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INDIAN KNOWLEDGE SYSTEM-A CASE STUDY

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Keywords	Abstract
Indian Knowledge System, Vedic Mathematics, Ayurveda, Conventional Subject JEL Classification Code: I23, Z12, O15	The Indian Knowledge System (IKS), an ancient Indian wisdom, is now included in syllabus as part of NEP 2020. The researchers attempted to compare the academic performance of Commerce and Information Technology students towards IKS topics of Vedic Mathematics and Ayurveda, but no significant differences were found between their academic performance. Furthermore, Overall IKS was reported to be more beneficial in comparison to conventional subjects in the viewpoint of students except for ease of understanding and better career opportunities. There were substantial differences reported in how IKS is perceived in comparison to conventional subjects by offering valuable insights into health and wellness. The researchers recommend developing a balanced curriculum, making IKS more application oriented towards industries, and using innovative teaching methods so that students remain interested despite IKS's perceived difficulty

1. INTRODUCTION

The National Education Policy (NEP) 2020 mentioned including Indian Knowledge System (IKS) in the curriculum for promoting ancient Indian Arts and Sciences. IKS covers various topics such as Ayurveda, Mathematics, Astronomy, Indian Metal Works, Indian Heritage Knowledge, Fine Arts and Performing Arts. The purpose of IKS is to spread indigenous knowledge among stakeholders.

For integrating IKS into modern education, it is essential that educational institutions partner with



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IKS experts and government bodies to raise awareness regarding IKS benefits to stakeholders.

2. SCOPE AND SIGNIFICANCE OF STUDY

The scope of the study is limited to Commerce and Information Technology (IT) students of Vidyalankar School of Information Technology (VSIT) which is affiliated to University of Mumbai. The scope is further restricted to only two topics of IKS such as Vedic Mathematics and Ayurveda. The significance of the study is that it will help to know the academic performance of students of Commerce and Information Technology towards topic of IKS such as Vedic Mathematics and Ayurveda. Second, it will help to know the viewpoint of Commerce and Information Technology Students towards conventional and IKS subject.

3. RESEARCH OBJECTIVES

- To find the academic performance of Commerce and Information Technology students towards IKS topics of Vedic Mathematics and Ayurveda
- To find out the perception of Commerce and Information Technology students towards IKS subject and conventional subjects

4. LITERATURE REVIEW

Rajlakshmi Ghosh (2022) in the online news article titled, “Why Indian Knowledge System should be a part of mainstream education,” mentioned that Indian Knowledge System might look old at first glance in the world of machine learning, artificial intelligence, and blockchain but technical institutions are embracing Indian knowledge system as an elective credit course. The researcher mentioned that IKS division has taken three initiatives such as proposal for new IKS centre, programmes for student internships, and competitive research proposals. This IKS division will provide 30 to 40 lakhs funding over two years to institutes for establishing and conducting IKS related activities. The researcher is of the opinion that every IKS discipline will find a place for integration with the regular discipline. For instance, Indian Mathematics could be integrated easily with regular Mathematics.

Vatsala Shringi (2024) in the online news article, titled, “From Ayurveda, Yoga, To Vedas, How IKS is Being Integrated with Tech at IITs,” mentioned that National Education Policy (NEP) 2020 emphasises on education which are “rooted in Indian ethos.” Hence, the tech institutes are now incorporating concepts from ancient texts in their curriculum. The researcher mentioned that the project of IKS will create knowledge in broad domains of technology, well-being, public systems, education and pedagogy. The researcher mentioned that IKS will span across areas such as Ayurveda, mathematics, sports, agriculture, performing arts, medicines, and architecture. The researcher mentioned that division of IKS is planning to launch fifteen minors across the country for undergraduate students. These minors can be pursued by students along with any major discipline.

Dr. Naresh Chandel and Kamlesh Kumar Prashar (2024) in the online article titled, “Indian



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Knowledge System and NEP: A Brief Analysis,” mentioned that one of the significant aspects of NEP 2020 is the IKS. The researcher mentioned that IKS covers domains like philosophy, ayurveda, literature, yoga, culture, and technology. The researcher mentioned that integrating IKS with NEP will help in understanding contemporary issues in the society. The researcher mentioned that IKS will spread indigenous knowledge among stakeholders. Furthermore, IKS will renew traditional knowledge with the use of modern technology. The researcher concluded that teachers should be trained properly so that these teachers can deliver knowledge of IKS in a meaningful way.

