A Study of Level of Awareness among Teachers of Higher Education Regarding Integration of AI and IKS: Patna District, Bihar (India)

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ABSTRACT

The Indian Knowledge System (IKS) deals with traditional knowledge and it's sources, the ancient philosophies, the understanding about science, arts, and the effective methods of teaching and learning that are present since ages. NEP 2020, focuses on the integration of AI and IKS and including IKS in the mainstream education and research along with Artificial Intelligence (AI). The study aims at knowing the extent of awareness among the teachers of higher education in Patna District about the integration of Artificial Intelligence (AI) with Indian Knowledge Systems (IKS). AI as a tool of transformation in the field of education, globally the Indian policy frameworks like the National Education Policy (NEP) 2020 lays emphasis on embedding IKS into the existing curriculum and training the concerned educators in ways by which they can blend traditional knowledge with modern technologies .In the present research work descriptive survey has been done the sample being 150 teachers across disciplines, in three universities of Patna district Maulana Mazharul Haque Arabic and Persian university, Patna University and Aryabhatta Knowledge University the work tends to explore awareness levels, perceived benefits, hurdles and the suggestions for enhanced capacity-building. The findings of the research shows average awareness and significant enthusiasm for IKS-AI synergy, but there are gaps in training and availability of resources. The paper concludes with implications for policy and practice in teacher education.

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KEY WORDS

INTRODUCTION

The Indian Knowledge System (IKS) deals with traditional knowledge and it's sources, the ancient philosophies, the understanding about science, arts, and the effective methods of teaching and learning that are present since ages. NEP 2020, focuses on the integration of AI and IKS and including IKS in the mainstream education and research along with Artificial Intelligence (AI) as a tool for reshaping modern education through adaptive learning, assessment which is automated and personalized pedagogy. There begins the curiosity about how modern technologies and methods can enrich and work in strengthening the traditional knowledge practices? How can AI and IKS work for each other and act as good and vehicle, the other concerns being how teachers in Indian higher education perceive? And are aware of the facts regarding this integration of AI with India's indigenous knowledge frameworks particularly in Patna District.

Artificial Intelligence (AI)

The AI tools are reshaping global education on a large scale by exposure to personalized learning, automating administrative tasks for educators, and accessibility for diverse learners has increased. This transformation is moving education systems away from a one-size-fits-all model towards more efficient, engaging, and student-centric approaches.

Ways in which AI is reshaping the education system:

➢ **Personalized Learning Paths**: The student data is analyzed by the use of AI by with progress and learning styles is known which helps in creating tailored educational content and experiences. This helps in identification of weaknesses and receive extra support in the specific areas also making learning to be self-paced.

➢ **Automated Administrative Tasks**: Using AI helps in saving of time and making work easy to handle this provides space for more creative and productive work.

➢ **Enhanced Accessibility: The** tools like real-time translation, speech-to-text, and text-to-speech software helps in removing the language barrier. This helps in development of inclusive learning environment with better opportunity and chances to succeed.

➢ **Intelligent Tutoring Systems** : AI-powered chatbot and virtual assistants and other AI platforms act as platform for better learning helping with questions and queries resolved .This also helps in creation of content and it's analysis .The learning gaps and students performance too can be tracked and help in better tutorial programme.

Not only in India all over the world AI is becoming a part of the education system be it Singapore "smart Nation " or India's NEP 2020 , the investment in the sector too has increased. The future is all about deeper integration of AI and education including learning experiences and inclusion in politics related to education. UNESCO is actively developing competency frameworks and guidance for policymakers which will ensure the responsible use of AI in education. India's emphasis on digital transformation under the National Education Policy (NEP) 2020. DIKSHA (Digital Infrastructure for Knowledge Sharing) is meant to serve as "One Nation, One Digital Platform," provides multilingual e-content and QR-coded textbooks for schools across the nation. There are major reforms in higher education like, Academic Bank of Credits (ABC): A digital repository for storing academic credits earned by students, facilitating "Multiple Entry and Exit'' (MEME) options so learners can pause and resume their studies across different institutions. SWAYAM: MOOC portal with over 5.15 crore enrollments, allows students to transfer up to 40% of their credits from online courses

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toward their degrees. Virtual Labs are also functional Over 900 digital lab are there for hands-on learning even in under-resourced areas. There are advancements in translations through Anuvadini removing the language barrier.

