

Reverse Mentoring for Institutional Transformation in Higher Education: A Systematic Review of Adoption Patterns, Contextual Enablers, and Learning-Innovation Outcomes

ABSTRACT

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Reverse mentoring (RM) has emerged as a promising mechanism for intergenerational knowledge exchange in higher education, yet empirical evidence remains scattered across isolated studies without systematic synthesis. This review addresses the gap by examining how RM is adopted, implemented, and linked to organizational outcomes in higher education settings. Following PRISMA guidelines, searches of Scopus, Web of Science, and ERIC identified ten empirical studies—four from higher education and six from other sectors serving as comparative references. Thematic synthesis revealed four adoption patterns in higher education: governance-oriented, training-centred, curriculum-embedded, and community-partnered models. Six contextual enablers proved critical for successful implementation: governance sponsorship, open culture, dedicated resources, structured routines, external pressures, and evaluation mechanisms. Higher education institutions demonstrated particular strengths in evaluation culture and structural support through existing infrastructure such as teaching and learning centres. Three outcome themes emerged progressively: learning as foundational skill development, alignment as improved cross-level communication, and innovation as cumulative institutional change. Cross-sector comparison provided practical insights for universities, including quantitative outcome tracking from technology firms, process embedding from manufacturing, shadow committees from hospitality, and consortium resource-sharing from SMEs. These findings offer a coherent framework connecting RM's contextual conditions to its learning and innovation outcomes, offering practical guidance for university leaders.

Keywords: Reverse mentoring; Systematic literature review; Higher education; Organizational learning; Intergenerational collaboration; Institutional innovation

1. Introduction

Higher education institutions worldwide face unprecedented challenges arising from generational diversity and technological acceleration. As digital natives enter universities both as students and early-career staff, significant knowledge asymmetries emerge between those fluent in emerging technologies and senior administrators shaped by pre-digital experiences (Chaudhuri & Ghosh, 2012). Meanwhile, calls for participatory governance have intensified, with students increasingly demanding meaningful involvement in institutional decision-making rather than tokenistic representation (Matthews & Dollinger, 2023). These converging pressures provide conditions favouring reverse mentoring (RM), a developmental practice that inverts traditional hierarchical learning by positioning younger or less experienced individuals as mentors to senior colleagues. Unlike corporate settings where hierarchical barriers may be more rigid, universities possess unique characteristics—including cultures of inquiry, structured academic calendars, and existing mentoring infrastructure—that may either facilitate or complicate reverse mentoring implementation.

Reverse mentoring originated at General Electric in 1999, when Jack Welch paired junior employees with executives to transfer digital competencies upward (Marcinkus Murphy, 2012). The practice has since evolved beyond technological upskilling to encompass diversity awareness, cultural transformation, and inclusive leadership development (Marcinkus Murphy, 2012; Gordon, 2025). Within higher education, RM holds particular promise as a mechanism for bridging the student-leadership gap, enabling fresh perspectives to inform institutional strategy while developing student mentors’ professional capabilities (Gündüz & Aksit, 2018; Raymond et al., 2021). Universities have deployed RM through teaching and learning centers, embedded it within academic courses, and extended it to community partnerships, showing RM’s adaptability across contexts (Çevik et al., 2025; Juris et al., 2022).

Yet despite growing adoption, RM research remains fragmented. Empirical studies are scattered across sectors—corporate, healthcare, and higher education—without comparative synthesis (Dale, 2025). Theoretical frameworks are invoked selectively, with scholars drawing on social exchange theory to explain relational dynamics, social learning theory to account for knowledge transfer, and organizational learning theory to interpret institutional outcomes, but rarely integrating these perspectives (Gadomska-Lila, 2020). Consequently, understanding of when and why RM succeeds or fails remains incomplete. This gap carries practical consequences: university leaders either avoid adopting RM due to uncertainty about implementation requirements, or launch initiatives without adequate structural support, resulting in unsustainable programs that dissipate once initial enthusiasm fades.

To address these limitations, this study conducts a systematic literature review examining how RM is adopted, implemented, and linked to organizational outcomes in higher education settings. Following PRISMA guidelines, searches across Scopus, Web of Science, and ERIC identified ten empirical studies meeting inclusion criteria—four from higher education and six from other organizational sectors serving as comparative references. Through thematic synthesis, the review analyzes adoption patterns, contextual enablers, and learning-innovation outcomes, with higher education as the primary analytical focus and cross-sector comparison illuminating distinctive features and transferable insights.

Three research questions guide this inquiry:

- RQ1: What patterns of RM adoption characterize higher education institutions?
- RQ2: What contextual factors shape RM implementation in higher education settings?
- RQ3: What learning and innovation outcomes does RM produce in higher education?

Table 1 presents the mapping between research questions, analytical methods, and expected outputs.

Table 1. Research Question–Method–Output Mapping

Research Question	Data Source	Analysis Method	Output
RQ1: Adoption patterns	10 studies (4 HE primary, 6 other sectors comparison)	Cross-case classification	Table 4: Adopter typology with HE focus
RQ2: Contextual enablers	Coding of contextual factors across 10 studies	Cross-case thematic matrix	Figure 2: Enabler comparison by sector

RQ3: Outcomes	Evidence extraction with HE sub-analysis	Thematic synthesis	Figure 3: Outcome prevalence heatmap
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This review contributes to the literature in three ways. First, it establishes a conceptual framework integrating contextual enablers and outcome dimensions specifically calibrated for higher education contexts. Second, it broadens the empirical foundation by systematically comparing RM implementation across sectors, revealing what universities can learn from corporate and community applications. Third, it provides evidence-based guidance for institutional leaders seeking to design sustainable RM initiatives that strengthen participatory governance and organizational learning.

2. Literature Review

2.1. Conceptual and Theoretical Foundations

Reverse mentoring refers to a developmental relationship in which a younger or less senior individual mentors a more experienced colleague, transferring knowledge and perspectives that flow counter to traditional organizational hierarchies (Chaudhuri & Ghosh, 2012). The concept emerged from General Electric’s initiative in 1999, when CEO Jack Welch paired 500 junior employees with senior executives to help leadership understand the emerging digital landscape (Marcinkus Murphy, 2012). What began as a technology transfer mechanism has since expanded to address diversity awareness, generational understanding, and cultural transformation across organizational settings (Marcinkus Murphy, 2012; Harvey & Allard, 2020).

Several theoretical perspectives inform the study of reverse mentoring. Social Exchange Theory explains how mentoring relationships are sustained through perceived mutual benefit rather than formal authority (Chaudhuri & Ghosh, 2012). In reverse mentoring, junior mentors offer technological expertise and contemporary perspectives, while senior mentees reciprocate with organizational insight, career guidance, and access to professional networks. The perception of fair exchange becomes critical to maintaining engagement, particularly when traditional power differentials are inverted (Rutti et al., 2013).

Social Learning Theory provides a complementary lens by emphasizing observational learning and behavioural modelling (Bandura, 1977). This perspective is further supported by evidence from higher education research emphasizing the role of specific leadership competencies in shaping effective developmental outcomes. Core competencies such as communication, interpersonal skills, critical thinking, emotional intelligence, and digital proficiency have been consistently identified as essential for leadership effectiveness in contemporary academic environments (Saidi & Abd Aziz, 2025). Reverse mentoring creates environments where both parties learn through demonstration, dialogue, and reflection—not merely through instruction. Senior leaders observe how younger colleagues navigate digital tools and contemporary workplace norms, while junior mentors gain exposure to strategic thinking and organizational politics. This bidirectional observation produces cognitive and behavioural changes that extend beyond the immediate mentoring relationship (Gong et al., 2024).

At the organizational level, reverse mentoring connects to Organizational Learning Theory, which conceptualizes institutions as entities capable of acquiring, interpreting, and embedding knowledge into routines and practices (Argyris & Schön, 1978). Reverse mentoring can function as a mechanism for “sensing” environmental shifts—particularly technological and generational changes—and translating individual learning into collective capability (Gupta et al., 2024). The Dynamic Capabilities Framework extends this perspective by positioning reverse mentoring as a means through which organizations sense emerging trends, seize opportunities for renewal, and transform their practices accordingly (Teece, 2007). When reverse mentoring is embedded in organizational routines rather than treated as a one-off initiative, it can contribute to sustained adaptive capacity.

Despite the availability of these theoretical tools, the literature tends to invoke them selectively. Studies emphasizing relational dynamics draw on social exchange; those focused on skill transfer lean toward social learning; and those examining institutional outcomes reference organizational learning or dynamic capabilities (Gadomska-Lila, 2020). Rare are attempts to integrate these perspectives into a unified framework that traces how individual exchanges aggregate into organizational outcomes. This theoretical fragmentation limits cumulative knowledge building and leaves practitioners without clear guidance on which mechanisms matter most under different conditions.

2.2. Evolution and Key Themes in RM Research

Over the past two decades, academic interest in reverse mentoring has grown and shifted in response to changing organizational priorities. During the early phase (2000–2010), research concentrated on technological and generational divides. Studies documented corporate experiments at firms like GE, IBM, and Procter & Gamble, noting improvements in executives' digital literacy but also challenges in sustaining engagement once initial novelty wore off (Chaudhuri & Ghosh, 2012). The dominant framing positioned reverse mentoring as a response to the “digital divide” between technology-fluent younger workers and senior leaders less comfortable with emerging tools.

