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### Metacognition in the *Upaniṣads*

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#### Abstract:

Several centuries ago, in ancient India, knowledge was not merely transmitted in the artificial classroom settings but unfolded in quiet hermitages where the act of learning was not different from the act of living. This paper begins by situating learning in the Upanishads within its original context, where knowledge was not merely transmitted but lived, unfolding through dialogical exchanges between preceptor (*Guru*) and a pupil (*śiṣya*). In these texts, inquiries into the Supreme Soul (*Brahman*) and Individual soul (*Ātman*) emerge through reflective engagement (*anubhūti*) rather than formal instruction (*upadeśa*).

Against this background, the study identifies the modern notion of Metacognition widely discussed in the virtue epistemology branch of philosophy and psychology. Metacognition refers to 'cognition about cognitive phenomenon' or 'thinking about thinking'. Here, the individual who is undergoing the action of 'cognizing' becomes both the subject (observer) and the object (observed) of the same action.

The current research aims to (1) derive metacognitive insights from the select eight conversations in the *Chāndogya Upaniṣad*, (2) discern the importance of metacognition in pedagogy, and (3) propose a few learner-and-mentor-specific metacognitive traits to be incorporated in curricula for (a) strengthening the student-teacher relationship, (b) carrying out the holistic development of the students by teaching the younger generation not just about cognitive values, but the 'value of values', and (c) help in the overall knowledge-generating activity. Methodologically, the study adopts a comparative and interpretive approach, combining textual analysis of Upanishadic passages with the theoretical framework of metacognition as articulated by John Flavell in 1979, including elements such as self-reflection, cognitive monitoring, and intentional learning.

The findings suggest that while the Upanishads do not explicitly theorize metacognition, they embody a nuanced form of reflexive awareness in which the learner turns inward as both observer and observed, characterised by critical thinking, epistemic motivation, self-reflection, goal setting, resource planning and so on. This study proposes that integrating such metacognitive sensibilities into contemporary curricula, at the level of both learner and mentor, can strengthen the student and teacher relationship, foster holistic development, and shift education toward an appreciation not only of knowledge, but of the deeper value underlying it.

**Keywords:** Metacognition, *Upaniṣad*, Indian Pedagogy, Intellectual Humility, Indian Knowledge Systems

“Only a few know how much one must know to know how little one knows.”  
- Werner Heisenberg<sup>1</sup>

## INTRODUCTION

Indigenous literature of ancient India has never failed to mesmerize us in ways that seem captivating, glorious, enchanting and fascinating at the same time. Any single piece of knowledge, with its intrinsic vibrant forces, opens itself to the readers a variety of aspects based on readers’ interests, expertise, intentions, dispositions, and objectives as a consequence of its integrated and holistic outlook. This has enabled scholars to read poetry in astronomical texts, science in spiritual texts, ethics in the texts on medicine, philosophy in didactic literature, human psychology in literary science, logic in grammatical texts, and cognitive science in the texts of philosophy of language. The pluralistic approach to the development of literature still brings awe to the minds of readers even after thousands of years. By adopting such an interdisciplinary approach, the current paper re-reads the ancient Indian Upaniṣadic literature through the lenses of metacognition and discovers yet another contribution of the *Upaniṣads* to the studies in Virtue Epistemology, not denying its significant place in the philosophical and spiritual realm.

### **The Upaniṣads:**

*Upaniṣads* are the philosophical-spiritual texts written in the Sanskrit language, composed in the later Vedic period (*circa* 800-500 BCE). They belong to the Indian tradition of *Darśana* (spiritual vision or philosophy) literature that adheres a specific mode of inquiry which differs from the Western conception of philosophy in its experiential and lived realization. They are ascribed to one of the Vedic *Samhitā* texts, which appear after the *Brāhmaṇa* texts of sacrificial rites and *Āraṇyaka* texts on spirituality. Content-wise and chronology-wise, they are the apex of the Vedic thoughts, hence are known as ‘*Vedānta*’ (‘the end’ / ‘the culmination of the

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<sup>1</sup> Werner Heisenberg (1901-1976) was a famous German theoretical physicist and an admirer of Indian Philosophy.

*Vedas*'), and 'the jewels of the Indian philosophical literature'. They also stand as the origin for the development of different philosophical schools in later times.

*Upaniṣads*, thus, are the metaphysical texts aimed at grasping the fundamental truth of being (Hume, 1921, p. vii). The main theme of the *Upaniṣads* is to elucidate the true nature of the *Brahman* (the Ultimate Reality) and *Ātman* (the Individual Self) and the non-duality between them. The etymological meaning of the term '*Upaniṣad*' concurs with this idea with its constituent components *upa* + *ni* + *sad* that means 'to sit near down.' The extended meaning conveys surrendering oneself at the feet of the *Guru* to let go of one's ego to attain *ātma-jñāna* (knowledge of Self). The term *Upaniṣad* itself means knowledge by virtue of its significance that it kills or shatters or destroys the ignorance in this world, loosens the bondages and brings the intuitive or experiential knowledge of self-realization or self-actualization, also known as *Parā Vidyā*. To attain this experience, there is a necessity of a *Guru* (preceptor) who himself has attained this knowledge, is aware of the personality, attitudes, dispositions and tendencies of his *Śiṣya* (disciple), and is equipped with the capability to remove the obstacles from his journey towards *Brahma-jñāna* (knowledge of Ultimate Reality).

The knowledge - *Brahma-jñāna* - is imparted by *Guru* to the seeker (*śiṣya*), who stays with him in his home or a *Gurukula* till the completion of the studies, by employing the self-paced and personalized method catered for an individual *śiṣya*. This method of dialogues between a preceptor and a disciple has gained much appreciation from Western scholars as the most radiant, eloquent and spiritual method of dialogues and question-answers (Johnston, 1910, pp. 27, 358). This teaching aims to prepare a student as a safe container to which the experiential or intuitive knowledge would reveal itself.<sup>2</sup> This wisdom cannot be imparted merely by oral teachings or other intellectual activities<sup>3</sup> but rather by following a specific method of purification of oneself to reach the truth within oneself.

Consisting of both prose and poetry, the *Upaniṣadic* literature is full of short and pregnant aphoristic statements used by the *Guru*, the questions-and-answers by both *Guru* and the *Śiṣya/s* and sometimes even the lengthy monologues which make it more poetic and rhythmic. The *Guru* adopts several types of pedagogical methods such as the use of *kathās* (a discourse, tale or a narrative), analogies, and monologues, synthesis of knowledge, experimental, collaborative and cooperative learning and so on. The method of imparting knowledge may seem enigmatic at times, or sometimes mysterious (Johnston, 1910, p. 186) as well. It may give

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<sup>2</sup> *hiraṇmayena pātreṇa satyasyāpihitam mukham| tat-tvaṃ pūṣannapāvṛṇu satyadharmāya dṛṣṭaye||* (Īśa Upaniṣad 15)

"The door (real nature) of the truth (Satya Brahman) is covered by a golden disc. Open it, O Nourisher! Remove it so that I who have been worshipping the truth may behold it."

