

Strategic Management of Digital Infrastructure for Digitalization of Higher Education: A Comparative Study of Public Vs Private Universities in Assam

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Abstract:

Present paper aims to identify the strategic approaches for management of digital transformation in public and private universities of assam. In digital transformation of higher education existing public and private universities have played an emerging role in the educational scenario of assam. Strategic management of digital infrastructure for digitalization of higher education need right technologies and infrastructure as well as the ability to develop, manage and deliver technological changes. In this regard study tries to identify the managerial aspects of public and private universities of assam with respect to digital transformation as well as problems that has been facing by these universities towards digitalization of higher education. Present study based on primary sources of data that could serve as evidence in the existing body of knowledge in the field of higher education. In this study attempt has been made to highlighted some of the basic suggestions to overcome the challenges faced by the public and private universities of assam to deal with the issues of digitalization in higher education.

Key words: Strategic management, Digital Infrastructure, Digitalization, Public Universities, Private Universities, Assam, Higher education.

Introduction:

The technological advancement for digital transformation of higher education is one of the most impacted fields. Integration of digital technologies in the field of education is not just about adopting new technologies, it also about incorporating pedagogical approaches as well as administrative processes for fulfilling the needs of students and educators in a digital age. NEP 2020 considered digital infrastructure as one of the most essential components for transforming the higher education system towards digitalization through special emphases on access, quality and innovation. But the success of this emerging initiate depends on strategic approaches adopted by the institutions of higher education towards digital transformation. Definitely universities across type of management are differ in their strategic management practices to implement digitalization of higher education. In fostering effectiveness and quality of higher education digital technologies have a huge potentiality. A sustainable digital ecosystem for teaching and learning involves shared understanding among leaders and

stakeholders. For digital integrated academic environment, we have to prioritize the training and development of the academic staff as well as technological competence. Digitalization requires an active participation by policy makers, policy implementers, students, faculty, and administrators to support the change. Digitalization in higher education includes several key dimensions such as digital course delivery, virtual classrooms, digitally conducting exams and assessments, digital academic integrity, use of web cams, capacity and quality of video conferencing, Zoom, MS Teams, and other software systems etc.

Research Question:

- i) How do strategic management practices for digital infrastructure differ between public and private universities in assam?
- ii) What challenges do public and private universities in assam face in digitalization of higher education?

Objectives of the Study:

- i) To compare the strategic management practices adopted by public and private universities for digital infrastructure in support of institutional functions.
- ii) To explore perceived barrier related to digital infrastructure faced by public and private universities in digitalization of higher education.

Significance of the study:

Study will provide a comprehensive understanding on institutional preparedness for digitalization of higher education. Study will serve as a significant field of inquiry to the strategic management practices in public and private universities. Comparative analysis of public and private universities would elucidate the similarities and differences in their management frameworks and approaches. Study can shed light on gathering knowledge for policymakers and other stakeholders involved in the field of education to work on sustainable management practices for higher education. This study will provide a scope of awareness about preparedness of higher education institutions towards NEP 2020 led digitalization of higher education. Study also intends to highlights various issues of digitalization face by the public and private universities. Study also highlights the challenges faced by the public and private universities of assam in achieving digital transformation. Data of the present study may work as a shadow for corrective and predictive decision making, Highlighted area of challenges will be work to proposed framework and policy decision as an area of strength in the context of digitalization of higher education.

Review of Literature:

Study conducted by Ravi, S., & Nair, V. (2020) on digital skill initiatives in public universities of India with the objectives to analyse implementation of digital skill programs and to assess effectiveness in student employability. Study observed that initiatives exist but remain unstructured and inconsistent. Study suggested development of standardized curricula, link with industry requirements, and ensure systematic evaluation.

Aditya et.al., (2021) conducted a study on categories for Barriers to Digital Transformation in Higher Education: An Analysis Based on Literature with an aim to identifying barriers to digital transformation in Higher education institutions. Study found a total of 22 specific barriers to effective digital transformation have been identified. Which include issues related to vision, institutional strategy, and the economic environment.

Khan, A., & Ahmad, F. (2021). investigated digital transformation in Indian public universities: Challenges and opportunities. It aims at assessing the integration of Learning Management Systems (LMS) in universities and to examine barriers to digital transformation. It reported public universities lag in LMS integration due to bureaucracy and lack of skilled manpower and funding constraints. Study recommended increasing ICT funding, train academic and administrative staff in LMS use, and adopt flexible policies to accelerate digital adoption.

Thomos, A. (2022) carried out a study on digital transformation in private higher education institutions. Study explores digital transformation in private universities to analyse pace of digital adoption and to compare outcomes with public institutions. It reported private universities aggressively pursue digitalization. Study provides suggestive measures such as sustain digital investment, provide faculty training, and ensure cyber-security infrastructure.

