

Research Article

A Systematic Literature Review of Human Capital and Education Policy 2014-2024

Zhi Ma* 

International Affairs Office, Shanghai University of International Business and Economics, Shanghai, China

Abstract

Education has traditionally been viewed as an economic investment, a perspective that has strongly influenced policy agendas across the world. Yet this narrow focus on productivity often neglects education's broader ethical, cultural, and social purposes. This study critically re-examines how the concept of human capital has evolved in higher education policy research from 2014 to 2024. Drawing on postmodern and intersectional perspectives, it explores how economic, cultural, and justice-oriented dimensions intersect in shaping contemporary understandings of education's value. A systematic literature review was undertaken in line with established research protocols, analysing 43 peer-reviewed studies selected from 256 records. Bibliometric and network analyses were used to identify major thematic trends, influential authors, and institutional collaborations. Findings indicate that while the human capital framework remains dominant, recent scholarship has widened its scope to include social well-being, emotional development, and cultural participation. Evidence from varied national contexts shows that equity-oriented and context-responsive policies produce more sustainable and inclusive outcomes than market-driven approaches. The paper proposes a Tri-Anchor Framework connecting economic efficiency, cultural responsiveness, and intersectional equity, offering policymakers a conceptual tool to balance growth with inclusion. It concludes that higher education policy should move beyond productivity metrics towards advancing human flourishing, democratic participation, and long-term societal resilience.

Keywords

Human Capital Theory, Education Policy, Postmodernism, Intersectionality, Systematic Literature Review, Cultural Responsiveness

1. Introduction

Human capital theory (HCT) has historically proposed that educational investments yield significant economic returns through enhanced income distribution and economic efficiency. However, this perspective often fails to fully acknowledge the broader societal benefits of education, such as fostering democratic values, personal development, and social cohesion. It has been criticised for

perpetuating social inequalities by benefiting those already advantaged [11]. Human Capital Theory (HCT) suggests that investing in education produces economic benefits through increased productivity. However, recent scholarship has criticised this economic determinism for overlooking social and cultural objectives of education [1-3]. The current review re-examines HCT from post-

*Corresponding author: Zhi.ma@bath.edu (Zhi Ma)

Received: 12 April 2025; **Accepted:** 23 October 2025; **Published:** 3 December 2025



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modern and intersectional viewpoints, emphasising tensions between efficiency and fairness.

The importance of education in a nation's economic progress has been a central focus of research since the mid-twentieth century. Numerous studies have examined the drivers of economic growth, with education consistently identified as a critical component [36]. Education enhances social functioning and living standards, leading to a more skilled workforce, higher productivity, technological innovation, increased wages, and stronger consumer demand [1]. Such evidence demonstrates a clear correlation between education, personal wealth, and national economic development [41].

Consequently, policies worldwide have prioritised investments in education. Initiatives such as the World Bank's *Learning for All 2020* strategy emphasise education's role in stimulating economic growth by enhancing workforce knowledge and skills [60]. However, the distribution of educational opportunities remains uneven, particularly in developing countries, which continues to undermine social and economic equity [9, 57]. In nations with large populations, such as China, where a substantial proportion of rural children are affected by internal migration, UNESCO reports highlight how such demographic shifts perpetuate educational inequality [54].

In this study, I attempted to go beyond the traditional view of education as a mechanism for knowledge transmission. I assess its profound influence on nations' strategic economic frameworks in a rapidly globalising world, where knowledge and skills are increasingly valued. Differences in access to education and its quality, influenced by socioeconomic and geographic factors, complicate the understanding of education's role within broader economic and social structures. This systematic review employs a visual analytical tool to examine the relationship between Human Capital Theory (HCT) and education policy. It also incorporates Lyotard's postmodern critique as a conceptual lens for interpreting the findings [8].

The next section provides a brief overview of the historical development of HCT and its implications in the field of education. It also discusses the potential application of a postmodern critical theory approach to review articles. The following sections outline the methodology used for the literature search and summarise the prevailing theoretical and contextual trends. It then discusses the findings and concludes the paper by suggesting areas for future research.

2. Human Capital Theory

2.1. Historical Overview

The upcoming section overviews how Human Capital Theory (HCT) has evolved and impacted education. It also delves into using a critical theory approach to analyse articles. Subsequent sections detail the methodology employed for the

literature research and summarise the contextual patterns. They then present the findings and suggest areas for research. The examination of HCT in discussions can be traced back to Schultz and Becker's work. These scholars redefined education, well-being, and training as investments in productivity and economic progress rather than mere costs.

Schultz introduced human labour capacity as a vital form of capital essential to both individual prosperity and national economic development [46]. The conceptualisation of education as both economic and symbolic capital echoes Lakoff and Johnson's account of how metaphors structure human understanding of abstract systems [24]. He argued that such investments could correct and balance economic disparities, offering a new perspective on economic dynamics [47]. Schultz further maintained that human capital-comparable to physical assets such as factories and equipment-is fundamental to economic growth because of its inherently human dimension [48, 49]. He emphasised the macroeconomic benefits of investing in human capital, highlighting its central role in driving productivity, innovation, and long-term development.

Becker expanded upon Schultz's framework by identifying specific forms of human capital investment that generate significant economic returns. His analytical work demonstrated that education and healthcare are both beneficial and essential for improving individual economic outcomes and strengthening overall economic resilience [4-7]. Becker explored these ideas further through detailed micro-level studies that examined the effects of on-the-job training, family dynamics, and the economic assumptions linking higher education to increased productivity.

Since its emergence, Human Capital Theory (HCT) has been widely applied across various sectors, extending beyond economics to domains such as education, public administration, and ethics. Its adaptability is particularly evident in education, where HCT serves as a framework for analysing and addressing economic disparities [7, 45]. The theory provides a means of evaluating how educational investments influence economic outcomes, underscoring the central role of education in promoting national development and social progress.

Despite its strong influence in economics and education, Human Capital Theory (HCT) has faced increasing criticism amid the evolving global economy. Recent downturns have revealed gaps between academic achievement and labour market demands, raising doubts about the presumed direct link between higher education and economic efficiency [44]. Moreover, rising unemployment among university graduates challenges HCT's assumption that education unilaterally enhances labour productivity [2].

Furthermore, intersectional research has shown that the intersections of race, gender, and ethnicity with educational outcomes significantly influence economic opportunities, suggesting that HCT requires a more nuanced understanding of these dynamics [16, 25, 29, 33]. These studies argue that skilled educators play a crucial role in improving student

outcomes—a central proposition of HCT that warrants examination beyond instructional effectiveness. Hanushek et al. [25] demonstrated a strong correlation between teacher quality and student achievement, yet a postmodern lens urges us to consider how social and cultural structures mediate this relationship. Similarly, Lavy [33] revealed that educational innovations may perpetuate gender disparities, showing that even evidence-based reforms are often shaped by cultural assumptions reinforcing existing power hierarchies.