The middle phase (2011–2020) expanded beyond technology transfer toward diversity and inclusion agendas. Reverse mentoring became incorporated into leadership development programs aimed at fostering empathy across lines of gender, ethnicity, and age (Marcinkus Murphy, 2012). Universities and public institutions began experimenting with reverse mentoring as a tool for inclusive governance, pairing students with administrators or pairing junior faculty with senior colleagues to surface marginalized perspectives (Zauchner-Studnicka, 2017). Methodological approaches also diversified during this period, with qualitative case studies and reflective interventions examining psychological safety, trust formation, and relational dynamics (Gadomska-Lila, 2020).

Recent research (2021–present) increasingly frames reverse mentoring as an organizational learning and innovation mechanism rather than merely a means of role reversal. Researchers such as Gupta et al. (2024) and Li et al. (2025) examine how reverse mentoring contributes to strategic renewal through cross-level knowledge integration. The analytical focus has shifted from interpersonal learning to system-level processes, including capability building and cultural agility. Garg et al. (2021) empirically linked reverse mentoring practices with innovative behavior in technology firms, demonstrating that learning engagement mediates the relationship between mentoring participation and innovation outcomes. This recent turn positions reverse mentoring not as a peripheral HR intervention but as a potential driver of organizational transformation.

2.3. Reverse Mentoring in Higher Education

Higher education institutions have characteristics that suit them to reverse mentoring while also presenting distinct challenges. As knowledge-intensive organizations, universities are fundamentally oriented toward learning, inquiry, and the exchange of ideas—values that align naturally with mentoring practices (Chun & Evans, 2021; Garvey et al., 2017). Students occupy a unique position as “insider-outsiders”: they are embedded within the institution yet bring external perspectives shaped by generational experiences, technological fluency, and diverse backgrounds that senior administrators may lack direct access to. These features align with what organizational theorists term “professional bureaucracies”—structures coordinated through expertise standardization rather than hierarchical supervision, where change proceeds through gradual professional evolution rather than top-down mandate (Mintzberg, 2024).

Several features of higher education facilitate reverse mentoring implementation. Teaching and learning centers provide natural institutional homes for mentoring initiatives, offering training infrastructure, coordination capacity, and evaluation expertise (Çevik et al., 2025). The academic calendar creates structured rhythms—semesters, terms, and academic years—that can anchor mentoring cycles and provide natural endpoints for assessment. Perhaps most importantly, universities possess deeply rooted cultures of reflection, feedback, and assessment that support the evaluative practices essential for program improvement and sustainability.

Yet higher education also presents obstacles. Academic hierarchies, while perhaps less rigid than corporate structures, still shape interaction patterns between students and senior leaders. Administrators may feel uncomfortable receiving guidance from students they are accustomed to directing. Students, for their part, may lack confidence to offer candid feedback to figures of institutional authority (Yurtseven Avci & Eren, 2023). Successful reverse mentoring in universities therefore requires deliberate cultivation of psychological safety and explicit institutional endorsement to legitimate the inverted relationship (Gündüz & Aksit, 2018).

The applications of reverse mentoring in higher education span governance, teaching, and community engagement. Governance-oriented programs pair students directly with senior administrators to inform strategic decisions and surface student perspectives on institutional priorities. Curriculum-embedded models integrate reverse mentoring into academic courses, providing students with structured learning experiences while connecting organizations with fresh viewpoints (Raymond et al., 2021). Community-partnered initiatives extend reverse mentoring beyond campus boundaries, linking university students with older adults or community members in intergenerational learning exchanges (Juris et al., 2022). Each model reflects different institutional priorities and draws on different governance structures for support.

2.4. Research Gaps

Despite growing interest, several gaps constrain current understanding of reverse mentoring in higher education. First, theoretical integration remains limited. Scholars invoke multiple frameworks—social exchange, social learning, organizational learning, dynamic capabilities—but rarely articulate how these perspectives connect or specify conditions under which one mechanism predominates over another. For instance, no study has examined how social exchange dynamics at the dyadic level translate into organizational learning at the institutional level. Second, empirical evidence is fragmented across isolated case studies, making it difficult to identify patterns that hold across contexts or to distinguish findings that reflect unique circumstances from those with broader applicability. Existing studies have also tended to examine leadership competencies and experiential engagement in isolation, with limited integration of how these elements interact within structured developmental practices such as reverse mentoring (Saidi & Abd Aziz; 2025; Saidi et al., 20205). Third, the relationship between contextual conditions and outcomes remains underspecified. While governance support, cultural openness, and resource availability are frequently cited as important, the field lacks a systematic framework connecting specific enablers to particular outcomes. This review responds to Chaudhuri et al.’s (2022) call for research examining reverse mentoring beyond corporate contexts. By centering higher education and developing a sector-calibrated enabler-outcome framework, it addresses their observation that existing studies “rarely articulate how theoretical perspectives connect” (p. 472).

2.5. Conceptual Framework

Drawing on the theoretical perspectives reviewed above, this study proposes an integrative framework to guide analysis as shown in Figure 1. The framework identifies three categories of contextual enablers that shape reverse mentoring implementation.

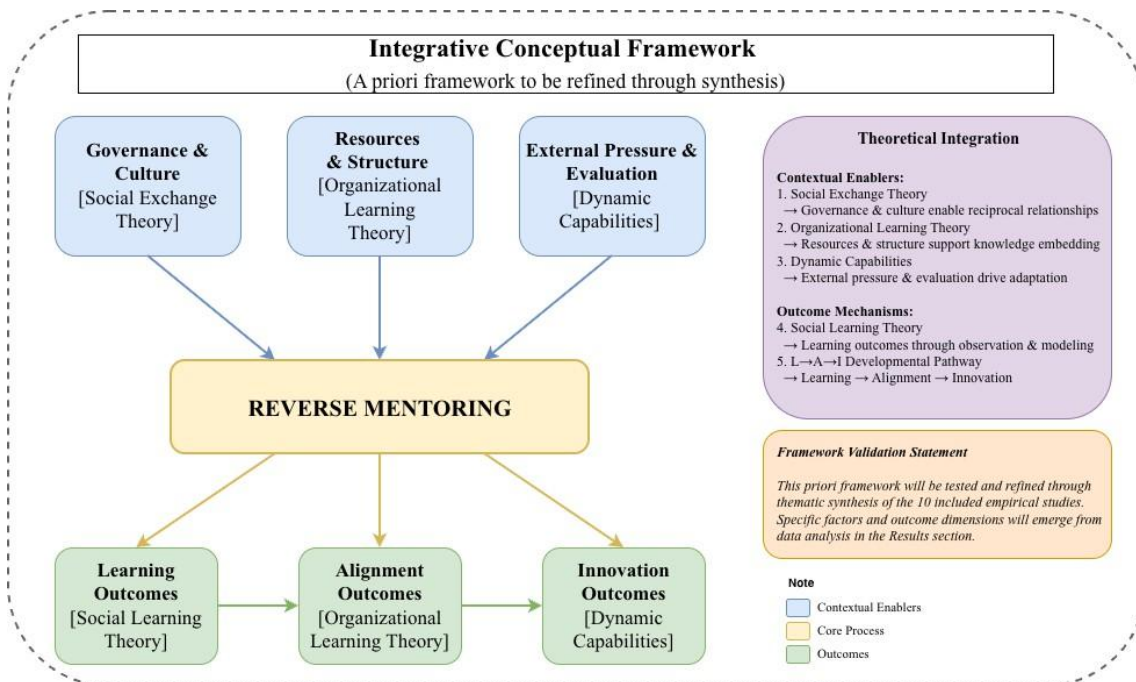


Figure 1. Integrative Conceptual Framework (Prior Analytical Framework)

The first category, governance and culture, draws on Social Exchange Theory (Chaudhuri & Ghosh, 2012). When participants perceive fair reciprocity, mentoring relationships are more likely to form and sustain. The second category, resources and structure, applies Organizational Learning Theory (Argyris & Schön, 1978). Adequate support systems help convert individual insights into collective knowledge. The third category, external pressure and evaluation, builds on Dynamic Capabilities (Teece, 2007). Environmental demands and feedback mechanisms prompt organizations to adapt.

The framework also proposes that reverse mentoring outcomes may follow a developmental sequence. Learning outcomes—grounded in Social Learning Theory (Bandura, 1977)—are theorized to form the foundation through observation and modelling. Alignment outcomes may build upon learning as knowledge spreads across levels, reflecting Organizational Learning processes. Innovation outcomes are hypothesized to emerge when learning and alignment become embedded in organizational routines, enabled by Dynamic Capabilities. This proposed L→A→I sequence draws on Crossan et al.'s (1999) 4I framework, where individual insights aggregate into institutional change. However, this sequence represents a theoretical proposition requiring longitudinal validation; cross-sectional studies cannot establish temporal ordering.

This framework serves as an analytical scaffold for the synthesis that follows. The three enabler categories will be refined into specific factors through analysis of the included studies. The outcome dimensions will also be elaborated based on empirical findings. This allows data to validate, challenge, or extend the proposed relationships.

3. Methodology

This study adopted a systematic literature review approach following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The review aimed to synthesize empirical evidence on reverse mentoring adoption, implementation, and outcomes, with particular attention to higher education contexts.

