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A Study Evaluating Usage of Artificial Intelligence in Higher Education among Faculty Members of Colleges in South Mumbai Region

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Abstract:
Higher education is entering a revolutionary period with impacts on teaching, learning, and institutional operations due to the growth of artificial intelligence (AI) technology. The purpose of conducting this research is to evaluate the awareness of artificial intelligence in higher education among faculty members of South Mumbai Region and also evaluate the demographic profile and usage of AI. The technique used in this study is a Wilcoxon one-sample signed rank test, ANOVA and independent t-test. The outcomes of the research showed that various artificial intelligence had different levels of awareness. High awareness was discovered in Canva, ChatGPT, GradeScope, Beautiful AI, Turnitin (plagiarism checker), Copilot Education, Google Board, Gamma, Quill Bot, and Grammarly. The amount of awareness was low in Sendsteps.ai, Yippity (Quiz), MagicSchool.ai, Red Cube Paper (Articles), and Squirrel AI, in contrast. The study also discovered that usage of AI in higher education is independent of gender but dependent on age groups.

Keywords: Artificial intelligence, Wilcoxon one-sample signed rank test,

Introduction:

According to Baker and Smith (2019), "machines that undertake activities that are usually linked with human brains, especially learning and problem-solving" is a general definition of artificial intelligence (AI). They make it clear that no specific technology is referred to when the term "AI" is used. It is a broad term that includes many different tools and processes, including "neural systems, machine learning, natural language processing, data mining, and algorithms". ML and AI are commonly used synonymously. Two instances of how machine learning, an AI approach, may be used for supervised and unsupervised classification and profiling include identifying the themes in written assignments or estimating a student's likelihood of passing a course or getting accepted into a programme. (Zawacki-Richter, O. et al. 2019).

Higher education plays a fundamental role in the development of ground-breaking technologies and the robust processing capability of intelligent machines. Higher education teaching and learning are faced with both new opportunities and challenges as a result of the development of artificial intelligence. Artificial intelligence has the potential to fundamentally alter educational systems. Since Aristotle, the idea of artificial intelligence has lacked a precise definition. (Kotamjani, Fahimirad, 2018). Students are currently the focus of issues with learning and teaching in higher education. A type of collaboration or answer that can help people with disabilities worldwide is human-AI contact. Thus, these technologies could promote the use of AI in higher education. As a result, teachers and students may be inspired to engage more completely in the teaching and learning process. Programmes of the United Nations for Development (2015) asserts that advanced computer systems that make use of machine learning algorithms are capable of assisting people with a range of skills.

Faculty members' knowledge of AI in higher education has been progressively increasing in recent years. Educators are becoming more aware of the potential advantages and concerns of AI in their teaching and research as technology develops and permeates more areas of academia. The use of AI to improve personalised learning experiences, automate administrative processes, and deliver useful insights through data analytics is becoming more and more apparent to faculty members. Due to this increased awareness, academics are having more talks and working together to find creative methods to incorporate AI tools and solutions into their research and teaching techniques. To fully use the potential of AI while taking ethical and pedagogical concerns into account, faculty members must stay educated and participate in continuing professional development as AI's role in higher education advances.

The study is crucial since it offers insightful information on the present and prospective future of AI in higher education. It provides a critical knowledge of the potential and problems connected with AI integration in academia by assessing faculty members' awareness of and attitudes on AI. This information may help organisations and educators

make wise judgements about implementing AI technology, thereby improving teaching, learning, and administrative procedures while taking pedagogical and ethical considerations into account. The study also advances the ongoing conversation about how AI will influence education in the future by enabling intelligent debate and strategic planning in this quickly developing area.

