

Academicians Insight on Changing Teaching and Learning Environment

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Abstract

Aim and Purpose: This investigation study aims to assess HE Academicians' perception towards changing teaching-learning environment. Academicians' preparedness to adopt to changing teaching-learning environment is studied based on the following dimension i.e., Expectation of AI adaptability personal innovation, self-efficacy, facilitating infrastructure and effort of the technology on teaching and learning environment.

Methodology and Design: The study adopted mixed methodology. The study collected quantitative data to draw a qualitative (descriptive) analysis to understand the HE academicians' perception towards changing teaching-learning environment due to technology advancement i.e., digitalisation and AI (Artificial Intelligence) adoption. HEI function in Coimbatore and non-STEM academicians professing in those institutions are considered as sample population. Needed data for the survey analysis were collected through supply of Google form among 250 college teachers.

Findings: Out of the 250 academicians surveyed nearly 58 per cent of academicians have experienced higher degree of changes over the years in HE environment and 39.20 per cent of the samples feel that HE environment have changed to a noteworthy level. As per the opinion survey results 93 per cent of the HEI are completely digitalised its academic affairs and administration of learners. Data assessed and related establish association between academicians' perception on changes in modern-day teaching-learning environment and nature of digital facilities their institutions equipped, AI tools used in higher education and nature of digital facilities institutions equipped and nature of digital facilities institutions and application of digital technology and AI tools.

Implication and Future Scope: The article concludes by stating that there prevails wider gap between one institution and another in establishing digital infrastructure, in training the academicians and adoption of AI tools in the process of T-L. HEI has to make more investment in ITC adoption, at the same time they have to keep updating the technology as the new technology introduced and teachers have to be trained and upscaled as per technology advancement. Further, the investors states that identified research dearth, provides wider opportunities for future researcher for assessing technology adoption in HES in India, technology advancement in HE, its benefits and challenges encountered by the academicians, learners (students), HEI and the society at the large.

Key Words: Higher Education System, Higher Education Institution, Digitalisation, Artificial Intelligence, Technology Adoption.

Introduction

HE in the 21st century aims to offer personalised learning, highly productive (in term of employment) and supportive (with the proper blend of technology applications). It is true that HE is slowly moving from its traditional outlook to technology enable format i.e, digitalisation and AI adoptions are norms of today's HE (Bordoli, 2021). Keeping phase with global education system, HEs (Higher Education system) of India is fastly transforming along with the technology advancement and digitalisation front. Transformation in HE focuses on enhancing quality of education, reaching global standards, technical advancement, research output and establishing partnership with industries for the benefit of learners (for empowering employable skills and tapping opportunities of employability) (Tomar, 2023). HES of India is second largest in the world (NITI, 2025), housing more than 56,000 HEIs (Higher Education Institutions), educating more than 40 million learners, expected to add 26 million learners by 2035 and equipped with 15 lakh learned professors. GOI (Government of India) have framed dedicated policies to enhance and adopt latest technology in the field of HE (Tomar, 2023). Educational transformation in India is segmented int four phases i.e., post-independence foundational phase (1947-1985), economic liberalization and expansion phase (1986-2005), globalization and reform phase (2005-

2019), and contemporary transformation phase (2020-Present) (Borthakur et al.,2024). Over the years HES functioning in India are gradually transforming from traditional mode of one-many teaching to digitalised mean of teaching and Learning (T-L) to adoption of AI (Artificial Intelligence) in T-L, that aims to offered tailored teaching suitable to individual needs /demand (Chakraborty et al., 2024).

Digitalisation is happening under two fronds, one due to the outbreak of Covid 19 and second due to heavy investment made by private institutions on technology advancement in their institution(s) to stay competitive and offer quality education to their students (Thomas et al.,2023). Digitalisation have gathered rapid momentum especially after outbreak of Covid 19. Yet, all kind of HEI haven't completely digitalised, still date their prevailing gap between the completely digitalised and partially digitalised HEI. Digitalisation and AI (Artificial Intelligence) adoption aids HEI in shaping the medium of teaching, nature of andragogy their design, nature of subjects taught to the future workforce of the nation, in institution management, the way in which research is conducted and in exchange of various knowledge and skills (Chakraborty et al., 2024). In short, modern HES is well-balanced between traditional method of teaching with adequate blend of technology. Technology has brought in flexibility in teaching and learning process and experiencing personalised learning experiences among the students. At this juncture, it is inevitable to gauge the teacher's perception towards changing HE environment (Thomas et al.,2023). This investigation study is conducted for meeting this purpose.