3.1. Identification

Literature searches were conducted across three databases: Scopus, Web of Science, and ERIC on September 15th, 2025. They were selected for their comprehensive coverage of management, organizational studies, education, and human resource development. The search period spanned January 2007 to October 2025, as structured reverse mentoring programs in organizational and educational settings began appearing in the academic literature around 2007. Table 2 presents the search strings employed across databases and initial retrieval results.

Table 2. Search Strings

Database	Field Used	Search String
Web of Science	TS	TS = (("reverse mentoring*" OR "upward mentoring*") AND ("enterprise*" OR "company" OR "organization*"))
Scopus	TITLE-ABS-KEY	TITLE-ABS-KEY(("reverse mentoring*" OR "upward mentoring*") AND ("enterprise*" OR "company" OR "organization*"))
ERIC	ANYWHERE	TX("reverse mentoring*" OR "upward mentoring*") AND ("organization*" OR "enterprise*" OR "workplace")

3.2. Screening

All retrieved articles (n=35) were screened using explicit inclusion and exclusion criteria to ensure the relevance, accessibility, and methodological quality of the selected studies. The criteria applied during the screening process are summarized in Table 3.

Table 3. Inclusion and Exclusion Criteria

Criteria Type	Inclusion Criteria	Exclusion Criteria
Publication Type	Peer-reviewed journal articles: empirical studies	Non-peer-reviewed sources, book chapters, review articles, or grey literature

Language	English	Non-English
Time Frame	January 2007 – October 2025	Articles published before 2007
Research Focus	Studies examining reverse mentoring (RM) in organizational contexts	Studies focused only on traditional mentoring, unrelated leadership training, or other non-RM programs.
Accessibility	Full-text, open-access	Non-open access, abstract-only records, or inaccessible documents

3.2.1. Cross-Sector Inclusion Rationale

The decision to include non-higher education studies alongside university research reflects the concept’s corporate origins (Marcinkus Murphy, 2012) and the scarcity of higher education empirical research. Cross-sector comparison enables identification of context-dependent versus transferable enablers—a strategy aligned with realist synthesis principles that emphasize understanding “what works, for whom, under what circumstances” (Pawson, 2006, p. 25).

3.2.2. Open-Access Inclusion Rationale and Bias Assessment

The decision to include only open-access peer-reviewed articles was made for two reasons: first, to ensure full-text accessibility for thorough analysis and potential replication; second, to align with principles of research transparency increasingly emphasized in educational scholarship. However, this choice introduces potential limitations that require explicit acknowledgment. A supplementary search without the open-access filter identified approximately 12 additional empirical studies that could not be accessed for full-text review. Table 4 documents notable excluded studies and their characteristics.

Table 4. Notable Paywalled Studies Excluded Due to Open-Access Filter

Study	Journal	Sector	Country	Focus
Marcinkus Murphy (2012)	<i>Human Resource Management</i>	Corporate	USA	Foundational RM framework
Garg, Murphy & Singh (2021)	<i>Career Development International</i>	Technology	India	RM, work engagement, innovation
Gadomska-Lila (2020)	<i>Journal of Organizational Change Management</i>	Multiple	Poland	RM intergenerational relationships
Kaše, Saksida & Mihelič (2019)	<i>Human Resource Management</i>	Corporate	Slovenia	Skill development in RM
Harvey et al. (2009)	<i>Int’l J. of Human Resource Management</i>	Global corporations	USA	Reverse and reciprocal mentoring
Upadhyay & Singh (2024)	<i>Int’l J. of Organizational Analysis</i>	Technology	India	Leader humility and RM
O’Connor et al. (2025)	<i>British Educational Research Journal</i>	Higher Education	UK	Student-leadership RM for EDI

Note: Studies identified through supplementary searches of Scopus and Web of Science without open-access restriction.

The paywalled studies are concentrated in European subscription journals and include quantitative designs underrepresented in our sample. This suggests the open-access filter may introduce geographic bias (under-representing European research), journal-type bias (excluding premier management journals such as *Academy of Management Journal* and *Organization Science*), and methodological bias (under-representing quantitative studies). The cross-sector comparison in this review therefore contrasts open-access-available research rather than necessarily representative practice from each sector.

Despite these limitations, the open-access filter was retained because it enables full reproducibility by researchers without institutional access barriers. Based on abstract review, the excluded paywalled studies do not appear to contradict the core thematic patterns identified regarding adoption models, enabler categories, and outcome dimensions. Future reviews with broader institutional access should expand searches to include

subscription journals, particularly for strengthening cross-sector comparisons and quantitative evidence synthesis.

3.3. Included

3.3.1. Retrieval and Deduplication

Literature searches were conducted on September 15, 2025. Table 5 presents the initial retrieval counts by database and the deduplication process.

Table 5. Database Retrieval and Deduplication

Stage	Scopus	Web of Science	ERIC	Total
Initial records retrieved	11	11	13	35
Duplicates removed (Mendeley)	2	1	1	4
Duplicates removed (manual check)	0	0	1	1
Records after deduplication	9	10	11	30

Note: Mendeley’s duplicate detection function identified 4 duplicate entries. Manual review identified 1 additional duplicate with variant author name spellings.

3.3.2. Screening Workflow

Title, abstract, and keyword screening was conducted by the first author on the 30 deduplicated records. Fifteen articles were excluded at this stage for the following reasons: not an empirical study (n = 5), not focused on reverse mentoring (n = 6), and not in an organizational context (n = 4). The second author independently screened a random sample of 12 records (40%) to assess reliability; agreement was reached on 11 of 12 records (92%), with the single discrepancy resolved through discussion.

The remaining 15 articles proceeded to full-text eligibility assessment. Full-text versions were retrieved and evaluated against inclusion and exclusion criteria by the first author. The second author independently reviewed all 15 full-texts. Five articles were excluded at this stage: no open-access full text available (n = 2), not a peer-reviewed article (n = 1), and insufficient empirical data (n = 2). Disagreements on 2 records were resolved through discussion until consensus was reached. Table 6 presents the complete exclusion reasons across both screening stages.

Table 6. Full-Text Exclusion Reasons

Stage	Exclusion Reason	Count
Title/Abstract Screening	Not empirical study	5
	Not focused on RM	6
	Not organizational context	4
	<i>Subtotal</i>	<i>15</i>
Full-Text Screening	No open-access full text	2
	Not peer-reviewed article	1
	Insufficient empirical data	2
	<i>Subtotal</i>	<i>5</i>
Total Excluded		20
Studies Included		10

After this assessment, ten studies met all requirements and were retained for synthesis. Figure 2 illustrates the selection process following PRISMA conventions.

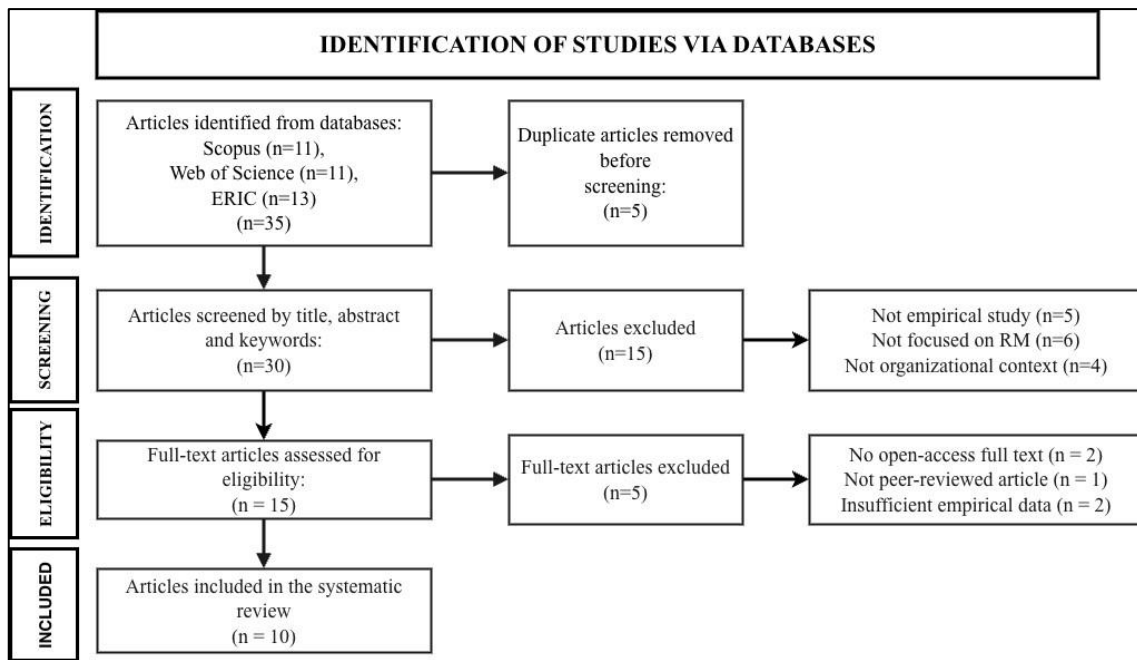


Figure 2. PRISMA Flow Diagram Adapted from Page et al. (2021)

3.4. Quality Appraisal

The methodological quality of included studies was assessed using the Crowe Critical Appraisal Tool (CCAT), which evaluates eight dimensions: preliminaries, introduction, design, sampling, data collection, ethical matters, results, and discussion (Crowe & Sheppard, 2011). Each dimension receives a score from 0 to 5, yielding a maximum total of 40 points, as shown in Appendix A. All ten studies achieved scores indicating acceptable methodological quality. Following Pawson (2006) and Dixon-Woods et al. (2006), no studies were excluded solely on quality grounds. This inclusive approach is appropriate for reviews seeking to understand mechanisms and contextual patterns rather than to calculate precise effect sizes, as excluding lower-scoring studies may reduce conceptual diversity.

