Redefining Teacher Identity in AI-Mediated Classrooms: A Constructivist Perspective on Teacher–AI–Learner Interaction

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Abstract The integration of artificial intelligence (AI) into education is reshaping not only instructional practices but also the professional identity of teachers. While much of the existing literature emphasizes technological capabilities and student outcomes, this paper focuses on the comparatively underexplored dimension of teacher identity in AI-mediated classrooms. Drawing on constructivist and socio-cultural perspectives, the study argues that AI represents a paradigmatic shift that reorganizes pedagogical roles, redistributes instructional authority, and reconfigures processes of knowledge construction.

Teacher identity is conceptualized as a dynamic and evolving construct, increasingly characterized by multi-dimensional roles that include facilitation, instructional design, ethical mediation, and technological engagement. The paper examines emerging teacher–AI partnerships, highlighting both the opportunities they create for responsive pedagogy and the tensions they introduce in relation to autonomy and professional agency. Through the Teacher–AI–Learner Interaction Model, the study demonstrates how knowledge is co-constructed within hybrid, mediated learning environments.

The analysis suggests that teacher identity is not diminished by AI but transformed within a more complex educational ecosystem. The paper concludes by outlining implications for teacher education, emphasizing the importance of AI literacy, reflective engagement, and ethical responsibility. By positioning AI as a mediational partner rather than a substitute for human teaching, the study contributes to a more nuanced understanding of teaching in contemporary contexts.

IndexTerms - Artificial Intelligence in Education; Teacher Identity; Constructivist Pedagogy; Teacher Education; Reflective Practice; AI-Mediated Learning

INTRODUCTION

The rapid integration of Artificial Intelligence (AI) into educational contexts is reshaping the fundamental nature of teaching and learning. While existing discourse has largely emphasized technological capabilities and student outcomes, comparatively less attention has been paid to the transformation of **teacher identity**. Traditionally anchored in subject expertise and instructional authority, teacher identity is increasingly being redefined in environments where intelligent systems participate actively in pedagogical processes. This shift necessitates a deeper examination of how teachers understand their roles, responsibilities, and professional purpose within AI-mediated classrooms.

These developments prompt fundamental questions about the nature of teaching in AI-mediated contexts. What defines the role of the teacher when knowledge is no longer exclusively human-generated? How does pedagogical authority shift when intelligent systems participate in instructional processes? This paper argues that AI does not simply extend existing practices but reconfigures teacher identity into a relational and adaptive construct that integrates facilitation, design, ethical mediation, and technological engagement.

2. Literature Review

2.1 AI and Constructivist Pedagogy

The integration of AI into education has increasingly been examined through the lens of constructivist and socio-cultural theories of learning. Constructivism posits that knowledge is actively constructed through interaction, experience, and reflection rather than transmitted from teacher to learner (Beijaard et al., 2004; Greene, 1973). Contemporary research suggests that AI technologies—particularly adaptive learning systems and generative tools—align with these principles by enabling **personalized, interactive, and iterative learning experiences** (Holmes et al., 2023; Luckin et al., 2023).

Recent scholarship reconceptualizes AI as more than an instructional aid, framing it as part of an evolving epistemic infrastructure that reshapes how knowledge is generated, validated, and shared (Zawacki-Richter et al., 2024). This perspective extends

constructivist thinking by recognizing that knowledge construction increasingly occurs within **human–technology networks**, rather than exclusively through human interaction.

AI-enabled environments provide adaptive scaffolding through real-time, context-sensitive feedback that supports incremental learning. This mirrors Vygotskian notions of mediated learning, where tools extend cognitive processes (Mishra & Koehler, 2006). However, emerging research also cautions that AI systems may prioritize efficiency over deep epistemic engagement, potentially undermining critical thinking if not pedagogically mediated (Holmes et al., 2023).

Furthermore, human-centred AI research emphasizes the importance of maintaining **learner and teacher agency** within AI-enhanced environments (Luckin et al., 2023). Without pedagogical alignment, AI risks reinforcing passive engagement, thereby contradicting core constructivist principles. Collectively, these studies indicate that AI can extend constructivist pedagogy, provided its use remains grounded in interaction, reflection, and human agency.