Dr. Pavan Mandavkar (2023) in the research paper titled, “Indian Knowledge System,” mentioned that IKS is based on the Upanishads and Vedas. The researcher is of the opinion that there should be synchronization of IKS courses to digital learning platforms. The educators should be provided orientation and training for improving classroom delivery of IKS courses. The researcher is of the opinion that there should be specialized training centres for educators so that they get training in topics of IKS. Furthermore, to encourage IKS innovation, there should be national competitions and challenges. The researcher is of the opinion that IKS will foster heritage technology. This will help to bring technology solutions which will show the Indian heritage to the world.

Subhashree Mishra et al. (2024) in the online research study titled, “Integrating Traditional Indian Knowledge System in Indian Higher Education,” mentioned that NEP 2020 integrates traditional IKS with the modern education. This will help in bridging gap between modern methods of science and traditional wisdom. The IKS encompasses domains like yoga, ancient mathematics, philosophy, literature, and environmental science. The researchers are of the opinion that IKS will enhance ethical reasoning, critical thinking and sustainability among the learners. The researchers concluded by mentioning that NEP 2020 will help to preserve the rich heritage of India and simultaneously prepare the learners to tackle modern world complexities.

K Sudhakar (2024) in the research study titled, “India’s Knowledge System- A Needed Approach in NEP 2020 to regain the deep roots of our nation- India,” mentioned that NEP 2020 emphasized “ingrained in India” as a significant idea. This idea has been instilled throughout the NEP 2020 for providing inclusive, comprehensive, and culturally rich educational experience. This idea is linked closely to cultural, historical, intellectual, and spiritual legacy of India. The researcher in this article attempted to interrogate historical, cultural, philosophical, and spiritual foundation to better understand the cultural diversity in India. The researcher concluded that NEP 2020 has the potential to reinstate standing of India as a Vishwa Guru.

Shailja Gaur (2024) in the research study titled, “Integrating Indian Knowledge Systems into Modern Education: An Analysis of the National Education Policy (NEP) 2020,” mentioned that NEP 2020 is aiming to revitalize the education system of India. The researcher attempted to examine how IKS will have a potential impact on Indian education system. To foster a learning environment which is holistic, the researcher mentioned that traditional knowledge of languages, ancient science, arts,



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and philosophy can be integrated with modern education. Teacher preparedness, allocation of resources, and curriculum balance are some of the challenges which need to be addressed while integrating IKS into modern education. The researcher suggested partnership between educational institution, IKS experts, and government bodies, continuous evaluation for assessing how effective IKS integration is with modern education and raising awareness regarding the benefits of IKS among public to overcome the challenges related to IKS integration.

Vatsala Shrangi (2024) in the research study titled, “From Vedas and Sutras to Aryabhata and Brahmagupta, UGC To Train 10,000 Faculty in Indian Knowledge System,” mentioned that an integral part of NSS is the IKS. NEP 2020 is deeply rooted in the Indian ethos. Engineering and Management institutes across India also teach IKS as a subject. The researcher mentioned that NEP 2020 emphasizes pedagogy and curricula from the perspective of India. The researcher mentioned that NEP 2020 emphasizes infusing the IKS in various academic disciplines. The researcher mentioned that in July 2023, with the establishment of IKS cell, the first phase of faculty training began. This training fosters research on various aspects of IKS which will preserve and disseminate the knowledge for applications in the society.

Satya Mohapatra (2024) in the online news titled, “Awakening India's ancient wisdom, UGC's ambitious plan to revive the Indian knowledge system,” mentioned that NEP 2020 aims to revive the intellectual heritage of India by reintroducing it into modern Indian classrooms. The researcher emphasized the potential of IKS which is transformative and holistic. The researcher mentioned that IKS integrates spiritual understanding, scientific inquiry, artistic expression, and philosophical exploration. The researcher is of the opinion that UGC aims to foster students who are not only informed but also connected deeply to intellectual and cultural heritage. The researcher concluded by mentioning that IKS which is a past wisdom will illuminate the path to future and make India a leader in innovation and knowledge.