Review of Literature:

1. **Alam, A. (2022).** The author conducted research on a successful educational interchange for learning-teaching of AI and ML using a digital game-based learning technique. This study aimed to consider recent game research that may be leveraged to improve AI & ML integrated pedagogy for efficient curriculum delivery. After a comprehensive search, pertinent articles and games were discovered and incorporated to this comprehensive content analysis. This article included a summary of important games and research that has been done, and it demonstrated how different games offer a fantastic and innovative chance to educate a range of AI and ML ideas and subjects.
2. **Amhag, L., et al. (2019).** This paper sought to understand how teacher educators employed digital tools and the resulting need for digital literacy in higher education. The majority of teacher educators do not utilise digital resources primarily for pedagogical goals, according to research on self-reported usage, competency, and the need for continuing education in digitalization in teaching. They require a lot of academic help as they develop digital schooling. Teacher educators must also use digital technology to assess the cognitive surplus value in their own educational and instructional setting in order to raise student interest in the real-world, successful, and subject-specific examples provided by senior educators.
3. **Bhutoria, A. (2022).** The goal of this study was to synthesise the extensive literature on using AI to personalise education and throw light on the major issues that underpinned how an AI-driven approach changed the structure of the current educational system. The findings demonstrated AI's capacity to adapt to the distinct learning needs, learning behaviours, and learning abilities of students in all three nations and direct them down optimum learning paths. Furthermore, it was evident from the research that AI improved educational content, customised it to each person's needs, and raised the red flag for prospective learning difficulties. This re-evaluated the role of the instructors in an effort to enhance the teaching-learning environment and the calibre of the educational experience.
4. **Chaudhry, M. A., & Kazim, E. (2022).** This article presented a synopsis of AI in Education (AIEd) with an emphasis on current research areas, such as the reduction of instructors' workload, contextualized learning for students, assessment reform, and improvements in intelligent tutoring systems. The study's conclusions showed that while AIEd displayed potential thirty years earlier, it still needs substantial AI advancements and a solid basis in order to realize its full potential. AIEd's primary objective was educational support, which was largely measured by learning results, rather than AI promotion. Meeting the specific learning needs of each kid was a difficulty. The future of education might benefit greatly from recent advances in AI, particularly in reinforcement learning. Learners and instructors have to remain at the centre of AI development efforts in order to ensure meaningful AI in education.
5. **Fahimirad, M., & Kotamjani, S. S. (2018).** The study focused at how new technologies are altering how schools teach and how students learn. This research set out to predict how artificial intelligence would impact international education in the future. Increasing the usage of AI does not imply disregard for the complicated debate around how teaching and learning are used in education. Despite the widespread acceptance of the impacts of technological advancement and job displacement, it was obvious that the role of teachers within the context of education required revision. By using AI or IT technologies to detect plagiarism, the problem of responsibility for teaching and learning has come to light. Furthermore, sophisticated AI algorithms have the capacity to replace a number of crucial operations in higher education teaching practises and introduce their own biases into operating systems. Universities are reconsidering pedagogical approaches and how they apply to AI. Higher education institutions are also capable of anticipating the benefits and challenges that could result from the use of artificial intelligence in teaching and learning. In order to preserve the fundamental ideas and goals of higher education, these techniques support learning while also creating teaching and learning possibilities.
6. **Raja, M., & Lakshmi Priya, G. G. (2022).** The authors investigated the use of VR, AR, and ICT technologies to improve quality in a dynamic classroom setting during the COVID-19 Pandemic. This study examined the benefits of integrating ICT with Virtual Reality and Augmented Reality to improve academic settings teaching professionals from different parts of India. The findings of this study show

that educators are in favour of and concur with the usage of virtual and augmented reality in the classroom. The study also showed that it might be difficult for students to learn technology in isolated areas. In this study, gender had no observable moderating effects.