3.5. Data Extraction and Coding

As can be seen in Table 7, a structured extraction protocol captured key information from each study: bibliographic details, geographic context, organizational sector, research design, sample characteristics, reverse mentoring program features, contextual factors, and reported outcomes.

Table 7: Data Extraction Fields

Category	Extracted Information
Study identification	Authors, year, country/region
Context	Organizational sector, institutional setting
Methods	Research design, sample size, data sources
RM program	Program type, duration, pairing approach
Contextual factors	Governance, culture, resources, structure, external pressures, evaluation
Outcomes	Learning, alignment, innovation—with supporting evidence

The coding process followed a hybrid approach combining deductive and inductive elements. The initial coding frame drew on categories identified in the literature review—contextual enablers and outcome types—while remaining open to themes emerging from the data. Coding was conducted by the first author using NVivo 14. The co-author independently reviewed coding of all 4 Higher Education studies (100%) and 2 randomly selected non-HE studies (33%); discrepancies were resolved through discussion until consensus was reached.

Thematic synthesis followed the approach outlined by Thomas and Harden (2008). This involved line-by-line coding of relevant passages, development of descriptive themes capturing patterns within the data, and

generation of analytical themes that extend beyond the content of individual studies to address the research questions. Coding dictionary is shown in Appendix B.

To assess coding reliability, the second author independently coded all 4 higher education studies (100% of HE corpus) and 2 randomly selected non-HE studies (33% of non-HE corpus), totalling 6 studies (60% of full corpus). Initial agreement on contextual enabler coding (A1–C2) reached 85%, and agreement on outcome coding (O-L, O-A, O-I) reached 90%. Discrepancies primarily involved distinguishing “Partial” from “Y” coding for Resources (B1), where some studies mentioned resources without specifying dedicated allocation, and whether certain impacts constituted Alignment versus Learning when studies described both communication improvement and skill development. All discrepancies were resolved through discussion until consensus was reached, with coding rules refined iteratively to improve clarity.

3.6. Summary of Included Studies

Table 8 provides an overview of the ten studies included in the synthesis, organized by sector. The complete data extraction table is available as supplementary materials.

Table 8. Summary of the Selected Studies

Study	Aim	Findings
Lužar et al. (2023)	To investigate impact of intergenerational differences on knowledge transfer among Slovenian engineers	Intergenerational differences (esp. tech skills) exist; RM & supportive culture improve knowledge transfer
Gupta et al. (2024)	To develop digital innovation and transformation capabilities in a large company (case study)	Key mechanisms (digital champions, council, core team, reverse mentoring) foster cultural change; coercive & mimetic pressures drive workforce upskilling
Chen (2013)	To explore reverse mentoring’s effect on traditional mentoring functions (career development, psychosocial support, role modeling)	Gen X/Y juniors have advanced IT skills, motivation, innovative thinking; reverse mentoring retains traditional functions (career, psychosocial, role-modeling)
Gündüz & Aksit (2018)	To explore student–university president reverse mentoring at Maltepe University and its significance for higher education	Highlights the importance of proper training for reverse mentors. Providing a Student–president reverse mentoring benefits universities broadly and helps dispel negative stereotyping in academia
Çevik et al. (2025)	To investigate effectiveness of a video-based online training program for student mentors in technology mentoring	Training significantly improved student mentors’ skills; mentors felt better prepared; mentees rated mentors highly in communication, enthusiasm, organization, planning
Schwartz et al. (2022)	To develop and pilot-test a new reverse mentoring model for SMEs to overcome innovation constraints	SMEs generated innovative ideas and adopted open innovation via this model; pilot showed feasibility and efficacy
Raymond et al. (2021)	To implement a student–employee reverse mentoring program in a marketing course (with a Fortune 500 company) to boost students’ career readiness	Reverse mentoring helped executives with knowledge continuity plans and improved students’ competencies (critical thinking, teamwork, professionalism, communication)
Li et al. (2025)	To examine how reverse mentoring influences employees’ innovative behavior and the roles of challenge stress and continuous learning	Reverse mentoring significantly boosts employees’ innovative behavior; effect is mediated by young mentors’ challenge-stress appraisal and continuous learning
Juris et al. (2022)	To use a virtual intergenerational reverse mentoring program (Cyber-Seniors) to reduce social isolation and loneliness in older adults	Older adult participants reported decreased loneliness post-program (learned new ways to connect); student mentors’ loneliness was unchanged
Cismaru & Iunius (2020)	To confirm reverse mentoring as a valuable talent management approach to bridge generational gaps in the hospitality industry	Reverse mentoring shows strong innovative potential in hospitality; employees have high interest but doubt management will implement it

4. Results and Findings

RQ1: What Patterns of RM Adoption Characterize Higher Education Institutions?

Ten studies were analyzed to identify organizational types that have adopted reverse mentoring. Classification was based on which entity designs, runs, and evaluates the program rather than on participant numbers. Five adopter types emerged: higher education (4 studies), technology enterprises (2), large manufacturing (2), hospitality (1), and SMEs (1). Table 9 summarizes these patterns.

Table 9. Types of Organizations Adopting RM

Type of Organization	No.	Article	Country	Governance Locus
Higher Education	4	Gündüz & Aksit (2018); Çevik et al. (2025); Raymond et al. (2021); Juris et al. (2022)	Turkey (2), USA (2)	Academic units, TLCs, governance offices
Technology Enterprises	2	Chen (2013); Li et al. (2025)	Taiwan, China	HR/L&D departments
Large Manufacturing	2	Gupta et al. (2024); Lužar et al. (2023)	India, Slovenia	Digital transformation offices
Hospitality & Services	1	Cismaru & Iunius (2020)	Switzerland, Romania	HR talent pipelines
SMEs	1	Schwartz et al. (2022)	Brazil	External industry federation

Geographic distribution merits attention. The corpus spans nine countries: Turkey (2), USA (2), Taiwan (1), China (1), India (1), Slovenia (1), Romania (1), and Brazil (1). Western and East Asian contexts predominate; no studies examined African, Middle Eastern, or Southeast Asian higher education systems, limiting generalizability to institutions operating under different governance traditions.

The four higher education studies showed distinct adoption patterns. Gündüz and Aksit (2018) documented a governance-oriented model at Maltepe University where students mentored senior executives including the president, with the program anchored in top leadership. Çevik et al. (2025) reported a training-centred model at Hacettepe University’s Teaching and Learning Center, emphasizing structured mentor preparation through online courses. Raymond et al. (2021) described a curriculum-embedded model where U.S. marketing students mentored Fortune 500 employees for course credit. Juris et al. (2022) examined a community-partnered model linking Appalachian State University students with older adults through a regional aging agency. These four patterns are not mutually exclusive; institutions may combine elements of multiple models, as when a training-centred program also embeds curriculum components.

Despite these differences, the higher education cases shared common features: all operated through established university units rather than as standalone projects; all aligned with academic calendars; and all incorporated formal evaluation through surveys, journals, or course assessment. Students served as “insider-outsiders”—embedded in the institution yet bringing fresh generational perspectives that senior staff might otherwise miss.

Cross-sector comparison revealed important differences. Technology firms (Chen, 2013; Li et al., 2025) embedded reverse mentoring in HR systems with project-based timelines and performance-linked evaluation. Manufacturing companies (Gupta et al., 2024; Lužar et al., 2023) connected the practice to digital transformation agendas. Hospitality (Cismaru & Iunius, 2020) used “shadow committee” arrangements where junior staff observed management decisions. SMEs (Schwartz et al., 2022) relied on external federation support to compensate for limited internal resources.

Table 10. Cross-Sector Insights for Higher Education

Source Sector	Distinctive Feature	Implication for HE
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Technology Enterprises	Integration with HR systems, rapid iteration	Embed RM in faculty development; establish quick feedback loops
Large Manufacturing	Alignment with strategic transformation	Link RM to university priorities like digital learning initiatives
Hospitality & Services	Shadow board mechanisms	Create student shadow committees beyond traditional representation
SMEs	Federation-based resource sharing	Form regional consortia to share training and evaluation tools

These comparisons suggest that higher education institutions are well-positioned for reverse mentoring given their existing infrastructure, evaluation culture, and semester-based rhythms. Table 10 presents how universities can learn from other sectors: technology firms’ agile iteration, manufacturing’s strategic alignment, hospitality’s shadow governance mechanisms, and SMEs’ consortium approaches all offer transferable lessons for strengthening university-based programs.

RQ2: What Contextual Factors Shape RM Implementation in Higher Education Settings?

To identify conditions that shape reverse mentoring implementation, six contextual factors were coded across the ten studies and grouped into three pairs: governance and culture (A1–A2), resources and structure (B1–B2), and external pressures and evaluation (C1–C2). Figure 3 displays the prevalence of each factor by organization type.

