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Sweden's quiet revolution: rethinking ai training in business schools

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ABSTRACT

This study develops an inventory-based diagnosis of how Swedish universities publicly stabilize staff-facing training in artificial intelligence and digitalization. Using an integrated framework of institutional logics, sociotechnical systems theory, and the capability approach, I map publicly visible provision and signposted enabling conditions across nine Swedish higher education institutions, anchored in AACSB-accredited business schools and complemented by digitally active additions (December 2024 to January 2025). Provision is coded through observable indicators that capture formalization and support, including named ownership, recurrence, stable access routes, governance signposting for integrity and data protection, and role-targeted pathways. The analysis identifies systematic cross-institutional variation in the density of institutionalization signals and in the visibility of conversion supports that could make participation and application feasible across staff roles. These differences are interpreted as variation in public formalization and capability-enabling conditions, not as evidence of uptake or effectiveness. The contribution is a replicable diagnostic for comparing staff-development provision without conflating availability with outcomes, and for informing institutional choices about governance, coordination, and inclusive capability-building under responsible AI expectations.

1. Introduction

The transformation of business education has accelerated in recent years, driven by artificial intelligence (AI), wider digitalization, and the systemic disruptions of the COVID-19 period. Business schools are under mounting pressure to renew not only curricula and teaching practices but also staff development infrastructures that shape how educational work is designed, assessed, and governed in AI-mediated environments [1,2]. While the pandemic catalyzed rapid adoption of online and hybrid models, it also sharpened concerns about uneven digital capacity and the ethical implications of AI for educational practice [3]. Meta-syntheses of AI in higher education further suggest that, despite rapid growth in research and implementation, staff-focused integration remains under-theorized and unevenly anchored in ethics, interdisciplinarity, and local context [4].

A persistent challenge is that institutional adaptation often lags behind technological change. Higher education institutions may struggle to keep pace with shifting expectations in AI-intensive work and learning environments, a dynamic long associated with institutional inertia and lag [5]. As a result, staff training provision frequently develops through fragmented initiatives rather than coherent, routinized pathways. Yet staff development is not peripheral. It is a core institutional capacity that mediates whether AI-related change becomes stabilized as organizational practice or remains confined to early adopters and local champions.

AI integration in education is also not reducible to technical adoption. It requires coordinated change across people, technologies, and organizational routines. From a sociotechnical systems perspective, institutionalization depends on alignment between tools, pedagogical aims, governance arrangements, and the professional conditions under which staff can incorporate AI into teaching and administrative work. At the same time, responsible and inclusive integration turns on capability conditions: the real opportunities staff have to access training, interpret guidance, and convert provision into meaningful and ethically informed practice. These concerns have become more salient as policy guidance increasingly emphasizes accountability, transparency, privacy, and human oversight in educational AI adoption [6,7].

This article brings these dimensions together through an integrated framework combining institutional logics, sociotechnical systems theory, and capability theory. Empirically, it examines how Swedish business schools publicly signal staff-facing AI and digitalization competence-building, using a qualitative inventory of publicly visible

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training provision and signposted enabling conditions, complemented by targeted outreach. The study is designed as an institutional diagnosis rather than an evaluation of effectiveness. It maps what is offered, how it is organized, for whom it is framed, and what kinds of governance and support structures are visible.

The study asks:

> *How do AI and digitalization training initiatives in Swedish business schools reflect institutional adaptation, sociotechnical integration, and the development of staff capabilities for inclusive higher education transformation?*

Sweden provides a relevant context because it combines high digital readiness with ongoing challenges of institutional alignment and inclusive implementation [8,9]. By examining variation across institutions, the article contributes a transferable inventory-based approach and a set of observable indicators that support cross-institutional comparison without conflating provision with outcomes.

The paper proceeds as follows. Section 2 situates the Swedish higher education context within broader digitalization trajectories. Section 3 introduces the theoretical framework. Section 4 details the methodology and coding scheme. Section 5 presents findings on institutionalization signals, coordination, and conversion supports. Section 6 discusses implications through the integrated theoretical lens. Section 7 outlines limitations and directions for future research.

2. Background

Sweden provides a useful setting for examining staff-facing AI and digitalization training in business schools because it combines high digital readiness with persistent challenges of institutional alignment and inclusive implementation. Sweden ranks highly on European digital readiness indicators such as the Digital Economy and Society Index (DESI), reflecting sustained national investment in digital infrastructure and transformation [10]. Across sectors including healthcare, welfare, transport, and manufacturing, digitalization and AI have prompted substantial upskilling efforts and organizational change, offering a wider national backdrop against which higher education is also expected to adapt [11–16].

Within higher education, these pressures are filtered through intersecting institutional logics. Swedish higher education institutions (HEIs) are pulled between professional-academic logics of autonomy and disciplinary authority, civic logics of public value and equity, and market-oriented expectations tied to relevance, performance, and external accountability. Accreditation frameworks such as those of the Association to Advance Collegiate Schools of Business (AACSB), together with intensified societal demand for digital competence, amplify incentives to modernize training structures and demonstrate responsiveness [17]. At the same time, adaptation can be slowed by institutional lag, where established governance routines and academic norms delay change even when environmental expectations shift [5]. Recent work on responsible AI integration reinforces that leadership and strategic alignment are consequential, not only for adoption but for the governance conditions under which adoption is legitimized and sustained [18]. In practice, this creates a context in which staff training may be centrally routinized in some institutions while remaining more localized and unit-driven in others.

A sociotechnical perspective further clarifies why variation in training provision is not simply a matter of offering tools. AI integration in teaching and administration depends on how technologies are coupled with work systems, support functions, and institutional routines. The growing use of technology-enhanced learning, chatbots, and AI-enabled platforms indicates expanding experimentation in Swedish higher education [19,20]. Yet sociotechnical integration requires more than experimentation. It rests on stable infrastructures such as support channels, pedagogical guidance, and governance signposting that connect AI use to everyday practices, including assessment integrity, procurement, and data protection. Where such coupling is weak, digital initiatives tend to remain pilot-based, unevenly distributed across units, and less accessible to staff groups outside core teaching roles [9,16].

