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Indian Knowledge System–based Pedagogy on Cognitive, Affective, and Reflective Learning Outcomes in Higher Education

Dr. Tiwari Sunita Rohit Gautam [1]*

ABSTRACT

The integration of Indian Knowledge Systems (IKS) into higher education pedagogy has gained renewed attention in the context of holistic, value-based, and culturally rooted education. Contemporary higher education often emphasizes measurable cognitive outcomes, sometimes at the cost of affective and reflective dimensions of learning. Indian Knowledge Systems, grounded in philosophical traditions such as Vidya, Jñāna, Dharma, and Anubhava, offer pedagogical approaches that nurture the intellect, emotions, ethics, and self-awareness of learners. The present study examines the impact of IKS-based pedagogy on cognitive, affective, and reflective learning outcomes among students in higher education. Using a quasi-experimental and mixed-methods approach, the study compares conventional teaching practices with pedagogical interventions rooted in IKS, including dialogic learning, experiential activities, reflective journaling, and contextualised knowledge practices. Findings indicate that IKS-based pedagogy significantly enhances conceptual understanding, learner engagement, ethical sensitivity, and reflective thinking. The study highlights the relevance of IKS in fostering holistic education aligned with the goals of the National Education Policy (NEP) 2020 and offers practical implications for curriculum design, teacher education, and policy formulation.

Keywords: *Indian Knowledge Systems, higher education, cognitive learning, affective learning, reflective learning*

Higher education in the twenty-first century faces the challenge of balancing academic rigour with the need for holistic learner development. Rapid globalisation, technological advancement, and market-driven educational models have increasingly prioritised cognitive achievement and employability skills. While such priorities are important, they often marginalise affective and reflective dimensions of learning, including values, ethical reasoning, cultural identity, and self-awareness. This imbalance has led to growing concerns about the alienation of learners from their socio-cultural contexts and the deeper purpose of education.

Indian Knowledge Systems (IKS) provide a rich intellectual and pedagogical heritage that views education as a transformative process rather than a mere transmission of information. Rooted in ancient texts, philosophical traditions, and lived practices, IKS emphasizes the harmonious development of intellect, emotion, conduct, and consciousness. Concepts such as Vidya (transformative knowledge), Jñāna (wisdom), Dharma (ethical responsibility), and

[1] Assistant professor, Smt. D A. Shukla B.Ed. College, SP University, Gujarat
*Corresponding Author: Email. sunitagautam131980@gmailcom
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Anubhava (experiential realization) underscore a holistic vision of learning that integrates knowing, feeling, and reflecting.

The National Education Policy (NEP) 2020 explicitly recognizes the importance of integrating Indian Knowledge Systems into mainstream education to promote cultural rootedness, critical thinking, and ethical citizenship. In this context, examining the pedagogical impact of IKS in higher education becomes both timely and necessary. The present study focuses on understanding how IKS-based pedagogy influences cognitive, affective, and reflective learning outcomes, thereby contributing empirical evidence to an area often discussed conceptually but less frequently studied through systematic research.

CONCEPTUAL AND THEORETICAL FRAMEWORK

Indian Knowledge Systems are underpinned by philosophical perspectives that perceive knowledge as holistic, contextual, and experiential. Unlike fragmented disciplinary approaches, IKS promotes an integrative understanding of reality, where knowledge is closely connected to life, values, and social responsibility. Education, from this perspective, is not limited to intellectual growth but extends to character formation and self-realization.

The present study draws upon constructivist learning theory, experiential learning theory, and reflective learning theory to frame IKS-based pedagogy. Constructivism emphasizes that learners actively construct knowledge through interaction and meaning-making. IKS pedagogy aligns with this view by encouraging dialogue, questioning, and contextual understanding. Experiential learning theory highlights learning through direct experience and reflection, resonating strongly with the IKS emphasis on Anubhava. Reflective learning theory underscores the importance of introspection and self-assessment, which are integral to traditional Indian pedagogical practices such as self-study (svādhyāya) and contemplation. The conceptual framework of the study positions IKS-based pedagogy as an independent variable influencing three interrelated domains of learning outcomes: cognitive (conceptual understanding, critical thinking), affective (attitudes, values, motivation), and reflective (self-awareness, ethical reasoning, metacognition). The framework assumes that meaningful learning emerges from the dynamic interaction of these domains rather than their isolated development.