Theoretical Background

Most of the HEI in South India are well digitalised, yet it is evidences that not all institutions are fully computerised or digitalised. Digital means are used for conduct of online classes, incorporated ICT in conduct of class room teaching and for providing various academic supports to the teachers and learners. The limited digitalisation and use of technology are reasoned to prevalence of inadequate digital infrastructure both in establishment of infrastructure and knowledge (know-how) of academicians to use the infrastructure, communication build between the teacher and the learners and financial resources needed for strengthening digital infrastructure (Thomas, 2023). Overcoming the above stated challenges with the support of well-established digital platform with AI integration (like machine learning, natural language processing, computerisation, logical analytic and various other technology supported tools) (Murgan et al., 2025) in HES is expected to bring newer dimension to the HE teaching and learning (T-L) (Sharma et al., 2024). This investigation study aims to assess the teachers' perception (preparedness and acceptance of changing T-L environment, as they are prime torch bearers and a bridge between technology and the students (learners). The prime objectives of the investigative study are:

- To analyse the academicians' experiences with changing HE environment.
- To assess the academicians' perception on nature of digital infrastructure and AI prevailing in their institution and purpose for which these facilities are used in HEI.
- To measure association academicians' perception on nature of digital and AI infrastructure prevailing in their institution and the purposes of its usage.

Academicians' preparedness to adopt to changing teaching-learning environment is studied based on the following dimension i.e., Expectation of AI adaptability personal innovation, self-efficacy, facilitating infrastructure and effort of the technology on teaching and learning (Thakur et al., 2024). Based on this concept following research questions are drafted:

Objective of Research Questions
the Study

Objective 1.1 Whether academicians' experiences changes in current T-L environment?

1 1.2 Whether academicians are familiar with AI technology adoption in HE?

Objective 2.1 What are the digital infrastructure prevailing in HEI, as per the academicians understanding and its application in various sphere?

3.1 What is the relationship between academicians' perception on changes in modern-day T-L environment vs nature of digital facilities established in their institutions?

Objective 3.2 What is the relationship between academicians' perception on familiarities with AI tools used in higher
3 education vs nature of digital facilities institutions?

3.3 What is the relationship between academicians' perception on nature of digital facilities institutions vs application of digital technology and AI tools.

Review of Literatures

Detailed meta-analysis with systematic review of past literature is conducted to gather qualitative knowledge on the digitalisation, AI adoption and academicians' perception and experiences towards it.

Status of HE in India

Compared to the BRICS (Brazil, Russia, India, China and South Africa), the association of developing country, students' enrolment in the HE (post-secondary) is lower in India, i.e., less than 20 per cent. The low students in HE is suffered due to prevailing in backwardness of regional areas, religious cum caste-based quota system, poor policies of Government and lack of needed infrastructure at the institutional level (Tilak and Biswal, 2013). HE in India has been facing transformation since post 1990's economic reforms and changes are fast especially during the period 2000-15. Education access has reached the elite have to have not the backward community and classes of the society. In post 2000, due to privatization of HE, most of the institutions are owned by private entities, especially in professional studies, that in turn demand for globalized workforce. Privatisation broke the chain of education reaches to elite and rich to the poor and to all (Rao, 2017). Transition in HE from elite to masses demand for equality in offering education, improving quality of education, arranging fund to gaining education and from Government part demand regulation and managing education system (Varghese, 2015). For enabling education become accessible to all section of people, GOI has framed market friendly policies to promoting private education growth in India, that ensure competition between institution, rank their performances, enable them for self-financing and obey by Government governance by finding institutional accountability (Bhushan, 2019). However, HE environment has significantly changes since the outbreak of Covid 19 virus, teachers and learners are in contact their online teaching mode and they adopt different ICT (Information and Communication technology) to establish contact and continue teaching and learning practices (Li and Lalani, 2020). With the use of ICT (Information and Communication Technology) in HE, HEI are able to establish cloud computing (networking of computers for sharing files and mails), establishing strong internet facilities with WIFI, adopt AI, enable robotics and make virtual reality of T-L in alignment with industrial human capital demand and skills expected (Shrivastava and Shrivastava, 2022). GR (Gross Enrollment) of students in the regional state of Tamil Nadu is above the national average. In spite of higher level of students' enrolment in HE, the state Universities and colleges still data follow traditional method of T-L, with few exceptionally functioning institutions, mostly private owned (Mandal, 2025).