These conditions also foreground a capability problem. Staff development is not only about access to learning opportunities but also about whether staff can convert training into meaningful and sustained practice. In capability terms, this conversion depends on enabling conditions such as time, recognition, role-sensitive pathways, and institutional supports that reduce practical and normative barriers to use. Sweden's long-standing policy emphasis on lifelong learning provides a supportive national narrative for competence development in response to technological change [8,2], and recent initiatives, including scalable massive open online course (MOOC) models and other flexible formats, reflect experimentation with more accessible provision [21]. However, capability-building efforts remain conditioned by organizational readiness, resource distribution, and motivation structures, which can widen participation gaps even in digitally mature contexts.

Finally, Sweden's digital trajectory is frequently linked to inclusion ambitions, yet inclusion is not an automatic consequence of technology adoption. Online platforms and hybrid formats can widen access and flexibility, but their equity effects depend on design choices, targeted outreach, and sustained support for diverse staff groups [22,21]. In parallel, ethical and legal governance expectations have become more explicit in education-facing AI guidance, emphasizing transparency, privacy, accountability, and human oversight [6,7]. This creates an additional institutional demand: staff training must support not only functional tool use, but also ethically informed judgment and governance literacy.

Taken together, Sweden's combination of high digital maturity, multi-logic pressures on universities, and explicit inclusion and governance expectations makes it a revealing context for examining how AI and digitalization training is publicly signposted and institutionally stabilized. This backdrop motivates the study's focus on observable institutionalization signals, sociotechnical coordination, and capability-enabling conditions across Swedish business schools and digitally active HEIs.

3. Theoretical framework

This study applies a hybrid theoretical framework that integrates institutional logics, sociotechnical systems theory (STS), and the capability approach to interpret how Swedish business schools publicly signal AI and digitalization training for staff. The framework is used diagnostically, not evaluatively. Because the empirical material consists of publicly visible provision and outreach confirmations, the lenses guide interpretation of institutionalization signals and conversion supports rather than training quality, reach, or outcomes [23–25]. Accordingly, claims about "alignment," "coordination," or "inclusion" refer to observable signposting in documentation, such as named ownership, recurrence, stable access pathways, governance guidance, support channels, and role-targeted routes (Appendix A).

3.1. Institutional logics and organizational adaptation

Institutional logics theory explains why staff training becomes salient and how it is framed under competing rationalities within higher education, including academic autonomy, market responsiveness, and civic responsibility [24]. In the context of AI-led transformation, business schools face pressures associated with accreditation expectations (e.g., AACSB), labor-market demands for AI-related competence, and societal expectations concerning ethical and inclusive practice [17]. These pressures can surface in public materials as shifts in emphasis, for example, from discretionary "skills workshops" to strategically framed competence-building tied to institutional priorities, integrity, or governance.

At the same time, institutional inertia and path dependence may temper the pace and form of visible adaptation [5]. In this study, such dynamics are not inferred from internal decision-making. They are read through the public formalization of staff development, including whether training is signposted as centrally owned or remains unit-specific, whether it appears as a recurring cycle rather than a one-off event, and whether it is linked to institutional routines and responsibilities (Appendix A).

3.1.1. Sociotechnical systems and organizational integration

STS foregrounds the interdependence of people, technologies, and organizational structures in shaping change [25]. From this perspective, AI training is not simply a matter of tool introduction. It is a reconfiguration of work systems in which technical infrastructure, staff competences, and routines such as assessment design, educational development support, and administrative processes must be aligned.

In an inventory-based design, sociotechnical integration is operationalized through visible couplings between training provision and enabling infrastructure. These include signposted access to approved tools, procurement or data-governance guidance, integrity and assessment recommendations, and identifiable support channels. Where such couplings are absent or weakly signposted, the analysis does not conclude that integration is unsuccessful; rather, it indicates fewer observable signals that training is embedded in a routinized institutional system during the observation window.

3.1.2. Capability approach and inclusive digital transformation

The capability approach directs attention to whether institutions enable staff to convert access to training into feasible practice and professional agency [23]. In this study, "capability" is not treated as an individual trait or an outcome measure. It is treated as an institutional condition, visible through conversion supports that plausibly make participation and application possible across roles.

Accordingly, capability-oriented signals include role-targeted pathways (academic, administrative, leadership), staged guidance for pedagogical application, workload recognition or formal incentives where explicitly stated, and governance literacy supports relevant to responsible use (e.g., privacy and data protection guidance, tool-use recommendations, integrity guidance). This lens is especially pertinent in a policy environment where responsible AI use increasingly intersects with legal and accountability obligations (e.g., GDPR and emerging AI regulation), making institutional support structures part of staff's practical freedom to act responsibly rather than merely access tools.

3.1.3. Integrating the lenses

Together, the three lenses allow the study to interpret variation in publicly visible training provision without equating availability with effectiveness. Institutional logics clarify how staff training is framed and legitimized under competing demands; STS specifies the infrastructural and routine-level couplings through which training becomes embedded; and the capability approach highlights whether conversion supports are signposted in ways that could enable inclusive participation. This integration anchors the analysis to observable indicators and supports a bounded interpretation of cross-institutional differences as variation in formalization, coordination signals, and capability-enabling conditions (*Appendix A*).

4. Methodology

4.1. Design: qualitative inventory

This study adopts a qualitative inventory approach to map publicly visible AI and digitalization staff-training provision in Swedish higher education institutions (HEIs), with a focus on business schools. The purpose is to document and compare provision and signposted enabling conditions, not to assess training effectiveness, uptake, or learning outcomes. The unit of analysis is publicly visible provision and signposted conversion supports (e.g., guidance, tool access pathways, support channels), supplemented by outreach confirmations where available.

Analytically, the inventory is interpreted through the integrated framework of institutional logics, sociotechnical systems theory (STS), and the capability approach [23–25]. These lenses direct attention to (i) how training is framed and legitimated under competing rationalities, (ii) whether provision is coupled to infrastructures and routines, and (iii) whether institutions visibly enable staff to convert access into feasible practice.