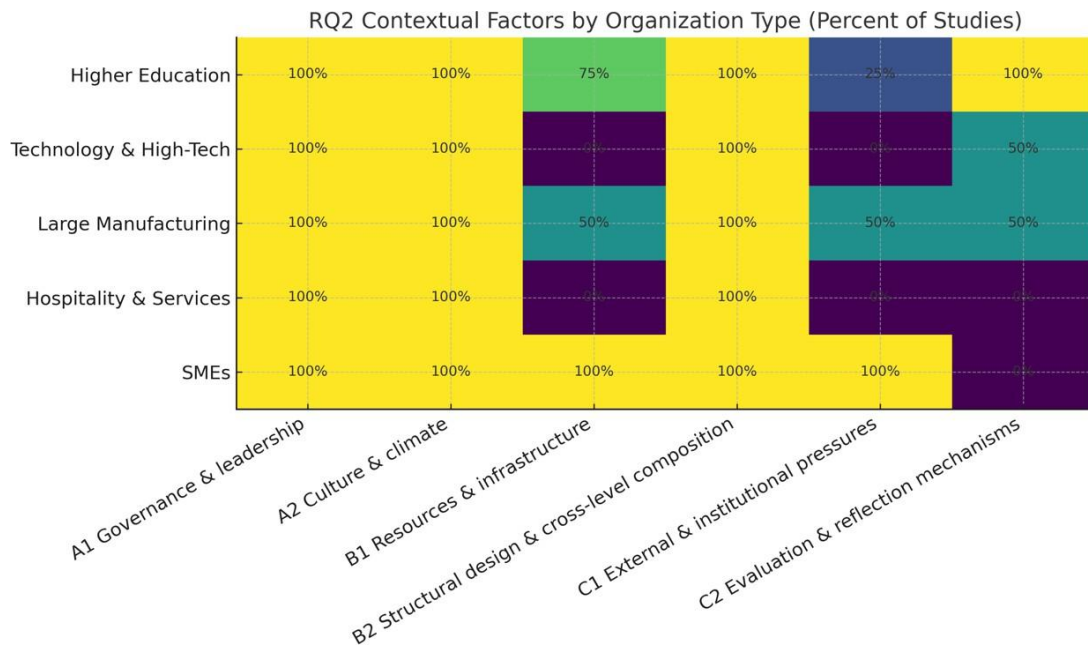


Figure 3. Contextual Factors by Organization Type

4.1. Governance and Culture (A1–A2)

Governance and culture together determine whether reverse mentoring moves from informal exchange to established practice. All ten studies reported governance mechanisms (A1) and cultural conditions (A2), confirming these as foundational requirements across sectors.

In higher education, governance takes distinctive forms. At Maltepe University, the president’s direct involvement legitimized student mentors and signaled institutional commitment (Gündüz & Aksit, 2018). Hacettepe University’s Teaching and Learning Center provided a formal home for mentor training and program coordination (Çevik et al., 2025). The U.S. marketing course operated through academic governance structures that ensured faculty oversight and curricular alignment (Raymond et al., 2021), while the Appalachian State initiative was anchored in community engagement offices (Juris et al., 2022). These arrangements share one

feature: reverse mentoring succeeds when it has a clear institutional owner rather than floating as an orphan initiative.

Cultural openness complements formal governance. Universities reported deliberate efforts to cultivate psychological safety—conditions where students feel comfortable offering candid feedback to senior staff and where administrators demonstrate genuine receptivity to challenge. Manufacturing firms similarly emphasized trust-building before expecting upward feedback (Lužar et al., 2023), suggesting that cultural preparation is necessary regardless of sector. The hospitality study noted that service-oriented norms supporting customer responsiveness extended to internal relationships, creating natural receptivity to junior input (Cismaru & Iunius, 2020).

4.2. Resources and Structure (B1–B2)

Resources and structural design provide the operational foundation for reverse mentoring. Here, notable differences emerged across sectors. Higher education showed strong structural design (B2 = 100%) but more varied resource investment (B1 = 75%). Three of four university studies reported dedicated training, platforms, or funding, while one relied primarily on existing course infrastructure without additional resource allocation.

Universities benefit from built-in advantages: teaching and learning centers offer training expertise, learning management systems provide communication platforms, and academic calendars create natural program rhythms. Çevik et al. (2025) developed a structured online course for mentor preparation, while Raymond et al. (2021) leveraged course assignments and reflection requirements. These existing assets reduce the marginal cost of reverse mentoring compared to organizations that must build infrastructure from scratch.

Technology and hospitality sectors showed a different pattern—strong structural design but minimal dedicated resources (B1 = 0%). These organizations embedded reverse mentoring within existing HR or team processes rather than creating separate resource streams. Manufacturing took a middle path, with half of studies reporting dedicated resources linked to digital transformation budgets (Gupta et al., 2024). SMEs compensated for internal resource limitations through external federation support, with FIEC providing training and coordination that individual small firms could not sustain (Schwartz et al., 2022).

4.3. External Pressures and Evaluation (C1–C2)

External pressures (C1) and evaluation mechanisms (C2) showed the greatest variation across sectors. Higher education reported the strongest evaluation practices (C2 = 100%) but the weakest external pressure drivers (C1 = 25%). Such a pattern reflects the academic culture of systematic assessment: all four university studies employed surveys, reflective journals, pre-post measures, or course-based evaluation. Universities evaluate because assessment is embedded in academic practice, not because external forces demand it.

External pressures operated differently across sectors. SMEs showed complete external pressure coverage (C1 = 100%), as the Brazilian pilot was explicitly driven by regional development policy and industry federation initiatives (Schwartz et al., 2022). Manufacturing firms responded to digital transformation imperatives and workforce demographic shifts (Gupta et al., 2024; Lužar et al., 2023). In contrast, university programs emerged more from internal pedagogical or governance goals than from external mandates—only one higher education study mentioned external drivers such as community partnership expectations (Juris et al., 2022).

4.4. Cross-Sector Insights for Higher Education

The cross-sector comparison suggests several lessons for universities. First, higher education's evaluation strength is a genuine asset—other sectors might learn from university assessment practices. Second, the relative weakness on external pressures may reflect autonomy: universities can implement reverse mentoring based on educational rationale rather than waiting for external mandates. Third, the resource variation across university studies indicates that reverse mentoring need not require substantial new investment if existing infrastructure is leveraged creatively.

From manufacturing and SMEs, universities can learn to connect reverse mentoring more explicitly to strategic priorities. When programs align with institutional goals—digital pedagogy, student voice in governance,

inclusive leadership—they gain legitimacy and resource support beyond what standalone initiatives typically attract. The SME consortium model also suggests that smaller institutions lacking teaching and learning centers might collaborate regionally to share training resources and evaluation tools.

RQ3: What Learning and Innovation Outcomes Does RM Produce in Higher Education?

Three outcome themes were coded across the ten studies: learning (O-L), alignment (O-A), and innovation (O-I). Learning refers to skill development, knowledge acquisition, and perspective change at individual or group levels. Alignment captures improved communication and coordination across hierarchical or generational boundaries. Innovation encompasses process improvements, institutional changes, and creative outputs at the organizational level. Figure 4 displays outcome prevalence by sector.

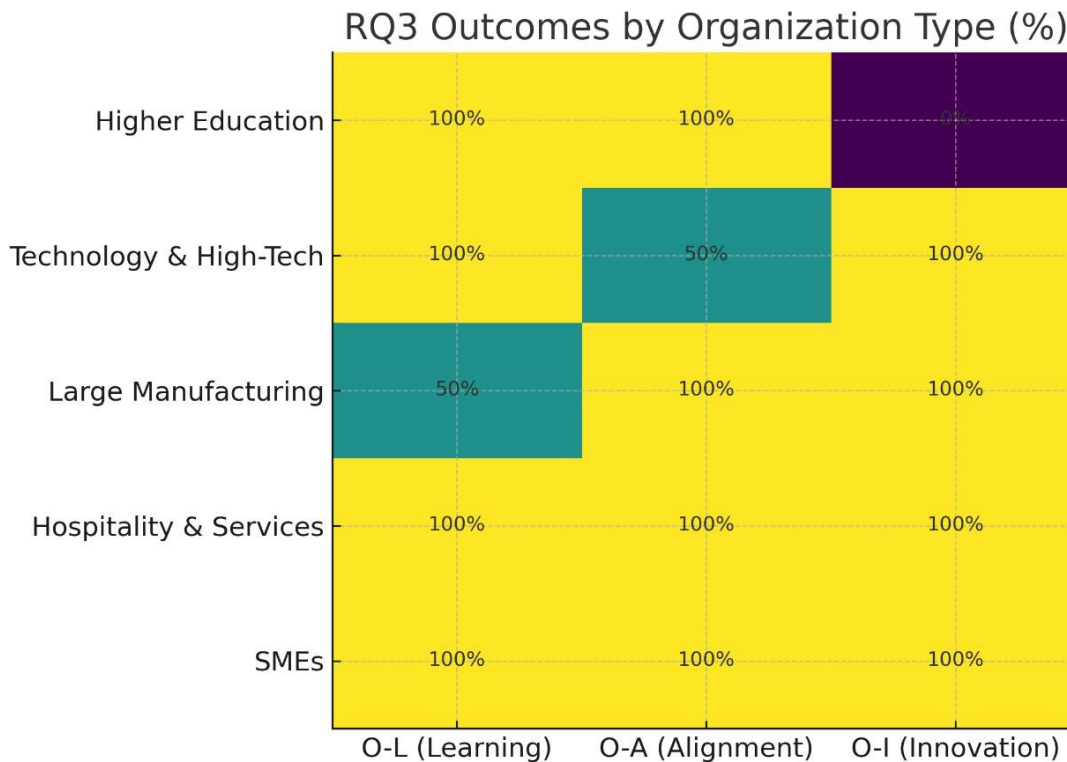


Figure 4. Outcomes Heatmap (O-L/O-A/O-I by type, %)

4.5. Learning Outcomes (O-L)

Learning was the most consistently reported outcome across all sectors. All four higher education studies documented learning gains, making O-L the strongest finding in university contexts. Student mentors reported growth in communication skills, organizational awareness, and professional confidence. At Hacettepe University, the structured training course strengthened students’ mentoring competence and reflective abilities (Çevik et al., 2025). Raymond et al. (2021) found that marketing students developed career readiness through their mentoring experience with Fortune 500 employees. The intergenerational program at Appalachian State enhanced students’ understanding of aging and community engagement (Juris et al., 2022).

