

Work Engagement Research among Higher Education Teachers (2010– 2025): A CiteSpace Bibliometric Analysis

Jiang Dongyan^{1,2}, Hamidah Mohamad¹

¹Universiti Tun Abdul Razak (UNIRAZAK), Malaysia

²Jilin Engineering Normal University, China

DOI: <https://doi.org/10.47772/IJRISS.2026.10100546>

Received: 29 January 2025; Accepted: 06 February 2026; Published: 17 February 2026

ABSTRACT

This study maps the thematic evolution and emerging research frontiers of work engagement among higher education teachers (2010–2025) using bibliometric knowledge mapping. Based on 327 articles and reviews retrieved from the Web of Science Core Collection, CiteSpace was used to analyze institutional collaboration and keyword co-occurrence, and to perform clustering, burst detection, and timeline visualization. The results indicate rapid publication growth over the past decade, reflecting sustained scholarly interest in engagement in higher education. However, institutional contributions remain widely distributed but weakly consolidated: many institutions publish only once, and a substantial proportion are isolated, pointing to fragmented and short-lived collaboration networks. Keyword and cluster patterns converge on an engagement–work context– outcomes structure linking work engagement with job demands and resources, burnout and well-being, job satisfaction, performance, and turnover-related outcomes. Burst and timeline analyses further suggest a shift from early emphasis on individual and contextual antecedents toward mechanism-oriented and relational/identity perspectives, alongside growing attention to sustainable academic work and organizational support. Overall, the field would benefit from stronger cross-institutional collaboration, clearer construct boundaries (work versus job/employee engagement), and integrative theorizing (e.g., JD–R, self-determination, and social identity) to enable more comparable operationalizations and actionable interventions in higher education.

Keywords: Work engagement; Higher education teachers; Bibliometric analysis; CiteSpace; Knowledge mapping

INTRODUCTION

Work engagement has become central to understanding how higher education teachers sustain professional vitality and effectiveness under intensified accountability, managerial reforms, and rapidly changing pedagogical practices. Academics are expected to deliver high-quality teaching, maintain research productivity, and fulfil service obligations while adapting to digitalised instruction and expanding administrative requirements. These pressures broaden role boundaries and raise concerns about well-being, retention, and long-term career sustainability, making work engagement a key construct for explaining sustained energy, dedication, and involvement at work.

However, evidence on higher education teachers' work engagement remains fragmented across disciplines and outlets and is characterised by terminological and contextual diversity (e.g., work/job/employee engagement; research-intensive vs. teaching-oriented vs. vocational/TVET institutions), which complicates cumulative synthesis and makes it difficult to identify the field's core themes and emerging directions. To address this gap, this study maps the intellectual structure and thematic evolution of work engagement research among higher education teachers from 2010 to 2025 using a Web of Science Core Collection corpus ($n = 327$) and CiteSpace-based science mapping. Specifically, we examine publication growth, institutional contribution and collaboration patterns, and keyword-based hotspots, clusters, bursts, and timelines. By providing an explicit longitudinal overview of how topics and emphases develop over time, the study helps clarify where the field is concentrated, where it is diverging, and which themes are gaining momentum for future agenda-setting in higher education teacher research.

Research Questions

This study addressed the following research questions:

RQ1. What is the publication trend of research on work engagement among higher education teachers (2010–2025)?

RQ2. Which institutions are the main contributors, and what collaboration patterns do the institutional indicators suggest?

RQ3. What research hotspots, thematic clusters, and emerging trends are identified through keyword co-occurrence, clustering, burst detection, and timeline analyses?

LITERATURE REVIEW

This section anchors the focal construct and population boundary for work engagement in higher education teaching, summarizes what prior reviews and mappings have covered, and identifies the remaining gap that motivates a longitudinal science-mapping analysis.

