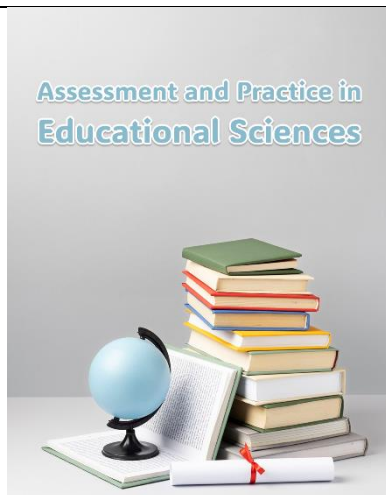




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Explanation and Analysis of the Philosophical Foundations of Belief Learning from the Perspectives of Plotinus and Mulla Sadra

ABSTRACT

This study aimed to explain and comparatively analyze the ontological, epistemological, anthropological, ethical, and teleological foundations of belief learning from the perspectives of Plotinus and Mulla Sadra. This study was conducted using a qualitative analytical-comparative review design. The research corpus consisted of purposively selected primary philosophical texts of Plotinus and Mulla Sadra together with relevant scholarly studies addressing ontology, epistemology, philosophical anthropology, knowledge, soul, intellectual intuition, substantial motion, human perfection, and educational implications. Data were collected through systematic documentary analysis and a researcher-developed conceptual extraction framework. The collected material was analyzed using thematic analysis, philosophical interpretation, within-case analysis, and cross-philosopher comparison. Concepts were first interpreted within the internal structure of each philosophical system and were subsequently compared to identify convergences, divergences, and educational implications for belief learning. The analysis showed that belief learning in both philosophical systems is a progressive and transformative process rather than mere reception of propositions. Five principal foundations were identified: ontological, epistemological, anthropological, transformative, and teleological. Plotinus conceptualizes learning as an ascent from sensible multiplicity toward intelligible unity and ultimately toward the One, whereas Mulla Sadra explains it through the gradation of existence, substantial motion, and the existential development of the soul. In both perspectives, sensory and discursive cognition constitute preliminary stages, while higher belief depends on rational verification, intellectual realization, self-knowledge, ethical purification, and increasingly immediate apprehension of truth. A developmental model of belief learning was derived, comprising receptive, conceptual, rationally verified, internalized, intellectually realized, existentially transformative, and teleologically perfected belief. The comparison also indicated that Mulla Sadra provides a more explicit ontological account of learning as transformation of the knowing subject, while Plotinus places greater emphasis on contemplative ascent and return to intelligible unity. Belief learning from the perspectives of Plotinus and Mulla Sadra can be understood as an ascending cognitive-existential process through which externally received propositions become rationally justified, internally integrated, and ultimately transformative of the learner's intellectual, ethical, and existential condition.

Keywords: Belief Learning, Plotinus, Mulla Sadra, Philosophy of Education, Philosophical Anthropology, Epistemology, Existential Transformation

Introduction

Belief learning occupies a foundational position in the philosophy of education because it concerns not only the acquisition of propositions about reality, morality, the human being, and the transcendent, but also the manner in which such propositions become understood, justified, internalized, and integrated into the learner's intellectual and existential life. Unlike forms of learning that are evaluated primarily through the reproduction of information or performance of observable skills, belief learning involves a deeper transformation in the relationship between the learner, knowledge, and reality. In educational settings, especially those concerned with religious and moral formation, the transmission of beliefs cannot be reduced to verbal instruction, memorization, or acceptance based solely on authority. Contemporary educational research continues to demonstrate the significance of moral climate, lived educational experience, critical and creative thinking, and the broader cultural context in shaping the way learners understand and respond to educational content (1). Similarly, studies focused specifically on the teaching of religious concepts emphasize that religious education can influence moral and social development when concepts are taught in ways that engage learners beyond superficial information transfer (2). The broader question, therefore, is not merely how beliefs are communicated, but how they become meaningful forms of knowledge capable of shaping judgment, identity, ethical orientation, and action.

This problem acquires particular importance when belief learning is considered within philosophical traditions in which knowledge is inseparable from the formation of the human person. Educational justice, moral formation, and the cultivation of human capacities are increasingly discussed in relation to the ethical foundations and purposes of education rather than solely to institutional access and distributive arrangements (3). At the same time, educational experience is influenced by psychological, social, institutional, and identity-related pressures that affect the learner and educator alike, reminding educational theory that learning never occurs in an abstract cognitive vacuum (4). A philosophical account of belief learning must therefore address both the nature of knowledge and the nature of the knowing subject. It must explain whether belief is simply a proposition assented to by the mind, whether rational argument is sufficient for the formation of conviction, whether ethical and existential development affects cognition, and whether the highest form of learning consists in possessing correct concepts or in becoming transformed through knowledge. These questions connect educational theory with ontology, epistemology, philosophical anthropology, ethics, and teleology.

Among the major philosophical systems capable of addressing these questions, the thought of Plotinus and Mulla Sadra is particularly significant. Despite belonging to distinct historical, cultural, and religious contexts, both philosophers developed comprehensive metaphysical systems in which human knowledge is embedded within a hierarchical conception of reality and in which the soul is capable of movement from lower to higher modes of existence and cognition. Plotinus situates human existence within a metaphysical hierarchy extending from the One to Intellect and Soul and from there to the sensible world. His account of the soul's ascent is therefore simultaneously ontological, epistemological, and spiritual. The human soul does not simply collect information about an external world; rather, its highest fulfillment requires a turning away from dispersion in sensible multiplicity and an inward and upward movement toward intelligible reality (5). In this framework, learning may be understood as a process of reorientation in which the soul gradually becomes capable of apprehending increasingly unified and fundamental dimensions of reality.

The Plotinian conception of ascent is inseparable from his understanding of the One as beyond ordinary determinations of being and relation. The One cannot be understood in the same way as finite beings because it transcends the multiplicity and relational structures through which ordinary cognition operates (6). This metaphysical position has important epistemological implications. If ultimate reality exceeds the categories through which discursive thought ordinarily organizes experience, then

rational analysis, while necessary, cannot constitute the final stage of cognition. Plotinus consequently places considerable emphasis on intellectual intuition and contemplation. Studies of intuition in Plotinus have shown that intellectual cognition is understood as more immediate than discursive reasoning and involves a mode of knowing in which the distance between subject and object is substantially reduced (7). The same theme has been examined comparatively in relation to Platonic and Plotinian accounts of intuition, emphasizing the transition from mediated cognition to direct intellectual apprehension (8). From the perspective of belief learning, this distinction suggests that one may possess a conceptual or argumentative understanding of a belief without yet attaining the deeper form of certainty associated with intellectual realization.

Plotinus's thought is therefore educationally relevant because it challenges the assumption that the communication of propositions is equivalent to the formation of knowledge. The soul may remain at the level of sensory impressions, images, verbal formulations, or discursive arguments, while its higher intellectual capacities remain insufficiently actualized. Genuine learning requires movement from multiplicity toward unity, from externality toward inwardness, and from representational knowledge toward contemplative apprehension. This emphasis on ascent also influenced later philosophical and intellectual traditions, and traces of Plotinian structures can be identified in various strands of Islamic and Persian philosophical thought (9). Nevertheless, the significance of Plotinus for the present inquiry does not depend on establishing a direct historical influence on Mulla Sadra. Rather, the analytical value lies in comparing two philosophical systems that independently provide sophisticated accounts of the relationship between being, knowledge, soul, and perfection.