Moreover, research examining race, gender, and ethnicity has demonstrated how these factors intersect to influence educational outcomes and, consequently, economic opportunities [16, 25, 29, 33]. This underscores the need for a more comprehensive understanding of such dynamics in education. Crenshaw [16], Hanushek et al. [25], Kaffenberger and Pritchett [29], and Lavy [33] collectively show that teacher quality and contextual factors play a decisive role in shaping student achievement. While Hanushek et al. [25] confirmed a link between teacher effectiveness and learning outcomes, a postmodern perspective invites reflection on how social and cultural forces mediate this relationship. Lavy [33] further revealed that certain educational reforms, though empirically supported, may perpetuate gender-based inequalities. These insights highlight that educational change is often guided by implicit cultural assumptions that reinforce established power structures. Thus, while early theorists emphasised the economic dimensions of human capital, later critiques have expanded its meaning through cultural and social lenses.

2.2. Reimagining HCT Through Postmodern and Intersectional Lenses

Traditional frameworks frequently fail to capture the intricate and diverse nature of human experience and thus neglect the subjective and multifaceted aspects of individuals [4]. This realisation has driven my systematic literature review, highlighting the urgent need for a more nuanced policy framework that values the diversity and complexity of human experiences.

Adopting Lyotard's perspective enables a shift from a purely economic paradigm to a more inclusive and holistic conception of human capital development [8]. This critical lens recognises individual diversity, cultural plurality, and the multifaceted nature of human growth [59]. Policies, therefore, should aim not only to enhance economic productivity but also to promote personal well-being, autonomy, and social enrichment [55]. Such a reimagined approach acknowledges the full spectrum of human potential and advances a more inclusive vision of societal progress.

This shift carries several key implications. Beyond the limitations of conventional economic indicators, it calls for policies that genuinely support the comprehensive development of individuals. This requires valuing diverse educational pathways, prioritising emotional and cultural growth, and embracing adaptive, context-sensitive strategies [43]. In

navigating the uncertainties of modern social and cultural life, Lyotard's critique offers a vital framework for rethinking human capital in ways that meaningfully enhance the human condition [50].

Operationalising the postmodern critique. In practical terms, Lyotard's scepticism toward grand narratives guides four analytic moves in this review: (i) anti-reductionism—flagging claims that equate educational value solely with economic output; (ii) plural evaluation—giving weight to diverse “language games” (e.g., civic, cultural, wellbeing outcomes) alongside labour-market metrics; (iii) power/knowledge attention—noting when audit cultures and performance regimes shape what counts as valid knowledge [35, 43]; and (iv) subjectification—tracing how policies position learners and teachers as economic units versus ethical agents [55]. Concretely, studies were coded for the presence/absence of these features; for example, a paper was tagged reductionist if benefits were reported only in earnings/productivity terms with no socio-cultural or civic outcomes [35, 43, 55].

3. Methodology

To move beyond theoretical critique, this section outlines the systematic review design, data collection, and analytical procedures used to examine developments in Human Capital Theory (HCT) and education policy between 2014 and 2024. The present study employed a systematic literature review (SLR) approach in accordance with the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020)* guidelines [17] to ensure transparency, reproducibility, and methodological rigour. The review aimed to map and critically interpret the intersections of HCT and education policy research published from 1 January 2014 to 1 January 2024.

3.1. Data Sources and Visualisation Tool

This study employed a systematic literature review (SLR) combined with bibliometric visualisation to examine developments in Human Capital Theory (HCT) and education policy from 2014 to 2024. The review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework to ensure methodological transparency and replicability.

Bibliometric data were obtained from the Web of Science (WoS) Core Collection, chosen for its breadth of peer-reviewed academic publications. The search query used was: ALL FIELDS = (“human capital theory”) AND ALL FIELDS = (“education policy”).

Filters applied:

- 1) Timespan: 1 January 2014 - 1 January 2024
- 2) Document Type: Article
- 3) Access: Open Access
- 4) Language: English

A total of 256 records were retrieved. Bibliographic data (authors, titles, abstracts, keywords, citations) were exported in plain-text format for processing in CiteSpace 6.3. R2 Advanced, a Java-based application designed for co-citation and keyword-cluster analysis [1-4].

CiteSpace was configured to:

- 1) detect co-citation networks and keyword bursts;
- 2) map thematic clusters; and
- 3) trace the temporal evolution of research fronts.

The analytical parameters were set as follows:

- 1) Time slicing: 2014 - 2024 (1-year per slice)
- 2) Node types: Author, Keyword, Cited Reference
- 3) Selection criteria: Top 50 items per slice
- 4) Pruning: Pathfinder and Minimum Spanning Tree
- 5) Label algorithm: Log-Likelihood Ratio (LLR)

This configuration produced visual networks that revealed dominant authors, research institutions, and emerging thematic patterns in HCT and education policy. Adjusting pa-

rameters such as burst duration and keyword significance improved precision and reduced noise in the dataset. The output informed both the descriptive bibliometric analysis and the interpretive narrative presented in later sections.

3.2. Data Selection and Screening

To ensure reliability and focus, each record was evaluated through two screening phases-automated filtering and manual verification-consistent with PRISMA protocols [5].

Phase 1 - Automated filtering:

Duplicates, non-English entries, and non-article materials (e.g., conference proceedings, editorials) were automatically removed, reducing the dataset from 256 to 164 records.

Phase 2 - Manual screening:

Abstracts and full texts were reviewed to determine theoretical and methodological relevance. The following inclusion and exclusion criteria were applied:

Table 1. Inclusion and Exclusion Criteria for Study Selection.

Criterion Type	Inclusion Conditions	Exclusion Conditions
Topical relevance	Explicit discussion of HCT within education policy, reform, or governance.	Uses "HCT" metaphorically or unrelated to education.
Theoretical scope	Addresses economic, sociological, postmodern, or intersectional dimensions of HCT.	Lacks theoretical engagement or conceptual rigour.
Methodological quality	Peer-reviewed empirical or conceptual studies with clear research design.	Grey literature, conference papers, unrefereed reports.
Language and accessibility	English language, full-text available.	Non-English or restricted access sources.

After screening, 43 studies met all criteria and were retained for analysis and visualisation. Figure 1 presents the annual trend in publications and citations, confirming a con-

sistent growth trajectory in HCT-related education policy research during 2014-2024.