4.2. Sampling strategy and institutional scope

Sampling was purposive and anchored in AACSB accreditation (Association to Advance Collegiate Schools of Business), used as an external reference point for institutional prioritization and accountability in business education [26]. At the time of data collection, AACSB-accredited Swedish business schools included: Jönköping International Business School; Linnaeus University; Lund University; Örebro University; the University of Gothenburg; Umeå University; Karlstad University; Stockholm Business School (Stockholm University); and the Stockholm School of Economics.

Despite repeated outreach, Karlstad University and the Stockholm School of Economics did not yield comparable publicly visible staff-facing training provision or outreach confirmation within the inventory window. Based on respondent recommendations and documented digitalization activity, two non-accredited but digitally active institutions were included to reduce accreditation-based blind spots: Linköping University and Malmö University. The final analytic sample therefore comprises nine institutions (seven AACSB-accredited plus two additions). AACSB functions here as a sampling anchor, not as a validation mechanism for the inventory data.

4.3. Data sources and collection window

Data collection was conducted in December 2024 and January 2025 using three complementary sources:

1. Desk-based web inventory of institutional pages (university sites and relevant sub-units).
2. Review of national competence infrastructures frequently referenced in the mapped material:
   - WASP-ED (Wallenberg AI and Transformative Technologies Education Development Program), which develops modular AI-education resources for higher education [27].
   - AI Sweden, a national center supporting AI adoption and competence building across sectors [28].
   - AI Competence for Sweden, a government-initiated university collaboration curating AI training opportunities for professionals and public-sector stakeholders [29].
3. Email outreach to roles typically responsible for staff development and digital pedagogy (e.g., deans/associate deans of education, educational developers, program directors, AI coordinators). Outreach was used to clarify provision and ownership where public information was ambiguous or dispersed.

Appendix B documents the primary publicly visible sources inventoried per institution. Outreach notes and any internal materials shared via email informed interpretation but are not reproduced for confidentiality.

4.4. Search protocol and inclusion criteria

For each institution, a structured search protocol was applied:

- Search locations: (i) central university sites; (ii) business school/faculty pages; (iii) educational development / teaching-and-learning center pages; (iv) library and pedagogical support pages; and (v) publicly accessible event calendars.
- Search terms: "AI," "generative AI," "digitalization/digitalisation," "digital transformation," "data literacy," "learning analytics," "teaching with AI," "academic integrity," "assessment," "workshop," "webinar," "course," and "professional development."

Items were included if they met at least one criterion:

(i) explicitly described staff training/professional development related to AI/digitalization;
(ii) were institutionally signposted as relevant support (e.g., tool-use recommendations, integrity guidance, governance guidance); or
(iii) constituted recurring or structured offers plausibly accessible to staff (e.g., webinar series, workshops, short courses, MOOCs).

Student-only degree courses were excluded unless explicitly positioned as staff-accessible professional development. A MOOC (massive open online course) was treated as staff-relevant when it was signposted as accessible or recommended for staff competence building.

4.5. Operational definitions and coding

Because the study is inventory-based, analytic categories are defined as observable signals in public documentation and outreach responses, rather than latent constructs or outcome measures. The full coding scheme is provided in Appendix A; core constructs are summarized here:

- Institutionalization signals: observable features indicating that AI/digitalization training is stabilized beyond ad hoc events. Indicators include:
  (i) named owner unit/role (e.g., educational development unit, teaching/learning center, AI coordinator);
  (ii) evidence of recurrence (e.g., webinar series, scheduled workshops, annual learning day);
  (iii) stable access pathway (e.g., persistent hub page, staff portal route, central registration);
  (iv) documented support channels (e.g., named contacts, helpdesk, support unit);
  (v) tool approval and data-governance guidance (e.g., privacy/GDPR guidance, procurement/approved-tools guidance, assessment integrity recommendations);
  (vi) role-targeted pathways (e.g., explicit audiences such as academic staff, administrative staff, leadership); and
  (vii) workload recognition or incentives when explicitly stated (e.g., micro-credential framing, credit-bearing staff courses, formal recognition mechanisms).
- Coordination: visible cross-unit alignment cues, such as centrally anchored ownership, cross-faculty structures, explicit linkage between training and institutional routines (e.g., assessment guidance, integrity frameworks), and integrated use of national infrastructures.
- Conversion supports (capability lens): visible scaffolds that plausibly help staff convert access into use, such as pedagogical application guidance, integrity/assessment recommendations, access routes to approved tools, support channels, staged pathways, and role-targeted access.

4.6. Classification: density of institutionalization signals

Institutions were classified into three descriptive categories: high, moderate, or low density of institutionalization signals. Density refers to the breadth and recurrence of observable signals across indicator categories during the inventory window (Appendix A, Table A1). Classification was assigned by comparing each institution's indicator profile across: ownership, recurrence, access pathways, support channels, governance guidance, and role-targeting.

- High density: signals present across most categories.
- Moderate density: signals cluster in some categories but remain incomplete, unit-specific, or unevenly signposted.
- Low density: sparse or stand-alone signals with limited visible recurrence, ownership, or structured access routes.

These labels do not indicate training quality, completion, reach, or effectiveness. They index publicly visible formalization and signposting in documentation and outreach responses.

4.7. Analysis procedure

Data were analyzed thematically and comparatively. For each institution, inventoried items were coded along:

- purpose/content (e.g., AI literacy, tool use, ethical guidance),
- delivery format (e.g., MOOCs, hybrid workshops, webinars),
- target groups (academic, administrative, leadership), and
- collaborations/partnerships (including national infrastructures).

The thematic patterns were then interpreted through the three theoretical lenses to characterize how institutions publicly signal adaptation (institutional logics), embedding and coupling to routines/infrastructure (STS), and conversion supports for inclusive participation (capability approach).

4.8. Boundary conditions of inference

Given the design, the study supports claims about presence, structure, ownership, recurrence, and signposted enabling conditions. It does not support claims about effectiveness, uptake, completion rates, behavioral change, or compliance readiness unless such information is explicitly and comparably disclosed in the inventoried materials. Where public information is absent, the analysis treats this as limited visibility rather than evidence of non-existence.