Mulla Sadra's transcendent philosophy offers an equally rich, but structurally distinct, foundation for understanding belief learning. The centrality of existence in his metaphysics radically reshapes the relation between ontology and epistemology. In *Al-Masha'ir*, Mulla Sadra develops the primacy and fundamental character of existence, thereby establishing a metaphysical framework in which realities are understood through different modes and intensities of being rather than merely through conceptual essences (10). This position is developed more comprehensively in *Al-Hikmat al-Muta'aliyah fi al-Asfar al-'Aqliyyah al-Arba'ah*, where the gradation of existence, substantial motion, the development of the soul, and the relation between knowledge and being form central components of the philosophical system (11). The educational implications of this framework are substantial because the human being is not treated as an ontologically static subject who merely acquires new representations. Rather, the soul is a developing reality whose cognitive advancement corresponds to genuine transformation in its mode of existence.

The doctrine of substantial motion provides one of the strongest philosophical foundations for understanding learning as existential development. According to this perspective, change is not confined to accidental properties while the substance remains fixed; rather, beings in the material order undergo transformation at the level of substance itself. Applied to the human soul, this means that the learner develops from lower forms of sensory and imaginative existence toward higher intellectual forms. Studies of Mulla Sadra's philosophical anthropology have therefore emphasized that his conception of the human being generates specific educational principles concerning development, perfection, agency, and the progressive actualization of human capacities (12). Likewise, examinations of the educational system implied by his psychology of the soul indicate that education can encompass the entire trajectory of human development, from material and sensory beginnings to intellectual and spiritual perfection (13). Belief learning, viewed within this framework, cannot adequately be defined as the addition of doctrinal propositions to an unchanged subject; rather, the very subject who believes is capable of qualitative transformation.

The relationship between knowledge and existence is further strengthened in Mulla Sadra's epistemology. Knowledge is not merely an external relation between a fixed knower and an independent object but is itself associated with a mode of being. This helps explain the importance of the unity of the knower and the known in Sadrian philosophy and provides a basis for distinguishing between the possession of concepts and the existential realization of knowledge. Discussions concerning the

status of representation, mental forms, and the philosophical interpretation of cognitive presence in Mulla Sadra further reveal the complexity of his attempt to explain how reality becomes present to the knower (14). In this context, belief may possess different degrees of depth depending on whether it exists merely as a verbal formulation, as an acquired concept, as a rationally demonstrated judgment, or as a more immediate and existentially integrated form of knowledge.

This epistemological hierarchy also has major educational consequences. Research on creativity within Mulla Sadra's epistemology has shown that his account of knowledge supports educational principles in which the learner is not passive but capable of intellectual discovery, development, and creative engagement with truth (15). Moreover, methodological discussions of Mulla Sadra's dialectical and philosophical procedures indicate that reasoning, questioning, demonstration, and movement among different epistemological perspectives play a significant role in the development of philosophical understanding (16). Thus, the Sadrian model does not eliminate rational inquiry in favor of intuition. Rather, demonstrative reasoning, intellectual discipline, and higher forms of cognition can be understood as complementary dimensions of the same developmental process. The implication for belief learning is that mature conviction must avoid both uncritical imitation and an overly narrow rationalism that assumes all forms of certainty can be reduced to discursive argument.

The philosophical background of this position also requires attention to the distinction between conceptual knowledge and more immediate modes of knowing. Within Islamic philosophy, knowledge has often been analyzed not merely as representation but also through the possibility of direct presence. Haeri Yazdi's investigations into practical reason and the foundations of knowledge illuminate the broader philosophical context in which cognition, rational agency, and direct awareness are treated as interconnected dimensions of human intellectual life (17). Similarly, Javadi Amoli's treatment of the relation between revelation, reason, and knowledge emphasizes that religious understanding should not be conceived as inherently opposed to rational knowledge but should instead be examined through a coherent epistemological framework (18). These perspectives are especially relevant to belief learning because they challenge an opposition between faith and knowledge and instead encourage analysis of the different epistemic routes through which belief may acquire justification and depth.

The philosophical realism articulated in contemporary interpretations of Islamic philosophy also provides an important background for examining belief. Tabatabaei's defense of philosophical realism emphasizes the distinction between reality and purely subjective construction and insists on the possibility of rational knowledge of an objective world (19). Belief learning within such a framework is therefore not merely the social production of internally coherent attitudes; it remains accountable to truth. This truth-oriented dimension is critical because an educational theory of belief must distinguish between psychologically strong conviction and epistemically justified conviction. A belief may be deeply internalized yet false, or socially powerful yet intellectually unsupported. Consequently, the depth of belief cannot by itself constitute a sufficient educational criterion. The formation of belief must also involve rational assessment, conceptual coherence, correspondence with reality, and appropriate epistemic grounds.

Plotinus and Mulla Sadra converge precisely at the point where the relationship between truth and the transformation of the knower becomes central. Plotinus maintains that the ascent of the soul requires purification from lower attachments and movement toward intellectual contemplation. Mulla Sadra similarly situates intellectual perfection within a broader transformation of the human soul. Their philosophical anthropologies therefore imply that cognitive deficiency may result not only from lack of information but also from the condition of the knower. Disordered desire, excessive attachment to sensible appearances, conceptual confusion, or underdeveloped intellectual faculties may limit the learner's capacity to apprehend truth. This provides a philosophical basis for integrating ethical education with epistemic education. Practical reason, moral orientation, and intellectual cultivation are not completely independent domains but can contribute jointly to the formation of

the human subject (17). Such an interpretation also resonates with educational approaches that treat moral development and the acquisition of religious concepts as mutually connected rather than isolated processes (2).

A further point of convergence concerns teleology. For both Plotinus and Mulla Sadra, knowledge has a final end beyond utilitarian problem solving. Plotinus locates the highest fulfillment of the soul in its ascent toward intelligible reality and ultimately toward the One (5), whereas Mulla Sadra interprets human development as progressive actualization toward intellectual and spiritual perfection (11). In both systems, the learner's development can therefore be judged in relation to an ultimate conception of human flourishing. This differs significantly from models of education concerned exclusively with measurable competencies, employability, or information retention. It also supports the idea that education must address questions of purpose, moral orientation, and the quality of the person being formed. The anthropological and educational implications extracted from Sadrian philosophy explicitly reinforce this developmental and perfection-oriented conception of education (12), while analyses of the human soul in his system further demonstrate the breadth of this formative trajectory (13).

Nevertheless, important differences between Plotinus and Mulla Sadra must not be obscured by structural similarities. Plotinus's metaphysical system is centered on emanation, the transcendence of the One, intellectual contemplation, and the soul's return from multiplicity to unity, whereas Mulla Sadra's transcendent philosophy is grounded in the primacy and gradation of existence, substantial motion, Islamic revelation, philosophical demonstration, and mystical knowledge. The Plotinian concept of the One as beyond being raises distinctive questions concerning the limits of predication and conceptual knowledge (6). In contrast, Mulla Sadra constructs a metaphysics in which existence itself possesses graded intensity and in which the soul's development can be interpreted as an intensification of being (10). The two systems therefore offer different metaphysical explanations for why higher knowledge transforms the knower. A rigorous comparative study must preserve these differences while identifying their educationally relevant correspondences.

Another significant gap concerns the fact that most existing studies have examined individual dimensions of the two philosophical systems rather than constructing a comparative model specifically centered on belief learning. Research on Plotinus has addressed intellectual intuition, contemplation, the transcendence of the One, and the ascent of the soul (5, 7, 8), while studies related to Mulla Sadra have analyzed philosophical anthropology, epistemology, educational implications, dialectical method, and the development of the soul (12, 13, 15, 16). Other works provide important background concerning realism, knowledge, practical reason, and the integration of rational and religious understanding (18, 19). Yet these strands of scholarship have rarely been systematically integrated around the educational question of how belief develops from initial reception to conceptual understanding, rational verification, internalization, and existential realization. The absence of such an integrated framework is particularly important because contemporary education frequently confronts the challenge of teaching religious and moral beliefs in contexts where simple transmission is insufficient and where learners increasingly expect rational engagement, personal relevance, and intellectual autonomy.