Objectives of the Study:

1. To study the awareness of artificial Intelligence in higher education among the faculty members in the South Mumbai Region.
2. To study the relationship between age and usage of AI in higher education
3. To study the impact of gender in the usage of AI in higher education

Hypotheses:

Hypothesis 1:

H_0: The awareness of artificial Intelligence in higher education among the faculty members is insignificant. (Median = 3)

H_1: The awareness of artificial Intelligence in higher education among the faculty members is significant. (Median ≠ 3)

Hypothesis 2:

H_0: There is no significant difference in the usage of AI and Age

H_1: There is a significant difference in the usage of AI and Age

Hypothesis 3:

H_0: There is no significant difference in usage of AI and gender

H_1: There is a significant difference in usage of AI and gender

Research Methodology:

Descriptive research design is used for the current study. The sample size selected for the study is 150 faculty members of colleges in the South Mumbai Region. The sampling technique used for the current study is non-probability purposive sampling. Both primary and secondary data collection sources have been used. one-sample Wilcoxon signed ranked test, independent t-test and ANOVA have been used using SPSS software.

Data Analysis and Interpretation:

Table No: 1 Demographic Profile

Variables	Category	Frequency	Percent
Gender	Male	60	40.00
	Female	90	60.00
Age	18 - 35 years	50	33.33
	36 - 45 years	70	46.67
	46 - 60 years	30	20.00
Stream	Arts	50	33.33
	Commerce	50	33.33
	Science	50	33.34
Years of Experience	5 years	19	12.66
	6 to 10 years	31	20.67
	11 years to 20 years	70	46.67
	21 years to 30 years and above	30	20.00
Educational Qualification	Bachelor's degree	36	24.00
	Master's degree	65	43.33
	Doctoral degree (Ph.D. or equivalent)	49	32.67

Data was collected from150 respondents out of which 60 of them were male, constituting 40.00 percent of the sample, while 90 were female, making up 60.00 percent of the responses. 50 respondents (33.33%) were between the ages of 18 and 35, 70 (46.67%) were between the ages of 36 and 45, and 30 (20%) were between the ages of 46 and 60. Regarding faculty, respondents were equally split between the subjects of arts (50, 33.33%), commerce (50, 33.33%), and science (50, 33.34%). In terms of years of professional experience, 19 (12.66%) had less than five years, 31 (20.67%) had between six and ten years, 70 (46.67%) had between eleven and twenty years, and 30 (20.00%) had between twenty years and thirty years or more.

Table No: 2 One Sample Wilcoxon signed ranked test

Items	Null hypothesis	Median	Level	Results
Sendsteps.ai	The median of **Sendsteps.ai** equals 3	3	0.389	Accepted (low Awareness)
Canva	The median **Canva** equals 3	4	0.000	Rejected (High Awareness)
ChatGPT	The median of **ChatGPT** equals 3	4	0.000	Rejected (High Awareness)

Yippity – Quiz	The median of **Yippity** equals 3	3	0.344	Accepted (Low Awareness)
Grade scope	The median of **Grade scope** equals 3	4	0.000	Rejected (High Awareness)
Beautiful AI	The median of **Beautiful AI** equals 3	4	0.000	Rejected (High Awareness)
Turnitin – plagiarism checker	The median of **Turnitin** equals 3	4	0.000	Rejected (High Awareness)
Copilot education	The median of **Copilot education** equals 3	4	0.000	Rejected (High Awareness)
Magicschool.ai	The median of **Magicschool.ai** equals 3	3	0.354	Accepted (low Awareness)
Red cube paper (articles)	The median of **Red cube paper** equals 3	3	0.387	Accepted (low Awareness)
Squirrel AI	The median of **Squirrel AI** equals 3	3	0.323	Accepted (low Awareness)
Google bard	The median of **Google bard** equals to 3	4	0.000	Rejected (High Awareness)
Gamma	The median of **gamma** equals to 3	4	0.000	Rejected (High Awareness)
Quill bot	The median of **Quill bot** equals to 3	4	0.000	Rejected (High Awareness)
Grammarly	The median of **Grammarly** equals to 3	4	0.000	Rejected (High Awareness)

Non - parametric one-sample Wilcoxon signed ranked test is applied to evaluate the awareness of Artificial Intelligence in Higher education among the faculty members in the South Mumbai Region. It is seen that p-value < 0.05, Canva, ChatGPT, Grade scope, Beautiful AI, Turnitin – plagiarism checker, Copilot education, Google board, Gamma, Quill bot and Grammarly have High Awareness. Sendsteps.ai, Yippity – Quiz, Magicschool.ai, Red cube paper (articles) and Squirrel AI have low awareness.