5. Findings

The inventory of staff-facing AI and digitalization training across nine Swedish HEIs shows clear variation in how institutions publicly signal strategic commitment, organizational embedding, and participation scaffolding. Reported patterns are interpreted through institutional logics, sociotechnical systems theory, and the capability approach. Throughout, the labels high, moderate, and low density of institutionalization signals refer to the breadth and recurrence of observable signals in publicly visible materials and outreach responses during the inventory window, not to verified internal quality, intent, uptake, or effectiveness.

5.1. Institutional logics and adaptation: strategic positioning under external pressures

Institutions differ in how explicitly they frame staff training as a strategic response to accreditation expectations, national digitalization agendas, and labor-market demands for AI competence.

Institutions classified as high density of institutionalization signals (e.g., Lund University; Örebro University) show more consistently signposted alignment between external expectations and internal planning. In the materials reviewed, they more often connect staff development to visible coordinating structures and national infrastructures (e.g., WASP-ED; AI Sweden). For example, Lund University's School of Economics and Management signposts a structured Data Literacy MOOC (massive open online course) alongside generative AI webinars. In the

inventory record, this combination reads as a publicly articulated pathway rather than isolated offerings.

Institutions classified as moderate density of institutionalization signals (e.g., University of Gothenburg; Linnaeus University) display partial adaptation. In the materials reviewed, provision is more often distributed across units, with less consistently signposted central ownership. Participation in national initiatives is visible, yet training frequently appears reliant on localized initiatives and individual champions, rather than being routinized through a clearly designated institutional pathway. Importantly, this interpretation concerns visibility and signposting in their documented materials, not underlying institutional intent.

Institutions classified as low density of institutionalization signals (e.g., Jönköping University; Umeå University) show fewer observable stabilization cues in the inventory window, including fewer recurring offers and less clearly documented access pathways and ownership arrangements. A plausible reading is that weaker public signposting corresponds to weaker formalization during the period observed. However, because the design is inventory-based, limited visibility cannot be treated as evidence of absent internal activity; it is reported here as limited public traceability of institutionalization signals.

5.2. Sociotechnical integration: coupling tools, roles, and routines

From a sociotechnical perspective, the mapped institutions vary in whether training appears connected to infrastructures, workflows, and cross-unit routines, or remains primarily tool-oriented.

Among high density institutions, training is more often represented as part of broader learning ecosystems. Örebro University's AI Impact Lab, for instance, is publicly framed as a platform for experimentation and dialogue that links researchers, educators, and external stakeholders. In the inventory record, this signals sociotechnical coupling, where capability-building is signposted alongside structures for coordination and continued engagement.

Among moderate density institutions, technical investment is more visible than organizational embedding. In the materials reviewed, initiatives appear to co-exist with uneven routinization across units. Where internal networks or partnerships are signposted (e.g., Linnaeus University's collaboration around WASP-ED), the inventory suggests movement toward alignment, but with less consistently documented linkage to stable routines (e.g., assessment guidance, procurement pathways, role-specific support).

Among low density institutions, publicly visible provision more often appears as locally organized workshops or stand-alone sessions (e.g., sessions on AI tools or large language models). In the inventory record, these are less frequently linked to institutional routines or cross-unit structures, which reads as weaker visible sociotechnical coordination.

5.3. Capability development: conversion supports for meaningful participation

A capability perspective shifts attention from availability to the conditions that enable staff to convert access into feasible practice. Here, differences are most visible in role-targeting, scaffolding, and the explicitness of support channels.

In high density institutions, the inventory more often captures structured provision accompanied by conversion supports, such as guidance resources, recurring formats, and signposted support structures. Lund's Data Literacy MOOC and Örebro's lab-based infrastructure are indicative of this pattern: training is publicly framed not only as tool exposure but as an opportunity for sustained engagement with data/AI practices, including ethical or governance-related considerations where signposted.

In moderate density institutions, the inventory suggests growing attention to inclusion, but role-targeted access pathways are less consistently visible. In the materials reviewed, training is not always described with differentiated pathways for academic versus administrative staff, part-time roles, or staff with differing baselines of AI literacy. This is reported as a documentation and signposting pattern, not as a claim about actual participation conditions. Where participation scaffolding is less explicit, the inventory suggests potential conversion frictions (time, role clarity, support access), which aligns with broader evidence that peer communities, perceived usefulness, and trust shape willingness to adopt generative AI tools.

In low density institutions, capability development signals appear more limited in the public record. Training descriptions more often foreground tool use without equally explicit scaffolds that would support conversion into sustained practice (e.g., staged pathways, workload recognition, or stable support channels). Again, this refers to what is visible and documented, not to internal uptake.

5.4. Cross-cutting innovations and recurring gaps

Two cross-cutting observations recur across the sample. First, both accredited and non-accredited institutions signpost innovative, public-facing offerings. For example, Linköping University and Malmö University provide interdisciplinary courses that foreground critical engagement with AI and digitalization, illustrating an emerging openness in competence-building provision.

Second, three gaps recur in the inventory record:

1. Uneven role-targeting, particularly limited visibility of administrative staff pathways.
2. Short-cycle and voluntary formats, with limited public indication of staged progression or workload recognition.
3. Ethical and governance signposting that is more systematic in some institutions than others and often unevenly translated into visible training design elements.

Taken together, these patterns suggest that what differentiates institutions in the public record is less the presence of any single initiative and more the extent of visible stabilization, coordination, and conversion supports. *Table 1* synthesizes these contrasts across the three theoretical lenses.

6. Discussion

Although the empirical setting is Swedish business schools, the paper's contribution is methodological and diagnostic. It offers a transferable three-lens framework (institutional logics, sociotechnical systems, and capabilities) and an operationalized set of observable indicators for mapping staff-facing AI and digitalization training provision without conflating availability with effectiveness. This inventory-based approach is suited to contexts where training is unevenly documented, difficult to compare, and often dispersed across institutional units. By design, the analysis remains bounded to publicly visible provision, institutionalization signals, and capability-enabling conditions rather than uptake or outcomes, thereby supporting replicable cross-institutional comparison while avoiding effectiveness claims that the data cannot substantiate.