Conceptualization and Scope Normalization

Work engagement is most commonly defined as a positive, fulfilling work-related state characterized by vigor, dedication, and absorption, and is typically operationalized via the Utrecht Work Engagement Scale (UWES) (Schaufeli et al., 2006). In contrast, labels such as job engagement or employee engagement are sometimes used to denote overlapping but not fully equivalent foci and may blur conceptual boundaries if treated interchangeably (Macey & Schneider, 2008; Saks, 2006). Accordingly, this study adopts work engagement as the focal construct and retains records only when engagement is explicitly work-related and the target population is higher education teachers/faculty/academic staff; job/employee engagement terms are treated as search-inclusive but scope-controlled synonyms to maximize retrieval sensitivity while limiting construct drift and improving longitudinal comparability (Mazzetti et al., 2023).

Existing Reviews and Bibliometric Mappings

Prior reviews and bibliometric studies have advanced engagement scholarship broadly, but most synthesize heterogeneous occupational populations or concentrate on sector-specific corpora outside higher education teaching. For instance, mappings of employee/work engagement often operate at an aggregate workforce level or within management- and industry-focused domains (Han et al., 2023; Kişi, 2023; Santosa et al., 2025; Zhang et al., 2025). Within education, “engagement” mappings frequently emphasize student/classroom engagement rather than isolating faculty work engagement, making population boundaries difficult to interpret when the term is used as an umbrella construct (Loyola-Carrillo et al., 2025). As a result, the knowledge structure, collaboration patterns, and thematic evolution of work engagement research specifically among higher education teachers remain insufficiently mapped longitudinally.

Rationale for Using CiteSpace

This study requires time-sliced science mapping to track thematic evolution, identify bursts, and visualize timeline-based frontiers; therefore, CiteSpace was selected because it directly supports time slicing, burst detection, and timeline views for longitudinal knowledge-domain analysis (Chen, 2006). Other tools (e.g., VOSviewer for visualization; Bibliometrix for integrated performance/science-mapping workflows) are valuable complements, but CiteSpace aligns most closely with the study’s temporal and frontier-identification objectives (Aria & Cuccurullo, 2017; van Eck & Waltman, 2010).

METHOD

This study used the Web of Science Core Collection (WoSCC) as the sole data source because its standardized bibliographic fields (e.g., affiliations, keywords, and cited references) support robust science mapping. A Topic

Search (TS) was conducted using a Boolean query with three concept blocks—(a) engagement constructs, (b) higher education teacher populations, and (c) higher education contexts. The full search string, filters (2010–2025; English; article and review article), and export settings are reported in Table 1. The search yielded 366 records. Records were then screened in two stages (title/abstract followed by full text) in line with transparent reporting principles (Page et al., 2021). Studies were retained only when they examined work-related engagement and focused on higher education teachers/faculty/academic staff; studies primarily addressing student engagement or non-higher education populations were excluded. After screening, 327 publications comprised the final corpus for subsequent bibliometric and science-mapping analyses. Table 1 Summary of data source and selection

Category	Specific standard requirements
Research database	Web of Science Core Collection
Search period	January 2010 to December 2025
Language	English
Search query	TS=((("work engagement" OR "job engagement" OR "employee engagement")AND (teacher* OR lecturer* OR faculty OR professor* OR "academic staff")AND ("higher education" OR universit* OR college* OR "tertiary education" OR "postsecondary education" OR "vocational education" OR TVET OR "vocational college*")))
Document types	Articles, Review articles
Data extraction	Export with full records and cited references in plain text format
Records retrieved	366 (Before manual screening)

RESULTS

This section presents the main bibliometric findings and knowledge maps derived from WoSCC using CiteSpace. The results describe field growth, institutional collaboration, and the evolution of keyword-based themes over time.

Temporal Distribution and Annual Publication Trends

Annual publication output is commonly used as a proxy indicator of a field’s developmental trajectory and the degree of scholarly attention it attracts over time. Figure 1 shows a pronounced upward trajectory in publications on work engagement among higher education teachers from 2010 to 2025, with growth concentrated in the most recent decade.