Table No: 3 Descriptives

Usage of AI in higher education

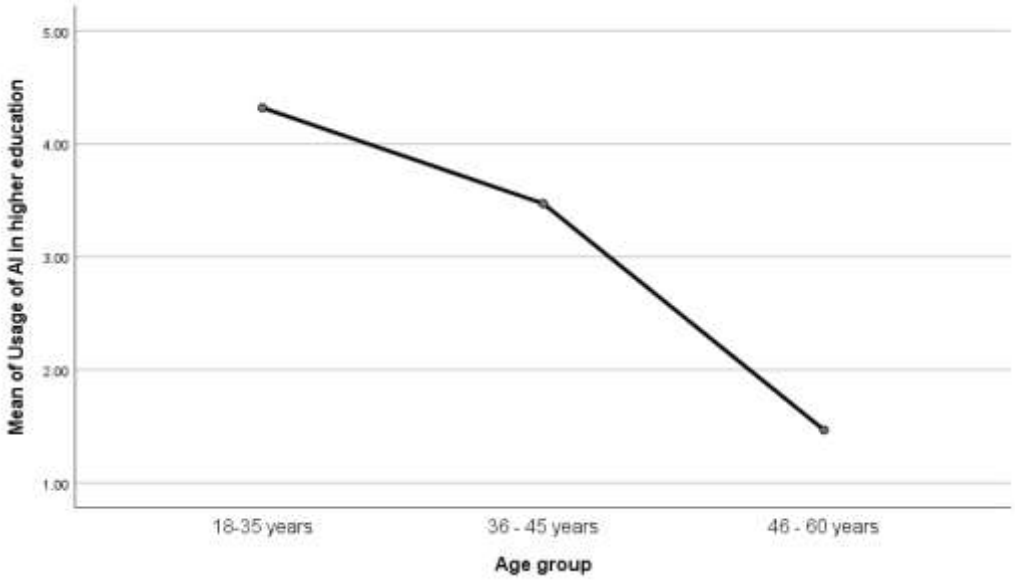
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
18-35 years	50	4.3200	.62073	.08778	4.1436	4.4964	3.00	5.00
36 - 45 years	70	3.4714	.50279	.06009	3.3515	3.5913	3.00	4.00
46 - 60 years	30	1.4667	.50742	.09264	1.2772	1.6561	1.00	2.00
Total	150	3.3533	1.15356	.09419	3.1672	3.5394	1.00	5.00

Table No: 4 ANOVA

Usage of AI in higher education

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	154.484	2	77.242	259.299	.000
Within Groups	43.790	147	.298		
Total	198.273	149			

Figure No: 1 Mean Plot



ANOVA is Applied to examine significant difference in Usage of AI & Age group.It is seen that p value of ANOVA = 0.000 which is less than the level of significance 5% thus Ho is rejected & It can be concluded that Age group of 18-35 years are more inclined towards Usage of AI as compared to older Age groups

Table No: 5 Group Statistics

Usage of AI in higher education	gender	N	Mean	Std. Deviation	Std. Error Mean
	Male	60	3.4833	.50394	.06506
	Female	90	3.5111	.50268	.05299

Table No: 6 Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Usage of AI in higher education	Equal variances assumed	.018	.893	-.331	148	.741	-.02778	.08386	-.19350	.13795
	Equal variances not assumed			-.331	126.372	.741	-.02778	.08391	-.19382	.13826

Independent t-test is applied to examine the significant difference in Usage of AI & Gender. It is seen that p-value =.741 which is more than the level of significance of 5% thus failed to reject Ho. Thus, it can be concluded that the Usage of AI is independent of gender.

