

Digital Transformation of Local Universities in Western China: Challenges and Countermeasures

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Abstract: The digitalization of education is a central strategic lever for the high-quality development of higher education in China. Local universities in western China—regionally administered institutions, as distinct from centrally administered national universities—currently face four interconnected challenges in their digital transformation: deficiencies in infrastructure and data governance, constraints on the total volume and structure of funding, gaps in faculty digital literacy and technical personnel, and the absence of governance mechanisms and evaluation systems. In response, this paper proposes adaptive optimization strategies along five dimensions: targeted policy support, regional east–west collaboration, internal governance reform, faculty empowerment, and industry–education integration. The analysis offers a practical reference for the digital transformation of local universities in western China.

Keywords: Local Universities in Western China; Digitalization of Education; Transformation Challenges; Governance Optimization; Balanced Development of Higher Education.

1. Background and Significance

Higher education both generates new technologies and adopts them early [1]. The deep integration of digital technology with higher education is a defining trend in educational change worldwide; for China, it is also a strategic choice in the drive to build a leading country in education and to raise the quality of higher education. Since the launch of the Digital China initiative and the strategic action for the digitalization of education, the digitalization of Chinese higher education has been evolving from the application of technology toward a systemic reshaping of educational philosophies, teaching models, and governance systems. Digital technology has freed education from the old constraint that students learn only what teachers teach, and from the spatial and temporal limits of the campus, opening up diverse learning settings and high-quality resources [2].

Western China is a priority region in the national effort to achieve balanced development in higher education. As the main force serving regional economic and social development, local universities find in digital transformation both an internal requirement for improving their own provision and a key instrument for narrowing the educational gap between eastern and western China and advancing educational equity. Constrained by locational conditions, resource endowments, and institutional foundations, their digital transformation lags behind overall, and the difficulties involved are widely shared across institutions. Sorting out these challenges systematically and proposing workable countermeasures has clear practical value for the digital development of higher education in the west.

2. Challenges Facing Digital Transformation in Local Universities in Western China

(1) Dual Deficiencies in Infrastructure and Data Governance

Hardware infrastructure is the physical foundation of digital transformation, and local universities in western China

carry a visible backlog of underinvestment here. Most institutions lack adequate network bandwidth, run aging terminal equipment, and have low coverage of smart classrooms and virtual simulation laboratories—too weak a base to support blended learning at scale or the needs of research innovation. Even where individual institutions have completed hardware upgrades through dedicated projects, an emphasis on construction over operation and maintenance, and on hardware over application, remains widespread: equipment sits idle at high rates and delivers little real benefit. Campus data governance lags as well. Departments have built their own business systems in isolation, with inconsistent data standards and incompatible interfaces; data silos are pronounced, and cross-departmental data sharing and process coordination remain difficult. Capacity to develop locally adapted digital teaching resources is weak, and generic resources procured from outside rarely fit an institution's own teaching needs.

(2) Constraints in Total Funding and Funding Structure

Local universities in western China depend heavily on local government finance, and the total funding earmarked for digitalization is insufficient, which directly constrains infrastructure renewal and the procurement of high-end digital resources. The imbalance in funding structure is even more pronounced. Limited funds are concentrated on visible items such as hardware purchases, while the less visible items that require sustained investment—software development, system operation and maintenance, resource development, faculty training—receive far too little. Under this pattern of prioritizing one-off investment over continuous operation, many digital systems lack professional maintenance and upgrading once built; functionality falls behind, the user experience suffers, and the systems end up as showcase projects with little practical use—a low-efficiency waste of educational resources.