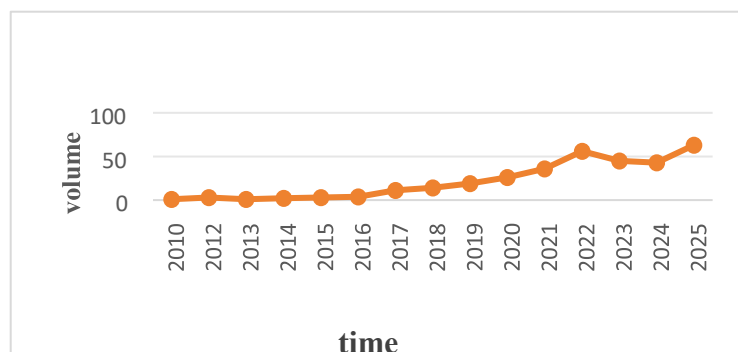


Figure 1. Annual publications on work engagement among higher education teachers (2010–2025).

Output remained low during 2010–2016 (approximately 1–4 papers per year; 14 publications in total), indicating an early exploratory phase. Publication activity then accelerated in 2017–2020, rising from 11 papers in 2017 to 26 in 2020 (70 publications overall). The period 2021–2025 reflects rapid expansion with short-term volatility: publications increased to 36 in 2021, peaked at 56 in 2022, declined modestly in 2023–2024 (45 and 43), and

reached a new high in 2025 (63). Overall, 2017–2025 accounts for 313 publications (95.7% of the corpus), suggesting that the field’s substantive consolidation and agenda expansion have occurred primarily in the last decade.

Institutional Contribution Analysis

Institutional output in this field is highly dispersed, with contributions distributed across a large number of organisations and a clear long-tail pattern in which most institutions appear only once in the corpus. A small set of institutions contributes multiple publications, led by Universiti Sains Malaysia, North West University (South Africa), and The Chinese University of Hong Kong, followed by a second tier of repeat contributors (Table 2).

Table 2. Top contributing institutions in the institutional node table

Rank	Institution	Freq	Degree
1	Universiti Sains Malaysia	8	12
2	North West University (South Africa)	6	12
3	The Chinese University of Hong Kong	5	7
4	Universiti Malaysia Kelantan	4	11
5	Universiti Utara Malaysia	4	8
6	University of Namibia	4	3
7	Henan University	4	3
Rank	Institution	Freq	Degree
8	Shandong University	4	2
9	Universiti Malaya	4	2
10	Covenant University	4	0

Note. Freq indicates the occurrence frequency of an institution in the affiliation field as processed by CiteSpace. Degree represents the number of collaboration ties connected to the institutional node. Non-academic entities inadvertently captured in the affiliation/organization fields were removed prior to institutional analysis.

From a collaboration perspective, inter-institutional ties are generally limited: a substantial subset of institutions shows no recorded collaboration links in the exported network, whereas the leading contributors also occupy the most connected positions (Table 2). Overall, the institutional evidence points to broad participation but weak consolidation into sustained cross-institution research communities, indicating scope for stronger and more durable collaborative programmes in future work.

Keyword Co-occurrence Analysis

Using the screened WoSCC corpus for 2010–2025, a keyword co-occurrence network was generated in CiteSpace (Table 3). In line with common CiteSpace visual conventions, node size reflects keyword occurrence frequency, links indicate co-occurrence relationships, node colours encode the temporal distribution of keywords, and nodes with a purple rim typically denote relatively high betweenness centrality (often ≥ 0.10), suggesting a potential bridging role between thematic areas.

Table 3. Top keywords by frequency and betweenness centrality in the keyword co-occurrence network (2010–2025)

Rank	Top keywords by frequency	Freq	Top keywords by centrality	Centrality
1	work engagement	191	engagement	0.30
2	employee engagement	82	performance	0.19

3	performance	68	job satisfaction	0.16
4	higher education	64	higher education	0.15
5	burnout	64	employee engagement	0.14
6	job satisfaction	55	turnover intention	0.13
7	satisfaction	49	outcome	0.12
8	resources	48	work engagement	0.11
9	model	46	job demands	0.11
10	impact	44	perceptions	0.11

Note. Freq and betweenness centrality are derived from the CiteSpace-exported keyword node table.