Across the institutions inventoried, the density of institutionalization signals varies in ways that are analytically interpretable through the hybrid framework. Differences in visible formalization are not reducible to infrastructure alone; they also reflect how institutions align with external expectations, how they coordinate sociotechnical elements across units, and how they scaffold staff members' opportunities to convert training access into meaningful practice. These patterns are reported as variation in documented signals within the inventory window, not as verified differences in training quality, participation, completion, or impact.

Table 1
Summary of AI and digitalization training across swedish business schools: a theoretical lens perspective.

Theoretical Lens	Focus of Analysis	High density of institutionalization signals	Moderate density of institutionalization signals	Low density of institutionalization signals
Institutional Logics	Alignment with external pressures (e.g., accreditation, societal expectations)	Proactive alignment with AACSB goals and national digital strategies (e.g., Lund, Örebro)	Partial adaptation; training tied to select departments or initiatives (e.g., Gothenburg, Linnaeus)	Training provision appears more ad hoc/ stand-alone in publicly visible materials (e.g., Jönköping, Umeå)
Sociotechnical Systems	Integration of people, technology, and organizational routines	Cross-departmental coordination; integration into learning ecosystems and labs	Technical efforts not yet institutionally embedded; siloed efforts across units	Tool-focused provision with limited visible organizational embedding
Capability Development	Staff empowerment, ethical literacy, and inclusive access	Structured training with ethical components and interdisciplinary access	Some inclusive aims, but barriers in accessibility and engagement persist	Narrow focus on tools with limited capability expansion or incentives

Categories index visibility and formalization signals in public documentation and outreach responses; they do not measure training quality, reach, or outcomes.

6.1. Responding to institutional pressures: reform, reframing, and visible formalization

From an institutional logics perspective, some institutions display clearer public alignment between external expectations and internal signposting of training provision, including more explicit ownership, recurring cycles, and stable access routes. In the inventory, these patterns are consistent with business-school environments that are increasingly expected to demonstrate innovation, relevance, and societal impact, including through accreditation-facing accountability narratives [26,17]. Where such alignment is visible, AI and digitalization training can plausibly function as part of an institutional response that reframes external pressures as strategic opportunities for coordinated capability-building rather than as stand-alone compliance or productivity initiatives [8,17].

Conversely, institutions categorized as low density of institutionalization signals are characterized, in publicly visible materials and outreach responses, by fewer stabilizing cues such as recurring program cycles, centrally signposted ownership, and role-targeted pathways. These patterns are consistent with classic accounts of institutional inertia and lag in organizational adaptation while remaining strictly descriptive of what is documented in the inventory [2,5]. Importantly, the present design cannot establish why such signals are absent or less explicit, nor can it rule out substantial internal activity that is not publicly documented. The contribution, therefore, is not to label "leaders" and "laggards" in outcome terms, but to show how visible formalization varies and how that variation can be interpreted as different degrees of institutionalization signaling under competing logics.

Recent work on institutional GenAI governance reinforces the relevance of distinguishing between ad hoc initiatives and more formalized responses. For instance, An, Yu, and James [30] show that many higher education institutions are developing stakeholder-specific guidelines that address both opportunities and risks of generative AI. Such governance artifacts are directly aligned with the kinds of institutionalization signals captured in this study (e.g., stable hubs, guidance pages, role-targeted policies), and they illustrate how institutional logics are operationalized through visible rule-setting and routinized support mechanisms rather than through training availability alone [30].

6.2. Sociotechnical alignment: from tool exposure to coordinated systems

A sociotechnical systems lens foregrounds the interdependence of people, technologies, and organizational routines in sustaining change beyond early adoption. In the inventory, higher-density cases more often show evidence of coordination across these elements through labs, cross-unit structures, or training that is visibly embedded in broader learning ecosystems. Such arrangements align with sociotechnical arguments that durable digital transformation requires more than tool acquisition; it depends on organizational readiness, workflow integration, and routinized support that connects infrastructure to pedagogical and administrative practice [9,25]. Swedish evidence on technology-enhanced learning further suggests that adoption is experienced as a sociotechnical shift, shaped by both organizational conditions and teachers' situated work practices, which underscores the analytic value of examining visible coordination signals rather than simply cataloguing tools or sessions [19].

By contrast, moderate-density cases more often appear, in the materials reviewed, to combine technical investment with less consistently signposted institutional embedding. This pattern is compatible with prior findings that digital transformation efforts can remain fragmented when technologies are introduced without accompanying procedural, cultural, and organizational integration, resulting in limited routinization beyond local champions [9]. The inventory cannot test these mechanisms directly, but it can credibly show whether institutions publicly document access pathways, support channels, governance guidance, and explicit linkages to institutional routines (e.g., assessment, integrity, procurement). In this sense, sociotechnical alignment is interpreted through documented enabling conditions rather than inferred effectiveness.

6.3. Building capabilities: conversion conditions, inclusion, and ethical participation

A capability perspective shifts the interpretive focus from training access to conversion conditions: whether institutions provide visible scaffolds that enable staff to translate training opportunities into sustained, valued practice [23]. In the present study, conversion supports are operationalized as publicly signposted guidance, approved-tool pathways, integrity and assessment recommendations, support channels, and role-targeted routes that plausibly lower barriers to participation and use. Where such supports are visible, institutions more clearly signal that capability-building is not left to individual motivation alone, which matters because opportunity to participate is unequally distributed across roles, workload conditions, and baseline competencies.

The inventory also reveals unevenness in how participation conditions are publicly specified, including whether training is optional or recognized within workload structures. This matters because the literature suggests that sustained engagement with generative AI in higher education depends on more than technical self-efficacy. Faculty adoption is shaped by perceived usefulness, trust, social support, and facilitation conditions, which are precisely the kinds of institutional supports that inventories can check for in visible documentation, even if they cannot measure uptake [31,32]. Similarly, evidence of qualitatively different teaching experiences with GenAI underscores that capability-building involves pedagogical framing and reflective practice, not merely exposure to tools, which reinforces the importance of role-sensitive pathways and guided application rather than stand-alone workshops [33].