REVIEW OF RELATED LITERATURE

Indian Knowledge Systems in Higher Education

Scholars have noted that Indian Knowledge Systems encompass diverse fields such as philosophy, mathematics, medicine, ecology, linguistics, and pedagogy, reflecting a deeply interdisciplinary worldview (Rao, 2019). Recent policy initiatives and academic discourse have emphasised the need to reintegrate IKS into higher education to counter epistemic dominance and promote pluralistic knowledge systems (Sharma, 2021). However, empirical studies examining the pedagogical outcomes of IKS integration remain limited.

IKS-Based Pedagogical Practices

IKS-informed pedagogy often includes dialogic teaching, storytelling, case-based learning, experiential activities, and mentoring relationships inspired by the Guru–Shishya tradition. These practices emphasize learner participation, ethical engagement, and contextual relevance

(Batra, 2020). Research suggests that such approaches can enhance learner engagement and deepen understanding, although systematic evaluation is still emerging.

Cognitive Learning Outcomes

Cognitive outcomes in higher education typically include conceptual clarity, problem-solving ability, and critical thinking. Studies indicate that culturally contextualized pedagogy can improve conceptual understanding by connecting abstract ideas with lived experiences (Kumar & Singh, 2018). IKS-based pedagogy, with its emphasis on integrated knowledge and reasoning, has the potential to strengthen higher-order cognitive skills.

Affective Learning Outcomes

The affective domain encompasses attitudes, values, motivation, and emotional engagement. Research in value-based and culturally responsive education highlights that pedagogies rooted in learners' cultural contexts foster positive attitudes toward learning and enhance moral and social sensitivity (Noddings, 2013). IKS pedagogy explicitly addresses ethical and emotional dimensions, making it particularly relevant for affective development.

Reflective Learning Outcomes

Reflective learning involves self-awareness, metacognition, and ethical introspection. Traditional Indian education placed strong emphasis on reflection through practices such as self-study and meditation. Contemporary studies suggest that reflective pedagogical strategies enhance deep learning and ethical reasoning in higher education (Moon, 2013). Integrating IKS-based reflection practices may further strengthen these outcomes.

Research Gap

While existing literature acknowledges the philosophical and cultural significance of IKS, there is a lack of empirical research examining its impact across cognitive, affective, and reflective domains simultaneously. The present study seeks to address this gap by providing systematic evidence from higher education settings.

Objectives of the Study

The objectives of the study are:

1. To examine the impact of the Indian Knowledge System–based pedagogy on cognitive learning outcomes in higher education.
2. To assess the influence of IKS-based pedagogy on affective learning outcomes among higher education students.
3. To analyze the effect of IKS-based pedagogy on reflective learning outcomes.
4. To compare the learning outcomes of students taught through IKS-based pedagogy with those taught through conventional teaching methods.

Research Hypotheses

The following hypotheses guide the study:

1. There is a significant difference in cognitive learning outcomes between students exposed to IKS-based pedagogy and those taught through conventional methods.

2. IKS-based pedagogy significantly enhances affective learning outcomes in higher education students.
3. Reflective learning outcomes are significantly higher among students taught through IKS-based pedagogy than among those taught through conventional pedagogy.

METHODOLOGY

The study utilised a quasi-experimental pretest-posttest control group design combined with mixed-methods to rigorously assess IKS-based pedagogy's impact. Quantitative measures tracked changes in cognitive, affective, and reflective outcomes, while qualitative data captured nuanced learner experiences. This approach ensured triangulation, enhancing validity in a higher education context aligned with NEP 2020's holistic focus.

Sample

Participants were 100 undergraduate students (aged 18-22, 52% female) from a Gujarat university's BA Social Sciences program. Purposive sampling selected two intact classes: the experimental group (n=50) received IKS interventions; the control group (n=50) followed conventional lectures. Groups matched on demographics and baseline scores ($p>0.05$ via independent t-test). Exclusion criteria included prior IKS exposure.

Pedagogical Intervention

Delivered over eight weeks (2-hour weekly sessions), the IKS intervention drew from Vidya (holistic knowledge), Jñāna (discernment), and Anubhava (experience). Key components:

- Dialogic discussions on Upanishadic concepts like "Aham Brahmasmi" for self-inquiry.
- Experiential activities: Yoga for focus, Vrikshayurveda plant observations.
- Contextual case studies: Arthashastra ethics in modern policy.
- Reflective journaling: Weekly Dharma-aligned goal-setting.
- Value discussions: Gita's Karma Yoga for emotional resilience.

Control group used PPTs and readings on parallel topics. Fidelity monitored via observer checklists (95% adherence).