Table 3 summarizes the most prominent keywords from two complementary perspectives: (a) high-frequency keywords that delineate the substantive core of the field, and (b) high-centrality keywords that occupy structurally important positions in the co-occurrence network. High-frequency results show that research on work engagement among higher education teachers concentrates on the focal construct itself (*work engagement*, 191) and closely related engagement terminology (*employee engagement*, 82), alongside outcomes and correlates such as *performance* (68) and *job satisfaction* (55). Meanwhile, the frequent appearance of *higher education* (64), *burnout* (64) and *resources* (48) indicates that the literature commonly situates engagement within the higher-education work context and examines it together with job stressors/resources and well-being or effectiveness-related outcomes.

Betweenness centrality offers a different lens by highlighting keywords that connect otherwise separate topical clusters; in many bibliometric studies, keywords with centrality above 0.10 are treated as structurally salient nodes that can signal important integrative themes or potential “hotspots.”

In this dataset, *engagement* exhibits the highest centrality (0.30), followed by *performance* (0.19), *job satisfaction* (0.16), *higher education* (0.15), and *employee engagement* (0.14). This pattern suggests that the field is organized around an engagement–outcome nexus, with performance and satisfaction functioning as major connective foci that link motivational/attitudinal discussions to applied questions about effectiveness in higher education. Notably, frequency and centrality are not fully aligned: some keywords (e.g., *turnover intention*, centrality = 0.13) appear less often but play a comparatively strong bridging role, implying that retention-related outcomes may connect multiple research threads (e.g., engagement, satisfaction, motivation, and institutional contexts) rather than forming a single isolated topic.

Keyword Clustering Analysis

Based on the keyword co-occurrence network, CiteSpace was used to conduct keyword clustering to identify the major thematic structures in the literature. As shown in Figure 2, the network includes $N = 356$ nodes and $E = 685$ links (Density = 0.0108). The clustering results show Modularity $Q = 0.5477$ and Weighted Mean Silhouette $S = 0.8442$, indicating a clear and reliable clustering structure.

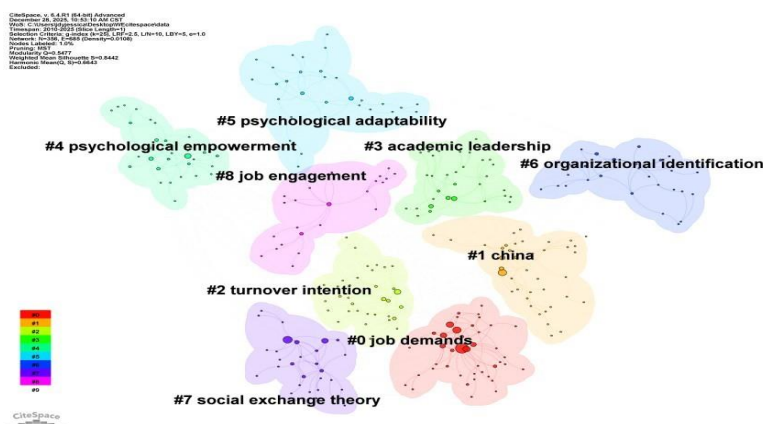


Figure 2. Keyword Clustering Map of Work Engagement Research among Higher Education Teachers (2010–2025).

Figure 2 displays nine labelled clusters (#0–#8). Overall, the clusters suggest that research on work engagement among higher education teachers is organised around three core thematic pillars:

First, work-related antecedents (JD–R-related themes): The largest cluster, #0 job demands, highlights the centrality of demand-related factors (e.g., workload and stressors) in explaining engagement in higher education work contexts.