The need for such a framework is also strengthened by contemporary educational concerns. Current research emphasizes the effects of school culture, moral climate, lived experience, teacher conditions, and educational justice on learning and human development (1, 3, 4). These concerns suggest that belief formation cannot be isolated from the broader educational environment in which the learner develops. However, without an adequate philosophical anthropology and epistemology, educational discussions may remain confined to instructional techniques and psychosocial variables without clarifying what mature belief itself means. The philosophies of Plotinus and Mulla Sadra provide conceptual resources for addressing this deeper problem because both understand the human being as capable of ascending from lower to higher cognitive conditions and both connect knowledge with transformation. Their comparison can therefore contribute to a philosophical model in which

belief learning encompasses cognitive, rational, ethical, contemplative, and existential dimensions while remaining oriented toward truth and human perfection.

Accordingly, belief learning can be provisionally understood as a progressive process through which an initially received proposition becomes conceptually comprehended, critically examined, rationally justified, personally internalized, and ultimately integrated into the learner's mode of understanding and being. Such a definition neither equates belief with unreflective acceptance nor reduces it to discursive reasoning. It allows for degrees of epistemic development and recognizes that the formation of belief may involve sensory experience, imagination, reasoning, self-knowledge, intellectual intuition, moral purification, and existential transformation. Plotinus provides a metaphysics of ascent in which knowledge reaches fulfillment through the soul's movement toward intelligible unity, whereas Mulla Sadra provides a metaphysics of becoming in which the knowing subject itself develops through intensified modes of existence. Their conjunction therefore creates a productive philosophical field for examining whether belief learning should be understood not merely as learning *that* something is true, but also as becoming a subject capable of apprehending, embodying, and living in relation to that truth.

Therefore, the aim of the present study is to explain and comparatively analyze the ontological, epistemological, anthropological, ethical, and teleological foundations of belief learning from the perspectives of Plotinus and Mulla Sadra.

Methods and Materials

Study Design and Participants

This study employed a qualitative, analytical-comparative review design to explain and analyze the philosophical foundations of belief learning from the perspectives of Plotinus and Mulla Sadra. Given the conceptual and philosophical nature of the research problem, the study did not involve human participants or an empirical statistical sample; rather, its research corpus consisted of primary philosophical texts and relevant secondary scholarly literature concerning the ontological, epistemological, anthropological, and educational dimensions of the thought of Plotinus and Mulla Sadra. The primary textual corpus was selected purposively on the basis of its direct relevance to the concepts of knowledge, belief, intellect, soul, human perfection, the hierarchy of existence, and the process through which the human being moves from lower forms of cognition toward intellectual or spiritual realization. In the case of Plotinus, particular attention was given to the *Enneads*, especially passages addressing the One, Intellect, Soul, contemplation, purification, intellectual knowledge, and the soul's return to its metaphysical origin. In the case of Mulla Sadra, the principal sources included his major philosophical works, particularly *al-Hikmah al-Muta'aliyah fi al-Asfar al-'Aqliyyah al-Arba'ah* (*The Transcendent Philosophy of the Four Intellectual Journeys*), as well as other works relevant to knowledge, the soul, substantial motion, the gradation of existence, and human perfection. Secondary sources included peer-reviewed journal articles, scholarly books, dissertations, philosophical commentaries, and comparative studies that addressed Plotinian and Sadrian ontology, epistemology, philosophical anthropology, and the implications of their thought for human learning and intellectual-spiritual development. Sources were included when they provided substantial conceptual material for reconstructing the philosophical foundations of belief learning, clarified central concepts within either philosopher's system, or contributed to a defensible comparison between the two traditions. Sources that merely referred to Plotinus or Mulla Sadra without engaging the relevant philosophical concepts, repeated secondary interpretations without analytical contribution, or lacked sufficient scholarly credibility were excluded. Sampling therefore followed a purposive and concept-oriented logic rather than statistical representativeness, and the scope of the corpus was determined by conceptual adequacy and theoretical saturation, meaning that source collection continued until additional texts no longer produced substantially new categories relevant to the philosophical foundations of belief learning.

Data Collection Tools

Data were collected through systematic documentary examination and structured note-taking based on a researcher-developed conceptual extraction framework. Because the subject of the study concerned philosophical foundations rather than observable behavioral variables, the principal data-collection instrument was a document analysis form designed to extract, organize, and compare propositions relevant to belief learning within the two philosophical systems. The extraction framework focused on several interconnected conceptual domains, including the nature and hierarchy of existence, the ontological position of the human being, the nature and faculties of the soul, the relationship between sensory perception and intellectual cognition, the status of reason and intuition in the acquisition of knowledge, the relationship between knowledge and being, the meaning of belief and certainty, the mechanisms of intellectual and spiritual transformation, the role of purification and ethical development in cognition, the ultimate purpose of knowledge, and the movement of the human soul toward perfection. During the reading of the primary sources, relevant passages and philosophical propositions were recorded together with their conceptual context to prevent interpretations from being detached from the internal architecture of each philosopher's system. Secondary literature was used principally to clarify technical terminology, identify major interpretive controversies, and examine established readings of concepts such as emanation, intellectual contemplation, return to the One, the unity of knower and known, substantial motion, gradation of existence, acquired and presential knowledge, and the perfection of the rational soul. Particular care was taken to distinguish concepts explicitly formulated by Plotinus or Mulla Sadra from educational implications inferred by the researchers. Accordingly, the concept of "belief learning" was treated as an analytical construct through which philosophical propositions concerning the formation, deepening, justification, internalization, and existential realization of beliefs could be examined, rather than being retrospectively attributed to either philosopher as a modern technical term. The credibility of data collection was strengthened by repeated reading of central passages, cross-checking interpretations against multiple scholarly commentaries, maintaining conceptual consistency between extracted propositions and their original philosophical contexts, and documenting similarities and differences in terminology before constructing higher-order comparative categories.

Data Analysis

The collected material was analyzed using qualitative thematic analysis combined with philosophical interpretation and comparative analysis. Analysis proceeded through several interconnected stages in which relevant textual units were first identified and coded according to their explicit or implicit relationship with belief formation, knowledge acquisition, intellectual development, and spiritual perfection. Initial codes were subsequently grouped into broader conceptual categories representing the principal philosophical foundations of learning, including ontological foundations, epistemological foundations, anthropological foundations, axiological and teleological foundations, and the mechanisms through which cognitive and existential transformation occurs. Within each philosophical system, concepts were first interpreted internally and independently in order to preserve their systematic meaning and avoid premature equivalence between Plotinian and Sadrian terminology. Plotinus's concepts were therefore examined within the hierarchical relationship among the One, Intellect, Soul, and the sensible world, while Mulla Sadra's concepts were interpreted in relation to the primacy and gradation of existence, substantial motion, the unity of the knower and the known, and the progressive perfection of the soul. After this within-case analysis, a cross-philosopher comparison was conducted to identify convergences, divergences, and structurally analogous concepts. Particular analytical attention was devoted to whether learning in each philosophical system could be understood merely as the acquisition of propositions or, more fundamentally, as a transformation in the ontological and

intellectual condition of the learner. The comparison therefore examined such issues as the relationship between knowledge and existential perfection, the transition from sensory or discursive cognition to higher intellectual awareness, the role of self-knowledge, the function of moral and spiritual purification, the relationship between rational demonstration and supra-discursive cognition, and the ultimate orientation of learning toward metaphysical truth. Similarities were interpreted cautiously and were not treated as evidence of complete philosophical identity, since the Neoplatonic metaphysical framework of Plotinus and the Islamic transcendent philosophy of Mulla Sadra emerge from distinct intellectual, theological, and historical contexts. Interpretive validity was enhanced through constant comparison between codes and original textual passages, examination of alternative interpretations in the secondary literature, and repeated revision of conceptual categories until a coherent comparative framework was achieved. The final analytical model was constructed by synthesizing the identified categories into an explanatory account of the philosophical foundations, processes, and aims of belief learning in the thought of Plotinus and Mulla Sadra.