The Indian Knowledge System (IKS)

As known the Indian Knowledge System (IKS) is multidisciplinary in nature build up through ages including ancient and traditional Indian wisdom. Presently it is being integrated with the modern education system and is practically being applied through different courses developed under the initiatives of the National Education Policy (NEP 2020). The scope of IKS is broad it covers almost all facets of human life and natural sciences. The **Scientific and Technical Fields** like ancient Indian mathematics (Vedic maths), astronomy, metallurgy, and architecture (Vastu Shastra).**Health sector includes** Ayurveda, Siddha, Unani, and Yoga for overall physical and mental well-being. **Humanities and Social Sciences includes** linguistics (Sanskrit and other classical languages), philosophy (Vedas, Upanishads), ethics, governance, and law.**Agriculture and Environment with** Focus on traditional farming techniques, ecological balance, and sustainable resource management. **Arts and Culture** part includes classical music, dance, visual arts, and literary traditions.

The main function of IKS is to act as a connecting link between ancient traditions and present modern day needs for which integrations are required like combining the ancient Ayurvedic theories with modern pharmacology, fostering of cultural pride and bringing about holistic learning through inclusion of IKS in higher education curriculum and implementation is also needful. Another major part of IKS deals with preservation and digitization of ancient manuscripts and creation of digital repositories. One of the major social functions of IKS is Application of traditional insights in solving modern problems (societal and climatic) like changes in climate, mental health issues and sustainable development.

IKS is growing in the recent years yet the restoring of IKS is with its own challenges and hurdles. There are a lot of problems and difficulties in the verification of ancient experiential knowledge through today's empirical or scientific methods. The ancient tests and documents are deteriorating due to negligence and requires digitalization for preservation along with it there is a lot of academic resistance added to language and cultural barriers.

A standardized curricula for the institutions across the country is lacking and there is a shortage of qualified educators trained having knowledge about both traditional and modern systems and it's integration.

The Integration of AI and IKS

The integration of Artificial Intelligence (AI) and the Indian Knowledge Systems (IKS) in 2026 is mainstay of transformation of India's higher education and the National Education Policy (NEP) 2020. The collaboration of these aiming at the modernization of ancient wisdom for providing values, ethically and culturally rooted frameworks for enhanced technology. The major areas of integration -

1. The preservation and digitalization of the ancient manuscripts and the decoding.
2. Researchers and innovations in the field. The fields being Vedic mathematics, Ayurveda and health, the issues related to sustainability in the field of agriculture and water management.
3. Integration of IKS Principles in the development of AI tools and bringing about immersive learning is the field for recreation of historical sites.

Bihar being a historically and culturally rich state and with a golden past may prove to be a fertile ground for working on IKS and reviving the facts with integration of AI from preservation of manuscript to recreation of historical sites the state provides a large field for the integration of IKS with AI. There are several challenges to AI integration in Bihar the major ones being related to the unavailability of infrastructure like Internet, equipments etc, especially in rural areas, the low digital literacy rate is an added problem to infrastructure unavailability. The research work in the area is limited and this acts as an barrier for formation of strategies for

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future and hence ethical concerns too are present. Added to all the above there exists a resistance to change related to technology and adoption of new methods.

The study done focuses on awareness amongst Teachers of Higher Education (all disciplines) of different universities in Patna district regarding Integration of AI within IKS. The major universities covered in the study being Maulana Mazharul Haque Arabic and Persian University, Patna University and Aryabhatta Knowledge University.