(3) Gaps in Faculty Digital Literacy and Technical Personnel

Faculty members are the central actors in digital transformation, yet at local universities in western China their overall digital literacy remains low. Most mid-career and

senior teachers remain accustomed to conventional teaching models. Their use of digital technology rarely goes beyond such surface-level applications as displaying courseware, and they lack the instructional design capacity and innovative awareness needed to integrate technology deeply into disciplinary teaching. Existing training programs are largely perfunctory and offer little hands-on guidance; they fail to build application skills effectively and can even provoke resistance. Salary levels and limited room for professional growth, meanwhile, make it hard for these universities to attract and retain specialists in educational technology and data governance. In-house technical teams are weak, producing a self-reinforcing cycle: personnel shortages slow the transformation, and the slow pace of transformation further weakens the institution's attractiveness to talent.

(4) Absence of Governance Mechanisms and Evaluation Systems

Internal digital governance at a university is, in essence, a dynamic process in which digital technologies and tool-based thinking continually readjust themselves as they adapt to organizational institutions and internal structures [3]. Most local universities in western China, however, lack systematic and long-term top-level planning for digital transformation. Initiatives typically take the form of scattered, department-level explorations; a university-wide coordination mechanism is missing, departments act in isolation with little collaboration, policy implementation is inefficient, and resources are difficult to pool and optimize. The absence of evaluation and incentive mechanisms is the core institutional reason for this weak momentum. Academic title evaluation and performance evaluation still center on conventional research output and teaching hours, while the effort invested in digital teaching innovation and online course development receives no effective recognition. Student assessment likewise relies primarily on written examination scores; digital literacy and information competence have yet to enter the core assessment dimensions. With the gains of transformation decoupled from individual returns, the intrinsic motivation of faculty and students to take part in it is markedly insufficient.

None of these challenges stems from a single factor; they result from the combined effects of regional economic endowments, the allocation of policy resources, and the inertia of organizational culture. Path dependence created by lagging economic development means that local public finance has an inherently limited capacity to fund digitalization. The dilution of policy support as it travels down to the grassroots level of implementation, together with the Matthew effect in resource allocation, further aggravates the resource disadvantage of local universities in western China. Traditional organizational culture and cognitive biases inside the institutions constitute a deeper layer of resistance. As these factors intertwine, local universities in western China are caught in a double bind of weak foundations and insufficient momentum—one that can only be resolved through systemic, well-adapted countermeasures.

3. Policy Responses and Optimization Strategies

(1) Targeted Policy Support and Top-Level Institutional Design

Education authorities should shift support for the digitalization of higher education in western China from

undifferentiated, one-size-fits-all provision to targeted, needs-based funding. Dedicated funds should back infrastructure upgrading, the development of distinctive digital resources, and faculty capacity building at local universities, with asymmetric policy preferences in project review and talent programs to offset the regional resource disadvantage. Within each institution, universities need a working mechanism under the unified leadership of the university party committee that coordinates across departments, a clear transformation roadmap with staged targets, specified responsibilities for each department, and stronger overall coordination of the transformation.

(2) East–West Collaboration and Resource-Sharing Mechanisms

Building on the existing framework of paired assistance between eastern and western universities, digital education collaboration should be upgraded from one-way resource delivery to multidimensional capacity co-building. The shallow model of simply exporting MOOCs (massive open online courses) should give way to cross-regional blended learning communities. Within such communities, partner institutions would staff joint disciplinary teaching teams and offer core courses in synchrony. Digital teaching resources developed together can then carry the experience and instructional design methods of eastern universities into the day-to-day teaching of their western counterparts. Faculty development can follow the same pairing logic: under a joint program for raising digital literacy, experts from eastern institutions mentor young core teachers in the west through online workshops supplemented by on-site residencies, until the latter are able to develop digital courses and design smart instruction on their own.

Collaboration need not stop at the east–west axis. Within each province, local universities can form a consortium for digital development and share, on a lightweight basis, high-quality digital teaching resources, virtual simulation training modules, and expertise in system operation and maintenance. Because costs are shared and experience circulates among members, no single institution bears the full threshold and investment pressure of digital transformation.