<sup>3</sup> *naiṣā tarkeṇa matirāpaneyā...* (Katha Upaniṣad 1.2.9)

"This understanding cannot be attained through mere dry logic or intellectual argumentation."

*nāyamātmā pravacanena labhyo na medhayā na bahunā śrutena...* (Mundaka Upaniṣad 3.2.3, Kaṭha Upaniṣad 1.2.23)

"The Self is not to be won by eloquent teaching, nor by brain power, nor by much learning"

a sense that the *Guru* offers only partial knowledge and not in its entirety to a disciple. The relationship of the *Guru* and *Śiṣya* is critiqued as an example of masochism with unhealthy Oedipus complex by some western analysers as recorded by Vaidyanathan in his study (1989, p. 158), yet the entire pedagogical setting in the *Upaniṣads* stands as an embodiment of spiritual enlightenment where the *Śiṣya* asks the right questions, is humble and persistent and has the basic intelligence to detect a half-truth and persuades the *Guru* to reveal the complete truth (Olivelle, 1999, p. 66). Something that remains constant as the foundation of all such teaching-and-learning episodes in the *Upaniṣads* is the fact that they are always profound and rich in the spiritual message aiming at the character development of the disciple through the infusion of piety and religiousness (Altekar, 1965, p. 9).

### THE CONCEPT OF METACOGNITION

The term Metacognition appears in the consciousness studies in Philosophy. Human beings are not just aware of their surroundings but also of themselves *as themselves* (self-conscious or self-aware), paradigmatically referred to by the terms “I”, “me”, and “my”.

The term Metacognition also appears in the Virtue Epistemology branch of Western Philosophy which studies the role of virtues in one’s intellectual activities. The neo-Aristotelean account in Virtue Epistemology put forth by Linda Zagzebski in 2003 considers the cultivated virtues of an epistemic agent more important in the knowledge-generating activity than the object itself. Thus, the epistemic agent becomes the central topic in epistemology (Broncano, 2014, p. 50). These cultivated character traits or epistemic *responsibilities* gave the name to this account ‘*Responsibilism*’ that stands as different from the earlier view of ‘*Reliabilism*’ put forth by Ernest Sosa which holds that the proper functioning of the virtues is more important (Sosa, 2001, p. 195). The *Reliabilism* school calls the cognitive faculties of a person such as memory, perception, and so on virtuous insofar as they are reliably functioning the way they are supposed to. Thus, it focuses more on the reliable or virtuous functioning of a given agent’s cognitive faculties. Zagzebski, on the other hand, adopts a broadly Aristotelian view that both moral and intellectual virtues have no fundamental difference in them (Lepock, 2014, pp. 33-35), emphasizing on specific character traits of an agent such as intellectual courage and perseverance, open-mindedness, etc., which are collectively known as epistemic character or epistemic responsibilities of an agent. When the agent takes a reflective responsibility for their true beliefs, knowledge starts arising from such a motivated virtuous knower. Conscientiousness, respectfulness, humility, open-mindedness, perseverance, and metacognition are some of the traits that govern the character of such a knower.

The term metacognition refers to cognition about cognitive phenomenon, thinking about thinking (Lai, 2011, pp. 4-5), the knowledge and control over one’s thinking, and an awareness of the content of one’s understanding. According to Flavell, the term

metacognition refers to “one’s knowledge concerning one’s own cognitive processes and products or anything related to them”. In the metacognitive activity, the individual who is undergoing the action of ‘cognizing’ becomes both the subject (observer) and the object (observed) of the same action. In other words, metacognition is characterized by self-appraisal and self-management concerning one’s thinking. Thus, it becomes the epistemic trait or virtue of an agent which disposes him rightly in the knowledge-generation activity.

Compared with cognition, Georghiades (2004, p. 372) and others explain the term metacognition as follows:

- (i) Cognition refers to the actual process or strategies of knowing, while metacognition controls these cognitive processes. Thus, metacognition can be viewed as a subset of cognition. It is a particular kind of cognition.
- (ii) While cognition facilitates learning, metacognition monitors the learning process.
- (iii) Metacognition is a second-order cognition. It is thoughts *about* thoughts, cognitions *about* cognitions. It is in a hierarchical relationship to cognition, *viz.*, it draws from cognition. Metacognitive processes direct our cognitive processes.
- (iv) Passive cognition or learning may be possible, but passive metacognition is not possible. Metacognition is always a conscious and critical analysis of one’s awareness.

Historically, it can be observed that monitoring one’s own cognition was studied by ancient Greek philosophers starting from Socrates (469-399 BCE) with his Socratic method of questioning featuring a common form, a common strategy, and a common epistemological presupposition, followed by the theory of mind (*psuchē* in Greek) put forth by his student Plato (429?-347 BCE), and the idea that the faculty of mind is beyond hearing and seeing as discussed by Plato’s disciple Aristotle (384-322 BCE). In the field of Psychology during late 19<sup>th</sup> Century, it was William James who emphasized the importance of ‘Introspective Observation’ in his twelve-hundred-page masterwork *The Principles of Psychology* that contains seeds of pragmatism and phenomenology. Later in the field of philosophy, the perception of the state of one’s mind was again discussed by the 17<sup>th</sup>-Century British philosopher John Locke who emphasized the ideas are caused by the objects and they also represent the objects which cause them. In the mid-20<sup>th</sup> Century, a promising work by a Russian school teacher and a psychologist Lev Vygotsky stands as a turning point in using reflective thinking in pedagogical settings. Vygotsky argued that conscious reflective control and deliberate mastery over it are essential factors for the cognitive development in school children and he proposed two-layered metacognitive aspects of performance, *viz.*, (1) *automatic unconscious acquisition* of knowledge and (2) *active conscious control* over it. The late 20<sup>th</sup> Century witnessed the importance of the concept of reflected abstraction to human intelligence, primarily discussed by Jean Piaget in 1976. For all such introspective activities, the term metacognition was first formalized by John Flavell (1979). Today,

metacognition is studied under different areas of philosophy, psychology (developmental, social, neuro, forensic, educational, etc.) and pedagogy.

Metacognition is a multidimensional set of general, rather than domain-specific, skills. Some scholars argue that it is a disposition rather than a skill (Green, 2019, p. 120) as it includes dispositions such as attitudes, and specific habits of mind such as fair-mindedness, inquisitiveness (epistemic motivation, a desire to be well-informed), cognitive flexibility (respect for and willingness to entertain diverse viewpoints), critical thinking (a propensity to seek reason), self-reflection, goal setting, and resource planning. These skills are empirically distinct from general intelligence and may even help to compensate for deficits in general intelligence or cognitive limitations (Veenman, 2006, p. 6). The current paper revolves around these dispositions as observable in the *Upaniṣads*.