Conclusion:

The results of this study provide important new information on faculty members' understanding of artificial intelligence (AI) in higher education. It is clear that the knowledge of AI varies, with some AI tools and platforms enjoying widespread use while others are still relatively unknown. The academic world has paid considerable attention to and used high-awareness applications like Canva, ChatGPT, Gradescope, and Grammarly. The low awareness tools, such as Sendsteps.ai, Yippity - Quiz, Magicschool.ai, Red cube paper (articles), and Squirrel AI, on the other hand, show that there is space for growth in terms of advertising and sharing knowledge about these AI solutions. To guarantee that they have access to a wider range of AI resources, it is crucial to increase the visibility and comprehension of these technologies among faculty members.

The findings emphasise how important it is to understand that age plays a crucial role in the adoption and use of AI. It is essential for stakeholders, including companies, educators, and legislators, to adopt proactive measures in order to fully utilise AI technology and provide fair access for all age groups. The key to addressing the age-related gaps in AI adoption and paving the road for a more inclusive and technologically advanced society is to tailor AI solutions, support education and training programmes, and prioritise user-centric design.

It should be highlighted that the technological environment is dynamic, and patterns can change over time, even if this research implies that there is no statistically significant difference in the adoption of AI across genders. In order to maintain AI's accessibility and inclusivity for users of all genders, it is imperative to keep tracking and pushing gender-neutral AI adoption tactics. Additionally, promoting gender diversity in AI development continues to be a key objective in order to design AI systems that take into account the various requirements and viewpoints of everyone.

In conclusion, the study emphasises the significance of closing the knowledge gap and promoting a culture of ongoing learning and adaptation in higher education. In order to apply AI tools and platforms in educational settings to their full potential, it emphasises the need for focused awareness efforts, approachable user interfaces, collaborative platforms, and continuing research and development. By taking into consideration these suggestions, educational institutions may play a crucial role in promoting the use of AI for personalised learning, improving the standard of teaching and learning in higher education. Furthermore, this research adds to the ongoing discussion on AI's place in higher education by ensuring that professors are well-informed and

equipped to make ethical and creative decisions as the educational landscape changes.

Recommendations:

Collaboration in AI Awareness and Training: Encourage academic institutions and AI suppliers to work together on AI awareness campaigns and training programmes for academics, especially those who are underinformed about AI.

Continuous Professional Development: Establish a continuing programme for faculty members' professional development to keep them informed about advancements in AI in education. Promote attendance at conferences and training sessions on the use of AI in education.

Initiatives for Collaborative Research: Encourage collaborations between academic institutions and vendors of AI solutions. Encourage creativity and acceptance among academics so that tailored AI solutions may be developed to address problems in higher education.

AI Ethics in Education: Promote debates and instruction on AI ethics and appropriate usage, including privacy, bias, and algorithm transparency. Give academic staff the information and resources they need to integrate AI ethically.

Age-Related Groups' AI Literacy: Create educational activities and training programmes to increase older people's AI literacy and close the age-based AI adoption gap. Organise workshops, online classes, and AI systems with user-friendly interfaces.

User-Centric AI Design: Give top priority to user-centric AI design, which includes creating user interfaces that are appropriate for all ages. Especially for less tech-savvy people, put an emphasis on user experience, simple navigation, and clear directions.

Inclusive Marketing: Continue to promote AI products in an inclusive and gender-neutral manner notwithstanding the lack of appreciable use variations between men and women. Make access available to everyone and avoid any potential gender-based discrimination.

Gender Diversity in AI Development: Encourage gender diversity in the field of artificial intelligence to produce more inclusive AI products that are suitable for both sexes. Innovation may be stimulated by a varied developer and engineer staff.

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