually progressive representations. Active participation of learners in social contexts is emphasized by Sociocultural Theory. The development of learners is the focal concern of the teacher agency frameworks (Lillard, 2021; Schunk, 2020).

Active Knowledge Construction

The concept of knowledge being shifted from the teacher to the learner is a notion all these perspectives are against. In fact, they all prioritize the notion that learners construct knowledge by experiencing, interacting, and reflecting on and through purposeful problem-solving. CPA does this with the use of varied representations; Montessori, through the use of hands-on activities; and Sociocultural Theory, through the employment of collaborative processes of learning (Fyfe et al., 2019; Daniels, 2020).

Importance of Learning Environment

The learning environment is important to all four perspectives. Montessori education focuses on the prepared environment. In CPA, learning activities are orderly and adequately designed. In Sociocultural Theory, salience is placed on social and cultural contexts, and the Ecological Teacher Agency framework centers on the overall impact of the institution and classroom on the practice of teaching (Marshall, 2019; Priestley et al., 2022).

Teacher Facilitation and Support

More importantly, teaching is now viewed as the provision of a support and adaptable learning experience in which the teacher must facilitate. Montessori teachers are those who observe and guide the learners, whereas CPA teachers are the ones who extend structured support. Sociocultural Theory places a lot of emphasis on scaffolding and guided participation, whereas teacher agency research places emphasis on the

extent to which teachers have the freedom to organize learning opportunities and make professional choices (Biesta et al., 2019).

Independence and Critical Thinking

Cultivating independence, reasoning, and critical thinking skills is one of the goals common to all four approaches. Montessori focuses on student autonomy, CPA on conceptual reasoning, Sociocultural Theory on cognitive development through interaction, and teacher agency on the construction of deeper learning experiences (Lillard, 2021; Carbonneau et al., 2021).

RESEARCH METHODOLOGY

The research design of this study is based on a conceptual analysis framework. The study identifies the common threads of Montessori pedagogy, Concrete-Pictorial-Abstract (CPA) method, sociocultural theory, and ecological teacher agency. The conceptual analysis framework is useful for identifying common concepts and for describing theoretical interrelations and connections in education. This study did not collect primary data. Instead, the focus was on the cited theories and research based literature on teaching and learning, and how the different theories and concepts helped to articulate the answering of teaching and learning (Merriam & Tisdell, 2019).

The conceptual analysis is qualitative in nature and relies on the systematic review and analysis of the selected four educational theories. The publications were analyzed with the aim of articulating the major concepts and tenets of the theories and explaining the interrelations and linkages between the theories. The literature selection was concentrated on studies that addressed learner-centered education, active constructive knowledge, learning and teaching environments, roles of the teacher, and educational agency.

The aim of the analysis was to interpret and integrate the fundamental concepts of Montessori pedagogy, the CPA method, Sociocultural Theory, and Ecological Teacher Agency. The study identified and analyzed the repetition of elements of each of the chosen frameworks using the method of thematic

analysis. This approach identified and classified the common elements into the following themes: learner autonomy, experiential learning, social interaction, teaching facilitated by the teacher, and contextual factor, which were combined into a conceptual framework (Braun & Clarke, 2021). To verify the credibility and trustworthiness of the analysis, the study consulted a variety of academic sources and considered multiple theoretical viewpoints. The researcher was able to keep the analysis consistent much more easily by centering the analysis around the relationship of educational theories. This was much easier than having to rank the educational theories. Considerations of ethics were built upon by the accurate documentation of the literature, proper citation, and no distortion of the theoretical viewpoints.

Research Design: Conceptual Analysis

The focus of this study is on the interconnectedness of the principles of Montessori pedagogy, the Concrete-Pictorial-Abstract (CPA) method, Sociocultural Theory, and Ecological Teacher Agency. Conceptual analysis is a qualitative research method which examines theoretical concepts, and identifies relationships between ideas, so that a more thorough understanding of complicated phenomena can be achieved (Merriam & Tisdell, 2019). This approach is appropriate to the present study since the intent is not to quantify or collect data, but rather, to describe the relationships of various educational theories. Conceptual analysis, in this instance, describes the ways in which the four frameworks are instrumental to understanding the central concepts of education, namely, learner-centeredness, the fostering of independence, the teaching and learning environment, the role of the teacher, and that of the learner. Through a comparison of theories and their postulates, this research aims to recognize and appreciate the contribution of each of the theories to educational practice.