Technology Impact on HE (Digitalisation and AI Technology)

Modern day HE academicians in HSS (Humanities and Social Science) disciplines incorporate innovation, diversification, expansion and assessment of concept in T-L, as the outcome of technology adoption in their work life (Sarkar et al., 2024). Academicians exhibit positive attitude towards technology adoption and OER (Open Education Resource) usage in HE (Mishar and Singh, 2017). Technology advancement has enabled to conduct flexible classes at home environment removing the obstacles of resources inadequacy (Elangovan, 2021). Modern education systems ensure blend of traditional and technology supported learning environment for knowledge hungry students (Bordoloi et al., 2021). Integration of AI technology in HE is expected to bring in new dimension of T-L (Sharma et al., 2024). AI integration in HE has brought in fundamental transformation in the way in which students learn in HES i.e., in term of knowledge accruing, teachers delivering their lecture session and the way institution functions (Sharma, 2017). However, AI adoption in HE is influenced by the infrastructure of the institution, its capacity to spend on investment and teachers' knowledge towards AI usage in HE (Garbowski et al., 2024). In addition to these challenges, adoption to AI tools in adoption also related with the teachers training to adopt new technology, issues of security, privacy of data sharing and ethical norm practices are considered as vital (Sahoo and Chauhan, 2023).

Academicians perceived understanding about technology, feel of ease of use, HEI support in adopting technology and their satisfaction determines their adoption of e-learning system (Kumar et al., 2023). Similarly, academicians feel that for adoption of AI in their day-to-day T-L environment they need the support of their institutions (in form of training and

in creating infrastructure) and abiding the ethical norms (right way of technology usage) (Gomathi, 2024). Teachers in HEI strongly believe that adoption of AI tools increases their efficacy of teaching (Krishnamoorthy et al., 2025). Digital environment (computerization, uninterpreted internet supply and AI adoption) support teachers in their professional development (Gunasekaran et al., 2024). Foster AI in HE will empower learning environment, foster effective culture of learning in future with innovation and excel in career (Jeyakumaran, 2025)

Absence of most trusted data availability on the changing HES system (especially non-STEM institutions) in India is considered as the major limitation of past literatures. Till date HES in the country faces number of challenges on one-end and favour on other-end, that are not yet documented in an effective way. Identified research dearth, provides wider opportunities for future researcher for assessing technology adoption in HES in India, its benefits and challenges encountered by the academicians, learners (students), HEI and the society at the large.

Methodology

The study adopted mixed methodology. The study collected quantitative data to draw a qualitative (descriptive) analysis to understand the HE academicians' perception towards changing teaching-learning environment due to technology advancement i.e., digitalisation and AI (Artificial Intelligence) adoption. Educational institutions functioning in South India are pioneer and earlier adoption of digitalisation (Thomas, 2023), based on this concept Coimbatore, one of the HE hub in India is considered as study region, similarly, based on this research work finding academicians serving in HEI function in Coimbatore and academicians professing in those institutions are considered as sample population. The study focused on the academicians of non-STEM (Science, Technology, Engineering and Math courses) i.e., disciplines like: Commerce, Arts, Business Management, Humanities, and Social Affairs) (IBEF, 2023). The study considered HEI academicians currently serving in Coimbatore region as samples. Needed data for the survey analysis were collected through supply of Google form among 250 college teachers.