(3) Internal Governance Reform and Removal of Data and Departmental Barriers

What is at stake in modernizing higher education governance goes well beyond a technical upgrade: digital technology is being used to restructure the relations of educational production and to release the productive power of knowledge [4]. Digital transformation gives universities an occasion to renew their internal governance systems, and data governance offers the most direct instrument for breaking down departmental barriers. One workable approach is checklist-based management at two levels, university and secondary college, under which each functional department and college has its data-sharing responsibilities and process-coordination procedures spelled out and the collection standards and interface specifications for core campus data are unified. Nor does data integration require a large-scale central platform of the traditional kind. A lightweight data middleware platform at the university level can gradually clear the blockages in data flows among business systems and achieve interoperability across teaching, student affairs, research, and finance at much lower cost.

Evaluation can reinforce these arrangements. Indicators such as data sharing, platform use, and teaching innovation belong in the annual assessment of schools and departments

and in the performance review of administrative cadres, so that transformation outcomes feed into the allocation of departmental resources. Room for failure matters alongside measurement: a fault-tolerant mechanism for pilot innovation would give secondary colleges the confidence to pursue differentiated experiments in digital teaching and help foster a campus climate that accommodates trial and error and embraces proactive change.

(4) Faculty Empowerment and Intrinsic Motivation

Faculty development works best when goals are differentiated rather than uniform. A tiered system for building digital literacy would set different targets by seniority and discipline. Longer-serving teachers need hands-on training with basic digital tools, enough to function comfortably in standard smart-teaching settings. Younger faculty can be pushed further, toward digital instructional design, with school-based workshops and discipline-specific training giving them repeated practice in embedding digital technology within course teaching.

Recognition has to keep pace with training. A pluralistic mechanism for acknowledging digital teaching achievements would count the online courses, blended learning cases, and virtual simulation training resources that faculty develop on equal footing with conventional research publications and teaching hours, in academic title evaluation, performance evaluation, and awards. A workload conversion scheme for digital teaching should also be introduced, giving due recognition to the additional effort teachers invest in preparing digital instruction, developing resources, and analyzing student learning, so as to mobilize their internal drive to participate in digital teaching reform.

(5) Industry–Education Integration and External Resource Channels

Anchored in the digital transformation needs of regional industry, universities should deepen embedded cooperation with enterprises in the field of digital education. Equipment donation and internship-base construction, the shallow forms such cooperation often takes, are not enough. Working with leading local enterprises, universities can build digital workshops and virtual simulation training stations and convert real production scenarios and industry technical standards into modular digital teaching resources for the curricula of the relevant majors. Reciprocal appointments add a further layer: enterprise technical experts come to campus to develop digital courses and contribute to practical teaching, while university faculty join enterprise digitalization projects, strengthening the digital teaching workforce in both directions. In this kind of deep industry–university–research collaboration, the technological resources and scenario advantages of enterprises compensate for the institutional

weaknesses of universities, and the universities in turn supply enterprises with application-oriented talent suited to industrial digitalization, so that the digital transformation of universities develops in step with regional industrial upgrading.

4. Conclusion

The digital transformation of local universities in western China is not a simple accumulation of technological tools. What is underway is a systemic change that reaches into institutional mission, resource allocation, governance models, and talent cultivation all at once, and on it hangs a critical link in achieving regional balance in China's higher education and safeguarding educational equity. The region's development base and resource endowments rule out simply copying the construction paths of leading universities in eastern China; what these institutions need is a distinctive path of their own, suited to their positioning and to regional needs. That places demands on both sides. National and local governments must supply precise policy support and cross-regional resource reinforcement. The universities, for their part, must sustain effort on three fronts: optimizing internal governance, upgrading faculty capacity, and integrating with the industrial ecosystem. If the principles of low cost, practical effectiveness, and strong adaptation hold, and digital technology is rooted deeply in the institutional mission of cultivating application-oriented talent and serving local industry, the enabling value of digitalization can be fully released and lend sustained momentum to the intensive, quality-driven development of higher education in western China.

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