## BACKGROUND OF RESEARCH

Indigenous knowledge systems of India developed for more than 6000 years in the fertile valley of the Indus River spread across the Gāndhāra region at the west to the Suvarṇadvīpa in the east offered a befitting place for the learned people and the sages to understand the external world by the way of philosophizing and bringing the infinite experiential knowledge or wisdom to the finite sets of language transmitted carefully and rigorously through the oral tradition in the *Guru-Śiṣya Paramparā*. The Upaniṣadic literature is the worthiest exemplar of this knowledge tradition. Profound in its philosophical and spiritual message, potent with ethical and moral standards, and full of poetic and rhythmic beauty, each sentence in the *Upaniṣads* carries the pancultural and panhuman benefits and still continues to guide us. The current paper revisits the select eight conversations in one of the oldest *Upaniṣads*, the *Chāndogya Upaniṣad*, from the lenses of modern psychology and philosophy to derive the metacognitive insights immersed in these conversations of a *Guru* and a *Śiṣya*.

This paper is the extension of research conducted previously on the theme ‘*Vidyā Vinamratā*’ also known by the term Intellectual Humility in the Virtue Epistemology branch of Western Philosophy.

- Two experimental research were conducted on more than 440 Indian adult populations to impart the Upaniṣadic wisdom in them, primarily through the readings of Upaniṣadic narratives and reflecting on the method of pedagogy and human values embedded in it.<sup>4</sup>

It was found from both qualitative and quantitative analysis that

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<sup>4</sup> This work was performed by the author in the pandemic time in 2020 via online Google Forms and later in 2022 to 2024 in collaboration with Keerthi Sree Marappu (Student of BTech, IIT Kharagpur, India) by developing a website for participants to read different Upaniṣadic stories over a period of two years and monitor their progress in episteme and ethics via the HEXACO framework of personality assessment (<https://hexaco.org/>).

- (1) guided exposure to these narratives stimulates multifaceted reflection pertinent to Intellectual Humility
- (2) structured self-reflection accompanying the Upaniṣadic readings is crucial
- (3) the dialogical nature of the text prompts consideration of diverse perspectives in the participants.

This work titled ‘*Ancient Wisdom, Modern Impact: Exploring the Relevance of Upanishadic Stories to the Intellectual Humility in Indian Students*’ was presented at the 19<sup>th</sup> World Sanskrit Conference, Kathmandu, Nepal (26-30 June 2025).

- Theoretical research was conducted to derive the insights on Intellectual Humility from ‘*Thirukkural*’- the ancient Tamil text, also known as *Tamil Marai* (‘Tamil Veda’) (Gajjam, 2022), from the ‘*Chāndogya Upaniṣad*’ (Gajjam, 2023; Gajjam, 2024) and the ‘*Bhagavadgītā*’.<sup>5</sup> An attempt was made in these works to derive the five most important traits of Intellectual Humility, named the Five-Factor Model of Intellectual Humility.
- Theoretical research was performed on discerning the taxonomy of metacognition in the didactic literature ‘*Nīṭisataka*’ of Bhartrihari (5<sup>th</sup>- 7<sup>th</sup> Century CE) through his wonderful portrayal of an interplay between *vidyā* (knowledge), *jāḍyam* (ignorance) and *śīlam* (virtues) (Gajjam, 2026)<sup>6</sup>.
- The ongoing experimental work aims to inculcate metacognition in Indian younger adults through the activity of ‘Conscious Eating’ (*āhāra-vidhi-viśeṣa-yatna*) as mentioned in the Ayurvedic texts.

## SCOPE

The current paper resorts to the select eight stories in one of the oldest *Upaniṣads* in Indian Knowledge Systems, the *Chāndogya Upaniṣad* (Ch. Up., hereafter), which is ascribed to the *Tāṇḍya* school of the *Sāma Veda*. It deals with topics such as the true nature of *Brahman* and *Ātman*, *Agni Vidyā*, *Bhūma Vidyā*, *Prāṇa Vidyā*, types of *Upāsanas*, *Kośa Vijñāna*, and so on.

The current work revolves around the rich heritage of ethics and human values in the indigenous literature of ancient India. The larger aim of this research is to emphasize the importance of metacognitive activities in students that are beneficial for self-reflection, self-assessment and self-progress for proper dissemination of knowledge. A few insights are also

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<sup>5</sup> This work was performed in collaboration with Karthik Vasamsetty (Student of BTech, IIT Kharagpur, India) during 2022 to 2023. The work titled ‘*Redefining ‘Intellectual Humility’ in Indian Context: Ideas Derived from the Bhagavadgītā*’ was presented at the National Youth Conference on Indian Knowledge Systems (NYCIKS), IIT Roorkee, India (25-27 August 2023).

<sup>6</sup> The work titled ‘*Metacognition in Nīṭisataka*’ was presented at the Unravelling Indian Knowledge Across Asia (UNIKAA), IIT Guwahati, India (03-05 October 2024).

provided for incorporating metacognitive activities in pedagogy for holistic development of the students. It highlights teaching the younger generation not just about cognitive values, but the ‘*value of values.*’

### METACOGNITION IN THE UPANIŞADS

*Upaniṣads* are celebrated as the epitome of the rich heritage of *Guru-Śiṣya Parampara*. They can be considered the best resource to study the phenomenon of metacognition. The following stories are considered (Table I) for this research based on their significance in terms of philosophical, pedagogical and metacognitive perspectives which are pivoted by the conversation between at least two interlocutors.

Story #	Story Details	Chapter #
1.	The Satyakāma and Upakosala Conversation	Ch. Up. 4.10
2.	The Śvetaketu, Uddālaka, and Pravāhaṇa Conversation	Ch. Up. 5.3-10
3.	The Satyakāma Jābāla and Haridrumata Gautama Conversation	Ch. Up. 4.4-9
4.	The Raikwa and Jānaśruti Conversation	Ch. Up. 4.1-2
5.	The Ṛsis, Uddālaka and Aśvapati Conversation	Ch. Up. 5.11
6.	The Indriyas and Prajāpati Conversation	Ch. Up. 5.1.6-15
7.	The Indra, Virocana and Prajāpati Conversation	Ch. Up. 8.7-12
8.	The Śvetaketu and Uddālaka Conversation	Ch. Up. 6.1

**Table I: List of the Stories in the *Chāndogya Upaniṣad***

In these stories both the disciple who is seeking knowledge and the preceptor who is imparting knowledge and at times, the preceptor himself becoming a disciple of another preceptor, depict a variety of metacognitive activities. After revisiting these stories, the following metacognitive traits are derived:

1. Cognitive Knowledge
2. Cognitive Monitoring
3. Cognitive Flexibility
4. Cognitive Tenacity

Metacognition consists of two major aspects of mental functioning, *viz.*, Cognitive Knowledge and Cognitive Monitoring. Cognitive Knowledge includes declarative, procedural and conditional knowledge, while Cognitive Monitoring includes self-assessment leading to goal setting, task execution, strategy planning and so on. While performing these activities, an epistemic agent must have certain character traits which prove to be rather epistemic traits, such as Cognitive Flexibility which allows one to revisit one’s viewpoints in the face of evidence and Cognitive Tenacity which is led by inquisitiveness and allows one to have a

complete cognitive closure. All these metacognitive activities occur *before* the actual cognitive practices (planning), *during* such practices (monitoring) or *after* practices (evaluating). Lepock, in their book '*Virtue Epistemology Naturalized*' (2014, p. 33), emphasized that knowledge only arises with such a proper subset of reliable processes.