2.2 AI in Teacher Education

The incorporation of AI into teacher education has emerged as a critical area of inquiry, reflecting the need to prepare educators for increasingly complex, technology-mediated classrooms. Systematic reviews indicate that while AI is widely studied in relation to student learning, comparatively less attention has been given to its role in **teacher professional development** (Zawacki-Richter et al., 2019; Zawacki-Richter et al., 2024).

Recent studies demonstrate that AI can enhance teacher education through:

- **Simulated teaching environments**
- **Automated feedback systems**
- **AI-supported lesson planning and instructional design**

These tools support the development of pedagogical skills by enabling **practice, feedback, and iteration** (Holmes et al., 2023). However, research also shows that without structured training, teachers may struggle to effectively integrate AI into pedagogical contexts (Luckin et al., 2023).

A key limitation identified in the literature is the tendency to focus on **technical proficiency rather than pedagogical integration**. Teacher education programs often emphasize how to use AI tools, but not how to critically evaluate their outputs or align them with learning objectives. This suggests the need for a more comprehensive approach that integrates **AI literacy with pedagogical and reflective competencies** (Mishra & Koehler, 2006).

Emerging frameworks advocate preparing teachers for roles which include facilitator of learning, designer of instructional experiences, and guide for inquiry.

Thus, AI in teacher education extends beyond a matter of skill acquisition but involves the **reconfiguration of professional competence and identity**.

2.3 AI and Reflective Teaching

Reflective practice is widely recognized as central to professional teaching, enabling educators to critically evaluate and refine their instructional approaches (Beijaard et al., 2004). The integration of AI introduces new possibilities for **data-informed and dialogic reflection**.

AI tools can support reflective teaching by:

- Analysing classroom interactions
- Providing structured feedback
- Supporting reflective writing and self-assessment

Recent literature suggests that AI enables **continuous and scalable reflection**, addressing limitations such as delayed feedback and limited mentoring capacity (Holmes et al., 2023). However, concerns have been raised regarding the potential for **cognitive offloading**, where teachers rely on AI-generated feedback without engaging in deeper critical reflection (Luckin et al., 2023).

Research emphasizes that reflective practice must remain **human-centred**, with AI functioning as a support rather than a substitute for professional judgment. This aligns with constructivist perspectives that position reflection as a key mechanism for knowledge construction and professional growth (Greene, 1973).

Importantly, reflective engagement with AI is increasingly necessary for navigating:

- Ethical challenges
- Epistemic reliability
- Pedagogical alignment

Thus, AI can enhance reflective practice, but only when integrated within **critical and intentional pedagogical frameworks**.

2.4 Redefining Teacher Identity in AI Contexts

A growing body of literature examines how AI is reshaping teacher identity, moving beyond role-based analyses to explore deeper shifts in professional self-conception. Teacher identity is increasingly understood as a **dynamic, context-dependent construct**, shaped by evolving practices and technological environments (Beijaard et al., 2004; El-Soussi, 2025).

Recent research indicates that AI integration prompts a shift from:

- Knowledge transmission → Facilitation and mediation
- Instructional authority → Distributed collaboration
- Content delivery → Learning design

Studies show that teachers increasingly adopt roles such as facilitators, designers, and ethical guides in AI-mediated environments (Holmes et al., 2023). At the same time, identity transformation is not linear; teachers often experience **tensions related to autonomy, control, and professional relevance** (Isma'il & Ibrahim, 2025).

Ecological perspectives suggest that teacher identity is shaped across multiple levels:

- Micro (classroom interactions)
- Meso (institutional structures)
- Macro (societal and technological contexts)

AI influences identity across all these levels, reinforcing the view that teacher identity is **relational and situated** (Zhao & Watterston, 2021).

Furthermore, research highlights that existing studies often adopt a **techno-centric perspective**, overlooking the subjective and emotional dimensions of teachers' experiences (Zawacki-Richter et al., 2024). This gap underscores the need to examine identity as a **meaning-making process**, rather than merely a functional adaptation.