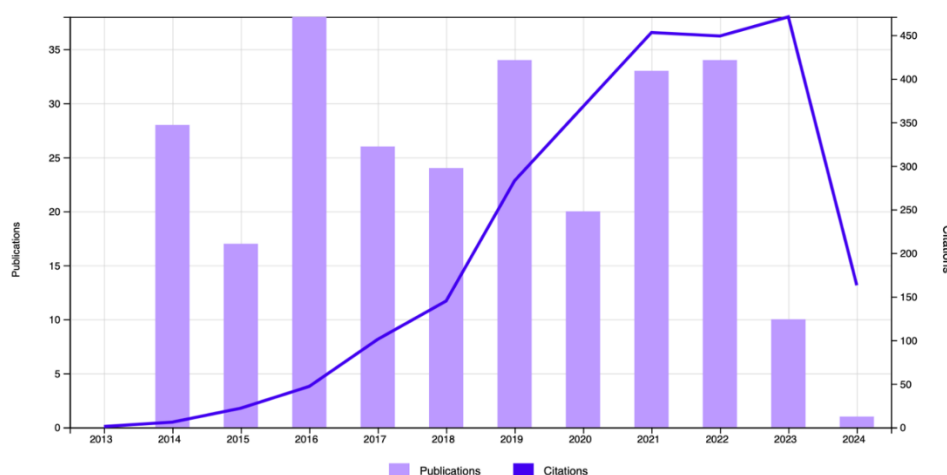


Figure 1. Times Cited and Initially Identified Publications Over Time.

This increase in publications indicates the growing interest and exploration of scholars in this field. The increasing number of publications and citations underscores the importance of this area. I am excited to see where future research would take me. Additionally, the exponential growth in citations is a notable observation. As a crucial metric for measuring the influence of research, the increasing citation count indicates that work in this field is expanding, gaining recognition, and being integrated into broader scholarly discourse.

After retrieving the initial results, articles were manually screened to ensure that they met the research criteria. When selecting reports for my eligibility assessment, I established several essential criteria to ensure that the selected articles were relevant and beneficial to my research on HCT in terms of educational policy.

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Criterion 1: Relevance to My Research Objectives

I meticulously included only those reports that directly aligned with my research questions. These reports need to offer data, insights, and case studies that are directly pertinent

to the themes of this study.

Criterion 2: Methodological Integrity

Reports that exhibited solid methodological rigour were selected. This involved choosing documents with well-documented research methods, clearly defined variables, appropriate statistical techniques, and logical analyses.

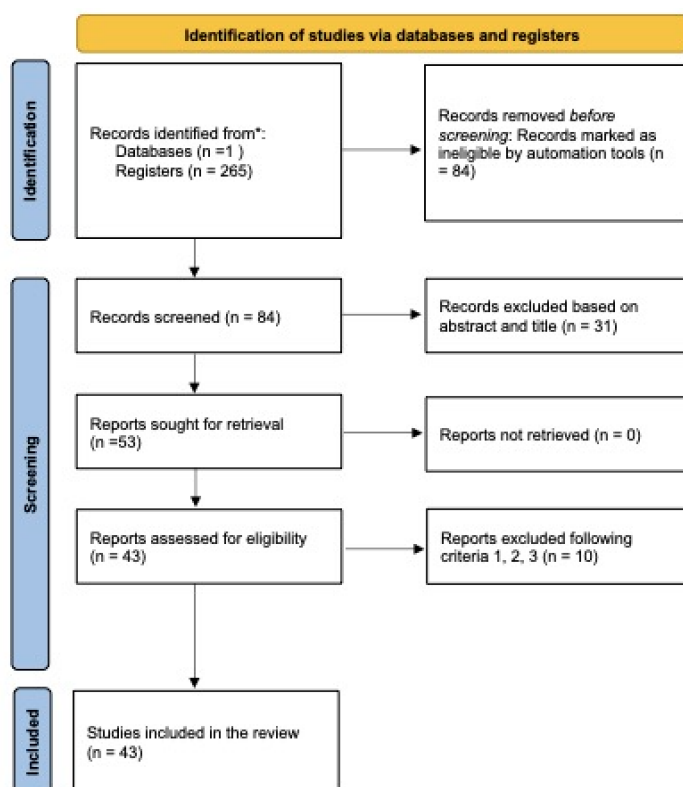
Criterion 3: Report Influence

The influence of reports is a significant factor in the selection process. I evaluated how often other researchers cited each report, which typically indicated its impact and relevance within the academic community.

3.3. PRISMA Screening Process

The PRISMA flow diagram (Figure 2) summarises the identification, screening, eligibility, and inclusion stages:

- 1) *Identification*: 256 records retrieved from WoS.
- 2) *Screening*: 92 records removed as duplicates or irrelevant.
- 3) *Eligibility*: 121 full texts assessed; 78 excluded for insufficient theoretical depth.
- 4) *Inclusion*: 43 studies included for full review and CiteSpace visualisation.



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

Figure 2. Flowchart of data collection of reviewed articles.

3.4. Analytical Procedure

The final corpus was imported into CiteSpace to conduct bibliometric mapping and thematic clustering. Analytical parameters were configured as follows:

- 1) Time slicing: 2014 - 2024 (1-year per slice)
- 2) Node types: author, keyword, cited reference
- 3) Selection criteria: top 50 per slice
- 4) Pruning: Pathfinder and Minimum Spanning Tree algorithms
- 5) Cluster labelling: Log-Likelihood Ratio (LLR)

The combination of bibliometric analysis and narrative synthesis allowed both macro-level pattern recognition and micro-level interpretation of key theoretical and contextual trends.

3.5. Data Validation and Reliability

To enhance reliability and minimise bias:

- 1) All bibliographic data were cross-checked for duplicates and inconsistencies.
- 2) A 10 per cent sample was validated against Scopus to confirm data accuracy.
- 3) A secondary reviewer re-screened a random subset of 10 articles: inter-coder agreement = 0.91.

- 4) Parameter sensitivity testing ensured the stability of cluster outputs.

These steps ensured methodological rigour and reproducibility of the findings.

The validated dataset and visualised clusters formed the empirical foundation for analysing author networks, institutional collaboration, and emerging thematic clusters, which are presented in Section 4: Results.

4. Results

4.1. Analysis of the Network of Cited Authors

As shown in Figure 3, the network of cited authors reveals a highly complex and interconnected academic landscape. This intricate web of relationships and influences among scholars provides valuable insight into the progression and evolution of research in this field. In Figure 3, the nodes represent individual authors, and their size reflects their relative importance or influence within the academic community. Larger nodes denote authors who have accumulated numerous citations or played a central role in shaping the research agenda [14].