## COGNITIVE KNOWLEDGE

Having knowledge of the contents of one's understanding is known as Cognitive Knowledge. This is the starting point in metacognitive knowledge. The famous cognitive bias the *Dunning-Kruger Effect* suggests that a person should at least have some sort of basic knowledge even to know that he does not know certain things. An absolutely foolish person or a stupid person cannot be aware of his ignorance at all owing to a lack of metacognitive abilities. Bhartrihari's *Nītiśataka* (*Nītiśataka*, 3, 4, 7, 10, 11) criticizes such stupidity among men. He states that even ignorance is acceptable in some cases, but ignorance about one's own ignorance is highly disregarded. It is argued by Gajjam (2026) that *understanding* one's own understanding or having *awareness* of one's phenomenological experience is an important epistemic achievement. It is done by constantly stepping back mentally to appraise and rework one's plans, in other words, openly monitoring one's cognitive behaviour which are crucial for coherent and successful behaviour.

(a) **Declarative Knowledge** includes '*knowing what*', the knowledge of oneself as a learner and other factors that affect cognition such as self-appraisal, and epistemological understanding.

For example,

- In the story about *Agni-vidyā* (*The Science of Fire*, Ch. Up. 4.10), we come across a disciple Upakosala, the descendent of Kamala and the preceptor Satyakāma. While the teacher instructed everyone that dwelt with him, he did not instruct Upakosala. With extreme fervor, when Upakosala abstained from eating and was full of sickness, the three fires at the preceptor's home start instructing him that '*prāṇo brahma, kam brahma, kham brahmeti*' (Eternal is Life. Eternal is Joy. And the Eternal is expanse.).

Here, Upakosala narrates to the *Agnis* that he has the knowledge that *prāṇa* (Breath) is *Brahman*, but he is ignorant that '*ka*' (bliss/ pleasure) and '*kha*' (sky/ *ākāśa*) are also *Brahman*.<sup>7</sup> His awareness about his own knowledge and limitations of it indicates Declarative Knowledge on the part of Upakosala. Finding out the content of one's intellect is said to be the chief aim of philosophic endeavor which then leads to intuition (Radhakrishnan, 1923, p. 173). Piaget (1950, pp. 145-151), in his book *Psychology of Intelligence*, states that such intuition consists of a complex configuration of

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<sup>7</sup> *vijānāmyaham yat-prāṇo brahma kam ca tu kham ca na vijānāmīti...* (Ch. Up. 4.10.5)  
"I know that *prāṇa* is *Brahman*. But that *ka* and *kha* are *Brahman* I do not know."

assimilated thoughts which is the advanced stage of symbolic or pre-conceptual thought. Thus, the awareness of the content of one's knowledge stands as the starting point of experiential or intuitive awareness of *parā vidyā*.

- Pravāhaṇa Jaivali in Ch. Up. 5.3-10, a Kṣatriya king of the Jivala region, in his court, asks the young Śvetaketu, son and disciple of one of the greatest Brahmin sage Uddālaka, five such questions that Śvetaketu cannot answer. These questions were about the greatest mysteries of reincarnation and liberation that Śvetaketu was not initiated in. With much discountenance upon the statement of Jaivali that “*how, then, didst thou say that thou hast been instructed? For how could he, who knew not these things, say he had been instructed?*”, Śvetaketu goes back to his father Uddālaka and narrates to him the entire story. Uddālaka himself is unaware of the answers to those questions which were only known to the Kṣatriya kings.<sup>8</sup> Both the preceptor and the disciple are aware of the limitations of their knowledge. Uddālaka's awareness of his knowledge led him to further epistemic pursuit at Jaivali's court which is the first instance of the initiation of *brāhmaṇa* into these mysteries which were never known to a *brāhmaṇa*.

(b) **Procedural Knowledge** includes ‘*knowing how*’ about any task. Thus, procedural knowledge follows declarative knowledge. It consists of an awareness and management of one's cognition, including knowledge about strategies. Both the declarative and procedural knowledge of one's memory is known by the term Metamemory (Mahdavi, 2014, p. 531), a fundamental component of metacognition. It includes judgments of learning (JOLs) that includes predictions about one's future recall, and the states of feeling-of-knowing (FOK) and tip-of-the-tongue (TOT).

For example,

- In the story of Satyakāma Jābāla (*The Lover of Truth*, Ch. Up. 4.4-9), during the years of wandering in the forest until the four hundred lean and weak cows turn into thousands as instructed by his *Guru* Gautama, the disciple Satyakāma, obtains four-quarters of knowledge each from different entities, *viz.*, a bull, the *agni*, a swan, and a *madgu* (a kind of an aquatic bird), that the Brahman is luminous (*prakāśavān*), endless (*anantavān*), radiant (*jyotiṣmān*) and all-supporting one (*āyatanavān*), respectively. In forming this declarative knowledge, the synthesis of each quarter of information provided by four different entities requires the inner ability of ‘cognitive integration’.

Satyakāma's declarative knowledge leads to procedural knowledge when he decides to resort to his *Guru* for the final understanding of the same knowledge. He states that only the knowledge obtained from the *Guru* becomes the best.<sup>9</sup> Satyakāma's ability to

<sup>8</sup> *ahamaṣāṁ naikañcana veda yadyahamimānavediṣyaṁ katham te nāvakṣyamiti* (Ch. Up. 5.3.5)

“I am not able to answer even one of them. If I knew the answers, why should I have not told you?”

<sup>9</sup> *ācāryāddhaiva vidyā viditā sādhiṣṭhaṁ prāpatīti...* (Ch. Up. 4.9.3)

“knowledge learned from a competent teacher is the best.”

find the best available resources, adjust the strategies in his learning process and resort to the compensatory methods of knowledge acquisition are characterized by metamemory.

- In the story of Raikwa- a cart-puller and a Kṣatriya king Jānaśruti (the grandson of Janaśruta) (Ch. Up. 4.1-2), we come across Jānaśruti who was a faithful giver bestowing much riches to his people. But he notices that even after making lots of donations, his mind is not tranquil. He discerns that he should meet a man, a cart-puller, Raikwa who is said to be the most content person that people know of. Jānaśruti pursues Raikwa multiple times with proper respect, offering him gold and his own daughter for marriage to obtain knowledge that “Do charity but without having any ego!” Knowing how to obtain certain knowledge, how to use different strategies to achieve one’s goal is known by the term procedural knowledge which is clearly showcased by Jānaśruti in this story.