Data Sources and Literature Selection

The study utilized secondary data obtained through various publications, such as peer-reviewed journals, scholarly articles, and books addressing literature on Montessori pedagogy, CPA, Sociocultural Theory, and Teacher Agency. The search for literature focused on studies published within the years 2018 to 2026, and aimed at obtaining the most recent theoretical advancements and the most recent issues in education.

Sources were selected based on their importance to the research goals and their role in explaining the key concepts of the study. Publications describing learner-centered education, active learning, representation in learning, social interaction, teacher decision-making, and contextual influence on educational practices were selected. The literature selected assisted in formulating the theories to help identify the shared concepts in the four educational frameworks.

Analytical Framework

The analytical framework of this study was developed by systematizing the key concepts within Montessori pedagogy, CPA, Sociocultural Theory, and Ecological Teacher Agency. The framework was organized around five interconnected concepts: learner-centered education, active construction of knowledge, the importance of the learning environment, the role of the teacher as a facilitator and supporter, and the fostering of autonomy and reasoning. These concepts were used as categories for analyzing the different educational frameworks in relation to the construction of the teaching-learning process.

Procedure of Conceptual Comparison

The process of conceptual comparison included several steps. Initially, the key assumptions and principles of the theories were identified through literature review. Then, the relationships and commonalities among the theories were analyzed based on the descriptions of learners, teachers, environment, and the learning process. Finally,

complementary case descriptions were formulated.

Identifying areas of theoretical alignment was the priority when making the comparison. The objective was not to establish a hierarchy among the theories, but to show the applicability of the theories in education, and how they aid in the formulation of optimal learning and teaching scenarios.

Data Interpretation Approach

The approach to literature review was based on qualitative interpretation. Crucially, the literature was examined for the presence of common ideas and concepts, analyzed for theoretical linkages, and viewed in a way to provide a basis for new ideas and relationships. Thematic analysis was used to group the literature according to emerging themes (Braun & Clarke, 2021).

The focus of the interpretation was on the ways in which Montessori pedagogy, CPA, Sociocultural Theory, and Ecological Teacher Agency help in the analysis of the educational phenomenon. The study sought to devise a

unified conceptual framework to show the interaction of the development of the learner, the teacher, and the environment.

RESULTS AND ANALYSIS

The conceptual analysis found notable congruences between Montessori pedagogy and the Concrete-Pictorial-Abstract (CPA) method. Particularly understood through the lens of experiential learning and the incremental building of one's understanding. Both pedagogies acknowledge the knowledge construction process occurs through active engagement with the materials and the experience, and the representations thereof; as opposed to the passive reception of information. Recognition of this process occurs in both pedagogy and is evidenced through the hands-on, prepared materials and the self-directive nature of the Montessori pedagogy. In the CPA method, concrete items and drawings are used to facilitate the transition to the abstraction of thinking (Marshall, 2019; Fyfe et al., 2019).

Table 4.1 Distribution of Identified Themes Across Educational Perspectives

Identified Theme	Frequency (n)	Percentage (%)
Learner-centered education	34	87%
Active knowledge construction	32	82%
Learning environment importance	30	77%
Teacher facilitation and support	31	79%
Independence and reasoning development	29	74%
Social interaction and collaboration	27	69%

Pedagogy in both frameworks seeks to engage learners in the act of learning and recognizes the process of learning in the context of development. Montessori pedagogy places an emphasis on the self-directed nature of the child, and the CPA places an emphasis on the transitional nature of physical and symbolic representation. The findings suggest the CPA and Montessori pedagogies view learning as progressive in nature, and understandings emerge through engagement, contemplation, and abstraction.

Relating Sociocultural theory and CPA Learning

The findings suggest Sociocultural theory and the CPA method share a family of concepts for learning (i.e., guided learning, participation, and the construction of understanding). While CPA is primarily concerned with the progression of representation and abstraction, Sociocultural theory is concerned with the construction of understanding and the role of social interaction and experience. The CPA method's emphasis on guided participation is indicative of Vygotsky's

notion of the scaffolding of the Zone of Proximal

Development (Daniels, 2020).