Senior mentees also learned. At Maltepe University, administrators gained direct exposure to student perspectives they would not encounter through formal channels (Gündüz & Aksit, 2018). Older adults in the community partnership developed digital literacy skills through patient guidance from student mentors (Juris et al., 2022). All four studies emphasized bidirectional learning—both parties gained rather than knowledge flowing in only one direction.

Other sectors showed similar patterns. Technology firms reported mutual learning around digital tools and organizational context (Chen, 2013; Li et al., 2025). Manufacturing studies documented knowledge exchange

between generations of engineers (Gupta et al., 2024; Lužar et al., 2023). Learning appears to be the foundational outcome that reverse mentoring reliably produces regardless of setting.

4.6. Alignment Outcomes (O-A)

Alignment—improved cross-level communication and understanding—was reported in all four higher education studies, matching the learning outcome in prevalence. The Maltepe University case demonstrated how student-president mentoring reduced informational distance between students and top leadership (Gündüz & Aksit, 2018). Rather than relying on filtered reports through administrative layers, the president received direct student input on institutional priorities. This created feedback loops that became embedded in governance routines. Similarly, the intergenerational program built social connections that reduced isolation among older adults while helping students understand community needs (Juris et al., 2022).

In technology and manufacturing, alignment took different forms. Chen (2013) reported improved coordination between junior and senior engineers working on shared projects. Manufacturing studies showed how reverse mentoring facilitated knowledge integration across organizational levels, with younger staff helping translate new technologies for experienced colleagues and vice versa (Gupta et al., 2024; Lužar et al., 2023). The hospitality study connected alignment to vertical communication channels and shadow committee participation (Cismaru & Iunius, 2020).

4.7. Innovation Outcomes (O-I)

Innovation outcomes showed the starkest sectoral difference. None of the four higher education studies reported explicit innovation outcomes (O-I = 0%), while technology, manufacturing, hospitality, and SMEs all documented innovation at 100%. This finding requires interpretation rather than concern. Higher education studies focused on learning and governance goals—developing student capabilities, informing leadership decisions, building community connections—rather than commercial innovation or process improvement. The absence of reported innovation does not mean reverse mentoring fails in universities; it reflects different institutional priorities and outcome definitions.

In contrast, corporate and SME contexts explicitly linked reverse mentoring to innovation. Li et al. (2025) used a two-wave survey to demonstrate that reverse mentoring predicted innovative behavior among technology employees, with learning engagement serving as a mediating mechanism. Manufacturing studies connected the practice to digital transformation and process optimization (Gupta et al., 2024). The SME pilot documented small-scale innovations in workflow and customer engagement (Schwartz et al., 2022).

4.8. Cross-Sector Insights for Higher Education

The outcome comparison suggests that higher education excels at what it prioritizes—learning and relational alignment—but may underexplore reverse mentoring's innovation potential. Several insights emerge from other sectors. From technology, the Li et al. (2025) study offers a methodological lesson: innovation outcomes can be measured through surveys tracking creative behavior and idea generation. Universities could adapt such instruments to assess whether reverse mentoring stimulates teaching innovation, curricular creativity, or novel governance approaches. The finding that learning engagement mediates innovation suggests universities should design programs that maximize active participation rather than passive information exchange.

From manufacturing, the connection between reverse mentoring and strategic transformation (Gupta et al., 2024) suggests universities might frame the practice as supporting institutional change initiatives. When reverse mentoring aligns with goals like digital pedagogy or student experience improvement, innovation outcomes become more visible and measurable. From hospitality, the shadow committee model (Cismaru & Iunius, 2020) shows how junior voice can inform operational decisions. Universities might examine whether student mentors' insights lead to tangible changes in policies, services, or practices—a form of innovation that current studies may capture under alignment rather than innovation.

The pattern across outcomes appears consistent with the developmental sequence proposed in the conceptual framework: learning forms the foundation, alignment builds upon learning through improved relationships, and innovation may emerge when learning and alignment become embedded in organizational routines. However, this interpretation requires qualification. Only Li et al. (2025) employed a longitudinal design capable of establishing temporal sequencing; the remaining nine studies used cross-sectional approaches that document outcome presence but cannot confirm causal ordering. Alternative sequences remain possible—for instance, external pressure might trigger innovation attempts that subsequently drive learning, or strong alignment might enable rapid progression from learning to innovation. The L→A→I sequence should therefore be understood as a theoretical proposition consistent with the evidence rather than an empirically validated pathway. Higher education demonstrates learning and alignment clearly; the innovation stage may require longer timeframes, different measurement approaches, or more deliberate attention to document.

Table 11 summarizes the cross-study evidence patterns for contextual enablers and outcomes, with exemplar evidence from included studies demonstrating how codes were derived from primary texts.

Table 11. Evidence Patterns with Exemplar Quotations

Theme	Prevalence	Exemplar Evidence	Source
Contextual Enablers			
A1: Governance sponsorship	10/10 (100%)	“The president’s direct involvement in the mentoring program signaled institutional commitment and legitimized student mentors in their advisory roles.”	Gündüz & Akşit (2018)
A2: Open culture	10/10 (100%)	“Psychological safety was deliberately cultivated through orientation sessions where administrators expressed genuine openness to student feedback.”	Çevik et al. (2025)
B1: Dedicated resources	7/10 (70%)	“The Teaching and Learning Center allocated staff time, developed training materials, and provided a learning management system platform for mentor-mentee communication.”	Çevik et al. (2025)
B2: Structured routines	10/10 (100%)	“Mentoring sessions followed a semester-based cycle with biweekly meetings, mid-term check-ins, and end-of-term reflection assignments.”	Raymond et al. (2021)
C1: External pressures	7/10 (70%)	“The digital transformation mandate from headquarters created urgency for senior engineers to acquire new competencies from younger colleagues.”	Gupta et al. (2024)
C2: Evaluation mechanisms	8/10 (80%)	“Pre-post surveys measured changes in digital literacy, reflective journals captured qualitative learning, and completion reports documented program outcomes.”	Juris et al. (2022)
Outcomes			
O-L: Learning	10/10 (100%)	“Student mentors reported significant growth in communication skills, organizational awareness, and professional confidence through the mentoring experience.”	Raymond et al. (2021)
O-A: Alignment	9/10 (90%)	“The program reduced informational distance between students and leadership; administrators reported gaining direct insight into student perspectives they would not encounter through formal reporting channels.”	Gündüz & Akşit (2018)
O-I: Innovation	6/10 (60%)	“Reverse mentoring predicted employees’ innovative behavior, with continuous learning serving as the mediating mechanism between mentoring participation and innovation outcomes.”	Li et al. (2025)

Note: Quotations are paraphrased from original studies to illustrate coding decisions. Full coding dictionary with operational definitions is provided in Appendix B.

5. Discussion

5.1. Theoretical Contributions

The central theoretical contribution of this review lies in demonstrating how four previously separate theoretical perspectives operate as a sequential mechanism. This review validates and refines the conceptual framework proposed in the Literature Review while contributing specifically to understanding reverse

mentoring in higher education contexts. The thematic synthesis elaborated the initial broad categories of “governance, culture, and resources” into six operational factors: governance and culture (A1–A2), resources and structure (B1–B2), and external pressures and evaluation (C1–C2). This specification aligns with Ghosh and Reio’s (2013) argument that mentoring success depends on alignment across multiple organizational layers rather than isolated elements. Importantly, the factors showed differential salience across sectors—higher education demonstrated strength in governance, culture, structure, and evaluation, while corporate settings relied more heavily on external competitive pressures (Garg et al., 2021). The finding challenges the implicit assumption in early reverse mentoring literature that a single implementation model applies across contexts (Marcinkus Murphy, 2012), suggesting instead that effective implementation requires calibration to sector-specific profiles.