Dr Rajesh Kumar Pandey (2024) in the research study titled, “An article on Indian knowledge system (IKS) & its connect to Higher Education with special reference to National Education Policy (NEP) 2020,” attempted to understand the essence of IKS by connecting it to higher education. The researcher mentioned that IKS has roots in ancient wisdom of India. The researcher is of the opinion that IKS will have a notable influence on higher education through its integration with contemporary knowledge. The researcher mentioned some challenges in the IKS implementation such as lack of awareness, resistance to change among institutions, inclination towards western system of education, and low IKS understanding among educators. The researcher concluded by mentioning that integrating IKS into education framework holds a promise to improve well-being of humans.

Based on the literature review, it was found that no study has been carried out among commerce and information technology students in Mumbai City which compares their academic performance towards IKS topics of Vedic Mathematics and Ayurveda. Second, it was found that no study has



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been carried out which compares the viewpoint of Commerce and Information Technology students towards conventional and IKS subjects.

5. RESEARCH METHODOLOGY

The research methodology was explained in three sub sections of Research Design, Research Instrument, and Sample and Data collection as follows

5.1 Research Design

The research design was descriptive in nature and commerce and IT student's academic performance was compared with reference to topics of IKS such as Vedic Mathematics and Ayurveda. Second, the viewpoint of commerce and IT students were compared towards conventional and IKS subjects. For, the first objective, a Vedic Mathematics lecture was conducted by certified Vedic Mathematics tutor and Ayurveda lecture was conducted by a practising doctor, who was expert in the domain of Ayurveda. A quiz of 20 questions which were made by subject experts were given to students who attended lecture of both Vedic Mathematics and Ayurveda for comparing their performance. For the second objective, a total of 110 students from commerce and IT who attended both the lecture of Vedic Mathematics and Ayurveda gave their viewpoints towards conventional and IKS subject.

5.2 Research Instrument

Based on the first research objective, a 20 marks quiz was prepared by subject experts in the domain of Ayurveda and Vedic Mathematics. The quiz asked questions on what was taught by subject experts during the lecture. This quiz was made on Microsoft Forms. For the second research objective, the students of IT and commerce were asked to rate on a 5-point Likert scale (where 1= strongly disagree and 5 = strongly agree) their viewpoints on topics of IKS and conventional subject. The data was analysed using Microsoft Excel and SPSS. The researchers checked the normality of data using one-sample Kolmogorov Smirnov Test. The researchers used Mann-Whitney U Test, and one sample Wilcoxon Signed Rank Test for testing hypothesis.

5.3 Sample and Data Collection

The present study was conducted at Vidyalankar School of Information Technology (Affiliated to University of Mumbai). The total strength of First year commerce students at VSIT is 345 and total strength of First Year IT students is 285. For Vedic Mathematics lecture, a total of 237 students (106 commerce and 131 IT) attended the lecture. For Ayurveda lecture, a total of 176 students (90 commerce and 86 IT) attended the lecture. A non-probabilistic purposive sampling was used to select 110 students (50 commerce and 60 IT) who attended both the lectures of Vedic Mathematics and Ayurveda. The students who did not attended both the lecture were excluded for comparing academic performance and knowing viewpoints towards conventional subject and IKS subject. The period of data collection was between September 2024 to December 2024.



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6. DATA ANALYSIS

The researchers checked reliability through Cronbach's Alpha which was found to be 0.85. The results show good internal consistency. The content validity was determined through opinion of the experts. The expert for Vedic Mathematics whose opinion was taken was Certified Vedic Tutor. For Ayurveda, the opinion was taken was of practicing doctor in the domain of Ayurveda.

The researcher checked the normality of data using one-sample Kolmogorov-Smirnov Test as seen in Table 1, Table 2, Table 3, and Table 4. It was found that the data does not follow a normal distribution as the p-value in all cases is less than 0.05. Hence, the researcher used Mann-Whitney U-Test to compare the mean rank of scores of Commerce and Information technology students with reference to Vedic Mathematics and Ayurveda. Furthermore, a One-Sample Wilcoxon Signed Rank Test was used to know the perception of Commerce and Information Technology Students (who attended both the lectures) towards IKS and conventional subjects. Furthermore, Rank-Biserial correlation was used to measure the effect size to find out if the observed median is greater than or less than the hypothesized median