Findings and Results

The final analytical corpus consisted of primary and secondary philosophical sources selected on the basis of their direct relevance to the philosophical foundations of belief learning in the thought of Plotinus and Mulla Sadra. Because the present research was a qualitative philosophical review and did not involve human participants, demographic variables such as age, gender, educational level, or occupational status were not applicable. Instead, the descriptive characteristics of the research corpus were examined in terms of philosophical tradition, type of source, thematic orientation, and analytical function. The primary-source component comprised the principal writings in which the ontological, epistemological, anthropological, and teleological dimensions of the two philosophers' systems are most clearly articulated. In the Plotinian corpus, particular emphasis was placed on the *Enneads*, especially the treatises dealing with the One, Intellect, Soul, contemplation, self-knowledge, virtue, purification, and the ascent of the human soul. In the Sadrian corpus, particular attention was given to *al-Asfar al-Arba'ah* and complementary works addressing the primacy and gradation of existence, substantial motion, the immateriality and development of the soul, the unity of the knower and the known, acquired and presential knowledge, intellectual intuition, and ultimate human perfection. Secondary sources were used to clarify technical concepts, examine major interpretive positions, and establish the philosophical implications of these concepts for belief formation and learning. The reviewed materials showed that, although Plotinus and Mulla Sadra belonged to different historical, theological, and intellectual traditions, both systems conceptualized authentic learning as a process that exceeds the mere accumulation of propositions. In both perspectives, genuine knowledge is associated with transformation of the learner, elevation of the soul, progressive liberation from lower modes of cognition, and movement toward a more immediate apprehension of metaphysical truth. The analytical coding of the corpus produced five major dimensions of belief learning: ontological foundations, epistemological foundations, anthropological foundations, transformative mechanisms, and ultimate educational-teleological orientation. These dimensions provided the organizing framework for the comparative findings reported below.

Table 1. Principal Philosophical Dimensions of Belief Learning Identified in the Thought of Plotinus and Mulla Sadra

Philosophical dimension	Plotinus	Mulla Sadra	Implication for belief learning
Ontological foundation	Reality is hierarchically ordered from the One through Intellect and Soul to the sensible realm	Reality consists of graded modes of existence, with existence as fundamental and continuously intensified	Belief learning requires orientation from lower and fragmented levels of reality toward higher and more unified levels of being
Nature of knowledge	Higher knowledge occurs through intellectual contemplation and participation in Intellect	Knowledge possesses an existential character and culminates in unity between knower and known	Authentic belief is not merely verbally accepted but must become internally and existentially realized
Human nature	The soul possesses a higher orientation and is capable of returning toward its intelligible origin	The soul emerges in relation to the body but develops through substantial motion toward intellectual and spiritual immateriality	The learner is a developing being whose capacity for belief changes qualitatively through intellectual and spiritual growth
Role of reason	Discursive reasoning prepares the soul, but superior knowledge is attained through intellectual vision	Demonstrative reason is essential but can be completed by intellectual intuition and presential knowledge	Rational justification is necessary for mature belief but does not exhaust the highest form of certainty
Role of purification	Purification releases the soul from excessive attachment to sensible and bodily multiplicity	Moral refinement and purification facilitate higher intellectual and intuitive cognition	Ethical formation and cognitive development are interdependent in the formation of deep belief
Process of learning	Movement from sensible multiplicity toward intelligible unity and finally toward the One	Movement from weaker to more intense degrees of existence and cognition through substantial transformation	Belief learning is progressive and transformative rather than a single act of receiving information
Meaning of certainty	Certainty intensifies as the soul moves from discursive cognition to direct intellectual contemplation	Certainty reaches higher forms when conceptual knowledge develops into presential and witnessed knowledge	Strong belief depends on the transition from conceptual assent to immediate existential awareness
Ultimate aim	Assimilation to the divine and return of the soul toward its transcendent origin	Actualization of human intellectual-spiritual potential and proximity to ultimate reality	The final purpose of belief learning is existential perfection rather than solely doctrinal memorization

As shown in Table 1, the comparative analysis revealed a substantial structural convergence between Plotinus and Mulla Sadra concerning the fundamental architecture of belief learning, despite major differences in their metaphysical vocabularies and theological contexts. In both systems, belief learning is rooted in an ontological hierarchy that gives cognition a directional character. For Plotinus, the sensible world represents a lower and more dispersed mode of reality, whereas Intellect constitutes the domain of intelligible unity and the One stands beyond all multiplicity as the ultimate source of existence. Accordingly, learning acquires philosophical significance when it helps the soul move from dispersion in sensible objects toward intelligible unity and ultimately toward its transcendent origin. Mulla Sadra similarly interprets reality in hierarchical terms, but he formulates this hierarchy through the primacy and gradation of existence. From this perspective, entities differ not merely by conceptual classification but by the intensity and perfection of their existence. Human knowledge is therefore inseparable from the existential development of the knowing subject. This distinction is particularly important for the concept of belief learning. In both perspectives, a person may possess verbal, conceptual, or argumentative knowledge without having reached the highest level of conviction. Mature belief appears when the content of cognition is integrated into the learner's mode of being. The findings consequently suggest that belief learning has at least three interrelated levels: conceptual acquisition, rational verification, and existential realization. The first supplies the learner with propositions and concepts; the second transforms passive acceptance into reasoned conviction; and the third produces a deeper form of certainty in which knowledge becomes inseparable from the learner's intellectual and spiritual condition. This threefold interpretation explains why both Plotinus and Mulla Sadra attribute such importance to self-transformation, purification, contemplation, and the progressive elevation of cognition. The learner is not treated as a passive receiver of externally transmitted doctrines but as an existential subject whose capacity to apprehend truth develops in accordance with the quality of the soul itself.

Table 2. Ontological and Anthropological Foundations of Belief Learning

Analytical component	Plotinus	Mulla Sadra	Comparative interpretation
Structure of reality	Emanative hierarchy of the One, Intellect, Soul, and sensible reality	Hierarchical gradation of existence from weaker to more intense modes of being	Both locate human learning within an objectively ordered metaphysical universe
Position of the human soul	The soul is related to the intelligible realm but can become absorbed in sensible multiplicity	The soul begins with bodily dependence and progressively acquires immaterial intellectual perfection	Human beings possess the capacity for vertical development beyond their initial condition
Origin of cognitive limitation	Attachment to multiplicity, sensible appearances, passions, and forgetfulness of higher reality	Dependence on sensory and imaginative levels, limited existential capacity, and incomplete actualization of intellect	Cognitive deficiency is partly a condition of the learner rather than simply a shortage of information
Possibility of transformation	The soul can turn inward and upward toward Intellect and ultimately the One	The soul is dynamically transformed through substantial motion and intensification of existence	Learning is grounded in the possibility of qualitative transformation of the learner
Relationship between self-knowledge and metaphysical knowledge	Turning toward the true self opens access to intelligible reality	Knowledge of the soul discloses its immaterial and developmental nature and supports higher knowledge	Self-knowledge functions as an important route toward deepened metaphysical belief
Human perfection	Liberation from lower attachment and assimilation to intelligible and divine reality	Actualization of intellectual existence and progression toward increasingly perfect modes of being	Belief reaches maturity when it contributes to transformation of the whole person
Educational image of the learner	A soul capable of recollection, inward orientation, contemplation, and ascent	A dynamically constituted being whose cognitive faculties are gradually actualized	The learner should be understood as developmentally open rather than epistemically fixed