Budiyanto et.al., (2024) investigated the Barriers and Readiness to Deal with Digital Transformation in Higher Education. Study found that perceived challenges of students include a lack of IT equipment, insufficient digital literacy, passive learning, and fear of data loss. Study found perceived challenges of faculty includes lack of digital literacy and adjustment time are prominent. At the management level, difficulties in managing IT infrastructure and insufficient IT staff are highlighted.

Methodology of the Study:

The study is conducted through descriptive survey methods by using qualitative research approach. The study involves visiting of two public and two private universities of assam to get primary data. Present study based on primary sources of data. Primary data have been collected through self-structured questionnaires. Questionnaires have been administered among the faculty members of public and private universities of assam, where Likert scale items and close ended questions have been asked. The targeted population in this study included two public and two private universities where faculty members of the universities were respondents. In the present study by using simple random sampling technique, 120 faculty members were selected from both private and private universities of assam. Data analysis was completely done by using descriptive statistics. The Survey was conducted in both public and private universities of assam, targeting faculty members as academicians by concerning with strategic management of digital infrastructure for digitalization of higher education. Self-developed questionnaire was prepared which is consist of 18 items (Likert Scale) and problem check list with 13 items. Respondents were required to complete the questionnaire indicating the extent to which they agree or disagree with the questions.

Results and Discussion:

Objective 1: To compare the strategic management practices adopted by public and private universities for digital infrastructure in support of institutional functions-

Table 1: Comparison of strategic management practices between public and private universities for digital infrastructure

Strategic Management Practices		Public Universities			Private Universities			t	df	Sig. (2 - tailed)
		N	Mean	SD	N	Mean	SD			
1	Existence of digital infrastructure policy	60	2.9	1.43	60	2.75	1.48	0.565	118	0.573
2	Structured governance mechanism for digital infrastructure	60	2.98	1.41	60	3.08	1.42	-0.387	118	0.699
3	Stakeholders' engagement in policy framework	60	2.78	1.43	60	3.01	1.45	-0.875	118	0.383
4	University has access to digital platform of learning	60	3.27	1.35	60	3.18	1.51	0.344	117	0.731
5	Adequate training on using digital platform	60	2.96	1.45	60	3.06	1.42	-0.382	118	0.703
6	Organize capacity building programme for sharing digital best practices	60	3.16	1.53	60	3.21	1.34	-0.19	116	0.849
7	Provision of e-content repositories	60	3	1.45	60	3	1.55	0	117	1
8	Digitalization of administrative activities	60	3.14	1.43	60	3.03	1.37	0.43	118	0.668

9	Availability of assistive technology for differently abled learners	60	2.88	1.39	60	3.2	1.53	-1.199	117	0.233
10	Organize digital literacy programme	60	3.24	1.51	60	3.33	1.53	-0.324	118	0.746
11	Scope of using innovative ICT enabled pedagogy	60	3.27	1.48	60	3.03	1.55	0.867	118	0.387
12	Periodically reviews of digital initiatives	60	3.04	1.32	60	3.1	1.52	-0.231	116	0.818
13	Digital policies are aligned with emerging technologies	60	3.26	1.41	60	3.2	1.44	0.231	118	0.818
14	Digital access to learning resources	60	3.29	1.42	60	3.13	1.58	0.583	117	0.561
15	Adequate digital infrastructure for teaching learning	60	3.09	1.54	60	3.03	1.50	0.216	118	0.829
16	Provision of cybersecurity and data driven policy	60	2.90	1.35	60	2.58	1.45	1.251	117	0.213
17	Policy for green and sustainable digital practices	60	3.31	1.42	60	3.26	1.43	0.192	118	0.848
18	Digital collaboration for teaching, learning and resource sharing	60	3.18	1.36	60	2.98	1.40	0.794	118	0.429

H₀: There is no significant difference between public and private universities in strategic management practices for digital infrastructure.

Table 1 reveals that for item no 1-18 none of the p-value are value 0.05. Therefore, results are statistically not significant. This indicates that, null hypothesis there is no statistically significant difference between public and private universities in strategic management practices for digital infrastructure is accepted for all items.

Objective 2: To explore the perceived barrier related to digital infrastructure faced by public and private universities in digitalization of higher education.