Second, mechanisms and organizational processes: Clusters such as #4 psychological empowerment, #6 organizational identification, and #7 social exchange theory indicate that the literature increasingly explains how contextual conditions translate into engagement through psychological resources and relational/identity mechanisms.

Finally, consequences and applied outcomes: The presence of #2 turnover intention underscores a sustained interest in linking engagement to retention-related outcomes.

In addition, #1 China emerges as a distinct context-oriented cluster, suggesting that China-based evidence represents a visible strand within the broader international literature.

Keyword Burst Analysis (2010–2025)

Keyword burst detection in CiteSpace identifies terms that experience a rapid increase in usage within a specific time window, thereby signalling emerging hotspots and shifting research frontiers across the study period. In the burst map (Top 10 keywords), each red segment represents the time interval during which a keyword exhibits a statistically detectable burst, while burst strength reflects the intensity of that surge.

Top 10 Keywords with the Strongest Citation Bursts



Figure 3. Top 10 keywords with the strongest bursts (2010–2025)

Overall, the burst results show a clear phase-like evolution in research on work engagement among higher education teachers:

(1) Early foundational attention: defining actors and personal resources (2012–2020).

Two long-duration bursts: efficacy (strength = 2.16, 2012–2020) and academic staff (strength = 2.23, 2014–2020) suggest that early scholarship emphasised (a) the higher-education teaching workforce as the focal population and (b) individual psychological resources/competencies relevant to engagement. The extended burst span implies sustained attention to person-centered antecedents and foundational framing during the field's development.

(2) Mechanism-oriented consolidation: work conditions and motivational theory (2017–2021). The appearance of demands (strength = 1.97, 2017–2019) alongside self-determination theory (strength = 2.25, 2018–2019)

indicates a shift toward explanatory modelling, linking engagement to job characteristics and motivational mechanisms. The subsequent burst in impact (strength = 2.02, 2020–2021) suggests increasing emphasis on assessing the consequences or effects associated with engagement-related processes.

- (3) Recent frontier: relational/identity mechanisms and broader outcomes (2021–2025). In the most recent period, bursts cluster around organizational and relational constructs: trust (strength = 2.19, 2021–2023), organizational identification (strength = 2.51, 2022–2023; the strongest burst in the top 10), and organizational citizenship behavior (1.79, 2022–2023). This pattern indicates that the research frontier has moved toward social/relational mechanisms and extra-role behavioural outcomes, positioning engagement within a broader organizational behaviour framework. Importantly, two keywords: consequences (strength = 1.95, 2023–2025) and perceptions (strength = 1.91, 2023–2025) remain active through 2025, suggesting a continuing trend toward (a) mapping a wider set of downstream outcomes and (b) foregrounding perceptual/cognitive appraisal perspectives in explaining engagement-related dynamics.

Taken together, the burst trajectory reflects a transition from individual capability and population framing (efficacy; academic staff), to job conditions and motivational explanation (demands; self-determination theory), and most recently to organizational relational/identity pathways and expanded outcome domains (trust; organizational identification; OCB; consequences; perceptions).

Keyword Timeline Analysis (2010–2025)

Based on the keyword clustering results, the Timeline view in CiteSpace was used to visualise the temporal evolution of research themes (Figure 4). In this view, keywords within the same cluster are arranged chronologically along a single horizontal line, enabling an intuitive inspection of when a topic emerges, how long it remains active, and how it connects to neighbouring themes across time. As reported in Figure 4, the keyword network spans 2010–2025 and contains $N = 356$ nodes and $E = 685$ links (Density = 0.0108). The clustering solution achieves Modularity $Q = 0.5477$ and Weighted Mean Silhouette $S = 0.8442$, indicating a well-defined cluster structure with high internal consistency, thereby supporting the interpretability of the timeline patterns.