The outcome analysis revealed three distinct dimensions—learning, alignment, and innovation—that appear consistent with a developmental sequence. The proposed progression parallels Crossan et al.’s (1999) 4I framework, where individual intuiting and interpreting aggregate into group-level integration before achieving institutional change. However, our finding that higher education achieved strong learning and alignment but no documented innovation contrasts with corporate studies reporting innovation as a primary outcome (Li et al., 2025; Garg et al., 2021). This divergence may reflect measurement differences rather than actual outcome absence, or it may indicate that university programs have not yet achieved the institutionalization that organizational learning theory suggests requires sustained effort over extended timeframes (Argote & Miron-Spektor, 2011). This L→A→I sequence represents a theoretically grounded proposition rather than an empirically confirmed pathway. With only one longitudinal study (Li et al., 2025) in the corpus, cross-sectional evidence can demonstrate co-occurrence but not temporal ordering. Future research employing multi-wave designs is needed to test whether outcomes unfold sequentially as theorized.

The literature review presented Social Exchange (Chaudhuri & Ghosh, 2012), Social Learning (Bandura, 1977), Organizational Learning (Argyris & Schön, 1978), and Dynamic Capabilities (Teece, 2007) as separate theoretical lenses. The synthesis reveals how they operate as interconnected mechanisms: governance creates exchange conditions motivating participation (Chaudhuri & Ghosh, 2012); psychological safety enables observational learning (Bandura, 1977); training and evaluation convert individual insights into organizational knowledge (Argyris & Schön, 1978); and institutionalization generates renewal capabilities (Teece, 2007). This integration addresses Chaudhuri et al.’s (2022) critique that reverse mentoring research invokes theories selectively without articulating connections. The contribution lies not in identifying these perspectives but in tracing their sequential activation within a unified process model.

Beyond framework refinement, the review contributes higher education-specific understanding. The four adoption patterns identified—governance-oriented, training-centred, curriculum-embedded, and community-partnered—extend Marcinkus Murphy’s (2012) general framework to university contexts. The finding that students serve as “insider-outsiders” (Chun & Evans, 2021) resonates with Matthews and Dollinger’s (2023) argument that student voice mechanisms derive power from this dual positioning. However, unlike their focus on formal representation, reverse mentoring offers a complementary informal channel that may reach perspectives formal structures miss.

5.2. Cross-Sector Insights

The comparative analysis reveals complementary strengths across sectors, offering opportunities for mutual learning while also highlighting gaps in current understanding. Technology and manufacturing firms consistently documented innovation outcomes absent from higher education studies. Li et al. (2025) employed two-wave surveys with validated scales; Gupta et al. (2024) connected programs to digital transformation metrics. University studies captured learning through reflective journals without tracking whether insights translated into changed practices. This pattern echoes Chaudhuri et al.’s (2022) observation that reverse mentoring research privileges proximate indicators over distal organizational impacts. Universities might adapt corporate measurement approaches while retaining qualitative richness (Geller et al., 2025). More fundamentally, manufacturing firms’ strategic alignment of reverse mentoring—connecting it to transformation agendas rather than treating it as a standalone initiative—offers a sustainability model that prior higher education literature has not emphasized (Garg & Singh, 2020).

The SME study's "borrowed governance" model—using federation coordination to compensate for limited internal capacity (Schwartz et al., 2022)—suggests possibilities for resource-constrained institutions. This finding extends Joseph and Fazaeli's (2023) community-embedded mentoring concept to inter-organizational collaboration. Regional university consortia could share training and evaluation resources, democratizing access beyond well-resourced research universities.

Conversely, higher education's systematic evaluation culture produced stronger evidence bases than other sectors, where assessment remained informal. This advantage has gone largely unrecognized in cross-sector mentoring literature, which typically positions universities as learners from corporate practice (Ragins & Verbos, 2017). The academic calendar's structured rhythms similarly offer a transferable model for organizations lacking natural program cycles (O'Connor et al., 2025). Taken together, the findings suggest that knowledge transfer in reverse mentoring implementation should flow bidirectionally rather than assuming corporate superiority.

5.3. Interpreting the Innovation Gap in Higher Education

The most striking sectoral divergence concerns innovation outcomes: all six non-higher education studies reported innovation (100%), while none of the four higher education studies did (0%). This pattern warrants systematic examination through four complementary lenses.

1. *Measurement explanation.* Higher education studies primarily measured pedagogical and developmental outcomes—mentor skill growth, faculty digital competence, intergenerational understanding—rather than organizational innovation indicators. In contrast, Li et al. (2025) explicitly operationalized innovative behavior using validated scales. If higher education researchers had employed similar instruments, innovation outcomes might have been detected. Recent scholarship confirms that innovation measurement in universities requires sector-specific indicators beyond those developed for corporate contexts (Fernández et al., 2023).
2. *Timeframe explanation.* The higher education studies examined programs spanning single semesters, while corporate initiatives extended across multiple years. Institutional change in universities—characterized by shared governance and tenure systems—requires longer gestation periods than captured here. What appears as absence may reflect truncated observation windows (Alzahmi et al., 2025).
3. *Conceptual explanation.* In higher education, learning and alignment may constitute valued outcomes rather than precursors to innovation. When administrators gain unfiltered student perspectives (Gündüz & Akşit, 2018) or faculty develop digital competencies (Çevik et al., 2025), these directly serve institutional missions. The concept of "innovation" borrowed from corporate contexts may not translate directly to educational settings where relationship strengthening is a primary goal.
4. *Structural explanation.* Universities as professional bureaucracies differ fundamentally from corporate hierarchies (Mintzberg, 2024). Faculty autonomy and collegial governance mean insights from reverse mentoring must navigate multiple approval processes before becoming institutionalized. The pathway from learning to innovation may be longer and more indirect, requiring sustained effort across multiple program cycles (Kallio et al., 2020).

These explanations are not mutually exclusive. The finding should not be interpreted as evidence that reverse mentoring fails to produce innovation in higher education. Rather, it suggests future studies should employ innovation-specific measures, extend observation periods, adapt innovation concepts for educational contexts, and account for structural features that may delay but not prevent institutional change.

5.4. Practical Implications for Higher Education

Drawing on the findings, Box 1 synthesizes evidence-based guidance for university leaders. Each recommendation is tagged with an evidence strength indicator reflecting the consistency and directness of empirical support. University leaders should prioritize strongly supported elements while treating moderately supported recommendations as adaptable to local contexts.

Table 12. Implementing Reverse Mentoring in Higher Education - A Six-Step Guide

Step	Action	Evidence-Based Specifications	Evidence Strength
1. Establish Governance	Secure visible senior sponsorship; designate coordinating unit (TLC, Student Affairs, or governance office)	Presidential or provost-level endorsement documented in 100% of successful HE cases (Gündüz & Akşit, 2018; Çevik et al., 2025)	★★★ Strong
2. Design Pairing	Match based on complementary expertise; maintain 1:1 or 1:2 mentor-to-mentee ratios	Technology-based matching (Çevik et al., 2025) or strategic topic alignment (Raymond et al., 2021); larger ratios risk dilution	★★☆ Moderate
3. Train Mentors	Provide 4–8 hours pre-program orientation covering communication, boundaries, and institutional context	Structured training correlated with higher mentee satisfaction (Çevik et al., 2025); content should address power dynamics (Resch, 2023)	★★★ Strong
4. Structure Interaction	Align with semester (8–12 weeks); schedule biweekly 45–60-minute sessions; define discussion protocols	Academic calendar alignment reported across all HE studies; excessive flexibility reduces engagement	★★★ Strong
5. Evaluate Systematically	Deploy pre-post surveys + reflective journals; conduct mid-cycle check-ins; track completion rates	Multi-method evaluation standard in HE contexts (100% of studies); single-method approaches miss process insights	★★★ Strong
6. Institutionalize	Document procedures; train successive cohorts; connect to strategic priorities; report to governance bodies	Strategic alignment with institutional goals predicts sustainability (Gupta et al., 2024); isolated pilots rarely persist	★★☆ Moderate

Evidence strength key:

- ★★★ Strong = Consistent finding across 3+ studies with direct empirical support
- ★★☆ Moderate = Supported by 1–2 studies or inferred from cross-sector evidence
- ★★☆ Emerging = Theoretically grounded but limited empirical validation

5.5. Policy Implications

Beyond institutional implementation, the findings carry implications for higher education policy. First, quality assurance frameworks increasingly emphasize student engagement; reverse mentoring offers a mechanism that moves beyond consultation toward genuine partnership in governance (Matthews & Dollinger, 2023). Accreditation bodies and ministries might recognize structured reverse mentoring as evidence of meaningful student voice, incentivizing adoption. Second, the consortium model documented in SME contexts (Schwartz et al., 2022) suggests policy opportunities for regional coordination. Higher education authorities could facilitate shared training resources and evaluation instruments across institutions, reducing barriers for smaller universities lacking teaching and learning centers. Third, the innovation gap identified in this review points toward a research policy priority: funding agencies should encourage longitudinal studies tracking whether reverse mentoring contributes to institutional innovation over multi-year timeframes. Such investment would address the methodological limitations constraining current understanding while generating actionable evidence for practice (Palma et al., 2023).

5.6. Limitations and Future Research Directions

Several constraints shape interpretation of these findings and suggest research priorities. The review included only ten studies, with four higher education cases concentrated in Turkey and the United States. This geographic limitation is notable given evidence that mentoring practices vary significantly across cultural contexts (Ragins & Kram, 2007). The Asia-Pacific region, despite its large higher education sector, contributed no studies. Future research should examine whether adoption patterns and outcome sequences hold across different governance traditions and institutional cultures, or whether alternative configurations emerge in Confucian, South Asian, or other educational contexts.