Design of the Article

The study attempted to measure influences of the academicians' perception on changes in modern day teaching learning, their Familiarities with AI tools used in HE with the nature of digital facilities institutions and later it was compared with the teachers understanding on the application of digital technology and AI tools in their teaching and learning process. Investigators adopted two different five point and three-point scaling tools (Likert's scale) to value the nature of digitalisation adoption in HEI and for assessing the area in which it is applied. CTLE- Changes in modern day teaching learning, FAIHE-Familiarities with AI tools used in higher education, NDFI-Nature of digital facilities institutions. Nature of digitalisation HEIs are equipped with are grouped into seven heads as: DIGI-Digitalisation (computers & network system and uninterpreted wifi facilities), ATTA-AI tool application (AI tools (tailor made lessons), AI tools (support in research), virtual reality & argument reality (build in interactive & hands-on learning space) and AI supported search engine (like chatbots)), DAST-Data storage (digital locker (for student & academicians to store their information), virtual library and virtual tutor), RESU- Research support (plagiarism detecting software, technology for research, writing articles and data analysis tools), ADST- Administration (technology to track students' performance and others), TELE- Teaching and learning (study material preparation and language translators) and ADTAIT- Application of digital technology and AI tools. Areas where AI and digitalisation technology are applied are grouped into seven heads: SSEN- Students screening & enrolment (admission), SPMO- Students performance monitoring, CTRP- Conducting test & result publishing, ADIA- Administration of the institutions affairs, FCOM- For communication, RTLP- In regular teaching & learning practices and RKSE- For research & knowledge search.

Reliability and Validity

Computed Reliability .921 and .916, Composite Reliability values: .886 and .902, AFL: .834 and .844 are greater than 0.700 (threshold mark). Indicates the prevalence of existence of Convergent Validity. Measure of AVE values are greater than the square of R values: .860>.704, .809>.702 it indicates prevalence of discriminant validity. Thus, it has been concluded that Composite Reliability, Convergent and Divergent Reliability exists among the variables and data tested. Similarly, the sample adequacy is recorded as .864 (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) which satisfactory.

Profile of the Academicians

Investigation was conducted among 56.80 per cent of male teachers and 43.20 per cent of them are female teachers. Majority of the academicians were in the age group 31-35 years (34 per cent) and 36-45 years (20.80 per cent), Further assessed that 82.40 per cent of educators are married. About of 87.60 per cent of the academicians surveyed are associated with Private colleges, 9.60 per cent of the sample service in Government aided college and just 2.80 per cent of academicians are Government college teachers. Found that 61.20 per cent of the sample HEI are Arts and Science college and rests are management schools. Around 52 per cent of the academicians are Ph.D., degree holders, 82.40 per cent of the samples are designated as assistant professors and 37.20 per cent of samples have gathered teaching experiences of 6-10 years. It was found that 36.80 per cent of the teachers use laptops to establish their contact with the students and 21.60 per cent of the samples uses desktop for the same above-mentioned purpose.

Results and Discussion

Out of the 250 academicians surveyed nearly 58 per cent of academicians have experienced higher degree of changes over the years in HE environment and 39.20 per cent of the samples feel that HE environment have changed to a noteworthy level. As per the opinion survey results 93 per cent of the HEI are completely digitalised its academic affairs and administration of learners. About 83 per cent of the HEI have effective data management software, 81 per cent of the HEI have adopted AI techniques, 78.67 per cent of the HEI have technical advancement in their teaching-learning practices, 74.67 per cent of the institution have digitalised their administration task (college management). Out of 250 academicians surveyed only 69.40 per cent of the samples have accepted that they are familiar with AI technology adoption in HEIs. Various spheres of HE in which AI are applied are listed as: in regular teaching & learning practices (81 per cent) and for research & knowledge search (77.67 per cent). For establishing communication between academicians, learners and administration (75.67 per cent), administration of the institution’s affairs (75 per cent), students’ performance monitoring and for students screening & enrolment (admission) (73.67 per cent) and also conducting test and for result publishing (73 per cent).