Review of Related Literature

"While AI is capable of automating administrative tasks, Creating personalized content, and even assisting in teaching, it is unlikely to fully replace the Role of human teachers (Fitria, 2021)." " Instead, AI should complement traditional teaching Practices by assisting teachers in delivering more effective lessons and enhancing the learning Experience for students (Zawacki-Richter et al.,2019),Teachers of the future who will be incorporating AI tools and technologies into their Teaching practices, like Master of Education (M.Ed.) students, will be at the pioneering of this Educational change." ."According to Rainer Et al. (2016), "AI contains technologies that simulate human cognitive processes like learning, Problem-solving, reasoning, and creation, which includes expert systems, neural networks, Machine learning, deep learning, fuzzy logic, and intelligent agents. These technologies, which Offer creative ways to improve teaching strategies, student engagement, and learning outcomes, Have become more and more integrated into the educational landscape." "The potential of AI in the classroom includes tasks such as content Preparation, teaching methods, student interaction, collaboration, and performance assessments (Chassignol et al., 2018; Perrotta & Selwyn, 2020). "Another study by Goksel and Bozkurt (2019) identified key concepts in the field of AI in Education, such as adaptive learning, personalization, and intelligent tutoring systems, through a Co-word analysis of academic papers published between 1970 and 2018." Chen et al. (2020) and Xu & Ouyang (2022) explored "the challenges teachers Face in adopting AI, highlighting gaps in their technical knowledge and the limited inclusion of AI training in teacher education programs." "According To Okonkwo & Ade-Ibijola (2021), chatbots can assist in answering student queries, providing Guidance, and promoting interaction outside the classroom," " while intelligent tutoring systems can Offer personalized learning experiences by adapting to each student's needs (Luan & Chin-Chung, 2021)." "González-Calatayud et al. (2021) noted that teacher preparation programs often do not adequately prepare educators to use AI effectively. As a result, there is an urgent need to increase awareness and Training for M.Ed students on how AI can be utilized in the classroom to improve both teaching Practices and student outcomes." "According to Hwang & Tu (2021), AI applications in mathematics education, for Example, can help students at various levels of proficiency by offering tailored content and real-Time feedback, thereby promoting equity in learning opportunities. AI's potential in education is vast, and its applications can significantly enhance the Teaching-learning process. However, to fully realize its benefits, it is essential to raise awareness Among M.Ed students about the role AI can play in their future classrooms. By integrating AI-Focused curricula into teacher training programs and ensuring that future educators are equipped With the necessary skills to utilize these technologies." "Studies such as those by Zakaria et al. (2024) found that AI-driven platforms improve academic performance by providing personalized content and timely feedback, making learning more interactive and adaptive. This personalized approach not only improves grades but also enhances student involvement in the learning process." Similarly, Fazil et al. (2024) "documented how AI applications in Afghanistan's universities contributed to increased student engagement."Anither research paper published in regrento the area Bihar found "AI can offer a pathway to more inclusive and personalized learning, helping students overcome limitations related to access and infrastructure. The Chitransh Academic & Research Volume1 | Issue3 | June 2025, Amitabh." Though AI comes with numerous benefits, its implementation in the field of education is always related to ethical concerns, specifi related to data privacy, algorithmic bias, and fairness. Studies by Alam (2020) and Khalkho et al. (2024) emphasize that "if AI systems are not carefully designed and monitored, they may unintentionally perpetuate biases in assessments, leading to unfair outcomes

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for students. This is particularly concerning for regions like Bihar, where digital literacy may be lower, and students may lack awareness of the potential misuse of their personal data. AI systems often rely heavily on student data to provide personalized learning experiences." "This creates significant risks regarding data security and the ethical use of student information. As AI adoption grows in Bihar, ensuring that AI systems are transparent, fair, and accountable will be crucial for fostering trust and preventing inequitable educational outcomes. In terms of ethical challenges, the digital divide in Bihar adds another layer of complexity.

Research Gap

It is very clear from the review that mostly the studies are either related to AI or IKS separately, out of them a few even explore combined integration, but there is less documentation with respect to Bihar there is the need is to understand and explore the integration of AI and IKS in the region along with knowledge of level of awareness regarding this in the region.

Objective of the study.

1. To know the awareness of higher education teachers regarding integration of AI and IKS (Patna District)
2. To know the attitude of teachers of higher education towards the benefits and challenges of including IKS in the curriculum.
3. To know the viewpoint of teachers of higher education towards inclusion of AI in teaching pedagogy.
4. To determine the factors effecting the level of awareness among teachers of higher education (i.e, discipline, experience, training).

Hypotheses

H_{01}: There is no significant difference in the level of awareness regarding the integration of AI-IKS amongst the teachers on the basis of discipline.

H_{02}: There is on significant difference in the level of awareness regarding integration of AI-IKS amongst the teachers on the basis of training and experience.

H_{03}: There is no difference in attitude of teachers towards adaptation of AI in teaching pedagogy based on discipline.

H_{04}: There is no significant difference in attitude of teachers towards inclusion of IKS in the curriculum based on discipline.

Research Design

The study focuses on the level of awareness regarding AI and IKS and their integration in the state Bihar amongst the teachers of higher Education. The method used here is descriptive survey type.

The population of the study being teachers of higher education in Patna District of Bihar:

Stratified sampling was used for collection of the sample, the whole population was divided into three strata i.e the three universities Maulana Mazharul Haque Arabic and Persian University, Patna University, Patna and Aryabhatta Knowledge University of the district, the sample was collected, 40 teachers being from each University covering all the streams (arts, science, education).In total the sample size being 120.