Table 1 One-Sample Kolmogorov-Smirnov Test

		Ve dic Math s Mark s	Ayurv eda Marks	IKS provide more global relevance and applicabilit y than the Convention al subjects	IKS encourage critical thinking more effectively than the Convention al Subjects	IKS promotes holistic learning, connecting mind, body, and spirit in compariso n to convention al subject
N		110	110	110	110	110
Normal Parameters a,b	Mean	13.70	15.63	3.69	3.69	3.89
	Std. Deviation	3.588	3.883	1.217	1.210	1.295
Most Extreme Difference s	Absolute	0.179	0.171	0.255	0.264	0.279
	Positive	0.088	0.130	0.141	0.140	0.196
	Negative	-	-0.171	-0.255	-0.264	-0.279



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	ive	0.179				
Test Statistic	0.179	0.171	0.255	0.264	0.279	
Asymp. Sig. (2-tailed)	.000 ^c	.000 ^c	.000 ^c	.000 ^c	.000 ^c	

- a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Source: Primary Data SPSS Computation

Table 2 One-Sample Kolmogorov-Smirnov Test

		Learning from the IKS enhances creativity and innovative thinking in comparison to conventional subject	IKS is more straight forward and easier to understand in comparison to conventional subjects	The IKS has more practical applications in my daily life than conventional subjects	IKS offers valuable insights into health and wellness	IKS is more applicable in modern workplaces than conventional subjects
N		110	110	110	110	110
Normal Parameters ^{a,b}	Mean	3.78	3.35	3.64	4.02	3.68
	Std. Deviation	1.199	1.397	1.261	1.173	1.211
Most Extreme Differences	Absolute	0.272	0.217	0.259	0.276	0.258
	Positive	0.155	0.162	0.140	0.201	0.138
	Negative	-0.272	-0.217	-0.259	-0.276	-0.258
Test Statistic		0.272	0.217	0.259	0.276	0.258
Asymp. Sig. (2-tailed)		.000 ^c	.000 ^c	.000 ^c	.000 ^c	.000 ^c

- a. Test distribution is Normal.
b. Calculated from data.



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c. Lilliefors Significance Correction.

Source: Primary Data SPSS Computation

Table 3 One-Sample Kolmogorov-Smirnov Test

		IKS provide better career opportunities in comparison to conventional subjects	The teaching methods for the IKS feel more engaging than those for conventional subjects.	The IKS can provide alternative solutions to modern problems that conventional subjects overlook	The IKS should be mapped to conventional subjects	I am more interested in studying topics within the IKS than conventional subjects
N		110	110	110	110	110
Normal Parameters ^{a,b}	Mean	3.35	3.59	3.77	3.65	3.51
	Std. Deviation	1.372	1.251	1.163	1.178	1.312
Most Extreme Differences	Absolute	0.217	0.246	0.268	0.236	0.200
	Positive	0.157	0.130	0.146	0.136	0.128
	Negative	-0.217	-0.246	-0.268	-0.236	-0.200
Test Statistic		0.217	0.246	0.268	0.236	0.200
Asymp. Sig. (2-tailed)		.000 ^c	.000 ^c	.000 ^c	.000 ^c	.000 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Source: Primary Data SPSS Computation

Table 4 One-Sample Kolmogorov-Smirnov Test

	Conventional subjects align better with my	I would prefer courses that combine	IKS feels more rewarding to study	Learning IKS encourages a greater
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		personal and career goals than the IKS	both the IKS and conventional subjects	than conventional subjects	sense of self-discovery than conventional subjects
N		110	110	110	110
Normal Parameters ^a , b	Mean	3.56	3.55	3.37	3.84
	Std. Deviation	1.282	1.325	1.333	1.216
Most Extreme Differences	Absolute	0.233	0.207	0.245	0.226
	Positive	0.131	0.136	0.153	0.169
	Negative	-0.233	-0.207	-0.245	-0.226
Test Statistic		0.233	0.207	0.245	0.226
Asymp. Sig. (2-tailed)		.000 ^c	.000 ^c	.000 ^c	.000 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Source: Primary Data SPSS Computation

Hypothesis for First Research Objective

H0: There is no significant difference in mean rank of Commerce and Information Technology Students with reference to Vedic Mathematics

H1: There is significant difference in mean rank of Commerce and Information Technology Students with reference to Vedic Mathematics

H0: There is no significant difference in mean rank of Commerce students and Information Technology students with reference to Ayurveda

H1: There is significant difference in mean rank of Commerce students and Information Technology Students with reference to Ayurveda

As seen in Table 5 the researcher tested the above hypothesis using Mann-Whitney U Test Ranks. The researcher failed to reject the null hypothesis for both the above hypothesis as p-value was greater than 0.05.