SEM is performed to association between the academicians’ perception on changing teaching-learning environment.

EXHIBIT:1
ASSOCIATION BETWEEN THE ACADEMICIAN’S PERCEPTION
ON CHANGING TEACHING-LEARNING ENVIRONMENT

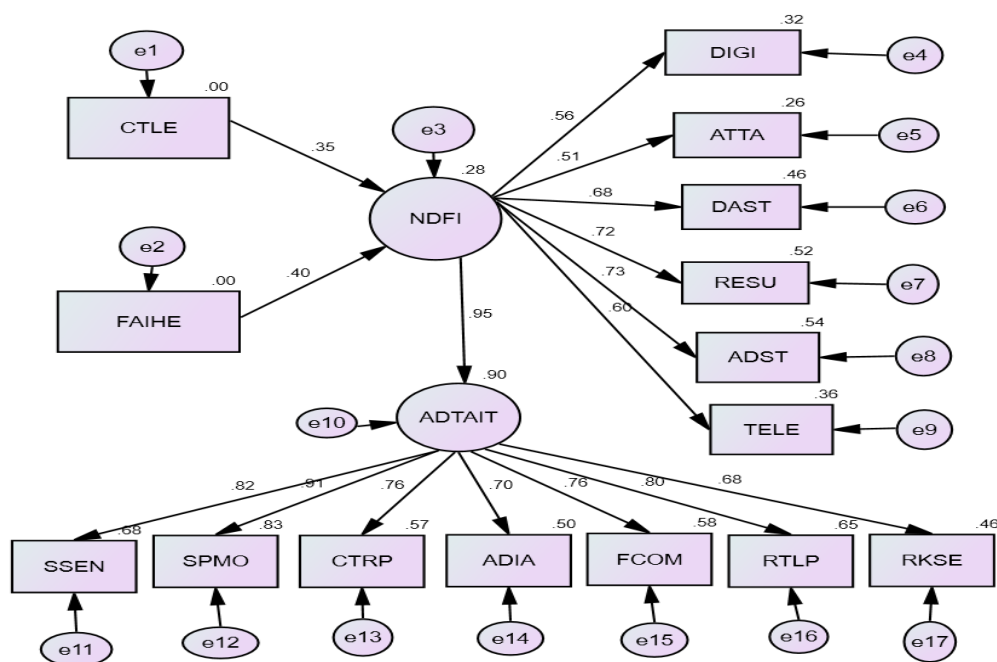


TABLE: 1
GOODNESS OF FIT STATISTICS

Goodness of Fit Statistics		Results
Absolute fit	Chi square (χ^2) of the Estimate model	259.551
Incremental fit	RMSEA	.003
	TLI	.944
	IFI	.915
	CFI	.913
Parsimonious fit	Parsimony fit (χ^2 / df)	2.916

Level of Significance: 5 per cent

For hypothesis testing, the proposed model with all measurement items from the CFA was estimated. The results in Table 1 revealed acceptable fit indices of the model; $\chi^2 = 259.551$, $p < 0.001$, degrees of freedom = 89; parsimony fit (χ^2/df) = 2.916; GFI = 0.942; AGFI = 0.918; CFI = 0.913; IFI = 0.915; RMSEA = 0.003.

TABLE: 2
STRUCTURAL MODEL RESULTS

Hypothesis	Path			Standardized Estimates	C.R	Relationship
Association between academicians' perception on changes in modern-day T-L environment vs nature of digital facilities established in their institutions?	NDFI	<-- -	CTLE	.355	5.012	Significant
Association between academicians' perception of familiarities with AI tools used in higher education vs nature of digital facilities institutions	NDFI	<-- -	FAIHE	.396	5.618	Significant
Association between nature of digital facilities institutions vs application of digital technology and AI tools	ADTAIT	<-- -	NDFI	.951	7.921	Significant
The intercorrelation of nature of digital facilities institutions	DAST	<-- -	NDFI	.678	8.294	Significant
	ATTA	<-- -	NDFI	.512	7.002	Significant
	DIGI	<-- -	NDFI	.563	5.632	Significant
	RESU	<-- -	NDFI	.724	8.558	Significant
	ADST	<-- -	NDFI	.733	8.658	Significant
	TELE	<-- -	NDFI	.602	7.962	Significant