The findings presented in Table 2 demonstrate that the ontological and anthropological foundations of Plotinus and Mulla Sadra are indispensable for understanding their potential contribution to a philosophical theory of belief learning. Neither thinker treats the human being as a static cognitive container into which information can simply be inserted. Plotinus conceives the soul as possessing an intelligible dimension while simultaneously being capable of directing its attention toward the multiplicity and instability of the sensible world. The fundamental problem of human cognition is therefore not absolute separation from truth but misorientation, dispersion, and excessive identification with lower levels of experience. Learning, from this standpoint, requires an inward and upward reorientation through which the soul recognizes its higher capacities and becomes increasingly capable of intelligible contemplation. Mulla Sadra develops a different but comparable account through the doctrine of substantial motion. The soul is not created as a fully actualized intellectual substance; rather, it develops progressively and undergoes genuine ontological transformation. Sensory perception, imagination, conceptual thought, intellectual understanding, and higher forms of knowledge represent stages in the actualization of human existence. This provides a particularly strong basis for interpreting belief learning as developmental. Belief cannot be adequately evaluated only by asking whether an individual possesses a particular proposition or verbally assents to a doctrinal statement. Its depth depends on the stage of cognitive and existential development through which that proposition has been understood. At an elementary level, belief may be dependent on sensory representation, authority, habit, or imitation. At a more advanced level, the same belief may be supported by conceptual coherence and rational demonstration. At its highest level, according to the philosophical logic reconstructed from the two systems, belief is integrated into the learner's self-understanding and mode of existence. Thus, the ontological anthropology of both philosophers implies that differences in belief are not merely differences in informational content; they can also be differences in the existential condition of the believer. This finding further indicates that philosophical education oriented toward belief should attend to the gradual transformation of intellectual capacities, dispositions, desires, and modes of attention rather than restricting instruction to the transmission of propositions.

Table 3. Epistemological Levels and Mechanisms in the Development of Belief

Level or mechanism	Plotinus	Mulla Sadra	Function in belief learning
Sensory cognition	Provides contact with the sensible world but remains connected to multiplicity and change	Represents an initial level of cognition associated with material and particular objects	Supplies preliminary experience but cannot independently ground ultimate metaphysical certainty
Imagination	Mediates representations and can retain forms derived from sensible experience	Functions between sensory and intellectual cognition and plays an important role in the soul's cognitive development	Provides representational mediation but requires regulation by higher cognitive faculties
Discursive reasoning	Enables analysis and prepares the soul for higher intellectual apprehension	Demonstration and rational argument establish systematic and justified philosophical knowledge	Converts inherited or imitative belief into critically examined and rationally defensible belief
Intellectual cognition	Direct apprehension of intelligible reality in relation to Intellect	Actualization of the intellect permits knowledge of universal and immaterial realities	Raises belief from conceptual assent toward intellectually grounded certainty
Intuitive or immediate knowledge	Culminates in non-discursive contemplation and ultimately a supra-intellectual orientation toward the One	Presential knowledge and intellectual intuition provide immediate modes of knowing beyond representational concepts	Deepens belief by reducing the distance between the knowing subject and the known reality
Self-knowledge	The inward turn discloses the soul's higher nature and its relation to intelligible being	Knowledge of the self reveals the soul as an immaterial and developing reality	Makes belief personally and existentially meaningful rather than externally imposed
Purification	Frees cognition from passions and excessive attachment to sensible multiplicity	Moral and spiritual refinement removes obstacles to higher cognition and prepares the soul for intellectual illumination	Establishes an ethical precondition for the stabilization and deepening of belief
Contemplation	Central means through which the soul becomes assimilated to higher reality	Complements demonstrative knowledge by directing the soul toward direct apprehension of truth	Integrates cognition, attention, and existential orientation
Integration of knowledge and being	True contemplation transforms the soul in accordance with intelligible reality	Knowledge is a mode of existence and the knower is perfected through knowing	Explains why authentic learning changes the learner rather than merely increasing stored information

As indicated in Table 3, the epistemological analysis showed that belief learning in both philosophical systems proceeds through qualitatively differentiated levels of cognition. Sensory cognition has an indispensable but limited role because it introduces the learner to particular manifestations of reality without providing access to the ultimate metaphysical principles upon which those manifestations depend. Imagination performs a mediating function, retaining and organizing representations and thereby making more complex cognition possible; nevertheless, both philosophical frameworks warn against allowing representational and sensible forms to be mistaken for the highest reality. Discursive reasoning therefore constitutes a decisive stage in belief learning because it permits concepts to be examined, propositions to be related systematically, contradictions to be identified, and claims to be supported through rational argument. Within an educational interpretation, this stage marks the transition from imitative belief to reflective belief. A learner who accepts a metaphysical or religious proposition solely because of social transmission has not yet attained the form of conviction envisioned by either philosopher's broader epistemology. Rational inquiry is required to transform externally received content into personally understood and intellectually defensible knowledge. However, the findings also show that neither Plotinus nor Mulla Sadra considers discursive reasoning the final horizon of cognition. Plotinus gives priority to intellectual contemplation in which the knower participates more directly in intelligible reality, while Mulla Sadra distinguishes conceptual and acquired knowledge from forms of presential knowledge in which reality is known without dependence on an intervening mental representation. Consequently, the highest form of belief learning is characterized by a decreasing distance between proposition, understanding, and existential realization. At lower levels, the learner knows "about" reality; at higher levels, truth is apprehended with increasing immediacy. This finding does not negate the importance of rational argument. Rather, it establishes a hierarchical relationship in which reasoning functions as both a criterion of intellectual discipline and a preparation for deeper cognition. Ethical purification and contemplation are

equally important because both philosophers regard the condition of the soul as relevant to what and how it can know. Belief learning is therefore simultaneously epistemic and formative: it requires valid reasoning, but it also requires cultivation of the kind of subject capable of sustaining attention to intelligible truth.

Table 4. Comparative Model of the Stages of Belief Learning

Stage of belief learning	Defining characteristic	Plotinian basis	Sadrian basis	Educational-philosophical outcome
Receptive belief	Initial acceptance of propositions through instruction, testimony, custom, or representation	The soul initially operates amid sensible multiplicity and externally presented forms	Cognition begins at sensory and representational levels	Familiarity with fundamental concepts and propositions
Conceptual belief	Formation of coherent meanings and distinctions	Discursive soul organizes and differentiates intelligible content	Abstraction and conceptual cognition organize the content of knowledge	Understanding replaces merely verbal repetition
Rationally verified belief	Critical examination and justification of propositions	Dialectical and rational activity prepares the soul for intellectual contemplation	Demonstrative reasoning provides systematic certainty regarding philosophical propositions	Belief becomes critically defensible rather than purely imitative
Internalized belief	Belief becomes connected with self-understanding, value orientation, and conduct	The soul turns inward, purifies itself, and aligns with intelligible order	Knowledge participates in the perfection and transformation of the knowing soul	Cognitive conviction becomes integrated with identity and ethical orientation
Intellectually realized belief	Direct and stable intellectual apprehension of higher reality	Contemplation establishes a more immediate relation with Intellect	Actualized intellect and higher knowledge intensify the soul's mode of existence	Belief acquires a high degree of intellectual certainty and existential stability
Existentially transformative belief	Knowledge changes the mode of being of the learner	Assimilation to intelligible reality and ascent toward the One	Unity of knowledge and existence, substantial perfection, and presential realization	Learning culminates in transformation of the learner rather than mere possession of information
Teleologically perfected belief	Cognition is oriented toward the final perfection of the human being	Return toward the transcendent source and assimilation to the divine	Movement toward ultimate intellectual and spiritual perfection	Belief functions as an organizing principle of human perfection and purposeful life