(c) **Conditional Knowledge** includes ‘*knowing when, where, why*’. It is the knowledge about why and when to use a given strategy (Lai, 2011, p. 9).

For example,

- In the story that emphasizes ‘the truth is known when all is known’ (Ch. Up. 5.11), one of the greatest sages of ancient India, Uddālaka, was visited by five learned *Ṛiṣis*, i.e., Prācīnaśīla, Satyayajña, Indradyumna, Jana and Budila. The *Ṛiṣis* conducted a discussion among themselves on ‘Which is our *Ātman* and who is *Brahman*?’ and failed to reach a consensus. The knowledge of *Ṛiṣis* to approach Uddālaka to clarify their doubts because Uddālaka himself was the serious student of the knowledge of *Vaiśvānara Ātman* (the All-Self) suggests their conditional knowledge to use appropriate strategies at the right time.
- In Ch. Up. 5.1.6-15, the six senses wanted to establish which is the supreme sense among them all. They visited their father Prajāpati for clarification. Prajāpati asks them to perform a small experiment where each sense leaves the human body one by one. The supremacy lies in that sense upon the departure of which the body cannot sustain anymore. All the six senses follow this method and establish the importance of breath (*prāṇa*) without which the body cannot function properly at all. In this story, Prajāpati showcases the conditional knowledge of using the self-experimental method of collaboration and cooperation to remove doubt about the sense organs. Mere oral teaching or intellectual activity might not have helped them to properly absorb the supremacy of a certain sense organ on account of the inherent limitation of one’s intellect.

While declarative knowledge of the content of one’s own knowledge allows one to understand one’s cognitive resources, procedural knowledge helps in applying them whereas conditional knowledge enables them to choose the right strategy at the right

time. Thus, both the procedural knowledge and conditional knowledge must work together, rather than in a sequential manner.

## COGNITIVE MONITORING

Cognitive knowledge is followed by Cognitive monitoring (*a.k.a.* cognitive regulation) which consists of task planning, execution and self-assessment. This aspect of metacognition is more important because different tasks in monitoring result in coherent and successful behaviour in the learners.

- (a) **Task Planning** includes identification and selection of appropriate strategies and allocation of resources. It is comprised of goal setting, activating background knowledge, and budgeting time.

For example,

- When the five learned Sages approach Uddālaka for knowledge about *Vaiśvānara Ātman* (Universal Self) (Ch. Up. 5.11), Uddālaka, despite being the great learned sage, requests the sages that they should all proceed to King Āśvapati (son of Kekaya) who, according to Uddālaka, was a more knowledgeable and authoritative person on *Vaiśvānara Ātman*. The king Āśvapati then instructed them in secret and tells them that this knowledge connects the individual (*Ātman*) with the universal (*Brahman*) through sacrifice and meditation only when one meditates on all, and not on parts because ‘*The Truth is known when all is seen!*’

This story suggests that to attain one’s cognitive goal, both the group of the *Riṣis* and Uddālaka have used a stable capacity to exert metacognitive control over their learning process (Martinez, 2006, p. 699; Lepock, 2014, p. 43) in finding the best resource available to them suitable for their epistemic pursuits. Uddālaka is apprehensive that he maybe asked questions too hard for him to answer; and this apprehension allows him to find a more suitable preceptor who clarifies all their doubts with lively symbolism. It is said that metacognitive agents will express a range of affective states depending on their situation (Green, 2019, p. 122).

- (b) **Task Execution** includes being aware of and monitoring or regulating one’s comprehension and task performance. It comprises understanding one’s cognitive experiences such as ‘I am not understanding this...’ and so on. This helps learners in ‘quality control’ and helps learners in setting their goals and reviving them.

For example,

- In the story of the ‘Investigation into the Nature of Brahman’ (Ch. Up. 8.7-12), we find three interlocutors, viz., Indra (the king of the Gods), Virocana (the leader of

the demons) and Prajāpati (the father of Indra and Virocana). Once Prajāpati announces that ‘the Self is the ageless, sinless and deathless one. One who seeks after it, knows it.’

Both Indra and Virocana approached Prajāpati to learn more about the *Ātman* and stayed with him as his disciples for thirty-two years following *Brahmacaryatva* (celibacy). At the end of the period, Prajāpati instructed them that ‘The person visible in the pupil of an eye is *Ātman*’. Both Indra and Virocana test this knowledge by looking in the pan of water which reflects the very image even to the very nails and hair. Prajāpati asks them to adorn themselves and then look again. They follow the instructions and Prajāpati narrates ‘This itself is *Ātman*’.

Upon listening to this, both Virocana and Indra feel satisfied, and they go back to their kingdoms. Prajāpati after observing this says, “*Whether they are gods or demons they will inevitably perish if they are satisfied with the mere reflection of the Reality.*” Ancient Indian pedagogy explicitly emphasizes that “*truth is known when all is known*” (Ch. Up. 5.11) and at the same time, half-knowledge or not having complete cognitive closure is criticized. To this very aspect, the *Upaniṣads* owe their meaning as ‘sitting near devotedly’ so that a *Guru* can impart wisdom (Sooklal, 1990, p. 18). For the same reason, **Cognitive Tenacity** is an essential factor in metacognition for successful execution of a task. Altekar (1965, pp. 24-25) states that scholarship cannot be achieved by dilettantish or perfunctory studies.<sup>10</sup>

After going back to his kingdom, Virocana never came back. On the other hand, even though Indra was satisfied for a moment, soon a doubt crept into his mind. Indra revisited his cognition, and he realized his confusion about his own understanding that he does not see anything really worthy in this body and asks Prajāpati to remove his ignorance. This trait characterized by **Cognitive Flexibility** stands as a hallmark in Self-assessment and strategy planning, because the flexibility of one’s mind helps one to review and revise one’s conceptualizations and orients one towards the correct knowledge. The same incident happens twice where Indra continuously revisits his cognition and approaches Prajāpati for more clarification until he obtains that knowledge, and has no more doubts. Diwakar (1950, p. 103) suggests that Indra taught this knowledge to Gods and it is to this knowledge Gods owe their godliness.

Indra here depicts the flexibility of the mind which is said to be one of the many traits of Spiritual Intelligence (Kathuria, Awasthy, & Sharma, 2023, p. 68). The

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<sup>10</sup> *aśuśruṣā tvarā ślāghā vidyāyāḥ śatras-trayaḥ* (Mahābhārata V.40.4)  
“Impatience is as great enemy as self-complacency.”

conflict between the Gods and the demon in this story is for obtaining the highest knowledge and due to the shallowness of the superficial knowledge of Virocana, the demons are defeated, and the Gods persist due to their need for cognition, and the perseverance and tenacity to achieve it. It is the inner ability of a person that distinguishes him from the rest of the people. The very core principles are highlighted by the Upaniṣadic literature where integrity or the desirability of integrity came to be known as the central feature of it (Narasimhan, Bhaskar, & Prakhya, 2010, pp. 377-378).