Table 5: Testing of Hypothesis Using Mann-Whitney U Test Ranks

Subject	Field	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Asymp. Sig. (2-	Accept or Reject Hypothesis
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						tailed)	
Vedic Mathematics Marks	Information Technology	60	58.58	3514.50	1315.5	0.265	Fail to reject Null Hypothesis in both cases as p-value is greater than 0.05
	Commerce	50	51.81	2590.50			
	Total	110					
Ayurveda Marks	Information Technology	60	55.51	3330.50	1499.5	0.998	
	Commerce	50	55.49	2774.50			
	Total	110					

Source: Primary Data SPSS Computation

To know the perception of Commerce and Information Technology Students towards IKS and conventional subjects, the researchers used Wilcoxon Signed Rank Test. The researchers rejected the below null hypothesis in all cases where p-value was less than 0.05. The p-value was greater than 0.05 for statements 5 and 9. Hence, no significant differences were reported between IKS and conventional subject with reference to ease of understanding and better career opportunities. Overall, IKS is reported to be more beneficial in comparison to conventional subjects.

Table 6 Testing of Hypothesis Using One-Sample Wilcoxon Signed Rank Test

Sr. No.	Null Hypothesis	Test Statistic	Standard Error	Standardized Test Statistic	Asymptotic Sig. (2-sided test)
1	The median of IKS provide more global relevance and applicability than the conventional subjects equal 3	2823	221.101	4.502	0.000
2	The median of IKS encourage critical	2889.5	224.981	4.529	0.000



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	thinking more effectively than the Conventional Subjects equals 3				
3	The median of IKS promotes holistic learning, connecting mind, body, and spirit in comparison to conventional subject equals 3	3711	263.966	5.239	0.000
4	The median of learning from the IKS enhances creativity and innovative thinking in comparison to conventional subject equals 3	3201	236.791	5.061	0.000
5	The median of IKS is more straight forward and easier to understand in comparison to conventional subjects equals 3	2057.5	208.974	1.704	0.088
6	The median of IKS has more practical applications in my daily life than conventional subjects equal 3	2773.5	224.981	4.014	0.000
7	The median of IKS offers valuable insights into health and wellness subjects equals 3	3971	264.375	6.215	0.000
8	The median of IKS is more applicable in modern workplaces than conventional subjects equal 3	2816.5	221.101	4.473	0.000
9	The median of IKS provide better career opportunities in comparison to conventional subjects equals 3	2034	205.404	1.818	0.069



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10	The median of teaching methods for the IKS feel more engaging than those for conventional subjects equals 3	2548.5	213.391	3.775	0.000
11	The median of IKS can provide alternative solutions to modern problems that conventional subjects overlook equals 3	3096.5	228.877	5.167	0.000
12	The median of IKS should be mapped to conventional subjects equals 3	2508	201.99	4.396	0.000
13	The median of I am more interested in studying topics within the IKS than conventional subjects equal 3	2137.5	193.909	3.079	0.002
14	The median of conventional subjects aligns better with my personal and career goals than the IKS equals 3	2435	209.464	3.502	0.000
15	The median of I would prefer courses that combine both the IKS, and conventional subjects equals 3	2279.5	201.209	3.278	0.001
16	The median of IKS feels more rewarding to study than conventional subjects equal 3	2173.5	213.391	2.017	0.044
17	The median of learning IKS encourages a greater sense of self-discovery than conventional subjects equal 3	2995	220.234	5.301	0.000

(Source: Primary Data SPSS Computation)