Theme	Key Focus	Major Insights	Representative Studies	Implications for Present Study
AI and Constructivist Pedagogy	Alignment of AI with learner-centered and interactive learning	AI supports personalization, adaptive scaffolding, and iterative learning; extends constructivist principles into socio-technical environments	Holmes et al. (2023); Luckin et al. (2023); Zawacki-Richter et al. (2024); Mishra & Koehler (2006)	Supports conceptualizing AI as a mediational agent in constructivist learning
AI in Teacher Education	Integration of AI in teacher training and professional development	AI enhances lesson planning, feedback, and simulation; lack of pedagogical integration remains a challenge	Zawacki-Richter et al. (2019, 2024); Holmes et al. (2023); Luckin et al. (2023)	Highlights need for AI literacy + pedagogical competence + reflective engagement
AI and Reflective Teaching	Role of AI in supporting teacher reflection	AI enables continuous, data-informed reflection; risk of cognitive offloading if uncritically used	Holmes et al. (2023); Luckin et al. (2023); Beijaard et al. (2004); Greene (1973)	Emphasizes importance of critical reflection and teacher agency
Teacher Identity in AI Contexts	Reconfiguration of teacher roles and professional identity	Shift from knowledge authority to facilitator, designer, and mediator; identity shaped by tensions and adaptation	Beijaard et al. (2004); El-Soussi (2025); Isma'il & Ibrahim (2025); Zhao & Watterston (2021)	Supports argument of identity reconstitution rather than replacement
Cross-Cutting Themes	Emerging patterns across literature	AI as active participant; distributed authority; hybrid knowledge construction; need for ethical mediation	Holmes et al. (2023); Zawacki-Richter et al. (2024); Selwyn (2019)	Justifies development of Teacher–AI–Learner Interaction Model

Table 1. Summary of Key Literature on AI, Pedagogy, and Teacher Identity

2.5 Synthesis and Research Gap

Across these strands, several key themes emerge.

First, AI is increasingly conceptualized as a **mediational agent** that participates actively in learning processes rather than functioning as a passive tool (Holmes et al., 2023). Second, AI extends constructivist principles into **socio-technical environments**, enabling new forms of interaction and knowledge construction (Luckin et al., 2023). Third, teacher identity is undergoing a process of **reconfiguration**, characterized by multi-role professionalism and distributed authority (El-Soussi, 2025).

At the same time, the literature highlights the continued importance of **human agency and reflective practice** in ensuring meaningful and ethical AI-mediated environments (Greene, 1973). However, several gaps remain, including limited attention to teacher subjectivity, insufficient integration of theory and technology, and the absence of comprehensive frameworks linking AI, pedagogy, and identity (Zawacki-Richter et al., 2024).

In response to these gaps, the present paper advances an **AI-augmented constructivist perspective**, proposing a Teacher–AI–Learner Interaction Model that conceptualizes learning as a co-constructed, mediated process within AI-enhanced classrooms. By integrating constructivist theory with emerging AI research, the paper contributes to a deeper understanding of how teacher identity is redefined in contemporary educational contexts.

3. Teacher Identity: A Dynamic Construct

Teacher identity has long been understood as a fluid and evolving construct, shaped by personal beliefs, professional experiences, and socio-cultural contexts. Early conceptualizations emphasized stability and role clarity; however, contemporary scholarship recognizes identity as continuously negotiated and context-dependent.

Research indicates that teacher identity evolves in response to changing educational environments, institutional expectations, and broader societal shifts. In the digital age, this evolution is accelerated by the integration of technology, requiring teachers to adapt not only their practices but also their self-conception as educators.

Philosophical perspectives further deepen this understanding. Scholars such as Maxine Greene emphasize that teaching is inherently relational and reflective, involving ongoing questioning of one's role, purpose, and responsibility. Identity, therefore, is not a static attribute but a process of becoming.

4. **From Knowledge Authority to Learning Facilitator**

One of the most significant shifts in teacher identity is the movement from knowledge authority to learning facilitator. Traditionally, teachers were positioned as the primary source of knowledge, responsible for transmitting information to students. This model reinforced hierarchical relationships and centralized control within the classroom.

However, AI disrupts this paradigm by providing alternative sources of knowledge and explanation. Intelligent systems can generate content, answer questions, and offer feedback, thereby decentralizing the teacher's epistemic authority. As a result, teachers increasingly assume roles such as:

- Facilitator of learning
- Designer of instructional experiences
- Guide for inquiry and exploration

This transformation aligns with constructivist principles, where learning is viewed as an active, student-centered process. In AI-mediated environments, the teacher's role is not diminished but reoriented toward enabling meaningful engagement with knowledge.