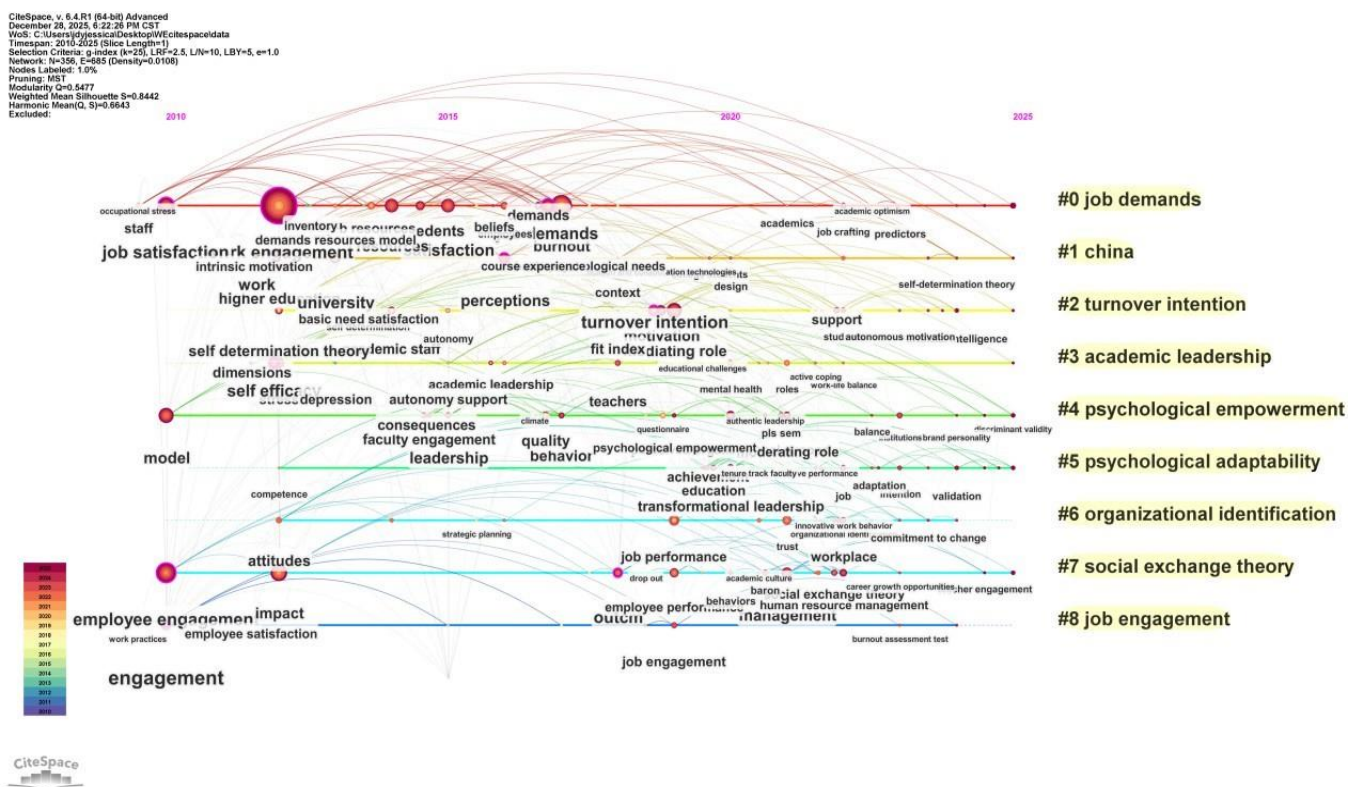


Figure 4. Keyword Timeline Map of Work Engagement Research among Higher Education Teachers (2010–2025).