The open-access filter applied during screening introduced additional limitations. As documented in Table 4, approximately 12 relevant empirical studies published in subscription journals could not be accessed for full-text review. These include quantitative research from India examining reverse mentoring's effects on innovation and turnover (Garg et al., 2021; Upadhyay & Singh, 2024), qualitative studies from Poland on intergenerational relationships (Gadomska-Lila, 2020), and a higher education case study from the UK on student-leadership mentoring (O'Connor et al., 2025). The paywalled studies are concentrated in European management journals and quantitative research designs, suggesting our findings may under-represent these perspectives. The cross-sector comparison particularly may not reflect typical corporate practice, as premier management journals such as *Human Resource Management* and *Career Development International* rarely offer immediate open-access options.

The methodological profile—seven qualitative cases, two cross-sectional surveys, one longitudinal study—limits causal inference. The learning–alignment–innovation sequence represents a theoretical proposition supported by cross-sectional patterns but not yet validated through longitudinal evidence. Only Li et al. (2025) employed a multi-wave design; the remaining studies cannot establish whether learning precedes alignment or whether alignment precedes innovation. Alternative temporal orderings—such as innovation attempts driving subsequent learning, or simultaneous rather than sequential emergence—cannot be ruled out with current evidence.

6. Conclusion

This systematic review synthesized ten empirical studies on reverse mentoring to examine how this practice is adopted, implemented, and linked to outcomes in higher education. By positioning four university-based studies as the primary analytical focus and six studies from other sectors as comparative reference, the review offers both a focused understanding of higher education contexts and cross-sector insights that enrich practical guidance.

The analysis reveals that universities approach reverse mentoring in ways shaped by their institutional character. Four distinct adoption patterns emerged—governance-oriented, training-centred, curriculum-embedded, and community-partnered—yet all shared reliance on existing infrastructure, academic calendars, and evaluation traditions that distinguish higher education from corporate settings. Students occupy a particularly valuable position as institutional insiders who nonetheless bring outsider perspectives, creating a tension that employee-to-employee mentoring cannot replicate.

Six contextual enablers—governance, culture, resources, structure, external pressures, and evaluation—together shape whether reverse mentoring takes root and endures, with universities demonstrating strength in most factors but relative weakness in external pressure drivers compared to corporate sectors where competitive imperatives create urgency. Outcomes followed a developmental pattern: learning appeared consistently across all higher education studies, alignment built upon learning foundations in most cases, while innovation outcomes remained largely undocumented in university research despite their prominence in corporate contexts—a gap that may reflect measurement differences, shorter study timeframes, or genuine distinctions in how universities pursue organizational change. Cross-sector comparison proved illuminating in both directions: technology firms' quantitative outcome tracking, manufacturing organizations' strategic alignment with transformation agendas, and SME consortium resource-sharing each offer models universities might adapt, while higher education's systematic evaluation culture and structured temporal rhythms represent transferable assets that corporate implementations often lack.

For university leaders, the findings suggest treating reverse mentoring as a strategic mechanism for institutional learning and participatory governance rather than a peripheral experiment. Teaching and learning centres emerge as natural governance anchors for such initiatives, offering coordination capacity, training expertise, and evaluation infrastructure. Regional consortia may enable resource-constrained institutions to participate through shared investment, and student shadow boards may strengthen governance feedback beyond traditional representative structures. The review's limitations—a small sample concentrated in Turkey and the United States, predominance of qualitative designs limiting causal inference, and absence of longitudinal tracking—point toward priorities for future research. Empirical studies from underrepresented regions, particularly the Asia-Pacific, would test whether identified patterns generalize across institutional cultures; longitudinal mixed-methods designs tracking participants over multiple academic years would strengthen

confidence in the learning–alignment–innovation pathway. Whether and how reverse mentoring translates into broader institutional transformation remains a question warranting sustained attention from both researchers and practitioners.

7. Ethics Statement

This systematic review synthesized published empirical studies and did not involve primary data collection from human subjects. Therefore, no ethical approval was required.

8. Data Availability Statement

The quality appraisal scores are presented in Appendix A. The coding dictionary with operational definitions, inclusion criteria, and decision rules is provided in Appendix B. The complete data extraction matrix showing all included studies with full citations, country, sector, research design, sample, main findings, enabler codes (A1–C2), outcome codes (O-L/O-A/O-I), and CCAT scores is available as Supplementary Material. The NVivo codebook export is available from the corresponding author upon reasonable request.

9. Declaration

The authors acknowledge the use of artificial intelligence tools (ChatGPT, OpenAI) to assist with language editing and clarity improvement during the preparation of this manuscript. The AI tool was not used for data analysis, interpretation of results, or generation of substantive scientific content. All final decisions regarding the content remain the responsibility of the authors.

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Appendix A: CCAT Quality Appraisal Scores

Study	Sector	Prel.	Intro.	Design	Sampling	Data	Ethics	Results	Disc.	Total (/40)
Gündüz & Akşit (2018)	HE	4	4	4	3	4	3	4	4	30
Çevik et al. (2025)	HE	5	4	4	4	5	4	4	4	34
Raymond et al. (2021)	HE	4	4	3	3	4	3	4	4	29
Juris et al. (2022)	HE	4	4	4	4	4	4	4	4	32
Chen (2013)	Tech	4	4	4	3	4	3	4	4	30
Li et al. (2025)	Tech	5	5	5	5	5	4	5	5	39
Gupta et al. (2024)	Mfg	4	5	4	4	4	4	5	4	34
Lužar et al. (2023)	Mfg	4	4	4	4	4	3	4	4	31
Cismaru & Iunius (2020)	Hosp	4	4	4	3	4	3	4	4	30
Schwartz et al. (2022)	SME	4	4	4	4	4	3	4	4	31

Note: HE (Higher Education), Tech (Technology Enterprises), Mfg (Large Manufacturing), Hosp (Hospitality & Services), SME (Small Medium-sized Enterprises)

Appendix B: Coding Dictionary

This appendix provides the operational definitions and coding rules used in the thematic synthesis. The coding framework comprises six contextual enablers (Table B1) and three outcome themes (Table B2), with decision rules specified in Table B3.

Table B1. Contextual Enablers – Operational Definitions and Coding Rules

Code	Definition	Inclusion Criteria	Example Evidence
A1-Governance	Formal leadership support, institutional arrangements, and authority allocation for RM programs	Explicit mention of senior sponsorship, policy backing, designated coordinating unit, or resource commitment from leadership	"The president directly endorsed the program"; "TLC serves as the coordinating unit"
A2-Culture	Organizational climate characterized by openness, psychological safety, and intergenerational respect	References to trust-building, openness to feedback from junior members, reduced hierarchy, or deliberate cultivation of safe dialogue	"Faculty felt comfortable receiving guidance from students"; "Open communication was encouraged"
B1-Resources	Dedicated investments including training programs, technology platforms, time allocation, and funding	Mention of budget allocation, training modules, learning management systems, or protected time for participation	"A 5-week online training course was developed"; "Funding was provided by the federation"
B2-Structure	Operational design elements including pairing mechanisms, interaction protocols, and program timelines	Description of matching criteria, meeting schedules, program duration, or structured interaction frameworks	"Mentors met with faculty biweekly for 8 weeks"; "Pairs were matched based on technology needs"

C1-External	Environmental pressures including policy mandates, competitive forces, and social mission imperatives	References to external mandates, industry competition, accreditation requirements, or community partnership obligations	"The program addressed regional aging policy goals"; "Digital transformation pressure drove adoption"
C2-Evaluation	Assessment mechanisms including measurement tools, feedback systems, and continuous improvement processes	Mention of surveys, interviews, reflection journals, outcome tracking, or program refinement based on data	"Pre-post questionnaires measured skill development"; "Feedback was used for program improvement"

Table B2. Outcome Themes – Operational Definitions and Coding Rules

Code	Definition	Strength Criteria	Example Evidence
O-L Learning	Individual and group-level knowledge acquisition, skill development, and perspective transformation	Strong: Multiple learning types (cognitive, behavioral, attitudinal) documented Moderate: Single learning type reported Weak: Learning implied but not explicitly measured	"Mentors reported improved communication skills"; "Faculty gained digital literacy"
O-A Alignment	Enhanced cross-level communication, improved coordination, and strengthened intergenerational relationships	Strong: Documented behavioral changes in communication patterns Moderate: Attitudinal improvements reported Weak: Relationship benefits implied only	"Information distance between students and leadership decreased"; "Cross-generational dialogue became routine"
O-I Innovation	Organizational-level process improvements, institutional changes, and creative outputs attributed to RM	Strong: Documented organizational or process changes Moderate: Individual innovative behaviors reported Weak: Innovation potential noted but not measured	"New teaching methods were adopted"; "Governance procedures were modified based on student input"

Table B3. Coding Decision Rules

Code	Decision Rule
Y (Yes)	Explicit evidence present in the study text; factor or outcome is directly described or measured
Partial	Indirect evidence or implied presence; factor mentioned but not central to study design or findings
N (No)	Not mentioned in the study or explicitly reported as absent