Table 4 synthesizes the comparative findings into a developmental model of belief learning consisting of receptive, conceptual, rationally verified, internalized, intellectually realized, existentially transformative, and teleologically perfected forms of belief. These stages should not be interpreted as mechanically separated psychological phases or as an empirical developmental scale directly formulated by Plotinus or Mulla Sadra. Rather, they represent an analytical reconstruction derived from the internal logic of their philosophical systems. Receptive belief constitutes the initial condition in which propositions are encountered through teaching, testimony, tradition, language, symbolic representation, or social transmission. Such reception is educationally necessary but philosophically insufficient because the learner may repeat propositions without understanding their conceptual implications. Conceptual belief emerges when the meanings of fundamental ideas become differentiated and coherently organized. Rationally verified belief develops when those concepts and propositions are subjected to analysis, argument, objection, and demonstration, thereby reducing dependence on mere authority or imitation. The next transition is especially significant because internalized belief entails integration between knowledge and the learner's self-understanding. At this stage, belief begins to influence judgment, orientation, conduct, and the interpretation of existence. Intellectual realization represents a still higher condition in which metaphysical truths are no longer merely inferred through chains of propositions but are apprehended with a degree of intellectual immediacy. Plotinus interprets this through contemplation and participation in intelligible reality, whereas Mulla Sadra provides a particularly explicit ontological interpretation through the unity of the knower and the known and the existential nature of knowledge. The stage of existentially transformative belief therefore represents the point at which learning itself changes the learner's mode of being. The significance of truth is no longer external to the subject; knowing and becoming increasingly converge. Finally, teleologically

perfected belief refers to the orientation of cognition toward the ultimate purpose of human existence. In both perspectives, knowledge has a final end that exceeds pragmatic utility. Learning reaches completion insofar as it contributes to human perfection and reorientation toward ultimate reality. The findings therefore indicate that a philosophical model of belief education inspired by Plotinus and Mulla Sadra cannot be reduced to doctrinal transmission or even to rational persuasion alone. It must account for the entire trajectory through which received propositions become understood, justified, internalized, directly apprehended, and existentially transformative.

Table 5. Major Convergences and Divergences Between Plotinus and Mulla Sadra Regarding Belief Learning

Comparative theme	Convergence	Principal divergence	Significance for belief learning
Hierarchy of reality	Both defend a vertically ordered conception of reality	Plotinus explains hierarchy primarily through emanation from the One; Mulla Sadra explains it through gradation and intensification of existence	Belief education should orient cognition toward increasingly comprehensive levels of reality while preserving the metaphysical distinctiveness of each system
Development of the soul	Both regard the soul as capable of movement toward higher perfection	Plotinus emphasizes return and inward ascent; Mulla Sadra emphasizes substantial becoming and ontological transformation	Learning is developmental, but the metaphysical explanation of development differs
Knowledge and transformation	Both reject a purely external or informational conception of higher knowledge	Plotinus emphasizes contemplative assimilation; Mulla Sadra explicitly treats knowledge as a mode of existence	Deep belief requires transformation of the learner in addition to conceptual understanding
Reason and supra-discursive cognition	Both recognize rational activity while assigning a higher status to direct intellectual apprehension	Plotinus culminates in contemplation and union-oriented ascent; Mulla Sadra integrates demonstration, illumination, and presential knowledge within transcendent philosophy	Rational education should remain essential while acknowledging levels of cognition beyond discursive reasoning
Ethical purification	Both connect moral-spiritual condition with cognitive advancement	Plotinus frames purification in relation to liberation from lower attachments; Mulla Sadra integrates ethical perfection with the existential development of the soul	Formation of belief requires attention to character as well as intellect
Self-knowledge	Both regard inward knowledge of the soul as a route toward higher reality	Their accounts of the soul's origin, embodiment, and development differ significantly	Reflective self-understanding is a central mechanism for internalizing metaphysical belief
Final goal	Both regard knowledge as directed toward ultimate perfection	Plotinus emphasizes return toward the One; Mulla Sadra places human perfection within an Islamic metaphysical and eschatological framework	Belief learning is teleological and must be evaluated by its contribution to human perfection
Relationship to religious doctrine	Plotinus operates within a Neoplatonic philosophical-spiritual framework	Mulla Sadra synthesizes philosophical reasoning with Islamic revelation, theology, mysticism, and Qur'anic anthropology	Similarities in philosophical structure should not obscure distinct doctrinal foundations and theological commitments
Conception of existential change	Intellectual purification and contemplation elevate the soul toward its source	Substantial motion provides an explicit theory of continuous ontological becoming	Mulla Sadra offers a more systematically articulated metaphysical basis for describing learning as existential development
Educational implication	Both support movement beyond passive reception toward reflective and transformative knowledge	The theoretical vocabulary and ultimate doctrinal contexts differ	A comparative model should use structural correspondences without collapsing one philosopher into the conceptual system of the other

The comparative synthesis presented in Table 5 demonstrates that the relationship between Plotinus and Mulla Sadra cannot be adequately described either as philosophical identity or as complete opposition. The strongest convergence concerns their rejection of a flat conception of reality and, consequently, of a purely informational understanding of knowledge. Both philosophers assume that reality possesses levels and that human cognition can itself become more or less adequate to these levels. This metaphysical assumption has direct implications for belief learning because it means that the quality of belief is related to the mode through which truth is apprehended. A proposition accepted through habit or testimony does not possess the same epistemological status as a proposition understood through demonstration, and demonstrative knowledge itself may not represent the highest attainable relation to truth. Both philosophers therefore support a hierarchical conception of

conviction. Nevertheless, the analysis identified important differences in the metaphysical explanation of this hierarchy. Plotinus organizes the structure of reality around the One, Intellect, and Soul and interprets spiritual advancement as an inward ascent and return from multiplicity toward unity. Mulla Sadra, by contrast, grounds his metaphysics in the primacy and gradation of existence and interprets the development of the soul through substantial motion. This latter doctrine gives the Sadrian account of learning a particularly explicit developmental character because cognitive advancement is not merely a change in the possession of mental content; it is an intensification in the existence of the knowing subject. Another major divergence concerns the relation between philosophy and revealed religion. Although Plotinus's philosophy has profound spiritual and theological dimensions, Mulla Sadra operates explicitly within an Islamic intellectual universe and seeks a synthesis among philosophical demonstration, revelation, mystical insight, and spiritual experience. Consequently, a comparative theory of belief learning must distinguish structural similarities from doctrinal equivalence. Concepts such as ascent, contemplation, purification, intellectual realization, and ultimate perfection can be compared at the level of philosophical function, but they cannot automatically be treated as semantically identical. Overall, the findings reveal that Plotinus provides a powerful account of inward return, contemplative elevation, and the passage from multiplicity to intelligible unity, whereas Mulla Sadra develops a more explicitly dynamic account in which cognition is integrated with the ontological becoming of the human soul. Their intersection offers a philosophical basis for understanding belief learning as a multidimensional process encompassing reception, understanding, rational justification, self-knowledge, ethical purification, intellectual realization, and existential transformation.