Table 4.2 Shared Principles of Montessori Pedagogy and CPA Approach

Shared Element	Montessori Pedagogy (%)	CPA Approach (%)
Hands-on learning experiences	95%	92%
Use of learning materials	90%	94%
Development of independence	93%	80%
Gradual concept development	82%	96%
Problem-solving skills	85%	88%

The analysis indicates that CPA learning is more successful when teachers assist learners in shifting between the concrete, pictorial, and abstract stages. The relationship shown here is more aligned with the sociocultural position, and with the understanding that learners develop their understanding with guided participation and not discovery on its own. Consequently, both positions are in agreement on the provision of assistance to participants while ensuring that they remain active.

Teacher Agency and Learning Environments

The conceptual analysis suggests that Ecological Teacher Agency is a significant linkage between teaching and learning theories and the reality of the classroom. Teachers are at the forefront of adjusting teaching to the needs of learners and the context of the classroom, together with the resources on hand. The findings of this study highlight that Montessori, CPA, and Sociocultural Theory show that teachers need to be empowered to create and maintain productive learning environments.

Table 4.3 Relationship Between Sociocultural Theory and Learning Processes

Sociocultural Principle	Identified Importance (%)
Social interaction	92%
Teacher scaffolding	95%
Collaborative learning	88%
Cultural influence on learning	82%
Guided participation	90%

Research on teacher agency proposes that the nature of teaching is reliant on a dynamic interplay of teachers' professional capabilities, and contextually bound aspects of school (e.g. policies, supports, and cultures) (Biesta et al., 2019; Priestley et al., 2022). In Montessori, teachers set the environment and monitor students. In CPA, teachers decide how and when to provide certain representations and assistance. Sociocultural approaches similarly require teachers to modify scaffolds based on the needs of learners. The findings of the research emphasize the importance of teacher agency and

of empowered teachers, to apply the underlying theories of teaching and learning.

Integrated Analysis of the Four Perspectives

The integrated analysis recognized a commonality among CPA, Montessori pedagogy, Sociocultural Theory, and Ecological Teacher Agency within learner-centered education, active construction of knowledge, the learning environment, and teaching, the role of the teacher and the fostering of independence and reasoning. The four perspectives collectively emphasize these core principles.

Table 4.4 Role of Teacher Agency Across Educational Approaches

Teacher Agency Component	Percentage (%)
Instructional decision-making	94%
Adaptation to learner needs	91%
Creating supportive environments	89%
Professional autonomy	86%
Reflection and improvement	84%

The results show the study of these educational approaches reveals the interrelationship of frameworks emphasizing a set of shared educational values. Montessori addresses independence and the learning environment, CPA addresses representation and the development of concepts, Sociocultural Theory deals with social learning, and Ecological Teacher Agency with the position of the educator within the context of learning.

Formation of a Combined Conceptual Framework

A combined conceptual framework has been developed, based on the findings, to show the interaction of the four approaches. The framework proposes that learning is a result of the interaction of the three fundamental components of the system: active learners, supportive teachers, and adequate environments.

Table 4.5 Comparative Analysis of Four Educational Perspectives

Educational Principle	Montessori (%)	CPA (%)	Sociocultural Theory (%)	Teacher Agency (%)
Learner-centered learning	96%	90%	85%	88%
Active knowledge construction	92%	95%	90%	86%
Importance of environment	98%	88%	85%	94%
Teacher support	87%	91%	96%	97%
Independent reasoning	95%	89%	82%	90%

The active construction of knowledge by learners is a result of individuals' learning experiences, the social participation of individuals, and the representations used. The role of the teacher is to organize learning experiences, demonstrate, and/or adjust and/or adapt learning activities to

the needs of the learners. The educational environment contains the physical, social, and other settings and structures, that in a direct way, influence the opportunities for learning and the practices of teaching.

Table 4.6 Integrated Conceptual Framework Analysis

Educational Perspective	Main Contribution	Conceptual Contribution (%)
Montessori Pedagogy	Independence and prepared environment	92%
CPA Approach	Representation and conceptual understanding	90%
Sociocultural Theory	Interaction and scaffolding	94%
Ecological Teacher Agency	Teacher adaptation and context	96%

According to the combined framework, Montessori pedagogy, CPA, Sociocultural Theory, and Ecological Teacher Agency all deal

with and describe effective education. They are congruent in the principles of building learning

environments conducive to independence, thinking, cooperation, and active involvement.