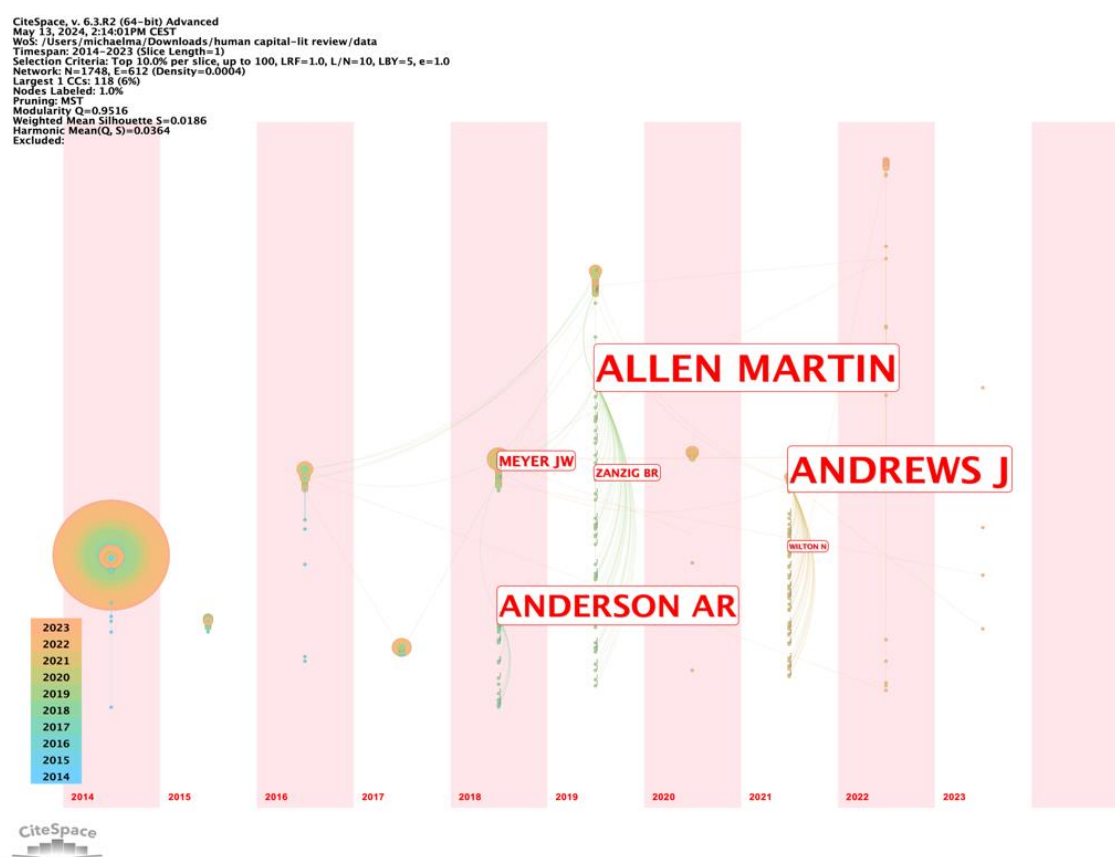


Figure 3. Network of Cited Authors.

Prominent authors such as Allen Martin, Andrews J, and Anderson AR occupy central positions within the network. Their frequently cited work indicated a relatively high influence and impact within the field during this period. These scholars form the core of the academic community and their research serves as a foundation for further exploration and development. Their achievements serve as a beacon of inspiration, guiding the academic community towards new horizons.

Smaller nodes, representing scholars such as Meyer JW and Zanzic BR, are not just smaller, but also crucial. Their work, although less widely cited than those of more prominent authors, is nonetheless significant. They often focus on niche areas or subfields, providing unique and valuable insights that enrich broader academic discourse and showcase the diversity

and inclusivity of academic communities.

4.2. Analysis of the Network of Authors

Figure 4 provides a detailed analysis of field impact and collaborative trends over the past decade. It employs citation networks to examine how various scholars and their work are interlinked within academic discourse. In Figure 4, authors are represented as nodes, the size of which reflects their citation frequency. The connections between these nodes illustrate reciprocal influences among scholars. This network reveals the dense and complex nature of scholarly interactions and highlights the dynamic interplay of ideas within academia [14].

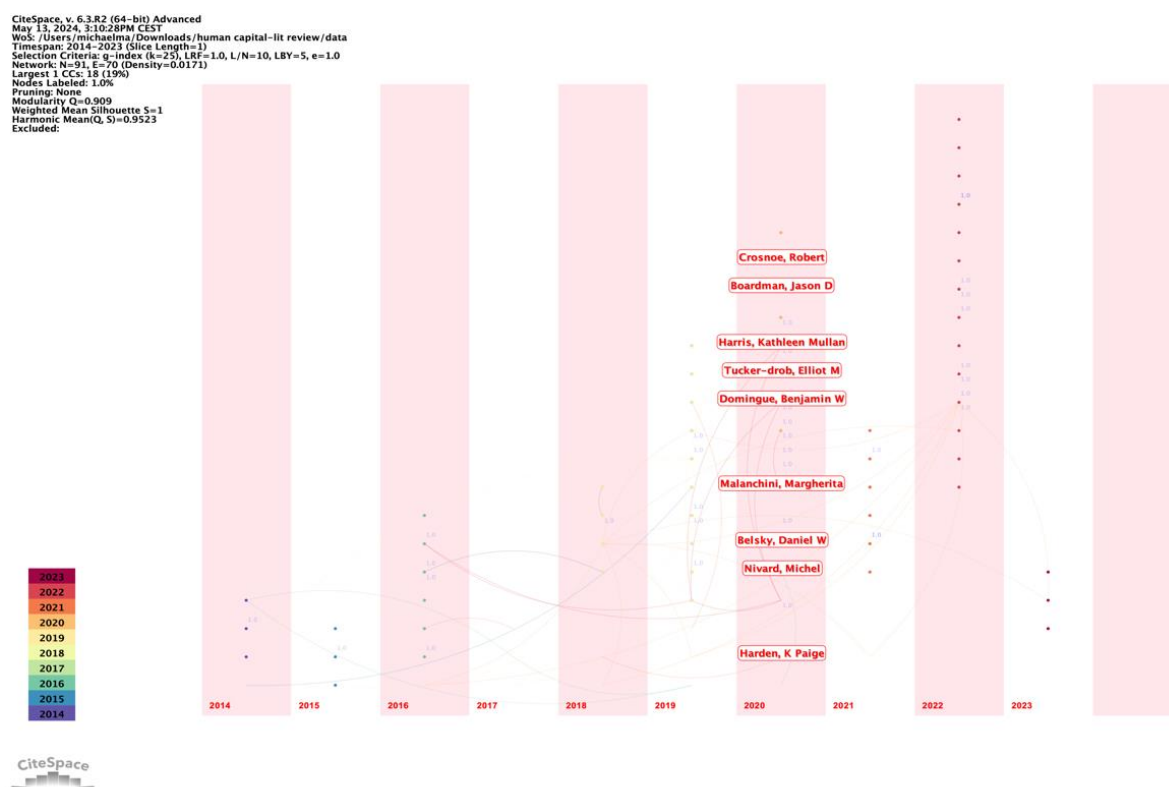


Figure 4. Network of Article's Authors.

Analysing network degrees-represented by the number of connections each author maintains-illuminates individual scholars' influence and collaborative reach. For instance, Harden et al. [26] demonstrated extensive connectivity, each with a network degree of eight. This degree of interconnection positions them as central figures in the academic community whose work plays a crucial role in shaping scholarly discourse. Figure 4 also highlights emerging scholars and novel research themes. Despite having fewer links, researchers such as Stofkova et al. [52] are gaining recognition in specific yet

influential research niches. This aspect of the analysis is vital, as it acknowledges established authorities while encouraging the inclusion of rising academics and evolving topics.