The intercorrelation of application of digital technology and AI tools	CTRP	<-- -	ADTAIT	.756	11.121	Significant
	SPMO	<-- -	ADTAIT	.910	13.195	Significant
	SSEN	<-- -	ADTAIT	.824	11.975	Significant
	FCOM	<-- -	ADTAIT	.761	11.401	Significant
	RTLTP	<-- -	ADTAIT	.804	12.008	Significant
	RKSE	<-- -	ADTAIT	.676	12.365	Significant
	ADIA	<-- -	ADTAIT	.705	10.330	Significant

Hypotheses Test Discussion

Association between academicians' perception on (i) changes in modern-day teaching-learning environment and nature of digital facilities their institutions equipped: NDFI vs CTLE ($\beta=.355$, $p=.000$) is found to positively correlated (35.50 per cent) and significant, (ii) AI tools used in higher education and nature of digital facilities institutions as: NDFI vs FAIHE ($\beta=.396$, $p=.000$) is correlated (39.60 per cent) and significant and (iii) nature of digital facilities institutions and application of digital technology and AI tools as: ADTAIT vs NDFI ($\beta=.951$, $p=.000$) is positively correlated (95.10 per cent) and significant. The intercorrelation of: (i) nature of digital facilities institutions as: DAST vs NDFI ($\beta=.678$, $p=.000$), ATTA vs NDFI ($\beta=.512$, $p=.000$), DIGI vs NDFI ($\beta=.563$, $p=.000$), RESU vs NDFI ($\beta=.724$, $p=.000$), ADST vs NDFI ($\beta=.733$, $p=.000$) and TELE vs NDFI ($\beta=.602$, $p=.000$) are positively correlated and significant and (ii) digital technology and AI tools as: CTRP vs ADTAIT ($\beta=.756$, $p=.000$), SPMO vs ADTAIT ($\beta=.910$, $p=.000$), SSEN vs ADTAIT ($\beta=.824$, $p=.000$), FCOM vs ADTAIT ($\beta=.761$, $p=.000$), RTLTP vs ADTAIT ($\beta=.804$, $p=.000$), RKSE vs ADTAIT ($\beta=.676$, $p=.000$) and ADIA vs ADTAIT ($\beta=.705$, $p=.000$) are positively correlated and found to be significant. Henceforth, the hypothesis is accepted and it has been found that there exists association between academicians' perception on (i) changes in modern-day teaching-learning environment and nature of digital facilities their institutions equipped, (ii) AI tools used in higher education and nature of digital facilities institutions equipped and (iii) nature of digital facilities institutions and application of digital technology and AI tools. Studies of Gomathi (2024), Garbowski et al., (2024), Krishnamoorthy et al., (2025) and Jeyakumaran (2025) found in relevance with the conclusions drawn by the investigators.

Conclusion and Future Research Scope

The investigation found that only 58 per cent of academicians have experienced higher degree of changes over the years in HE environment and 39.20 per cent of the samples feel that HE environment have changed to a noteworthy level. Data assessed and related establish association between academicians' perception on changes in modern-day teaching-learning environment and nature of digital facilities their institutions equipped, AI tools used in higher education and nature of digital facilities institutions equipped and nature of digital facilities institutions and application of digital technology and AI tools. The article concludes by stating that there prevails wider gap between one institution and another in establishing digital infrastructure, in training the academicians and adoption of AI tools in the process of T-L. HEI has to make more investment in ITC adoption, at the same time they have to keep updating the technology as the new technology introduced and teachers have to be trained and upscaled as per technology advancement. Further, the investors states that identified research dearth, provides wider opportunities for future researcher for assessing technology adoption in HES in India, technology advancement in HE, its benefits and challenges encountered by the academicians, learners (students), HEI and the society at the large.

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