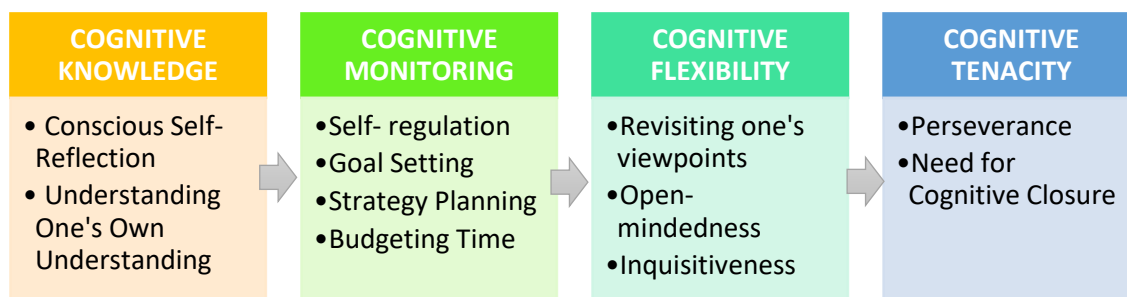
The trait of Cognitive Tenacity is explicitly used in this story when Prajāpati praises Indra, “*O Indra, you have deserved the knowledge of the highest truth by your persistent effort and intense inquisitiveness.*”

(c) **Self-Assessment** includes assessing and evaluating the processes and product of one’s learning, and, if necessary, revisiting and revising learning goals.

For example,

- In the story of a *Guru-śiṣya* and father-son, Uddālaka and Śvetaketu (Ch. Up. 6.1), the father imparts the knowledge of ‘Philosophy of a Being’ to Śvetaketu through a very refreshing pedagogical method by offering several homely illustrations and repeating a short, pregnant statement after each experiment, i.e., ‘*tat-tvam-asi Śvetaketo!*’ (That Thou Art, O Svetaketu!). The story starts with the efforts of Uddālaka to remove the conceit and arrogance in Śvetaketu after he returns from *Gurukula* after twelve years of learning. Uddālaka asks him about the knowledge by which the unheard can be heard, the unseen can be seen, and the unknowable can be known. Having no knowledge of this wisdom, Śvetaketu requests Uddālaka to impart this knowledge to him. Uddālaka narrates to him that by knowing one lump of clay, everything that is made of clay can be known. Similarly, the Pure Being has manifested itself in the forms of fire, water, food, life, etc.

After this, a series of questions posed by Śvetaketu to his father convince us that Śvetaketu indeed is a ‘Student-hero of the *Upaniṣads*’ exercising many metacognitive activities ( Figure 1) such as self-reflection (in which he brought to the surface the content of his conceptions), being aware of his own understanding and thereby monitoring his progress leading to the further successful learning process.



**Figure 1: Metacognitive Activities Emerging from Self-Reflection Leading to Successful Behavior**

Śvetaketu first asks his father what a man would do during sleep. Uddālaka replies that a man becomes one with the Spirit. Śvetaketu wanted to know more about this all-pervading power. He says, “*This is something very baffling, father! But, how on earth can I realize it, even if I merely know it?*” Uddālaka replies that just like a droplet of honey becomes indistinguishable from which flower it came from, we all become one when we merge in the ocean of consciousness of that Being.

Śvetaketu, here, revisits all that is taught to him and shows interest in knowing more and says that perhaps his teachers might not have known this fact, hence they might not have taught him this knowledge. Uddālaka gives two analogies of a river merging into an ocean and an example of a seed of a Banyan tree and enlightens him further. This individual merge into the great transcendental ocean of being is the goal of Upaniṣadic teaching (Stark, 1988, pp. 189-190). The breaking of a seed of a Banyan tree teaches Śvetaketu that nothing tangible is at the very generative heart of all these worldly manifestations but the intangible essence, something which cannot be qualified by verbal expressions (Arthur, 1986, p. 113). Śvetaketu again asks for further explanation and Uddālaka gives a comprehensive idea in a simplistic manner about the *Brahman* and how to realize that. In such a way, the philosophy of a Being is narrated in this story.

Prof Sadashiv Athavle (1958, p. 223) states that “*Śvetaketu presents himself as an honestly puzzled philosopher in the galaxy of the bigots of his age*”. The same is emphasized by Patrick Olivelle (1999, p. 67) that Śvetaketu becomes a ‘*good student*’ in this story instead of acting like the spoiled brat he was, and is *able to confess* his ignorance and learn from his teacher.

All these character traits suggest that Śvetaketu has exercised metacognitive activities in his epistemic journey. Śvetaketu’s self-regulation may be considered as superordinate to metacognition or as a plausible foundation of all other metacognitive activities. Self-assessment is an important character trait to reveal one’s noetic strengths and weaknesses. Metacognition is a crucial element in the development of intellectual humility (Church & Samuelson, 2017, p. 119). It is

intellectual humility (*vidyā-vinamratā*) that enables one to accept one's cognitive flaws or limitations leading to the further pursuit of knowledge. Holiness and humility are the qualities of an ascetic bringing in him the removal of ego and purification of soul (Radhakrishnan, 1923, p. 221). Under the concept of 'Quantum Leadership', it has been noted that humility is important in one's personal and professional life (Maheshwari, 2023, p. 58).

It is argued by Gajjam (2024, pp. 170-175) while proposing the Five-Factor Model of Intellectual Humility that *Vidyā-vinamratā* starts with Proper Pride on the part of an epistemic agent that gives one an accurate self-appraisal. A person with proper self-assessment can do epistemic justice than a person who is either Intellectually Arrogant or Intellectually Servile. The quality of open-mindedness or **Cognitive Flexibility** enables a person to own one's cognitive limitations leading to the pursuit of knowledge. It is also noted that certain general character traits such as humility (*vinamratā*), faith (*śraddhā*) and patience are the necessary prerequisites towards intellectual or epistemic traits. In Ch. Up. I.1.9, it is said that '*yadeva vidyayā karoti śraddhayopaniṣadā tadeva vīryavattaram*', translated by Max Müller (1860, p. 319) as 'What a man performs with knowledge, truth and faith, that is effectual.'

Only a person with a complete understanding of when to practice what can do epistemic justice because he is aware of the nature and value of both. Thus, metacognition is not obsessive self-reflection or regressive thinking about one's own thinking, but it also entails an appropriate amount of practice of both, having pride in one's achievements and being humble about the same (Green, 2019, p. 123). All such activities are known by the terms meta-learning, Deutero-learning or Meta-affection (Georghiadis, 2004, pp. 366, 372).