Taken together, the findings produced an integrated philosophical model in which belief learning is defined as the gradual transformation of received propositional content into rationally grounded, personally internalized, intellectually realized, and existentially effective knowledge. The analysis showed that three distinctions are particularly important. The first is the distinction between information and knowledge. Information can be externally transmitted, whereas genuine knowledge requires an active relationship between the learner and the truth known. The second is the distinction between conceptual knowledge and realized knowledge. A learner may possess a correct concept without having integrated its implications into self-understanding or conduct. The third is the distinction between cognitive change and existential transformation. Cognitive change modifies what a person knows, whereas existential transformation modifies the quality and orientation of the knowing subject. Plotinus and Mulla Sadra both provide conceptual resources for moving beyond the first member of each of these distinctions toward the second. From this perspective, the philosophical foundation of belief learning is simultaneously ontological, because learning concerns the learner's relation to levels of reality; epistemological, because it involves progression among modes of knowing; anthropological, because the human soul possesses developmental capacities; ethical, because purification and character influence cognition; and teleological, because the ultimate purpose of learning is the perfection of the human being. The resulting model therefore conceptualizes belief education not as the transfer of fixed doctrinal statements from teacher to learner, but as a guided process through which the learner moves from reception to understanding, from understanding to justification, from justification to internalization, and from internalization to transformative realization. Within this framework, intellectual autonomy does not require separation from metaphysical or spiritual truth; rather, it requires that truth become consciously understood and rationally appropriated instead of remaining dependent on unexamined imitation. At the same time, rational autonomy is not regarded as the final stage of development, because both Plotinian and Sadrian philosophies point toward forms of cognition in which truth is increasingly experienced as an immediate and formative reality. Thus, the principal finding of the study is that belief learning, when reconstructed through the philosophical perspectives of Plotinus and Mulla Sadra, can be understood as an ascending process of cognitive and existential formation whose ultimate criterion is not simply the correctness of propositions retained by the learner, but the

degree to which knowledge has transformed the learner's intellect, self-understanding, ethical orientation, and relation to ultimate reality.

Discussion and Conclusion

The present study was conducted to design and validate a common mathematics curriculum planning model across different educational levels based on a blended learning approach. The findings produced a multidimensional model consisting of four overarching components: curriculum objectives, content, teaching strategies, and assessment. These components were further represented by 16 organizing themes and 48 basic themes identified through thematic analysis of the qualitative data. The quantitative phase subsequently confirmed the empirical adequacy of the proposed model. The higher-order confirmatory analysis showed that all four components had strong factor loadings on the overall mathematics curriculum planning construct. Curriculum objectives had the highest factor loading (.982), followed by teaching strategies (.891), assessment (.859), and content (.805). All loadings were substantially above the minimum acceptable level, indicating that the identified components represented the overarching construct adequately. Reliability was also satisfactory, with Cronbach's alpha coefficients ranging from .82 to .92 and composite reliability coefficients ranging from .78 to .95. Convergent validity was supported by AVE values between .69 and .80, while the structural indices indicated substantial explanatory and predictive capacity. The R^2 coefficients ranged from .76 to .91, Q^2 values ranged from .367 to .403, and GOF values ranged from .39 to .53. Taken together, these findings demonstrate that the proposed model possesses satisfactory internal consistency, construct coherence, predictive relevance, and overall structural quality.

One of the most important findings was the central position of curriculum objectives in the proposed framework. The objectives dimension had the highest factor loading and the largest GOF value among the four components, indicating that the direction and coherence of mathematics curriculum planning are strongly dependent on clearly formulated learning objectives. The qualitative findings showed that these objectives should encompass cognitive, skill-based, attitudinal, and developmental dimensions. Specifically, critical thinking, problem-solving, creativity, digital literacy, self-directed learning, collaboration, responsibility for learning, motivation, lifelong learning, and developmental appropriateness emerged as important components. This result is consistent with contemporary curriculum theory, which emphasizes that curriculum planning should move beyond the transmission of isolated subject matter and instead articulate purposeful educational outcomes that organize content, pedagogy, and assessment around broader forms of knowledge and capability (20). The result also corresponds with recent approaches to curriculum renewal that emphasize flexibility, learner-centeredness, and responsiveness to changing educational and social requirements (21).

The prominence of objectives can also be understood in relation to the specific nature of mathematics education. Mathematics learning involves more than procedural accuracy; it requires conceptual understanding, reasoning, problem-solving, explanation, and the capacity to apply knowledge in unfamiliar situations. Research on mathematics teaching has emphasized that teachers require specialized content knowledge to transform mathematical concepts into learnable forms and to support students' progressive development of mathematical understanding (22, 23). Accordingly, a curriculum model that explicitly defines cognitive and skill-based objectives can provide a clearer basis for choosing content, designing learning experiences, and determining appropriate assessment procedures. The present findings suggest that a common curriculum across educational levels should preserve continuity in broad learning aims while allowing the complexity and manifestation of those aims to change according to developmental level.

The content dimension also constituted a significant component of the proposed model. The qualitative findings indicated four major requirements: appropriate organization of content, characteristics of blended content, alignment of content with

learners and educational levels, and continuous updating. Vertical continuity, horizontal coherence, logical sequencing, integration of face-to-face and digital resources, multimedia and interactive content, responsiveness to individual needs, and ongoing revision were all identified as essential. Although content had the lowest factor loading among the four components, its loading remained high, indicating a substantial contribution to the overall model. This finding is compatible with curriculum perspectives that regard content as meaningful only when it is organized in relation to educational purposes, pedagogical processes, and the structure of disciplinary knowledge (20). In mathematics in particular, where knowledge is cumulative, vertical coherence is indispensable because weaknesses in foundational concepts can restrict later understanding.

The emphasis on interactive and technology-supported content is also consistent with the theoretical basis of blended learning. Blended learning has been defined as a deliberate integration of face-to-face instruction with online or technologically mediated learning rather than a simple coexistence of two modes (24). Therefore, blended mathematics content must be structured so that digital and classroom materials complement rather than duplicate one another. Graham and Halverson argue that the quality of blended learning depends fundamentally on purposeful integration among learning environments, pedagogical intentions, and technological affordances (25). Similarly, Buhl-Wiggers and colleagues showed that the effectiveness of blended education depends not merely on adding online components but on how face-to-face and digital components are designed in relation to one another (26). The present findings support this view by demonstrating that blended content should be interactive, adaptable, continuously updated, and appropriate to both learners' educational level and technological conditions.

The teaching strategies component was another strongly supported dimension of the model and showed the second-highest factor loading. The qualitative findings emphasized active teaching strategies, blended learning, the changing role of the teacher, and the active role of the student. Collaborative learning, project-based learning, problem-based learning, integration of virtual and face-to-face instruction, instructional time management, diversity of learning environments, facilitation by teachers, continuous feedback, active participation, and self-regulated learning were identified as essential features. This result is consistent with research showing that meaningful mathematics learning is strengthened when students actively construct relationships among concepts, engage in problem-solving, and participate in cognitively meaningful learning activities (27). It also aligns with evidence showing that mathematical discussion and comparison can support deeper reasoning when cognitive demands are appropriately managed (28).

The importance attributed to collaborative and self-regulated learning is particularly noteworthy. Mathematics learning often requires students to articulate reasoning, compare strategies, identify errors, and revise their understanding through interaction. Smith and Mancy found that collaborative mathematical problem-solving can involve important forms of shared metacognitive regulation in which learners jointly monitor, evaluate, and direct their reasoning processes (29). Likewise, Lim and colleagues reported meaningful associations among peer learning, self-regulated learning, and academic achievement in blended learning contexts (30). These findings help explain why the present model places active participation, continuous interaction, and self-regulation within the teaching strategies dimension. In a blended mathematics curriculum, learners must often manage part of their learning outside direct classroom supervision, making self-regulatory competence especially important.