Overall, the timeline suggests a staged development from conceptual anchoring to mechanism-oriented explanation, and then to organizational processes and broader outcomes. In the earlier part of the timeline (left side), research is dominated by foundational terms closely tied to the core construct, such as engagement / work engagement / employee engagement, together with context and attitudinal correlates including university / higher education, academic staff, and job satisfaction. Moving into the mid-period, the network increasingly foregrounds explanatory variables and theoretical framing, with visible emphasis on work-context drivers and motivational/psychological mechanisms (e.g., demands, burnout, self-determination theory, self-efficacy) and the growing linkage of engagement to withdrawal-related outcomes such as turnover intention. In the more recent portion of the timeline (right side), the literature broadens further toward organizational and managerial processes and applied outcomes, with keywords such as transformational leadership / academic leadership, trust, workplace, organizational identification, and other outcome- and appraisal-related terms (e.g., consequences, perceptions) becoming more prominent.

From a cluster perspective, several themes show notable temporal characteristics. The largest cluster, #0 job demands, extends across much of the time span, implying that demand-related antecedents remain a persistent core line of inquiry. Meanwhile, clusters associated with organizational mechanisms and theoretical lenses (e.g., #6 organizational identification and #7 social exchange theory) appear more salient in the later stage, consistent with a shift toward explaining engagement through relational and identity-based pathways. The presence of a distinct #1 China cluster also indicates a visible stream of context-specific studies situated in the Chinese higher education setting within the broader international literature. Collectively, the timeline map depicts a field evolving from mapping the construct and its immediate correlates toward more integrated models that connect work conditions, psychological mechanisms, organizational processes, and downstream outcomes over time.

DISCUSSION AND OUTLOOK

This section interprets the bibliometric findings in relation to the broader scholarship on work engagement among higher education teachers and consolidates the main insights derived from the analyses.

Research Status and Existing Issues

Overall, the bibliometric evidence suggests that research on work engagement among higher education teachers is expanding rapidly, but its knowledge production and collaboration foundations remain relatively fragmented. On the one hand, the field has progressed from early, low-volume exploration into a stage of accelerated development in which annual outputs rise substantially in the later period of the timespan (Donthu et al., 2021). On the other hand, institutional participation appears broad but weakly consolidated: among 454 institutions, most occur only once (Freq = 1 accounts for 82.60%), and a notable share has no recorded collaborative ties (Degree = 0 for 20.70%) (Donthu et al., 2021). This combination implies that the literature is growing in scale, yet sustained, programme-based research communities and cross-institution collaboration networks are still limited (Donthu et al., 2021).

A second issue is conceptual and terminological dispersion, which may impede cumulative synthesis and cross-study comparability (Schaufeli et al., 2002). The dataset intentionally captures multiple engagement labels (e.g., work/job/employee engagement) within higher education teaching contexts, reflecting the field's interdisciplinary character and diverse theoretical lineages (Schaufeli et al., 2002). While this inclusiveness improves coverage, it also raises the likelihood that closely related constructs are operationalised differently across studies, creating a “conceptual overlap but measurement divergence” problem that complicates integrative conclusions (Schaufeli et al., 2002). In higher education settings where work roles often span teaching, research, and service, the challenge is not only definitional, but also contextual: engagement may be embedded in different institutional regimes (e.g., research-intensive vs. teaching-oriented vs. vocational/TVET), so inconsistent construct boundaries can obscure which findings are truly comparable across settings (Schaufeli et al., 2002).

A third issue concerns the evidentiary boundary of the current mapping and the interpretive limits of keyword-based knowledge structures (Chen, 2006; Donthu et al., 2021). This study is constrained to WoSCC-indexed, English-language journal articles and reviews, which improves metadata standardisation but may under-represent regionally indexed scholarship and non-English contributions (Donthu et al., 2021). In addition, keyword co-occurrence, clustering, burst detection, and timeline mapping are best interpreted as indicators of

knowledge structure and thematic evolution rather than as evidence of causal mechanisms or effect sizes (Chen, 2006). For editorial transparency, the analysis should therefore be read as a macro-level diagnosis of what topics connect the literature and how emphases shift over time, not as a substitute for theory-testing reviews or meta-analytic inference (Chen, 2006; Page et al., 2021).