Ethical and legal capability-building is particularly salient in European higher education, where staff-facing AI use increasingly intersects

with accountability obligations and risk governance. Education-facing guidance emphasizes transparency, privacy protections, and responsible human oversight, suggesting that institutions should link competence-building to clear governance signposting rather than leaving ethical judgment to individual discretion [6,7]. In addition, emerging regulatory obligations under the EU AI Act and established data protection requirements under the GDPR strengthen the rationale for treating regulatory and data-governance literacy as a core staff capability domain [34,35]. This study does not assess compliance readiness, but it can examine whether institutions visibly connect AI training to data protection guidance, tool approval and procurement pathways, integrity and assessment recommendations, and identifiable support channels in publicly accessible materials.

6.4. Theoretical contribution and implications without overclaiming outcomes

The study contributes to research on AI-driven transformation in higher education by demonstrating how institutional adaptation can be analyzed without equating provision with impact. First, it extends institutional theory by showing that external pressures (e.g., accreditation and policy expectations) are translated into unevenly visible forms of formalization and signposting, which can be interpreted as variation in institutionalization signals rather than as differences in effectiveness [26,17]. Second, it enriches sociotechnical perspectives by operationalizing coordination and embedding as observable indicators, thereby enabling systematic comparison of the conditions under which training is more likely to be routinized as part of organizational systems rather than treated as tool exposure [9,25]. Third, it advances a capability-oriented view of staff development by specifying conversion supports as a measurable set of publicly visible scaffolds that plausibly enable inclusive participation across academic and administrative roles [23].

These implications are transferable beyond Swedish business schools. The three-lens framework and inventory indicators can be applied to other faculties and national systems to map training provision, compare degrees of formalization, and diagnose gaps in governance signposting and conversion supports without implying outcomes. This is particularly relevant in settings where institutions face dual pressures: to innovate technologically while maintaining accountability, equity, and ethical responsibility in staff development [6,7].

6.5. Implementation guidance: interpreting inventories without overclaiming outcomes

An inventory can support implementable insights, provided claims remain bounded to what the design can show. First, it can reveal clarity of purpose. Where training is framed inconsistently across units (e.g., as integrity compliance, productivity support, pedagogical development, or ethical governance), provision is more likely to appear fragmented in public documentation than consolidated into a coherent pathway. From an institutional logics perspective, explicit purpose articulation reduces the risk of parallel initiatives developing without strategic alignment [17]. Second, an inventory can credibly indicate governance and ownership: whether responsibility is signposted through stable roles, named units, and persistent access routes, or whether provision appears dependent on local champions [30]. Third, a sociotechnical lens highlights infrastructure as an enabling condition: training is unlikely to be routinized unless paired with practical supports such as approved-tool access, procurement and data-governance guidance, assessment integrity recommendations, and identifiable support channels [6,9]. Fourth, a capability lens emphasizes role-sensitive and staged pathways rather than one-off sessions, because the opportunity to convert training into practice differs systematically across roles, workloads, and baselines of competence [23]. Finally, while inventories do not evaluate effectiveness, they can inform internal monitoring aligned with their scope, such as tracking formalization over time, audience coverage, diffusion beyond early adopters, and the visibility of ethical and regulatory literacy supports in relation to evolving governance expectations [34,6,35,7].

Equally important is what an inventory does not justify. Availability should not be equated with impact; voluntary provision should not be read as engagement without uptake evidence; and visibility bias implies that missing public information does not necessarily mean absence of internal activity. For these reasons, the typology used here should be read as variation in formalization and institutionalization signals, not as a ranking of institutional quality or intent. Questions of reach, completion, behavioral change, and longer-term outcomes require evaluative and longitudinal designs beyond an inventory approach.

7. Limitations, recommendations, and future directions

This study explored how Swedish business schools approach AI and digitalization training as part of their institutional strategies for transformation. While it provides a timely snapshot of evolving practices, several limitations must be acknowledged. First, the qualitative inventory approach provides descriptive insights but does not capture the long-term impact or effectiveness of the training initiatives. Second, reliance on publicly available documents and institutional communication introduces visibility bias: institutions differ in what they publish, how frequently they update web content, and how strategically they communicate staff-development activity. This means that the mapped initiatives capture publicly visible provision rather than full internal activity, and they do not permit systematic comparisons of uptake, participation, or completion rates across institutions. Third, the focus on a single national context, albeit rich in digital innovation, may limit the generalizability of findings to higher education systems operating under different governance models or institutional logics.

Despite these limitations, the findings offer valuable lessons about the institutional adaptation of Swedish business schools in the face of technological change. The varied levels of strategic alignment with AI training suggest that digital transformation is not solely a matter of access to technology or external pressure. It also involves how institutions interpret and internalize competing priorities such as innovation, disciplinary autonomy, and societal responsibility. To advance institutional adaptation, business schools should explicitly integrate digital transformation into their strategic agendas and accreditation commitments, while also renegotiating internal governance structures that may inhibit responsiveness.

In terms of sociotechnical integration, the study reveals that digital tools alone do not lead to sustainable transformation. Where training initiatives appeared more embedded, they were situated within broader organizational systems that aligned people, technologies, and institutional routines. This calls for business schools to move beyond tool-centric approaches and invest in sociotechnical infrastructures that promote interdisciplinary learning, continuous development, and cross-functional collaboration. For example, initiatives like Lund University's Data Literacy MOOC or Örebro University's AI Impact Lab exemplify how learning environments can serve as dynamic sociotechnical systems. Institutions should adopt similar systemic models that treat staff training not as isolated upskilling but as a lever for organizational learning and cultural change.

Finally, the study underscores the uneven development of staff capabilities for inclusive transformation. While some institutions foregrounded ethical AI use, flexible learning formats, and interdisciplinary access, others remained narrowly focused on technical skill delivery. For AI literacy to genuinely foster inclusive and ethical higher education, training must be oriented toward capability-building, empowering staff not only to use digital tools but also to question, shape, and lead the direction of technological change. This includes extending training to administrative and support staff, who are often overlooked despite their integral roles in institutional functioning. As Veletsianos et al. [36]

argue, the intersection of justice, hope, and educational technology must guide institutional responses to digital disruption. This requires reimagining digital transformation not only as a strategic or operational goal, but as a commitment to cultivating more just, equitable, and hopeful futures for all educational stakeholders.