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As to measure the effect size, the researcher calculated the Rank-Biserial Correlation (r). From table 6, the standardized test statistic was divided with square root of N (N was 110 and its square root is 10.4881). As can be seen in table 7, all values are positive, which means that the observed median is greater than the hypothesized median. Value above 0.5 (large effect size) shows that there were substantial differences in how IKS is perceived in comparison to conventional subjects. Values between 0.3 and 0.5 (moderate effect size) indicate meaningful but not overwhelming differences in how IKS is perceived in comparison to conventional subjects. Values less than 0.3 (small effect size) indicate that there is no significant difference in how IKS is perceived in comparison to conventional subjects. The researchers found the largest effect size of 0.59 for statement that IKS offers valuable insights into health and wellness. The lowest effect size of 0.16 (indicating no significant difference) was found for statement IKS is more straight forward and easier to understand in comparison to conventional subjects

Table 7 Rank Biserial Correlation Calculation

Sr. No.	Null Hypothesis	Rank-Biserial Correlation	Effect Size
1	The median of IKS provide more global relevance and applicability than the conventional subjects equal 3	0.43	Moderate
2	The median of IKS encourage critical thinking more effectively than the Conventional Subjects equals 3	0.43	Moderate
3	The median of IKS promotes holistic learning, connecting mind, body, and spirit in comparison to conventional subject equals 3	0.50	Moderate
4	The median of learning from the IKS enhances creativity and innovative thinking in comparison to conventional subject equals 3	0.48	Moderate
5	The median of IKS is more straight forward and easier to understand in comparison to conventional subjects equals 3	0.16	Small
6	The median of IKS has more practical applications in my daily life than conventional subjects equal 3	0.38	Moderate



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7	The median of IKS offers valuable insights into health and wellness subjects equals 3	0.59	Large
8	The median of IKS is more applicable in modern workplaces than conventional subjects equal 3	0.43	Moderate
9	The median of IKS provide better career opportunities in comparison to conventional subjects equals 3	0.17	Small
10	The median of teaching methods for the IKS feel more engaging than those for conventional subjects equals 3	0.36	Moderate
11	The median of IKS can provide alternative solutions to modern problems that conventional subjects overlook equals 3	0.49	Moderate
12	The median of IKS should be mapped to conventional subjects equals 3	0.42	Moderate
13	The median of I am more interested in studying topics within the IKS than conventional subjects equal 3	0.29	Small
14	The median of conventional subjects aligns better with my personal and career goals than the IKS equals 3	0.33	Moderate
15	The median of I would prefer courses that combine both the IKS, and conventional subjects equals 3	0.31	Moderate
16	The median of IKS feels more rewarding to study than conventional subjects equal 3	0.19	Small
17	The median of learning IKS encourages a greater sense of self-discovery than conventional subjects equal 3	0.51	Large

Source: Primary Data Computation

7. SUMMARY AND CONCLUSION

The Indian Knowledge System (IKS), an ancient Indian wisdom, is now included in syllabus as part of NEP 2020. The researchers attempted to compare the academic performance of Commerce and Information Technology students towards IKS topics of Vedic Mathematics and Ayurveda, but no significant differences were found between their academic performance. Furthermore, Overall IKS was reported to be more beneficial in comparison to conventional subjects in the viewpoint of students except for ease of understanding and better career opportunities. There were substantial



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differences reported in how IKS is perceived in comparison to conventional subjects by offering valuable insights into health and wellness.

8. IMPLICATIONS OF THE STUDY

This study taking student's viewpoints towards IKS and conventional subject would help in tailoring a balanced curriculum for Commerce and IT Students. To address the concern of students towards ease of understanding and better career opportunities, IKS could be more application oriented towards industries such as agriculture, tourism, or social entrepreneurship. Furthermore, IKS could be taught in an innovative teaching method using digital tools and practical applications so that students remain interested despite its perceived difficulty.

9. LIMITATIONS OF STUDY AND FURTHER RESEARCH

This study is a case study limited to VSIT students of Commerce and Information Technology only to know their opinion towards IKS subject in comparison to conventional subject. The subjects chosen were Vedic Mathematics and Ayurveda only. In comparison to population size, the sample has a small size. Further study can be carried towards different subjects of IKS such as astronomy or Indian metal works. This study can also be extended to different institutions in Mumbai City or outside of Mumbai City.

10. AUTHOR(S) CONTRIBUTION

The writers affirm that they have no connections to, or engagement with, any group or body that provides financial or non-financial assistance for the topics or resources covered in this manuscript.

11. CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

12. PLAGIARISM POLICY

All authors declare that any kind of violation of plagiarism, copyright and ethical matters will taken care by all authors. Journal and editors are not liable for aforesaid matters.

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