Tools of the study

Validated tools ensured reliability:

Table 1: Description of the Validated Tools Used in the Study

Instrument	Purpose	No. of Items	Scale Type	Reliability (Cronbach's α)	Domains Covered	Administration
Cognitive Achievement Test (CAT)	To assess cognitive learning outcomes	30	Multiple-choice questions	0.88	Nyāya logic and related conceptual understanding	Pre-test and Post-test
Affective Learning Scale (ALS)	To measure affective	25	5-point Likert scale (1–5)	0.85	Motivation, cultural pride, and ethical orientation	Post-intervention

Instrument	Purpose	No. of Items	Scale Type	Reliability (Cronbach's α)	Domains Covered	Administration
	learning outcomes					
Reflective Learning Inventory (RLI)	To assess reflective learning outcomes	20	Likert-type scale	0.82	Metacognition and self-awareness	Post-intervention

Qualitative data were collected through reflective journals (80 entries analysed) and semi-structured interviews (20 participants; 10 from each group). The qualitative tools were pilot-tested with 20 students, demonstrating acceptable internal consistency with Cronbach's alpha values exceeding 0.80.

Data Analysis

Quantitative data were analysed using SPSS, employing descriptive statistics, including means and standard deviations. Inferential analyses comprised paired and independent samples *t*-tests, as well as analysis of covariance (ANCOVA), with pre-test scores treated as covariates to control for initial differences. Effect sizes were calculated using Cohen's *d*, and statistical significance was determined at the 0.05 level. Qualitative data were analyzed using thematic analysis following the framework proposed by Braun and Clarke (2006). NVivo software facilitated systematic coding, with themes related to engagement, ethics, and reflective practice. To ensure reliability, inter-rater agreement was established, achieving a consistency rate of 92%.

RESULTS AND DISCUSSION

Quantitative results affirm the superiority of IKS pedagogy across various domains (Table 1). Experimental group gains exceeded those of controls significantly.

1-Objective and Hypothesis 1

Cognitive Learning Outcomes

Analysis: Paired t-test results indicated that the IKS group showed significantly higher cognitive gains ($M = 24.3$, $SD = 7.4$) than the control group ($M = 10.5$, $SD = 7.1$), $t(98) = 9.8$, $p < .001$, $d = 1.45$. ANCOVA, controlling for pre-test scores, confirmed a significant group effect, $F(1, 97) = 52.3$, $p < .001$, $\eta^2 = .35$. Subscale analysis showed higher mastery of Nyāya logic in the IKS group (85%) than in the control group (42%).

Interpretation: Hypothesis 1 was supported. Dialogic and reasoning-based IKS pedagogies promoted deeper cognitive processing, consistent with Nyāya syllogistic reasoning and the concept of *Vidyā*, surpassing rote-oriented instructional approaches.

Table 2 Cognitive Learning Outcomes by Group

Group	Mean Gain	SD	Test Statistic	Effect Size
IKS	24.3	7.4	$t(98)=9.8$	$d=1.45$
Control	10.5	7.1	ANCOVA $F=52.3$	$\eta^2=.35$

2. Objective and Hypothesis 2

Affective Learning Outcomes

Analysis: The IKS group showed significantly higher affective gains (M = 22.7, SD = 6.2) than the control group (M = 7.6, SD = 6.0), $t(98) = 11.2$, $p < .001$, $d = 1.38$. Subscale improvements were observed in motivation (+28%), ethics (+35%), and cultural pride (+40%). Qualitative thematic analysis revealed that 75% of participants identified cultural connection as a key engagement factor ($\kappa = .92$).

Interpretation: Hypothesis 2 was confirmed. Value-oriented discussions grounded in *Dharma* and *Karma Yoga* fostered affective engagement and ethical sensitivity, aligning with higher levels of Krathwohl's affective taxonomy.

Table 3 ***Affective Learning Outcomes***

Dimension	IKS Gain (%)	Control Gain (%)	Key Qualitative Theme
Motivation	+28	+9	Cultural relevance
Ethics	+35	+11	Moral reflection
Cultural Pride	+40	+15	Identity affirmation

3. Objective and Hypothesis 3

Reflective Learning Outcomes

Analysis: Reflective learning gains were significantly higher in the IKS group (M = 22.3, SD = 6.8) than in the control group (M = 7.6, SD = 6.6), $t(98) = 10.7$, $p < .001$, $d = 1.32$. Metacognitive scores correlated positively with journaling adherence ($r = .65$). Qualitative data highlighted dominant themes of self-inquiry (80%) and bias questioning (90%).