Future research would benefit from shifting from inventories of provision to designs that can speak to uptake and outcomes. Participation, completion, and post-training use are substantively important, yet such metrics are rarely reported in consistent or comparable formats across institutions, and where they exist, they are often embedded in internal systems that are not publicly accessible. A feasible next step would be a mixed-methods design that combines (i) standardized institutional indicators of provision and formalization (e.g., audience coverage, frequency, and infrastructural readiness) with (ii) comparable participation traces where available (registrations, attendance, and completion) and (iii) role-sensitive qualitative follow-ups with academic and administrative staff on conversion conditions (time, support, mandates, and perceived legitimacy). Where institutions allow it, pre/post designs could assess shifts in regulatory literacy, confidence in tool use, and reported changes in assessment or workflow routines, without assuming uniform pathways to impact. Longitudinal follow-up would further allow distinguishing short-lived experimentation from routinized practice and examining how governance arrangements and sociotechnical supports shape persistence over time. Such designs would complement the present study by evaluating outcomes while retaining sensitivity to the institutional logics and capability constraints that condition adoption.

8. Conclusion

This study examined how Swedish business schools and digitally active HEIs publicly signal staff-facing AI and digitalization competence-building. Using a qualitative inventory of publicly visible provision and signposted enabling conditions, it showed marked cross-institutional variation in the density of institutionalization signals, the degree of sociotechnical coordination, and the presence of capability-oriented conversion supports. In some settings, training is anchored through recurring cycles, identifiable ownership, stable access routes, and governance guidance that makes responsible use practicable. In others, provision is more episodic, locally organized, and weakly connected to routines and supports that would enable staff to translate access into sustained practice.

Interpreted through the combined lenses of institutional logics, sociotechnical systems theory, and capability theory, the findings suggest that divergence is not adequately explained by "more or less training" alone. What differentiates trajectories is whether institutions stabilize training as an organizational arrangement, align infrastructures with pedagogical and administrative work, and make participation realistically achievable across roles. This framing matters because it shifts attention from adoption rhetoric to the institutional conditions under which responsible and inclusive AI integration can plausibly become routine.

The contribution is therefore diagnostic rather than evaluative. The paper provides a replicable mapping approach, an operationalized indicator set, and a three-lens interpretive frame that allow comparisons of provision without implying learning outcomes or effectiveness. Used in other national and disciplinary contexts, the approach can support clearer internal decision-making about ownership, routinization, support infrastructures, and role-sensitive pathways. It also establishes a concrete baseline for the next research step: evaluative and longitudinal designs that connect provision and enabling conditions to uptake, conversion experiences, and longer-term changes in practice.

Availability of data and material

Public URLs are listed in Appendix B; outreach notes are not shared due to confidentiality but can be summarized upon reasonable request.

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CRediT authorship contribution statement

Selcen Ozturkcan: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Coding scheme: constructs and observable indicators

Table A1 lists the constructs, operational definitions, and observable indicators used in the inventory-based coding of publicly visible training provision and enabling conditions.

Table A1
Coding scheme and observable indicators for the qualitative inventory.

Construct (analytic label)	Operational definition (inventory-based)	Observable indicators searched for (public materials + outreach responses)	Example evidence types
Institutionalization signals	Stabilization cues indicating training is anchored beyond one-off events	Named owner unit/role; recurring cycle; persistent hub/access route; documented support channels; tool approval/data governance guidance; role-targeted pathways; workload recognition/incentives	Staff-facing guidance pages; event calendars; workshop series pages; named contacts; governance/AI guidance pages; central registration pages; outreach confirmations
Coordination	Visible alignment across people/technology/structures	Central ownership signposted; cross-unit network; explicit links between training and institutional routines (assessment, integrity, procurement); partnerships (WASP-ED/AI Sweden) explicitly integrated	Institutional "current themes" pages; educational development unit pages; partnership mentions; role descriptions; outreach responses

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Table A1 (*continued*)

Construct (analytic label)	Operational definition (inventory-based)	Observable indicators searched for (public materials + outreach responses)	Example evidence types
Conversion supports (capability lens)	Visible scaffolds enabling staff to convert access into use	Practical pedagogical guidance; integrity/assessment recommendations; approved-tool guidance; support channels; staged pathways; role-targeted access	Guides/FAQs; assessment design webinars; tool access guidance; staff support units; targeted offerings to admin staff
Ethical responsibility framing	Ethical/legal governance signposting in relation to AI use	Mentions of privacy/GDPR; bias; transparency; academic integrity; policy guidance; references to EC/UNESCO/EU AI Act	Ethics webinar descriptions; institutional guidance; educator guidelines; policy references
High/Moderate/Low density of institutionalization signals (classification)	Relative density and breadth of signals within the observation window	Count/coverage across the above indicators; breadth of audiences; recurrence; central ownership signposting	Cross-institution comparison notes; institutional summaries (inventory)

Classification was assigned based on the observed indicator profile during the study period; it does not imply differences in training quality, uptake, or outcomes.

Appendix B. Publicly visible sources inventoried and institutional sampling frame (Sweden)

This appendix documents the publicly visible sources inventoried for the qualitative inventory described in the Methodology section (data collection period: December 2024 to January 2025). The purpose is reproducibility. Table B1 lists the initial institutional sampling frame, anchored in AACSB-accredited Swedish business schools. As reported in the Methodology, two AACSB institutions (Karlstad University and the Stockholm School of Economics) did not yield comparable publicly visible training provision or outreach responses during the inventory window. Two digitally active non-accredited institutions (Linköping University and Malmö University) were therefore added based on respondent recommendations. The final analytic sample discussed in the *Findings* comprises nine institutions (seven AACSB-accredited and two additions).

Table B1
Institutional sampling frame and institutional homepages consulted.