4.3. Leading Institutions' Article Publications Analysis

Table 1 presents an overview of the top nine research institutes, their rankings, degree centralities, citation counts, centralities, and sigma values. These variables offer detailed

insights into institutions' research influence and collaboration ability.

Table 2. Distribution of Articles Published by The Top 8 Research Institutions.

Rank	Institution	Degree Centrality	Citation Counts	Centrality	Sigma	Percentage of Publications
1	Columbia University	8	1	0.01	1	9.09%
2	University College London (UCL)	6	4	0.01	1	9.09%
3	University of London	6	4	0.01	1	6.06%
4	Medical Research Council UK (MRC)	5	1	0	1	4.55%
5	Boston University	5	2	0	1	4.55%
6	Stanford University	5	1	0	1	4.55%
7	King's College London	3	2	0	1	4.55%
8	University of Zilina	2	1	0	1	2.27%

Degree Centrality refers to an institution's direct links with others, and indicates its ability to collaborate. Citation counts measure an institution's influence on its research. Centrality highlights an institution's pivotal role in connecting the research groups. Sigma is a comprehensive measure that combines burst citations and betweenness centrality. The Percentage of Publications was calculated as follows.

Percentage of Publications = (Number of Publications by Institution / Total Number of Publications) × 100%; *Percentage of Publications* = (total number of publications by institution) × 100%.

- 1) *Columbia University* is the network's most central and influential institution with a degree centrality of 8. Despite having a lower citation count of 1, its high centrality (0.01) and sigma (1.00) values demonstrate that it is a crucial bridge that connects diverse research clusters. This strategic position allows Columbia University to influence various research domains significantly. It accounts for 9.09% of publications, reflecting its prominent role in the academic landscape.
- 2) *University College London (UCL)* exhibits robust engagement in collaborative research with a solid degree centrality of 6 and a citation count of 4. Their contribution is essential for fostering a collaborative environment and advancing academic knowledge in the areas in which they specialise. UCL contributed 9.09% of the publications, reflecting its significant research output and influence.
- 3) *University of London* has a high degree centrality of 6, indicating significant collaboration within the network. The university's centrality (0.01) and sigma (1.00) values demonstrate its pivotal role in advancing research and disseminating knowledge across various disciplines,

thus establishing it as the cornerstone of academic collaboration and innovation. University of London accounts for 6.06% of the total number of publications, thereby underscoring its substantial research output.

- 4) *Medical Research Council UK (MRC)* is highly connected to the research network, with a degree of centrality of 5. Although its citation count is lower at 1, its high sigma value 1.00 emphasises its significance in network dynamics. This contributes to the vitality of the broader research ecosystem and accounts for 4.55% of publications, indicating substantial research contributions.
- 5) *Boston University* has high collaborative ties, with a centrality of 5 and a citation count of 2. The presence of dual entries in the data suggests that their influence extends across several research areas. Boston University contributed to 4.55% of the total publications, indicating its active participation in research.
- 6) *Stanford University* has a degree centrality of 5, and its high sigma value of 1.00 indicates that Stanford plays a pivotal role in connecting different research topics, leading to significant contributions to knowledge and innovation across various fields. Stanford University demonstrated a significant research presence, with 4.55% of the total publications.
- 7) *King's College London* has a balanced degree of centrality of 3 and a citation count of 2, indicating that it has actively engaged in collaborative efforts. King's College London accounted for 4.55% of the total number of publications.
- 8) *University of Zilina* has a degree centrality of 2 and a citation count of 1. Despite having fewer citations than other institutions, its mere presence in the research network underscores its importance in specific clusters.

Furthermore, with a 2.27% share of total publications, the University of Zilina is dedicated to producing quality, albeit targeted, research output.

4.4. Analysis of Top 6 Ranking Generated-clusters

As shown in Figure 5, the data were selected to include only the top 20% of the values per slice, with a maximum of 100 items included to maintain the quality of the dataset and to prevent information overload. The Pathfinder and Minimum Spanning Tree pruning methods were employed to filter out irrelevant connections and identify the most pertinent ones.

I employed the latent semantic indexing (LSI) and likelihood ratio (LLR) methods to organise this information and identify clusters. The algorithms employed for this purpose group similar nodes, thereby revealing distinct patterns and

themes in the data. The clusters were labelled using LSI terms, LLR, and Mutual Information (MI) to ensure clarity and facilitate interpretation. To further analyse the network, betweenness centrality was calculated to identify key nodes with significant influence within the network. This metric provides insights into the critical connections and interactions of the academic community. Finally, a coherent network visualisation was created, showcasing ten significant clusters labelled according to their dominant themes. Every aspect of the network, from its layout to its labelling, was meticulously optimised to ensure maximum clarity and comprehension. The final product was a dynamic, comprehensive, and illuminating map that depicted the intricate interconnectivity of the academic landscape, enabling researchers to effortlessly comprehend the intricate relationships between various clusters.

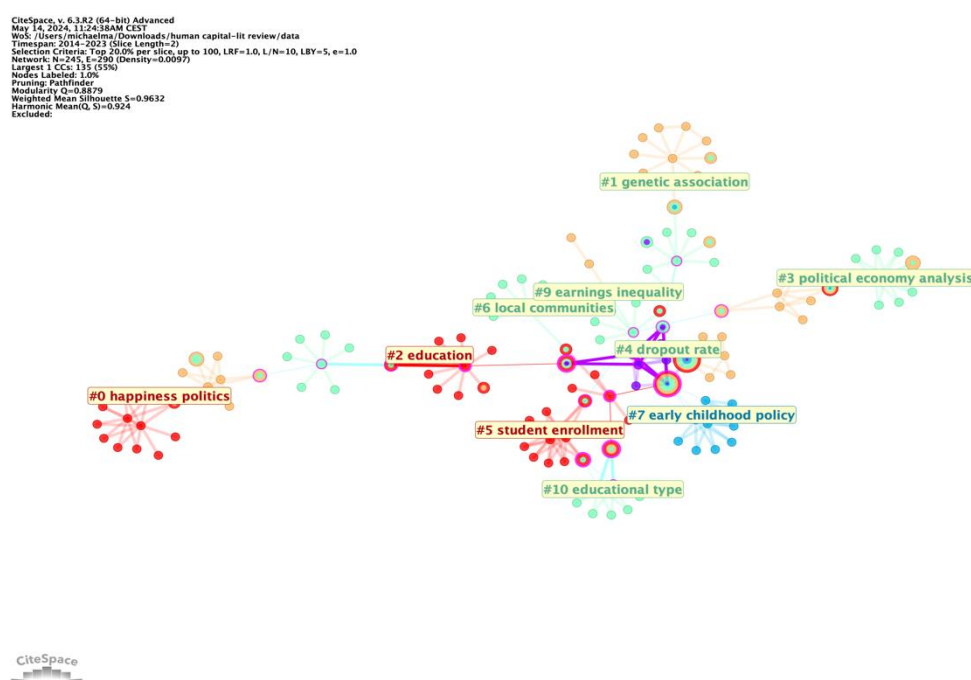


Figure 5. Network of keyword clusters.