The tool used for data collection was questionnaire and the findings where found through calculation of percentage. Data collected was studied and represented in tables and charts. Hypothesis was tested and conclusion was drawn.

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Table 1: Distribution of sample (The total sample size being 120)

| Name of the University	Sample size
Maulana Mazharul Haque Arabic and Persian University	40
Patna University	40
Aryabhatta Knowledge University	40

Data Representation, Analysis and Interpretation

The analysis of data collected is based on the sample i.e 120 teachers of the three universities under study. The data was collected using a structured questionnaire, percentage analysis was done and representation was done through tables and graphs.

Table 2: University -wise Distribution of Teachers

Name of the University	Sample size
Maulana Mazharul Haque Arabic and Persian University	40
Patna University	40
Aryabhatta Knowledge University	40

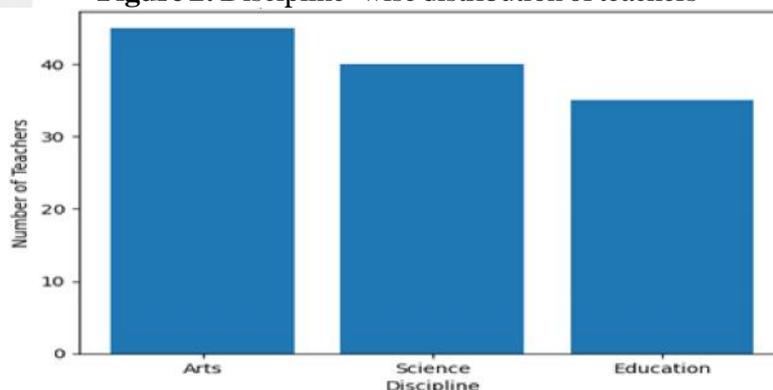**Figure 1:** University-wise Distribution of Teachers
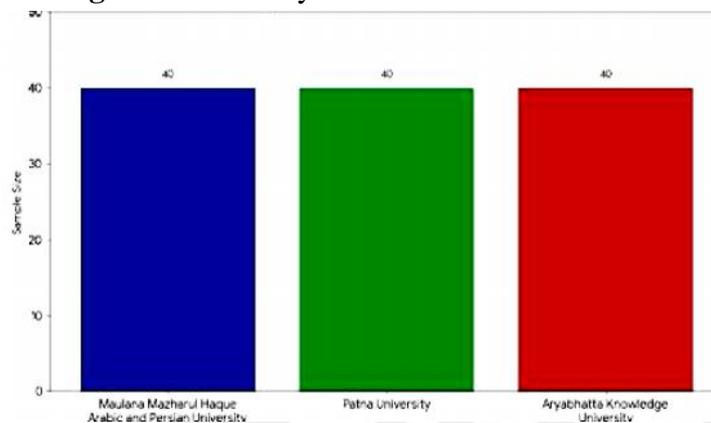
The pie diagram hereby shows the distribution of teachers University wise which is in equal proportions for better validity and representatives sample.

Table 3: Discipline -wise distribution of teachers.

Discipline	Number	Percentage
Arts and Humanities	45	37.50
Science	40	33.33
Education	35	29.17
Total	120	100.00

*(**Source:** Primary Data)*

Figure 2: Discipline -wise distribution of teachers

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The number of Arts and humanities faculty was 45, with science being 40 and education 35 Thus the sample seems to be multidisciplinary.

Almost half of the teachers show moderate awareness, this indicates partial familiarity with AI–IKS integration. However, there is significant unawareness too which shows the need of orientation regarding the integration of AI-IKS.

Testing of the Hypothesis

H_{01}: As per the data collected the awareness level among the teachers based on discipline varies significantly the awareness is highest among the science teachers being 64 percent followed by 56 percent amongst the teachers of education and 48 percent amongst the teachers of Arts. Hence hypothesis H_{01} is rejected.