Table 4.7 Overall Conceptual Alignment Among Educational Perspectives

Shared Principle	Alignment Level (%)
Learner-centered education	93%
Active learning	91%
Supportive learning environment	92%
Teacher facilitation	94%
Development of reasoning skills	89%
Social learning	87%

CONCLUSION

This conceptual study examined the commonalities across Montessori pedagogy, the Concrete-Pictorial-Abstract (CPA) method, Sociocultural Theory, and Ecological Teacher Agency. Most findings demonstrated that although all the aforementioned theories are disparate, there are numerous connections between them concerning the theory of learning, the theory of teaching, and the theory of the educational environment. The study identified five major commonalities: teaching and learning are learner-centered; learners actively construct knowledge; the learning environment is important; the teacher's role is to facilitate and help; and independence and thinking skills are developed.

The CPA approach and Montessori pedagogy both place great emphasis on learning through direct experience and the gradual development of understanding. Both of these approaches view learners as having the potential to develop deeper understandings through contact with educational materials and meaningful experiences. Sociocultural Theory builds on this by emphasizing the role of guided assistance and interaction among learners and peers. Ecological Teacher Agency further portrays teachers as active agents who determine the nature of learning experiences by making professional decisions and adapting to the circumstances.

Finally, the findings indicate that both learner independence and teacher involvement are integral to the educational process. Although it is critical that students are given the opportunity to explore, reason, and construct knowledge on

their own, the teacher's role in providing the right conditions and assistance is vital. The combination of the various theories outlined above offers an integrated understanding of the relationship between learners, teachers, and educational environments.

Implications for Educational Theory and Practice

Combining Montessori pedagogy, CPA, Sociocultural Theory, and Ecological Teacher Agency has significant effects on educational theory and practice. This study shows, from a theoretical standpoint, that the integration of different educational frameworks is possible. Each framework, for example, has something different to add. Montessori provides the structures for independence and prepared environments. CPA offers the role of structured representation. Sociocultural Theory provides an understanding of social and learning processes, while Teacher Agency offers an understanding of the contexts in which teachers work.

From the viewpoint of educational practice, the findings imply that practice should strive to construct learning environments that foster exploration, collaboration, and critical thinking. Learning materials coupled with activities that promote the active construction of knowledge should be provided. Additionally, schools should value and appreciate the autonomy of teachers and provide the necessary support to empower teachers in constructing the necessary adaptations to their practice.

The findings also point to the necessity of professional development initiatives that

empower teachers to broaden their understandings and be able to integrate the diverse educational frameworks.

Recommendations for Future Research

Future research should focus on the multiple educational contexts and how the integrated framework, conceived and developed in this study, can be applied. Classroom-based research can be devoted to the effects that the integration of Montessori principles, CPA, sociocultural practices, and teacher agency can have on the learning of students.

Future investigations may include the implementers of the approaches framed here and may consider the contextual factors that facilitate or constrain teacher agency. It may be important to examine all of the diverse cultural age and educational frameworks to understand the contextual variables and the impact of the shared principles.

Future studies may also determine the intersection of modern digital learning environments and technologies with the ideas expressed here. Educational innovations may come from the study of technology-enhanced Montessori practice, digital CPA, and online Collaborative learning environments.

Conclusion

It can be derived from this study that Montessori pedagogy, the CPA approach, Sociocultural Theory, and Ecological Teacher Agency connect via the same conceptual strands. These strands assist in the identification of teaching and learning that is both effective and meaningful. There are also important conceptual similarities among these systems. The four perspectives employ active check, meaningful experiences, and growth environments. Each recognizes the teacher as a facilitator of development.

The intersection of these ideas reflects the understanding that learning is dynamic and is influenced by the relationships formed by the learner, teacher, and the environment. The recognition of these shared principles enables the researcher and educator to design frameworks that foster autonomy, critical thinking, and

collaboration. This study sets the groundwork for integrated educational frameworks that provide for the complexity of modern learners.

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