(1) The Journey Begins: Happiness Politics

As the largest cluster, Cluster 0 comprises 19 members and has a silhouette value of 0.971. It encapsulates the intersection of political agendas and individual well-being [10, 23, 31, 39, 40]. For instance, Kim's [31] research represents a significant advancement in educational objectives by framing them through happiness and human capital development. This pivotal study serves as the cornerstone of this cluster, illuminating the intricate relationship between educational policy and individual happiness. Furthermore, the cluster highlights sociotechnical imaginaries and models that champion a holistic approach to education.

This comprehensive methodology seeks to nurture aca-

democratic excellence, overall happiness, and well-being, echoing the sentiments expressed by Fényes et al. [23], who examined the relationship between career consciousness and commitment to graduation among higher-education students in Central and Eastern Europe. Like Deignan's corpus-based approach to mapping conceptual and metaphorical clusters [13], these findings reveal how linguistic and cognitive constructs help define the scope of human capital discourse. Although their primary research objective did not directly address the linkage between academic performance and personal happiness, their study aligns with the broader discourse on "happiness politics," implying an implicit acknowledgement of the interconnection between educational attainment and an indi-

vidual's sense of fulfilment and happiness.

While Fényes et al. [23] provided insights into students' career aspirations and graduation commitments, Kim [31] offered a prescriptive framework for integrating happiness and well-being into educational policies and practices. Both underscored the crucial role of student happiness and well-being as fundamental elements of the educational journey, highlighting the multifaceted nature of educational success.

(2) Genetic Footprints in Education: Genetic Association

Cluster 1 is the second-largest cluster, comprising 18 members and exhibiting a silhouette value of 1. It explores the role of genetics in determining academic performance and persistence. Studies have demonstrated the significant influence of genetic factors on academic persistence, suggesting that inherent traits can shape educational trajectories [3, 18, 19, 26, 28, 32].

This cluster bridges the fields of genetics and education, illustrating how these two disciplines can inform each other. By elucidating genetic factors that influence educational outcomes, educators and policymakers can develop targeted interventions and strategies to support student learning and development. Furthermore, this cluster contributes to the broader discussion of human capital development. Identifying the genetic components that contribute to academic success provides valuable insights into nurturing and maximising individual potential. This knowledge can guide educational practices, policy formulation, and resource allocation, ultimately leading to a more equitable and effective education system.

Harden et al. [26] examined the genetic factors associated with mathematics tracking and persistence in secondary schools. Researchers identified genetic associations related to these aspects, indicating that genetics play a substantial role in academic performance and persistence. Djajic et al. [19] approached this topic from a broader perspective, analysing education policies and human capital accumulation. Although their focus was not solely on individual students' academic persistence, they emphasised the importance of educational policies in shaping human capital development. Their findings suggest that the educational environment and policy context significantly influence academic progress, even if genetic factors are not directly addressed.

(3) Navigating Inclusive Education: Education

Cluster 2 represents a distinct grouping within the broader context of educational research. It comprises 17 members with a silhouette value of 1, indicating strong cohesion and homogeneity among its constituent elements. This cluster focuses on the pressing issue of inclusive education, which holds major significance in contemporary educational discourse [10, 34, 53].

The cluster is characterised by the prominent contributions of Liasidou and Liasidou [34], whose meticulous research examined the power imbalances and inequities faced by students with disabilities within higher education systems. Their

study moves beyond superficial evaluation to provide an in-depth analysis of the systemic barriers that hinder equitable access and participation. Despite the establishment of progressive policies and legislative frameworks intended to promote inclusion, students with disabilities continue to experience substantial obstacles in accessing and fully engaging with higher education. The authors critically evaluated existing policies and practices, identified structural shortcomings, and proposed targeted policy interventions to address these inequities and advance genuine inclusivity in educational institutions.

(4) Unravelling Economic Forces: Political Economy Analysis

Cluster 3 comprises 17 members with a silhouette value of 0.944. It adopts a comprehensive approach to examining the economic forces and policy mechanisms that influence education, thereby providing a detailed understanding of how these factors shape educational outcomes [12, 18, 20, 22, 30, 32, 40]. One notable contribution within this cluster is the study by Ono and Uchida [40], which investigates the intricate relationship between education and broader economic policies through the lens of human capital, public debt, and economic growth. This research highlights the interdependence of these domains and underscores the significance of economic theory and fiscal policy in determining educational attainment and, by extension, human capital formation.

Moreover, this cluster aligns closely with the perspective of Kaya et al. [30], who emphasised the importance of understanding the interplay between economic factors and educational outcomes. Their findings reinforce the notion that education plays a pivotal role in cultivating human capital, which is fundamental for sustained economic growth and development. In contrast, Kaya et al. [30] employed a generalised ordered logit analysis to examine personal income distribution in Turkey. Although their study did not directly address education, it offered critical insights into the economic forces affecting equitable access to quality education. By analysing patterns of income distribution, their research sheds light on broader economic disparities that shape individuals' opportunities to pursue and afford education.

(5) Addressing Critical Dropout Issues: Dropout Rate

Cluster 4 focuses on the theme of dropout rate and examines various factors contributing to student attrition. With a silhouette score of 0.882 and 14 members, this cluster underscores the importance of targeted policies that enhance student retention and foster academic success [3, 10, 27, 38, 42, 51, 58]. The dropout rate remains a pressing concern in education as it directly affects learners' attainment and long-term prospects. Understanding the diverse factors that lead to attrition is critical for developing effective strategies to mitigate early withdrawal from education.

One significant factor, highlighted by Potochnick [42], concerns the accessibility and affordability of education for undocumented immigrant youth. By analysing the effects of in-state tuition policies, this study found that reducing finan-

cial barriers can substantially lower dropout rates among vulnerable groups. Similarly, Spohrer and Bailey [51] examined the role of character formation and resilience in English education policy, suggesting that an emphasis on social mobility, self-governance, and biopolitics can empower students to overcome challenges and persist in their studies.

Delahunty and O'Shea [not listed, insert as new ref if included in your full reference list] used a linguistic approach to analyse university discourses on academic success, revealing that students often prioritise short-term satisfaction and grades over deeper intellectual engagement. Such disengagement, they argued, contributes to higher attrition rates. Djajic et al. [19] further linked this issue to human capital development, showing that high dropout rates hinder the accumulation of skilled labour essential for economic growth.

Finally, Weymann [58] discussed how gendered education policies perpetuate structural inequalities that disproportionately affect student retention. Addressing these gendered and socio-economic disparities through inclusive and equitable education policies is therefore essential to reducing dropout rates and promoting sustained participation in education.