Table 4: Level of awareness regarding integration of AI-IKS on the basis of discipline

Discipline of the teacher	Level of awareness in percentage
Science	38.1
Education	28.6
Arts	33.3

*(**Source:** Primary Data)*

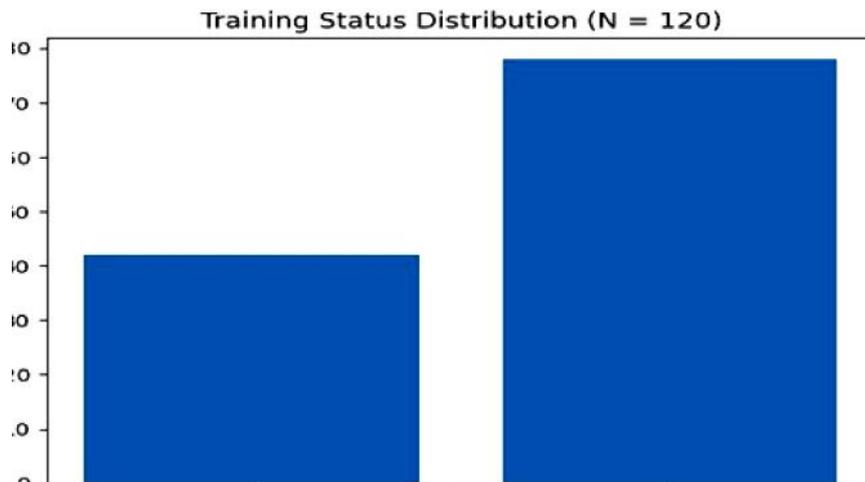**Figure 3:** Level of awareness regarding integration of AI-IKS on all the three disciplines
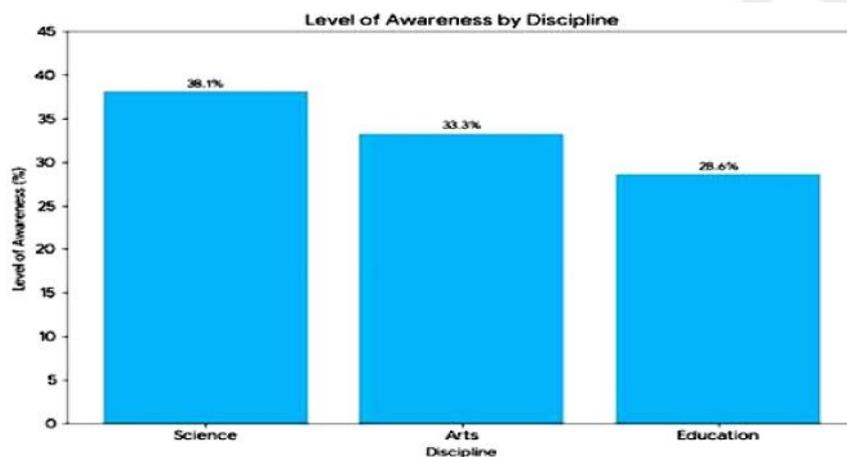
H_{02}

Table 5: The level of awareness on the basis of training and experience

Training status	Number	Percentage
Trained	42	35
Untrained	78	65

*(**Source:** Primary Data)*

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Fig. 4

Training Status Distribution (N = 120)

It was found that teachers with AI training and experience of IKS reflected higher level of awareness regarding integration of AI-IKS and hence the hypothesis H_{02} was rejected.

H_{03}

Table 6: The attitude of teachers towards adaptation of AI in teaching pedagogy.

Attitude towards AI in teaching	Number	Percentage overall
Positive	70	58.33
Neutral	32	26.67
Negative	18	15.00