The persistent Śvetaketu travels with his father till he has no more doubts illustrating **Cognitive Tenacity** so that he can obtain complete knowledge. The same is also enabled by Uddālaka to facilitate the learning process. During all this time, the Uddālaka applied a set of heuristics as an effective device for helping him organize his methods of learning and tracking his progress (Lai, 2011, pp. 4-5). By employing various analogies, the already-known knowledge about the banyan tree, the salt and the water, the river and the honeybee etc. in the new context, Uddālaka is also rendering his executive control. Chakravarty (1997, p. 216) states: "*He (Uddālaka) spared no pains to make son realise his fault and at times became rather cruel in the course of explaining to his son the real character of Brahman. Through different direct methods he perfected the imperfect knowledge...*"

As one of the most studied stories in the *Upaniṣads*, the conversation between Śvetaketu and Uddālaka not only brings delight to its readers but also stands as a personification of Metacognition itself.

## DISCUSSION

The importance of self-awareness is emphasized repetitively by the philosophy of the world, sociological discourses, by ancient Indian pedagogy. Famous quotes such as ‘*tapasā brahma vihijñāsva*’ (‘Know the Brahman by performing austerity’, *Taittirīya Upaniṣad* Bṛgu Vallī, 3.2.1), the ancient Greek Delphic maxim of ‘*Know Thyself*’, a Sufi quote by Rumi ‘Everything in the world is within you. Ask all from yourself!’ and the Japanese term *Wabi-Sabi* (appreciating something even with their imperfections) have been reiterating the same. Being self-conscious or having metacognition is the essence of human beings. Although, a few birds, rats, dolphins and primates have shown some rudimentary metacognition skills, the *very awareness* of having these skills sets human beings apart from the other animals.

It is suggested by Emily Lai (2011, pp. 15-18) that metacognition is teachable and it develops gradually in children over time.

Table II shows the development of different metacognitive skills in the children of different age groups.

Development of Metacognitive Skills	Children with age
Some rudimentary metacognitive skills	Age 3 - 5 years <sup>11</sup>
Cognitive knowledge	Age 6 years
Complete consolidated metacognitive skills	Age 8 - 10 years
Cognitive regulation	Age 10 - 14 years
Planning and Strategic Use	Age 14 years
Construction of one’s metacognitive theories	Age 17 years

**Table II: Metacognitive Skills through the age**

Even though metacognition improves with age, the development may not be unidirectional. Hence, in many adults, the skills of monitoring and self-evaluation remain undeveloped. To measure the development of metacognition, several observational methods are used rather than the Self-reporting or ‘Think-aloud’ methods because many associative skills of metacognition are not directly measurable. Thus, according to some scholars, Metacognition is not something to be ‘taught’ to the learner in an ‘outside–in’ process, but rather it is a skill that can be helped to develop in an ‘inside–out’ manner (Georghiadis, 2004, p. 369).

The famous quote by William James reminds us of the same idea, that attempting to grasp one’s own mind through introspection is like ‘turning up the gas quickly enough to see how the darkness looks!’ because it disrupts the natural flow of the thoughts and the true essence of their nature cannot be captured.

<sup>11</sup> Stanford Encyclopaedia of Philosophy (URL: <https://plato.stanford.edu/entries/self-consciousness/#Meta>) [Accessed on February 21, 2025, 11:40 IST]

This developmental view finds a compelling parallel in the pedagogical methods of the *Gurukula* System where learning was not imposed externally, but was facilitated by a *Guru* as a progressive awareness. The ‘inside-out’ teaching of the Upaniṣadic discourse allows the knowledge emerge or manifest in guided introspection or through lived experience.

In the last 100+ years there have been many efforts to incorporate metacognition in school curricula across the world to reform and boost the education system by fostering ‘thinking’ ability in children (Table III).

Researcher/ Proponent	Year	Programme and Other Details
Alfred Binet	1904	Devised the first mental tests, later known as IQ tests. Believed that children’s intellectual performance can be improved. Proposed a training system called ‘mental orthopaedics’.
Educational Policies Commission, US	1961	Established by the politicians, policymakers and academicians in the US to reform and boost the failing education of the post-Sputnik era focusing on the development of thinking ability in school-children.
Reuven Feuerstein	1976	Suggested ‘Instrumental Enrichment’ for improving learning skills and proposed ‘Neurocognitive Rehabilitation’.
Matthew Lipman	1976	Wrote the book ‘ <i>Philosophy for Children</i> ’ and implemented it with 5-year-old to 16-year-old children to promote metacognition in them.
Joël Biard	1986	Introduced PEEL- Project to Enhance Effective Learning, a multiple-year cross-subject approach in Australia aiming at secondary school students which included all lessons students had. Students had become more purposeful learners with a greater understanding of content.
John Flavell	1987	Propounded that good schools should be ‘ <i>hotbeds of metacognitive development</i> ’ offering opportunities for self-conscious learning, and teachers should be given training in metacognitive instructions.
Joseph C Campione	1987	Worked with the students with learning problems and sometimes with mentally retarded children.
Lee H Swanson	1990	Used metacognitive activities in problem-solving and proved that highly metacognitive students outperformed less metacognitive students irrespective of their overall aptitude level.
David Perkins	1993	Emphasized creating a culture that ‘ <i>enculturates</i> students into good thinking practices.’
Cathy Nutbrown	1994	Suggested ‘a curriculum for thinking children’ to change the system of education.

Robert Fisher	1998	Suggested ‘a thinking curriculum’ and placed the development of thinking at the heart of the educational process. Proposed ‘Philosophy for children’, a worldwide movement attempting to enhance the thinking, learning and language skills of students of all ages and abilities, through philosophical enquiry.
Petros Georghiades	2004	Implemented on younger students focusing on their thinking abilities, conceptual changes, and overall academic performance, by employing concept maps and annotated drawings.
Department for Education and Employment, UK	2018	(CASE) Cognitive Acceleration through Science Education aimed to explore an approach that hopes to improve pupils’ ability to learn under the widespread effort of ‘raising standards’, i.e., of improving long-term achievement. Developed a set of materials comprising a teachers’ guide and pupil’s worksheet for 30 lessons titled ‘Thinking Science’. Emphasized that metacognitive perspective should be part of the general theoretical framework in teaching, including Metacognitive Regulation.
Nenive Sanchez	2019	Argued that metacognition along with reflective writing and experiential learning develops cultural humility in students where they take the role of a learner rather than an expert to understand different social identities of people.
David D Preiss (2022)	2022	Stated that metacognition helps in systematic mind-wandering to generate and explore novel or creative ideas.
Kumar (India) (2023)	2023	Devised the GKMAS- Gurukul Kangri Metacognition Awareness Scale to assess a person’s Spiritual Cognitive Awareness, Metacognitive Knowledge and Metacognitive Regulation.
Other programmes around the world:		<ol style="list-style-type: none"> <li>1. ‘The Somerset Thinking Skills Course’</li> <li>2. ‘Thinking through Geography’</li> <li>3. ‘Activating Children’s Thinking Skills’ and so on...</li> </ol>

**Table III: Incorporating Metacognition in School Curriculum: Some Efforts<sup>12</sup>**

### SUGGESTIONS FOR FUTURE RESEARCH

The research on *Metacognition in the Upaniṣads* can be extended by discerning more insights by exploring other *Upaniṣads* as mentioned in Table IV.