Institution (School/University)	City	Institutional homepage consulted
Jönköping International Business School, Jönköping University	Jönköping	https://ju.se/en.html
Karlstad Business School, Karlstad University	Karlstad	https://www.kau.se/en
Linköping University	Linköping	https://liu.se/en
Linnaeus University, School of Business and Economics	Växjö, Kalmar	https://lnu.se/en/
Lund University, School of Economics and Management	Lund	https://www.lusem.lu.se/
Malmö University	Malmö	https://mau.se/en/
Örebro University School of Business	Örebro	https://www.oru.se/english/
School of Business, Economics, and Law, University of Gothenburg	Gothenburg	https://www.handels.gu.se/english/
Stockholm Business School, Stockholm University	Stockholm	https://www.sbs.su.se/en/
Stockholm School of Economics	Stockholm	https://www.hhs.se/en/
Umeå School of Business, Economics and Statistics, Umeå University	Umeå	https://www.umu.se/en/usbe/

Cross-institutional national sources inventoried.
https://www.ai.se/en (AI Sweden).
https://wasp-ed.org/ (WASP-ED).
https://ai-competence.se/en/ (AI Competence for Sweden).

Table B2

Table B2
Key training provision pages and programme sources inventoried (by institution).

Institution	Course or source title	Audience	Modality	URL
Stockholm Business School, Stockholm University	Exploring AI text generation for teaching and learning	Internal teaching staff	Online course	https://www.su.se/centre-for-the-advancement-of-university-teaching/calendar/exploring-ai-text-generation-for-teaching-and-learning-1.693091
Stockholm Business School, Stockholm University	Get a hold on AI search tools for teaching and learning	Internal teaching staff	Online course	https://www.su.se/centre-for-the-advancement-of-university-teaching/calendar/get-a-hold-on-ai-search-tools-for-teaching-and-learning-1.693098
Stockholm Business School, Stockholm University	Digitization and AI	Public	Non-interactive web platform	https://www.su.se/tema/digitalisering-och-ai
Linköping University	The basics of AI	Public	Online course	https://liu.se/utbildning/kurs/ete318
Linköping University	Elements of AI	Public	Online course	https://liu.se/en/education/course/ete318
Linköping University	Artificial intelligence at Linköping University	Public	Non-interactive web platform	https://liu.se/en/research/ai
Linköping University	An ice cream for your opinion on AI in education	Public	Web page	https://liu.se/nyhet/en-glass-for-din-asikt-om-ai-i-undervisning
Linköping University	AI tools for both employees and students at LiU, what does that mean?	Public	Blog post	https://didacticum.blog.liu.se/2024/01/10/ai-verktyg-for-bade-anstallda-och-studenter-vid-liu-vad-innebar-det/
Linköping University	Didacticum blog tag: AI	Public	Blog index/tag page	https://didacticum.blog.liu.se/tag/ai/

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Table B2 (*continued*)

Institution	Course or source title	Audience	Modality	URL
Lund University, School of Economics and Management	Courses in teaching and learning in higher education (autumn 2024)	Internal (institutional)	Internal link listing	https://www.lusem.lu.se/internal/education/courses-teaching-and-learning-higher-education/courses-autumn-2024
Lund University, School of Economics and Management	Courses in teaching and learning in higher education (spring 2025)	Internal (institutional)	Internal link listing	https://www.lusem.lu.se/internal/education/courses-teaching-and-learning-higher-education/courses-spring-2025
Lund University	Calendar category listing (webinars and events, category 75)	Public	Webinar/calendar listing	https://www.education.lu.se/en/calendar?category=75
Lund University	Generative AI tools (guidance, Q&A, videos)	Public	Web guidance hub	https://www.education.lu.se/en/current-themes/generative-ai-tools
University of Gothenburg	WASP-ED module resources (Module 1 entry point)	Public (teaching staff development resource)	Online resource repository	https://github.com/wasp-ed/moduler/blob/main/modul1.en.md
Malmö University	Generative AI in teaching and examination in higher education	Public	Freestanding course	https://mau.se/sok-utbildning/kurser/hp627a/
Malmö University	Artificial Intelligence, Ethics, Regulation, and Everyday Politics	Public	Freestanding course	https://mau.se/en/study-education/course/gp235l/
Örebro University	Competence development for professionals, AI short courses	Public	Course listing	https://www.oru.se/utbildning/kompetensutveckling-for-yrkesverksamma/ai/
Örebro University	AI Impact Lab	Public	Lab and collaboration page	https://www.oru.se/english/collaboration/oru-innovation/ai-impact-lab/
Örebro University	Artificial intelligence in higher education (Centre for Academic Development)	Staff	Support and guidance page	https://www.oru.se/english/about-us/centre-for-academic-development/perspectives/artificial-intelligence/
Cross-institutional national resource referenced in Örebro entry	AI Sweden, courses and competence building	Public/staff-facing platform	Course hub	https://www.ai.se/en/adoption/courses-and-competence-building
Jönköping International Business School, Jönköping University	No dedicated public training page URL recorded in inventory; training described as faculty-driven and supported by common university support functions	Not specified in public materials	Not specified in public materials	Not identified in inventory period
Linnaeus University, School of Business and Economics	No dedicated public training page URL recorded in inventory; staff training provision recorded through outreach notes referencing WASP-ED modules and internal coordination	Not specified in public materials	Not specified in public materials	Not identified in inventory period
Karlstad Business School, Karlstad University	Included in sampling frame; no training provision URL recorded in the inventory notes provided here	Not specified in public materials	Not specified in public materials	Not identified in inventory period
Umeå School of Business, Economics and Statistics, Umeå University	No dedicated public training page URL recorded in inventory; interventions recorded in outreach notes (Learning Day and seminars)	Not specified in public materials	Not specified in public materials	Not identified in inventory period
Stockholm School of Economics	Included in sampling frame; no reply recorded and no staff training provision URL recorded in the inventory notes provided here	Not specified in public materials	Not specified in public materials	Not identified in inventory period

Audience refers to the intended participants stated on the page (staff, internal teaching staff, public). *Modality* refers to the delivery format stated on the page (online course, freestanding course, webinar/calendar listing, or non-interactive platform). *Internal link* refers to pages that require institutional login but have a stable URL and were used as part of the inventory record.

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