Research Hotspots and Future Trends

The hotspot structure of this field is organised around an “engagement–work context–outcomes” configuration, and future research is likely to move toward more integrated mechanism explanations and broader consequence domains (Bakker & Demerouti, 2007). At the keyword level, high-frequency terms concentrate on the focal construct (work engagement = 191; employee engagement = 82) and prominent correlates/outcomes such as performance (68) and job satisfaction (55), while higher education (64), burnout (64), and resources (48) anchor engagement in higher-education work conditions and well-being/productivity discussions (Bakker & Demerouti, 2007). Structurally, centrality results highlight bridging themes: engagement (0.30), performance (0.19), job satisfaction (0.16), higher education (0.15), and turnover intention (0.13), suggesting that the knowledge network is held together by linkages between engagement, institutional context, and outcome-focused questions (Chen, 2006).

Looking forward, the timeline and burst patterns point to a staged frontier shift that can guide more cumulative agenda-setting (Chen, 2006; Donthu et al., 2021). Burst detection shows a transition from early attention to individual capability and population framing (e.g., efficacy, 2012–2020; academic staff, 2014–2020), to mechanism-oriented consolidation via job conditions and motivational lenses (e.g., demands, 2017–2019; self-determination theory, 2018–2019), and then to relational/identity mechanisms and expanded organizational outcomes (e.g., trust, 2021–2023; organizational identification, 2022–2023; organizational citizenship behavior, 2022–2023) (Chen, 2006). Importantly, “consequences” and “perceptions” remain active through 2025, implying a continuing shift toward (a) mapping wider downstream outcome sets and (b) examining cognitive appraisal pathways in engagement dynamics (Chen, 2006). This evolution suggests that the next wave of higher-education-teacher engagement research may benefit from explicitly integrating established frameworks (e.g., JD–R, self-determination, social exchange/identity perspectives) into more coherent explanatory models that connect work conditions, psychological mechanisms, and organizational processes to both core work outcomes and broader professional sustainability indicators (Bakker & Demerouti, 2007; Cropanzano & Mitchell, 2005).

Methodologically, future work should prioritise stronger accumulation strategies, particularly cross-institution collaboration, design diversification, and robustness-oriented mapping, to address the field’s current “growth-with-fragmentation” pattern (Donthu et al., 2021). The institutional evidence (high one-time participation and non-trivial isolation) indicates that multi-site collaborations and shared measurement protocols could materially improve comparability and reduce duplicated “parallel” lines of inquiry (Donthu et al., 2021; Schaufeli et al., 2002). At the mapping level, robustness checks using multi-database triangulation and parameter-sensitivity comparisons can be used in follow-up studies to test whether cluster structures and frontier signals remain stable beyond WoSCC-only constraints (Donthu et al., 2021; Aria & Cuccurullo, 2017).

CONCLUSION

In summary, this CiteSpace-based mapping clarifies that research on work engagement among higher education teachers (2010–2025) has entered a phase of accelerated growth while remaining institutionally dispersed and thematically organised around engagement, higher-education work conditions, and outcome linkages (Donthu et al., 2021; Chen, 2006). Institutionally, participation is broad but collaboration is uneven and often absent, signalling the need for more sustained cross-institution programmes (Donthu et al., 2021). Thematically, keyword co-occurrence and centrality results highlight an engagement–context–outcomes core, while clustering, burst detection, and timeline evidence indicate a staged evolution from person- and population-oriented emphases toward mechanism-based explanations and, most recently, relational/identity pathways and expanded consequence domains (Cropanzano & Mitchell, 2005). Taken together, these findings provide an evidence-traceable agenda for future research: consolidate conceptualisation and measurement, strengthen collaborative accumulation, and advance integrative models that link higher-education work conditions to engagement through motivational, relational, and identity-based mechanisms (Bakker & Demerouti, 2007). Practically, the mapped

hotspots and emerging themes provide useful signals for academic human resource management and faculty development planning.

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