5. **Emergence of Multi-Role Professional Identity**

The redefinition of teacher identity is characterized by the emergence of multi-role professionalism. Teachers are no longer confined to a single role but must navigate a complex set of responsibilities that include:

- Content curator
- Learning designer
- Data interpreter
- Ethical mediator
- Technological integrator

Research highlights that teachers are increasingly expected to adopt roles such as coach, mentor, and analyst, reflecting the expanding scope of their professional identity (Bermus, 2025).

The transformation of teacher identity is reflected in the emergence of multi-role professionalism. Rather than occupying a single instructional role, teachers now engage in a range of interconnected functions, including content curation, learning design, data interpretation, ethical mediation, and technological integration.

6. **Teacher–AI Partnership and Distributed Authority**

The incorporation of AI introduces a distinct relational dynamic in the classroom, characterized by a teacher–AI partnership in which both human and technological agents contribute to instructional processes. Unlike earlier tools, AI systems generate content, adapt to learner responses, and provide data-driven insights, thereby participating actively in pedagogical decision-making.

However, this redistribution does not imply a loss of teacher agency. Rather, it necessitates a recalibration of professional responsibility, as teachers assume greater roles in interpreting, validating, and contextualizing AI-generated outputs. The partnership is therefore best understood as **asymmetrical collaboration**, where AI enhances responsiveness, but the teacher retains epistemic and ethical control.

However, this partnership is not without tension. Teachers must negotiate:

- Control versus delegation
- Human judgment versus algorithmic recommendation
- Professional autonomy versus system constraints

These tensions highlight the need for a reconceptualization of authority, where the teacher remains the ultimate pedagogical decision-maker while leveraging AI as a supportive tool.

7. **Identity Tensions and Emotional Dimensions**

The transformation of teacher identity is not a smooth or uniform process. Research indicates that teachers experience a range of emotional responses, including:

- Anxiety about role displacement
- Uncertainty regarding professional relevance
- Resistance to technological change

A phenomenological study found that teachers initially feared erosion of their roles but gradually recognized AI's potential to support their practice (Isma'il & Ibrahim, 2025).

These findings underscore that identity transformation involves tension, negotiation, and adaptation. Rather than viewing these challenges as obstacles, they can be understood as integral to the process of identity reconstruction.

8. Ecological and Contextual Influences

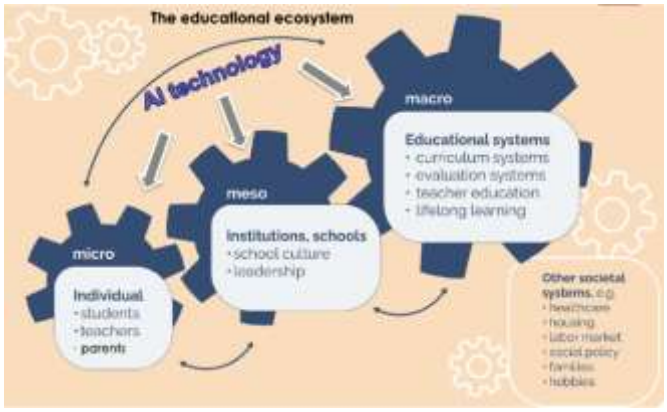
Teacher identity is shaped not only at the individual level but also within broader ecological systems. Research adopting an ecological perspective highlights that identity transformation occurs across multiple layers:

- Micro level: Classroom practices and interactions
- Meso level: Institutional policies and culture
- Macro level: Societal and technological changes

AI integration influences identity at all these levels, reshaping expectations, practices, and professional norms (Zhao & Watterston, 2021).

This multi-layered perspective emphasizes that redefining teacher identity is not solely an individual endeavor but a systemic transformation requiring support from institutions and policy frameworks. These developments reflect a transition from surface-level role adjustment to deeper identity transformation, where changes in practice are accompanied by shifts in how teachers understand their professional selves. The transformation of teacher identity in AI-mediated classrooms must be understood within a broader educational ecosystem that encompasses multiple interacting levels. Teaching and learning are not confined to isolated classroom practices but are shaped by dynamic relationships among learners, teachers, institutions, and technological systems. Figure 1 illustrates this ecosystemic perspective, highlighting the interconnected contexts within which teacher identity is continuously negotiated and reconstituted.

Figure 1: The educational ecosystem
Source: Author's own representation.