The dropout rate is a complex issue influenced by many factors, including financial constraints, lack of engagement, and gender inequalities. To effectively reduce the dropout rate, it is imperative to address these factors through comprehensive education policies. These policies should promote affordability, resilience, engagement, and inclusivity. By comprehending the intricate interplay between these factors and implementing targeted interventions, we can empower more students to remain in school and realise their full potential.

(6) Enrolment Dynamics: Student Enrolment

Cluster 5 comprises 12 members and has a silhouette value of 0.88. It explores the intricate relationship between tuition fees and the various factors influencing student enrolment in higher education institutions. This cluster provides a comprehensive understanding of the economic barriers that often deter students from pursuing tertiary education [3, 37].

A key study within this cluster is that of Minor [37], who examined the effects of tuition fee policies in Germany. Using a quasi-experimental design, the study demonstrated how financial considerations significantly influence enrolment decisions. Minor's findings revealed that increases in tuition fees have a marked negative effect on student participation, disproportionately impacting lower-income and disadvantaged learners.

Moreover, Minor [37] highlighted the long-term consequences of tuition fee policies, showing how such measures can perpetuate social inequality by restricting access to higher education for those unable to meet rising costs. This research underscores the pivotal role of financial policy in shaping educational access and equity, emphasising the urgent need for inclusive strategies that mitigate the socioeconomic barriers to higher education.

5. Discussion

Lyotard's postmodern critical theory provides a profound lens through which to reassess Human Capital Theory (HCT), challenging the traditional, reductionist, and universalist approaches that have long underpinned this field [8, 35]. Through this lens, the present review identifies significant limitations and overlooked implications within the established framework of HCT, emphasising the need for more nuanced and context-sensitive approaches.

5.1. The Limitations of Reductionism

Lyotard critiques the reliance on universal principles and economic quantification within Human Capital Theory (HCT), arguing that such approaches oversimplify the intricate and diverse nature of human experience. This reductionism marginalises individuals and disregards the complexity of their lived realities. Kim [31] demonstrates how policies grounded in these reductionist assumptions tend to prioritise economic outcomes over personal fulfilment and cultural enrichment. Although such policies may improve measurable economic indicators, they fail to nurture holistic development—an essential foundation for cultivating skilled, adaptive, and emotionally resilient citizens.

Empirical evidence from ÉEgert et al. [20] further illustrates this point, showing that human capital policies significantly influence per capita income across European and OECD countries. However, these policies often embody a narrow economic focus that overlooks the broader humanistic dimensions of education. While quantitative analyses remain methodologically rigorous, they inadequately account for qualitative factors such as personal well-being, civic engagement, and cultural enrichment—all of which are integral to the comprehensive development of individuals.

Lyotard's critique shows that quantifying learning outcomes alone fails to capture emotional and cultural growth [4]. The Finnish education model provides an instructive counterexample. Since the early 2000s, Finland has pursued equity-centred reforms—abolishing national testing at lower levels and investing in teacher autonomy and trust. Evidence from the OECD and Sahlberg's comparative studies [8] indicates that these policies improve both academic attainment and civic participation, demonstrating that collaboration and inclusivity—not competition—drive quality. This case challenges HCT's assumption that market competition maximises efficiency and reinforces Lyotard's call for plural and context-aware narratives of success. A complementary European contrast comes from Germany, where tuition-fee experiments show enrolment sensitivity among lower-income groups, underscoring that pricing signals alone can depress participation despite putative efficiency gains [37]. This reinforces the case for equity-safeguards when cost-sharing is introduced.

5.2. Socio-economic Complexity in China

Lyotard's emphasis on diversity and heterogeneity underscores the need for flexible and adaptive educational and economic policies. Fényes et al. [23] provide compelling empirical support for this argument by demonstrating the role of career consciousness in improving graduation rates and employability. Their research challenges the universalist assumptions of HCT, suggesting that effective policies must accommodate diverse educational trajectories and socio-cultural contexts. This finding aligns with Lyotard's contention that acknowledging complexity and pluralism in human experience is vital for sustainable human capital development.

Nevertheless, further research is required to reinforce and expand upon Fényes et al.'s [23] conclusions. Longitudinal analyses could help determine the long-term influence of career consciousness on employability outcomes, while comparative studies across different socioeconomic regions would enhance the generalisability and applicability of these insights.

In China, rural-urban migration continues to distort educational equity [9]. Migrant children often face exclusion from urban schools due to residency restrictions and limited funding. Policies grounded solely in HCT overlook these social and spatial dynamics. Applying an intersectional policy lens reveals overlapping disadvantages of class, geography, and household registration (*hukou*), which shape learning opportunities. Incorporating culturally responsive and multilingual strategies such as translanguaging can enhance inclusion and representation within policy design [15]. Addressing these disparities requires differentiated funding mechanisms and localised curriculum reform that respect cultural diversity while maintaining national standards. Such an approach transforms HCT from an economic model into a socially responsive framework.

5.3. The Simplification of Human Qualities

HCT is often criticised for reducing individuals to economic assets and privileging productivity potential over human complexity. Lyotard's critique challenges this narrow view by insisting on a more nuanced understanding of persons as multifaceted agents [35]. In line with this, Obara argues that policy design must account for endogenous choices and the specific contexts of different population subgroups, so that strategies move beyond purely economic optimisation to support holistic development and social justice [39].

Checchi and Van De Werfhorst provide empirical support by demonstrating a strong association between educational inequality and earnings inequality, underscoring the need to consider broader educational and social dynamics in policy analysis [12]. Pragmatic approaches to policy interpretation also highlight how communication, context, and meaning mediate these social structures [21]. While their study relies primarily on regression techniques, integrating qualitative

evidence on lived experiences would complement the quantitative results and yield a more comprehensive understanding of how inequality is produced and sustained.

5.4. Navigating Uncertainty and Indeterminacy

Lyotard's critique foregrounds the uncertainty and indeterminacy of social and cultural life, calling into question rigid, predictive policy models [35]. Usher's work on postmodernism and education further reinforces this view, advocating for interpretive flexibility and the rejection of universalist narratives in educational thought [56]. In line with this, Ono and Uchida analyse the interplay between human capital, public debt, and economic growth, arguing for fiscal sustainability tempered by flexibility and policy adaptability—an approach consistent with Lyotard's stance that policy must respond to contingent conditions [40]. This implies a dynamic policy-making posture that adjusts as contexts shift.

Falch similarly highlights difficult trade-offs in allocating resources between faster and slower learners and shows how these choices shape outcomes, strengthening the case for adaptive policies that recognise diverse learning needs and speed [22]. That said, Falch's contribution is primarily theoretical; stronger empirical testing is required to establish external validity and avoid policy designs that look sound in models but falter in practice.

5.5. Aligning Human Capital with Demographic Transitions

Bairoliya and Miller examine how demographic transitions in China—population ageing and declining birth rates—constrain human capital accumulation and long-run growth [3]. The takeaway is clear: education and labour policies must adapt to shifting age structures to remain effective, aligning with Lyotard's warning against one-size-fits-all policy models [35]. Flexibility and innovation (e.g., funding formulas responsive to cohort size, upskilling for older workers, and smoother school-to-work pathways) are essential to sustain outcomes.