<sup>12</sup> The data is partially taken from the research conducted by Georghiades Petros (2004) (Ministry of Education and Culture, Cyprus).

S. No.	Story Details	Chapter #
1	The Ajātaśātru and Bālākī Conversation	<i>Brihadaranyaka Upaniṣad 2.1-3</i>
2	The Yājñavalkya and Maitreyī Conversation	<i>Brihadaranyaka Upaniṣad 2.4</i>
3	The Yājñavalkya and Uddālaka Conversation	<i>Brihadaranyaka Upaniṣad 3.7</i>
4	The Yājñavalkya and Gārgī Conversation	<i>Brihadaranyaka Upaniṣad 3.8</i>
5	The Yājñavalkya and <i>Janaka</i> Conversation	<i>Brihadaranyaka Upaniṣad 4.3</i>
6	The Dialogue between Prajāpati and Gods, Men and Demons	<i>Brihadaranyaka Upaniṣad 5.2</i>
7	The Story of Yama and Naciketa	<i>Kaṭha Upaniṣad</i>
8	The Bhṛgu and Varuṇa Conversation	<i>Taittiriya Upaniṣad</i>

**Table IV: Upaniṣadic Stories for Future Research**

The obtained results can be used in pedagogy to prepare a curriculum for Indian students to practice different metacognitive skills resorting to the pedagogical insights of ancient India, such as:

- (i) Being inquisitive and persistent,
- (ii) Having faith and respect,
- (iii) Resorting to proper teachers or mentors, and methods to gain knowledge,
- (iv) Using *tapas* as a learning method (austerity),
- (v) Using *Samvāda* or Question-and-answer-based learning method,
- (vi) Aiming for complete understanding.

This will help in

- (a) the holistic development of students in terms of mental, emotional, intellectual and spiritual,
- (b) inculcating in them character traits such as humility, agreeableness, and respectfulness,
- (c) imparting in them epistemic traits such as open-mindedness, curiousness, flexibility in viewpoints, and intellectual confidence and tenacity.

If employed properly, it will result in more tolerance and inclusivity towards knowledge systems and knowledge partners resulting in proper dissemination of knowledge.

## CONCLUSION

Metacognition is a set of cognitive skills such as inquisitiveness, cognitive closure, open-mindedness, respectfulness, humility, and so on. Even though they appear to be general character traits, they prove to be useful for an epistemic agent in the journey to obtain knowledge. Ancient India has always emphasized on marriage of both knowledge and virtues with its concept of *vidyā-vinamratā* (Bhagavadgītā 5.18) and a maxim '*vidyā vinayena śobhate*' (Nītiśataka). It stands as a pivot for removal of one's ego, accept one's cognitive limitations, initiate oneself into an epistemic journey and lead it with the virtues of open-mindedness, openness to learn and experiment, maintain tenacity and perseverance till the cognitive closure, and monitor and reflect on one's journey.

Based on the content analysis the following metacognitive traits are derived

- Cognitive Knowledge encompassing declarative, procedural and conditional knowledge that helps an epistemic agent to be aware of the contents of their cognition, derive different ways through which the gaps in the knowledge can be filled in, and discern when and where to use certain strategies.
- Cognitive Monitoring encompassing task planning, task execution and self-assessment that help a learner in goal setting, identifying and using appropriate strategies, budgeting time and reviewing one's progress, overcoming the difficulties to attain a complete cognitive closure.

To achieve these two parameters, an epistemic agent must have

- Cognitive Flexibility that disposes him to carry a right attitude of open-mindedness, inquisitiveness, openness to learning, respectfulness, agreeableness, and owning one's cognitive limitations. During the entire process, a learner must also showcase.
- Cognitive Tenacity characterized by traits such as persistence, perseverance, grit, integrity, diligence and conscientiousness.

In the four aspects of metacognition mentioned in this article, the former two work in a sequential manner where cognitive knowledge precedes cognitive monitoring, while the latter two are their substratum. A proper amount of flexibility, that stands at the mean of two poles of the spectrum *viz.*, in between too much flexibility (i.e. intellectual timidity or servility) and too little flexibility (i.e. fastidiousness and dogmatism), helps a learner have proper self-assessment and intellectual courage. Similarly, the tenacity to pursue an object of cognition till one attains complete knowledge by removing all the doubts can be considered as the inherent message that the *Upaniṣads* want to convey.

The aim of the *Upaniṣads* is viewed as imparting the *parā vidyā* (the experiential knowledge) to the young disciple. However, in such a process, the preceptor has always seen to have tried to develop the personality- physical, mental, emotional, intellectual and spiritual, of a disciple, so as to prepare the right instrument with which a disciple can attain that experiential

knowledge by himself or herself, or to build a strong substratum to which the wisdom reveals itself. In consequence, all such metacognitive character traits become the most efficient cause (*karana*) to obtain the goal (*parā vidyā*) and to bring about the action of knowing (*jñāna*). It is stated that duty is a means to the end of the highest perfection and Upaniṣāds, especially, insist on the inwardness of morality and attach great importance to it (Radhakrishnan, 1923, pp. 208, 214).

The education system in the 21<sup>st</sup> Century in India may not directly or indirectly aim to inculcate such intuitive knowledge or Self-actualization in students. Nevertheless, the New Education Policy 2020 proposes to carry out the holistic development of a student in all aspects (p. 3) and adds in its principles virtues such as empathy, respect, tolerance and spirit of service (p. 5-7, 28). It also encourages students to have curiosity and scientific temper through debates and discussions by inculcating in them soft skills and communication skills to develop thoughtful individuals (p. 33-37). Given that, the metacognitive traits mentioned in this article, such open-mindedness, cognitive tenacity, intellectual perseverance, and self-reflexivity, can be inculcated in the pedagogical setting where both the teacher and a disciple are willing for their epistemic advancement. This reciprocal help will lead to strengthening of the student-mentor relationship and the knowledge-generating activity.

Considering this as the first step to building sharp brains with stronger minds, this research on *Metacognition in the Upaniṣads* may stand as a starting point in planning the curriculum, the pedagogy and the assessment methods. It will not merely help in one's pedagogical journey but will also carry a larger benefit for the better dissemination of knowledge and a harmonious society in the long run.

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**Statements and Declaration:** I hereby declare that this manuscript is my original work and does not infringe on any rights of third parties. All sources have been duly acknowledged and cited. This paper is an extension of the ideas and concepts presented by me at the *First Annual Academic Conference on Indian Knowledge Systems (IKS) on 'The Resurgence of IKS: Finding*

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