9. Reconstructing Identity Through Reflection and Practice

A critical aspect of redefining teacher identity is reflective practice. As teachers engage with AI, they must continuously evaluate:

- The pedagogical value of AI tools
- Their own role in mediating learning
- The ethical implications of technology use

Reflection enables teachers to move from passive adoption to critical engagement, transforming AI from a tool into a meaningful component of pedagogy.

Moreover, identity reconstruction is facilitated through:

- Professional development
- Collaborative learning communities
- Ongoing experimentation with AI tools

These processes support the emergence of a reflective, adaptive professional identity aligned with contemporary educational demands.

10. **Human Agency and Ethical Centrality**

Despite the increasing role of AI, the literature consistently emphasizes the indispensability of the teacher. AI lacks the relational, emotional, and ethical dimensions that define human teaching.

Teachers remain central as:

- Ethical decision-makers
- Facilitators of social interaction
- Cultivators of critical thinking

As one study notes, AI raises important questions about teacher autonomy and professional agency, reinforcing the need for human oversight (Selwyn, 2019).

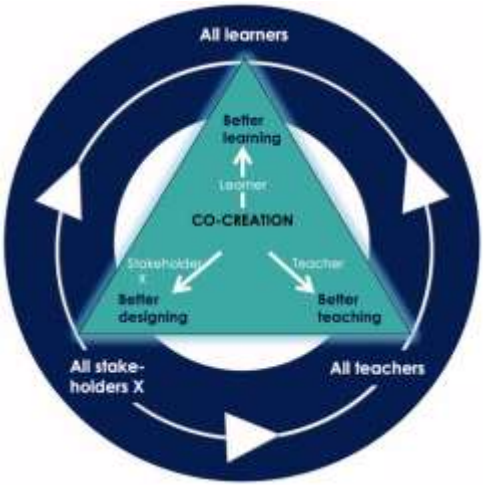
Thus, the redefinition of teacher identity should not be understood as replacement but as reconfiguration, where human agency is preserved and enhanced within AI-mediated environments.

11. **Teacher–AI–Learner Interaction Model**

The Teacher–AI–Learner Interaction Model conceptualizes teaching and learning as a triadic, dynamic, and mediated process, wherein knowledge emerges through continuous interaction among three key agents: the teacher, the learner, and AI systems. This model extends constructivist and socio-cultural perspectives by incorporating AI as an active participant in the learning ecosystem. The evolving relationship between teacher, learner, and artificial intelligence is illustrated in Figure 2.

Figure 2. Teacher–AI–Learner Interaction Model

Source: Author's own representation.



At the core of the model lies the principle of co-constructed knowledge, emphasizing that learning is not transmitted but developed through iterative engagement. The learner occupies a central role as an active agent, engaging in inquiry, interpretation, and reflection. However, this engagement is not isolated; it is shaped through interaction with both the teacher and AI systems, creating a distributed network of meaning-making.

The teacher's role within this model is redefined as that of a facilitator, designer, and ethical mediator. Rather than functioning as the sole authority, the teacher orchestrates interactions, guides learner engagement, and ensures that AI-generated inputs are pedagogically appropriate, ethical, and epistemically sound. This positioning reinforces the teacher's centrality while acknowledging the expanded complexity of instructional practice in AI-mediated environments.

AI systems function as adaptive mediational agents, providing real-time feedback, generating content, and supporting personalized learning pathways. Unlike traditional tools, AI introduces responsiveness and interactivity, enabling learners to engage in continuous cycles of questioning and refinement. However, its role remains bounded by human oversight, as it lacks the contextual sensitivity and ethical judgment inherent in human teaching.

The interactions among these three agents are reciprocal and iterative. Learners engage with AI systems to explore and refine understanding, while teachers interpret these interactions to inform instructional decisions. Simultaneously, teachers guide learners in critically evaluating AI outputs, thereby fostering epistemic awareness and responsible use of technology.

Importantly, the model highlights that knowledge construction in AI-mediated classrooms is hybrid in nature, emerging from the interplay between human cognition and machine-generated input. This hybridization does not diminish the role of the teacher; rather, it amplifies the need for pedagogical intentionality and ethical guidance.

The model also reflects key tensions inherent in AI integration. The distribution of instructional roles introduces challenges related to authority, agency, and control. Teachers must balance the affordances of AI with the need to maintain coherence, depth, and critical engagement in learning processes.