To strengthen the evidence base, future research should compare China with other countries experiencing similar transitions and test whether adaptive, HCT-aligned policies mitigate demographic drag. Such a comparative analysis would widen the external validity of [3] and guide context-sensitive policy design.

5.6. Towards Context-sensitive Policy

Synthesising insights from these three contexts, it becomes evident that effective education policy must balance economic rationality with socio-cultural meaning. Postmodern pluralism reminds policymakers that no single framework fits all societies; intersectionality demands recognition of the lived diversity within them. Together, they suggest a context-sensitive approach to HCT—where investment in human

capital includes emotional, ethical, and communal dimensions of learning. Education thus becomes a process of meaning-making and identity formation, not merely labour-market preparation.

In practice, this means that policy evaluation should incorporate qualitative measures such as learner well-being, social inclusion, and civic engagement alongside quantitative indicators of performance. This holistic vision aligns educational development with both economic sustainability and social justice, addressing the dual imperatives raised throughout this review.

6. Towards a Multidimensional Framework for Education Policy and Practice

6.1. The Tri-Anchor Framework for Education Policy

To operationalise the integration of Human Capital Theory (HCT) with postmodern and intersectional perspectives, this review proposes a Tri-Anchor Framework that links economic, cultural, and equity-based dimensions of education policy. This multidimensional structure moves beyond single-outcome models of efficiency to a more holistic conception of educational value that reflects human complexity, contextual variability, and social responsibility.

(A) Economic Efficiency

This anchor retains the legitimate insight of classical HCT [4, 7, 45-49] that education is an investment in human productivity and national development. However, economic efficiency must be understood dynamically: policies should measure not only the *returns to schooling* in terms of earnings, but also the *sustainability* of those returns through innovation, adaptability, and lifelong learning. For instance, evidence from the OECD [20] shows that economies integrating vocational education and continuous upskilling maintain higher resilience during downturns. Indicators may include graduate employment rates, labour-market alignment, and productivity growth across sectors.

(B) Cultural-Contextual Responsiveness

The second anchor recognises the postmodern claim that knowledge is plural, local, and culturally situated [8, 35, 43, 55]. Education policies must therefore value diverse epistemologies, languages, and community knowledges rather than imposing a single universal model. This principal echoes Lyotard's critique of *grand narratives* [35], emphasising that learning outcomes must also account for cultural identity, emotional well-being, and social participation. Measures may include learner satisfaction, school-community partnerships, cultural-heritage content in curricula, and participatory governance in educational decision-making. These indicators make visible the non-economic forms of value creation within education systems.

(C) Intersectional Equity

Building on Crenshaw's [16] intersectionality, this anchor introduces fairness as a structural and distributive dimension of educational investment. Equity policies should recognise overlapping disadvantages-class, gender, ethnicity, and geography-that mediate the returns to education [9, 10, 12, 30]. Context-sensitive strategies, such as differentiated funding, rural-urban resource balancing, and inclusive teacher training, are essential to ensure that human capital development benefits are not concentrated among privileged groups. Indicators here include access and attainment gaps, representation of marginalised learners, and policy responsiveness to disability and migration.

The three anchors are mutually reinforcing rather than hierarchical. Policy reforms and evaluations should be stress-tested across all three dimensions before implementation. For instance:

- 1) A vocational education reform designed for efficiency (A) must also incorporate local cultural relevance (B) and gender-equitable pathways (C).
- 2) Funding policies (A) must include progressive subsidies or bursaries (C) while safeguarding minority-language provision (B).
- 3) Digital learning initiatives (A) should assess learner well-being, autonomy, and identity development (B & C) alongside achievement metrics.

A practical monitoring model can employ a mixed-methods dashboard, combining quantitative indicators (employment, completion, income) with qualitative assessments (learner narratives, community feedback, cultural inclusion). This aligns with postmodern pluralism by valuing multiple evidence forms while maintaining transparency and accountability.

6.2. Implications for Further Practices

The intersection of human capital theory (HCT) and education policy development offers many opportunities for future research, especially when viewed through the lens of postmodern critiques. Addressing these gaps and questions in the HCT theoretical framework requires a multifaceted approach. However, several areas require further investigation.

Longitudinal studies on career consciousness can provide deeper insights into effective policy design by investigating the long-term impact of career consciousness on employability and personal fulfilment across different socioeconomic contexts. These studies can use the human capital theory to evaluate how career consciousness contributes to long-term economic and social outcomes. By integrating Lyotard's critique, they can also consider how individual experiences and aspirations shape career development, moving beyond mere economic metrics to include personal and cultural fulfilment.

Combining qualitative and quantitative methods to study vocational education and its socioeconomic impact can provide a more comprehensive understanding of how educational

policies affect diverse populations. Lyotard's lens can guide qualitative analysis to capture the nuanced experiences of individuals and reveal how policies might address or neglect the complexities of human development. Quantitative data can provide empirical support and create a balanced and thorough analysis of the effectiveness of vocational education.

Understanding the social and cultural factors contributing to brain drain can lead to more effective policies addressing the economic and non-economic aspects of human capital retention. Future studies can use human capital theory to evaluate the economic impacts of brain drain while incorporating Lyotard's critique to understand the broader social implications. This approach ensures that policies are economically viable and socially and culturally sensitive, thus fostering an environment in which talent can thrive domestically.

Incorporating qualitative assessments into studies of public education spending and economic growth can offer a deeper understanding of how educational quality and access impact long-term economic and social outcomes. Using Lyotard's lens, we can delve into the subjective experiences of students and educators, uncovering how educational policies shape students' daily lives and long-term aspirations. This qualitative focus can enhance our understanding and complement quantitative analyses.

7. Limitation

The initial corpus of 265 articles encompassed a range of outputs, including journal articles, monographs, dissertations, conference reports, and technical studies. However, in this study, I narrowed my focus to open-access journal papers for analysis. Including these other types of scientific output would enhance the accuracy and comprehensiveness of future analyses. In this study, I employed CiteSpace mapping skills to analyse the literature. The reliability of the conclusions is inherently tied to the data sources used in the analysis. However, different visualisation tools can produce varied analytical results when applied to the same dataset. In addition, future research should analyse and compare environmental education literature from databases in different languages and employ various visualisation tools.

Abbreviations

HCT	Human Capital Theory
Hukou	China's Household Registration System
LLR	Log-Likelihood Ratio (cluster-labelling algorithm in CiteSpace)
LSI	Latent Semantic Indexing (cluster-labelling method)
MI	Mutual Information (cluster-labelling method)
MRC	Medical Research Council (UK)

MST	Minimum Spanning Tree (Network Pruning Method)
OECD	Organisation for Economic Co-operation and Development
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SLR	Systematic Literature Review
UCL	University College London
WoS	Web of Science (Core Collection)

Author Contributions

Zhi Ma is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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