Fig. 5

Attitude of Teachers Towards Adaptation of AI in Teaching Pedagogy
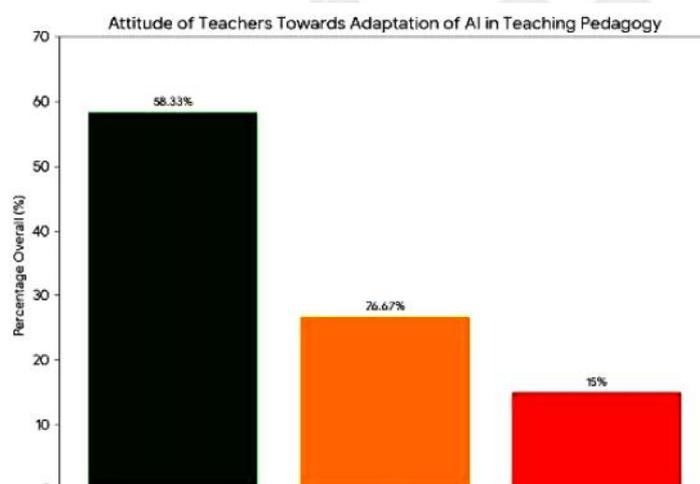
As per data collected the majority of teachers show positive attitude irrespective of discipline hence hypothesis H_{03} is accepted.
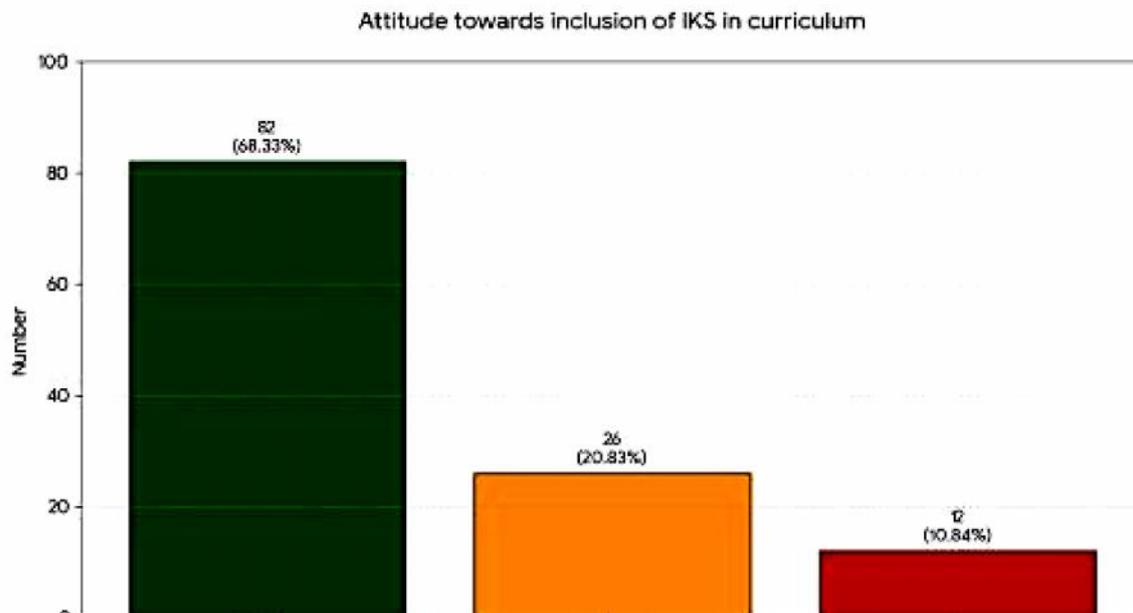
H_{04}

Table 7: The attitude of teachers towards inclusion of IKS in curriculum

Attitude towards inclusion of IKS in curriculum	Number	Percentage Overall
Positive	82	68.33
Neutral	26	20.83
Negative	12	10.84

*(**Source:** Primary Data)*

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Fig. 6

As per data collected a strong inclination towards inclusion of IKS with NEP 2020 was found irrespective of discipline, hence hypothesis H_{04} was accepted.

Discussion

As per findings based on the data collected from the three universities of Patna District it was found that there is moderate level of awareness regarding AI–IKS integration. Which is in support of earlier studies (Zawacki-Richter et al., 2019; Chen et al., 2020) "which emphasize that awareness alone does not guarantee readiness without structured training."

The discipline-wise difference is an indication that Science and education teachers are relatively more exposed to interdisciplinary discourse, while Arts faculty is lagging behind and needs more exposure.

Training seems to be the most important and a factor which is influencing the most and though there are infrastructural and ethical challenges in the area, yet the teachers showed positive attitudes, which is an indication of openness to innovation aligned with NEP 2020.

Findings

1. Mostly the teachers showed moderate awareness of AI–IKS integration.
2. Teachers with AI training exhibited significantly higher awareness.
3. Discipline has an influences on the awareness but it has no effect on the attitude.
4. There is a strong support for IKS inclusion in curriculum.
5. The Major problems in the region is lack of training, support from institution, infrastructure, and digital literacy, yet the overall attitude towards inclusion of AI-IKS is positive.

CONCLUSIONS AND RECOMMENDATIONS

The study concludes that while higher education teachers in Patna District are positively inclined towards integrating AI with Indian Knowledge Systems, their awareness and attitude is also effected by training and experience hence the recommendations are.

1. Development of FIP on AI and IKS.
2. Practical tool training and workshop to be conducted in the area.
3. Encouragement of interdisciplinary collaborations in the universities.

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