Overall, the Teacher–AI–Learner Interaction Model provides a conceptual framework for understanding education as a networked, co-constructed, and mediated process. It reinforces the central argument of this article that teacher identity is not diminished in the presence of AI but is reconfigured within a more complex and interactive pedagogical landscape. This model encapsulates the transformation of teacher identity from a position of singular authority to one of relational, adaptive, and ethically grounded mediation within AI-augmented learning environments.

12. Discussion

The analysis presented in this paper demonstrates that the integration of artificial intelligence into education extends beyond improvements in instructional efficiency to a more profound transformation of teacher identity and professional practice. Rather than functioning solely as a technological enhancement, AI reshapes the relational and epistemological foundations of teaching in contemporary classrooms.

A central insight emerging is that teacher identity is not merely adapting to technological change but is being reconfigured within a hybrid pedagogical environment. This reconfiguration is characterized by a shift toward distributed expertise, where knowledge and instructional processes are shared across human and technological agents. Such a transformation challenges traditional notions of teacher authority while simultaneously reinforcing the importance of teacher judgment in interpreting and contextualizing AI-generated outputs.

The Teacher–AI–Learner Interaction Model developed in this paper provides a conceptual lens through which these changes can be understood. By positioning AI as a mediational agent within a constructivist framework, the model highlights how learning is increasingly co-constructed through dynamic and iterative interactions. This shifts the focus from individual cognition to networked knowledge construction, where meaning emerges through engagement across human and technological actors.

At the same time, the analysis reveals that the integration of AI introduces significant tensions and ambiguities in teacher identity. The redistribution of instructional roles raises questions related to autonomy, control, and professional purpose. However, these tensions should not be viewed solely as challenges; rather, they constitute an integral part of identity transformation, enabling teachers to renegotiate and strengthen their professional roles in evolving educational contexts.

Another important dimension concerns the role of reflective practice in mediating this transformation. As teachers engage with AI tools, reflection becomes essential for ensuring that technological affordances are aligned with pedagogical goals and ethical considerations. In this sense, reflective practice functions as a critical mechanism through which teachers maintain agency and exercise professional judgment within AI-mediated environments.

The discussion also highlights important implications for teacher education. Preparing teachers for AI-integrated classrooms requires moving beyond technical training toward a more holistic approach that integrates AI literacy, pedagogical design, and ethical awareness. Teacher education programs must therefore support the development of adaptive, reflective, and critically engaged professionals capable of navigating complex socio-technical learning environments.

Overall, this paper contributes to the emerging discourse on AI in education by reframing teacher identity as a relational and evolving construct, situated within a broader ecosystem of human–technology interaction. By extending constructivist perspectives into AI-mediated contexts, the paper provides a theoretical foundation for understanding how teaching is being transformed in contemporary education.

13. Conclusion

The study highlights the need for teacher education to move beyond technical training and incorporate AI literacy, reflective engagement, and ethical awareness. Preparing teachers for AI-mediated classrooms requires developing the capacity to critically evaluate technological tools while aligning them with pedagogical goals.

Drawing on constructivist and socio-cultural perspectives, the analysis demonstrates that teachers are increasingly positioned as facilitators, designers, and ethical mediators within AI-mediated learning environments. The Teacher–AI–Learner Interaction Model further illustrates how knowledge is co-constructed through the interplay of human and technological agents, highlighting the hybrid nature of contemporary learning processes.

Importantly, the findings affirm that teacher identity is not diminished by the presence of AI but is reconfigured within a more complex and interactive pedagogical landscape. While this transformation introduces tensions and challenges, it also creates opportunities for enhanced engagement, innovation, and professional growth.

There is need for teacher education to integrate AI literacy, reflective practice, and ethical awareness, ensuring that teachers are prepared to navigate the evolving demands of AI-augmented classrooms. Ultimately, the future of education lies not in replacing teachers with intelligent systems, but in enabling teachers to engage critically and constructively with AI as a mediational partner in the co-construction of knowledge. This includes integrating AI-supported practicum experiences, critical evaluation of AI outputs, and structured reflective engagement into teacher education curricula.

I. Acknowledgment

The author acknowledges the help rendered by Dr. Maya Mohan in conceptualizing this article.

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