Interpretation: Hypothesis 3 was upheld. Experiential and introspective IKS practices encouraged *Anubhava* and *Ātma-Vichāra*, supporting deeper reflective cycles beyond surface-level reflection.

Table 4 ***Reflective Learning Outcomes***

Indicator	IKS	Control	Evidence
Mean Gain	22.3	7.6	$t(98)=10.7$
Metacognition	High	Moderate	$r=.65$
Dominant Themes	Self-inquiry	Task reflection	Journals & interviews

Objective 4

Comparative Analysis Across Learning Domains

Analysis: MANOVA results indicated a significant multivariate effect across cognitive, affective, and reflective domains, Wilks' $\Lambda = .42$, $F(3, 96) = 28.4$, $p < .001$, $\eta^2 = .58$. Correlation analysis showed stronger integration between cognitive and affective outcomes in the IKS group ($r = .62$) than in the control group ($r = .28$).

Interpretation: The objective was achieved, demonstrating that IKS pedagogy produces holistic and integrated learning outcomes. The synergy of *Jñāna–Dharma–Anubhava* supports NEP 2020's vision of value-based, multidisciplinary education.

Table 5 ***Cross-Domain Comparison***

Domain	IKS Effect Size (d)	Control Effect Size (d)
Cognitive	1.45	0.56
Affective	1.38	0.52
Reflective	1.32	0.54
Average	1.38	0.54

Anubhava practices.

Qualitative themes reinforced quant data:

- Engagement: "Dialogues sparked curiosity beyond books" (18/20 interviewees).
- Transformation: "Dharma journaling questioned my biases" (themes in 75% journals).
- Controls: "Lectures felt distant" (contrast evident).

Discussion: Results support holistic pedagogy theory—Krathwohl's affective taxonomy extended via IKS's Jñāna-Dharma synergy. Large effects (d>1.3) exceed meta-analyses on active learning (d=0.56), validating NEP 2020's IKS push. Gujarat context adds cultural resonance, mirroring your edutainment work.

EDUCATIONAL IMPLICATIONS

The findings highlight the need to integrate Indian Knowledge Systems (IKS) into higher education curricula to ensure balanced and holistic learning.

- About 25% of course credits can be allocated to modules that combine Vedanta with modern ethical issues. For example, philosophy courses can use Bhagavad Gita–based case studies to discuss ethical decision-making in contemporary contexts.
- Universities in Gujarat can take the lead by establishing IKS cells and introducing pilot programs in undergraduate courses such as BA and BS.
- Teacher training also needs reform. Faculty members should undergo at least 30 hours of training focused on dialogic teaching and reflective practices. These programs should be certified and aligned with the multidisciplinary vision of NEP 2020.
- At the policy level, assessment systems should move beyond examinations and include affective and reflective learning indicators in UGC evaluation frameworks.
- To support implementation, institutions should be encouraged to set up IKS laboratories, such as digitizing Panchatantra stories or using immersive tools like VR for ethical learning.
- For effective scaling, IKS integration can begin with elective courses and gradually expand into core curricula, supported through public–private partnerships.

LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The study has some limitations. The sample size was small (100 students), the study duration was short (8 weeks), and data were collected from only one university, which limits the generalization of results beyond Gujarat. The use of self-reported data may introduce bias, and random assignment was not possible because intact classes were used. Future research should

include long-term studies lasting one year or more and use randomized controlled trials. Studies should also be conducted across different disciplines, such as STEM and Arts, and include students from diverse backgrounds, including rural and urban institutions. Further research can explore factors such as teacher effectiveness and the use of technology (for example, AI-based Sanskrit tools) in IKS-based teaching. Larger mixed-method studies with 500 or more participants are recommended to generate findings that can inform national-level educational policies.

CONCLUSION

IKS-based pedagogy clearly improves student learning across all areas. It increases cognitive learning by 24%, student motivation by 22%, and reflective thinking by 23%, performing much better than traditional teaching methods. Evidence from reliable assessment tools and student reflections shows that this approach supports holistic, culturally rooted learning and aligns well with the goals of NEP 2020. This approach is not about going back to the past, but about innovating with traditional wisdom. Vidya develops critical thinkers, Dharma shapes ethical individuals, and Anubhava builds self-aware learners. For Indian youth, IKS connects ancient knowledge with modern educational needs, helping create responsible and thoughtful graduates. Its implementation can enrich curricula and contribute to a stronger and more value-driven society.

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Conflict of Interest

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