The results further support the idea that the role of the teacher changes within blended learning environments. Rather than functioning primarily as a transmitter of content, the teacher increasingly assumes responsibility for facilitating learning, organizing interactions, diagnosing learning difficulties, guiding students between digital and face-to-face activities, and providing timely feedback. This interpretation is consistent with studies showing that blended learning creates both pedagogical opportunities and implementation challenges that require teachers to navigate multiple instructional environments effectively (31, 32). The findings of Darmawan and colleagues similarly indicate that blended approaches can create flexible and

participatory learning opportunities when instructional activities are deliberately coordinated across technological and classroom contexts (33). Therefore, the strong loading of the teaching strategies dimension in the present study appears theoretically justified.

The findings concerning assessment also constitute an important contribution. Assessment was represented by formative assessment, summative assessment, assessment tools, and assessment quality. Continuous feedback, process-oriented measurement, improvement of learning, performance assessment, competency assessment, electronic tests, electronic portfolios, performance-based projects, educational equity, validity, reliability, and methodological diversity were all identified as necessary components. The relatively high factor loading of the assessment dimension indicates that assessment should be considered an integral part of curriculum architecture rather than an endpoint added after instruction. In blended mathematics education, assessment must capture not only final achievement but also learning processes, strategy use, participation, collaboration, and performance across physical and digital environments.

This finding is consistent with the broader logic of blended learning research. Because learners operate across multiple learning environments, assessment systems must also be sufficiently flexible to collect evidence from different forms of activity. The integration of online and face-to-face assessment can provide more frequent feedback and allow students to monitor their own progress. This is particularly relevant to self-regulated learning, which depends on learners receiving information about performance and using that information to adjust subsequent strategies (30). Technology-supported environments can further extend assessment through electronic tests, digital portfolios, interactive tasks, and data generated by learning platforms. Recent work on data-informed curriculum planning has highlighted the potential of digital information to support more responsive and differentiated educational decisions (34). The present findings extend this perspective by situating technology-supported assessment within a unified mathematics curriculum framework.

The model's emphasis on differentiated and flexible curriculum design is also supported by previous research. The qualitative results showed that content and objectives should be adapted to learners' needs, developmental characteristics, educational stage, and technological circumstances. Maia and Freire demonstrated that teachers' orientations toward differentiated instruction influence how curriculum planning is interpreted and implemented in practice (35). This is relevant to mathematics education because learners frequently differ substantially in prior knowledge, pace of learning, confidence, and preferred forms of representation. A common curriculum model should therefore establish shared principles without requiring identical implementation for all students or stages. The model developed in this study appears to accommodate this requirement through flexibility in objectives, content adaptation, multiple teaching methods, and diverse assessment strategies.

The emphasis on digital and interactive learning also corresponds with research on technology-enhanced mathematics instruction. Tokac and colleagues found that game-based learning can positively influence mathematics achievement, illustrating the potential value of technology-mediated, interactive learning experiences when these are aligned with educational objectives (36). However, such approaches are likely to be most effective when they are incorporated coherently into the curriculum rather than introduced as isolated innovations. This interpretation supports the structure of the present model, in which digital tools are not treated as a separate component but are embedded across objectives, content, teaching strategies, and assessment.

The quantitative validation results further reinforce the conceptual coherence of the model. High Cronbach's alpha and composite reliability coefficients indicate that the components were measured consistently, while AVE values above .50 provide support for convergent validity. The substantial R^2 coefficients suggest that the structural model explains a large proportion of variance in its key dimensions, particularly teaching strategies. The Q^2 values above .35 indicate strong predictive relevance, while the GOF values above .36 support strong overall model quality. These findings are important because they

suggest that the four dimensions identified qualitatively are not merely descriptive categories but form a coherent empirical structure. The strong relationships among the components also reflect the interconnected nature of curriculum planning: objectives guide content selection, content shapes pedagogical possibilities, teaching strategies influence how learners encounter that content, and assessment determines the extent to which intended learning outcomes have been achieved.

The interdependence among these dimensions is consistent with the broader literature on blended learning. Effective blended learning requires alignment among technology, instructional design, pedagogy, learner activity, and assessment (25). When these dimensions are poorly coordinated, learners may experience fragmented learning pathways and uncertainty regarding expectations, tasks, and modes of participation (32). Hill and Smith similarly emphasize that blended learning presents both opportunities and challenges at institutional and pedagogical levels, particularly when technological innovation is introduced without sufficient structural coherence (31). The model validated in the present study addresses this issue by providing a curriculum-level framework rather than focusing solely on isolated instructional techniques.

Another important contribution of the study is its cross-level orientation. Much of the existing literature has examined blended learning in particular educational settings or specific courses, whereas the present study sought to identify shared curriculum planning principles applicable across elementary, lower secondary, and upper secondary mathematics education. The findings suggest that common principles can indeed be identified, particularly in relation to critical thinking, problem-solving, active learning, blended content, teacher facilitation, learner self-regulation, formative feedback, and diverse assessment. At the same time, the model allows these principles to be adjusted according to developmental characteristics and educational stage. This balance between continuity and flexibility may be particularly valuable in mathematics, where conceptual progression across grades is essential.

The present study has several limitations that should be considered when interpreting its findings. The qualitative participants were selected from Fars Province, and the quantitative phase was restricted to mathematics teachers in Lamerd and Mohr; therefore, the findings may reflect contextual characteristics of these educational settings and should not automatically be generalized to all regions or educational systems. In addition, the quantitative validation relied primarily on teachers' responses to a researcher-developed questionnaire, which may be influenced by self-report bias, professional expectations, or participants' familiarity with blended learning. The study validated the structural relationships among the proposed curriculum components but did not examine the model through direct classroom implementation or longitudinal evaluation of student outcomes. Moreover, technological infrastructure, school resources, teacher digital competence, and access inequalities were not examined as independent contextual variables, although they may substantially influence the feasibility of blended curriculum implementation.

Future studies should validate the proposed model in broader and more diverse samples drawn from different provinces, school systems, and socioeconomic contexts. Comparative studies across elementary, lower secondary, and upper secondary education could examine whether the relative importance of the model components changes across educational stages. Further research could also employ longitudinal or experimental designs to determine whether implementation of the model improves mathematics achievement, problem-solving, critical thinking, self-regulated learning, motivation, or digital competence. Researchers may additionally examine the perspectives of students, school administrators, curriculum designers, and parents to complement teacher-based evidence. Multi-group structural equation modeling could be used to investigate measurement invariance across gender, teaching experience, educational level, or school type. Future studies should also explore how technological readiness, access to digital resources, teacher professional competence, and organizational support moderate the effectiveness of the proposed curriculum model.

In practice, curriculum planners should use the proposed model as an integrated framework in which objectives, content, teaching strategies, and assessment are designed concurrently rather than independently. Mathematics objectives should include conceptual, cognitive, skill-based, and attitudinal outcomes appropriate to each educational level, while maintaining continuity across grades. Curriculum content should combine face-to-face and digital resources, employ interactive and multimedia materials, and be updated regularly. Teachers should be supported through professional development focused on active learning, blended instructional design, facilitation, formative feedback, and management of digital learning environments. Schools should also provide reliable technological infrastructure and equitable student access to digital resources. Assessment systems should combine formative, summative, performance-based, and electronic methods and should provide continuous feedback that supports learning improvement. Finally, curriculum implementation should preserve a shared framework across educational levels while allowing teachers sufficient flexibility to adapt activities, resources, pacing, and assessment procedures to the developmental and individual needs of their students.

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All authors equally contributed to this study.

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The authors of this article declared no conflict of interest.

Ethical Considerations

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Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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