Table 2: Comparison of perceived barrier for digital infrastructure in public and private universities

Perceived barrier related to digital infrastructure		Public Universities	Private Universities
1	Absence of comprehensive policy and regulatory frameworks	70%	54%
2	Inadequate funding for infrastructural development	30%	86%
3	Lack of training among educators and administrators	80%	43%
4	Inadequate number of digital devices	55%	23%
5	Limitation in delivering all disciplines in digital mode	84%	58%
6	Inadequate development of technological infrastructure	47%	35%
7	Connectivity issue	36%	25%
8	Inadequate digital competencies among receivers to adapt to new technologies.	40%	32%
9	Slow procurement processes towards digital infrastructure	83%	51%
10	Bureaucratic obstacles	77%	31%
11	Insufficient IT infrastructure	65%	21%
12	Budgetary constraints	43%	79%
13	Resistance to change	45%	33%

Analysis:

From the collected data it has been found out that, 75% of respondents from public universities have agreed that absence of comprehensive policy and regulatory frameworks as a challenge while 54% respondents of the private universities have reported it. Problem such as inadequate funding for infrastructural development cited by 30% respondents from public universities while it was identified as a problem by 86% respondents of private universities. 80%

respondents from public universities reported the prevalence of lack of training among educators and administrators while it was reported by 43% respondents of private universities. Inadequate number of digital devices was considered as a problem by 55% respondents of public universities while, it is reported by 23% from private universities. Limitation in delivering all disciplines in digital mode perceived as a prominent concern by 84% respondents of public universities as compared by 58% in private universities. Inadequate development of technological infrastructure was identified by 47% respondents from public universities, but reported it 35% as an issue by private universities. Connectivity issue was reported by 36% respondents of the public universities as compared to 25% in private universities. Issue such as inadequate digital competencies among receivers to adapt to new technologies was reported by 40% respondents of public universities while it was identified by 32% as a problem by private universities. Slow procurement processes towards digital infrastructure were reported by 83% respondents of public universities compared to 51% in private universities. 77% respondents from public universities and 31% respondents from private universities also agreed that there is a challenge of bureaucratic obstacles for management of digital infrastructure. Insufficient IT infrastructure has been agreed upon by 65% respondents of public universities and 21% of the respondents from private universities. A considerable respondent from public universities that is 43% have expressed that they are facing the problem of budgetary constraints towards digital infrastructure, while 79% respondents from private universities reported it as a barrier.

Problem such as resistance to change was not reported by 45% respondents of public universities as compared to 33% in private universities.

Interpretation: Public universities face more challenges with respect to digital infrastructure compared to private universities. Whereas private universities also face challenges related to funding issues for infrastructural development and budgetary constraints. Findings of this present study reveals a number of challenges with respect to perceived barrier for digital infrastructure in public and private universities. Some challenges are consistent with some of them are specific.

Recommendations:

Based on the findings study recommended policy framework must work on ensuring professional development as well as ethical use of digital technologies for the users. For strategic management of digital infrastructure there is an urgent need of transformational leadership with greater productivity. For digitalization of higher education coherent managerial strategy should be established. Effective transformation of digitalization in higher education requires visionary leadership, digital skills, flexibility, and technology integration. Policy makers are suggested to design outcome-based plans that is shaped by strategies approaches. For successful implementation of digitalization of higher education technological, structural changes and managerial adaptations are necessary. It also requires digital literacy training and strengthening digital infrastructure. Strategic management practices for digital infrastructure requires right processes and digital technologies to support the goal and operations. Management practices for digitalization of higher education need administrative efficiencies. Strategic management practices must concern about clear vision, proper planning, changing customer experience as well as expectations, leadership support, change management with

respect to technology, competency-based training on digital skills, feedback analytics, prepare with strategies for technology and data challenges, smart and digital content, personalized learning, scope for global and remote learning and digital literacy of stakeholders. Strategic management practices must emphasis on vision for holistic digital transformation, critical IT skills, IT governance, proper software acquisition process in place, hardware, security, and network should be ready to manage potential security threats are to be established. Management support to combat challenges and to communicate with the long-term goal for digital transformation is urgent requirement. Digital transformation should be extended from the process of teaching and learning to governance, research, updated and new courses, program, student assessment and evaluation.

Conclusion:

In conclusion, present study provides a significant insight into the barriers encountered by public and private universities of assam in the digital transformation processes of higher education institutions. There is an urgent need of educational institutions to utilize the existing technologies to reinvent learning processes for a sustainable process of digitalization in higher education. Digitalization demands transforming the roles of the traditional faculties and technological renewal in the educational service. Findings of the can be used as an important input for both public and private universities to design academic processes that would be more effective, efficient and aligned with present day context of digitalization of higher education. Digitalization in higher education requires not only adaptation of new technologies but also to reevaluate their strategic organizational approaches by incorporating digital information, and digital processes. The data findings reveal a major variance between the public and private universities of assam regarding their perceived barrier for digital infrastructure and the requirements for digital transformation. Digitalization in higher education needs organizational vision and strategy, leadership, as well as communicative channels, right talent, digital skills, digital knowledge to support its long-term vision. The need for digital transformation at all levels of education has been reinforced and installed. Therefore, institution of higher education must develop strategic approaches and sophisticated methods for applying digital technology to create products or to deliver certain services,

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