



USING THE ALGORITHM TO ANALYZE HUNDREDS OF ACADEMIC ARTICLES - IDENTIFYING THE DOMINANT NARRATIVE IN SCHOOL IMPROVEMENT RESEARCH

THE IMPORTANCE OF INTERDISCIPLINARY ACADEMIC RESEARCH

School Improvement is crucial for policy-makers among different educational systems across countries and is one of the themes that have preoccupied research. Nowadays, the research literature on school improvement is highly prolific, comprehensive, and addresses various actors, processes, and outcomes, situated within diverse social and organizational contexts. In Interdisciplinary research that incorporates knowledge from the fields: technology, communication, and education, our purpose was to contribute to policymakers/practitioners and to reveal the central players and domains who are involved in the process of school improvement. Particularly, we look at whether the current literature addresses the need for reforms and calls for educational response to the changes of the 21st century, including the growing globalization and international competition, and the development of digital technologies.

THE SEMANTICS OF THE ECONOMIC LOGIC - IMPROVEMENT & SUCCESS

The research literature on school improvement frequently comes along with school effectiveness. The move to a system-level efforts for improvement was associated with the decentralization of the educational systems, incorporation of market principles in education, greater competition among schools, and more pressure for high standards accountability demands (Cheng, 2011; Hopkins, 2014). Hence, current effectiveness and improvement trends of education, enhance the need to maximize the learning outcomes of the disadvantage groups (Preston et al., 2017) and prepare youths for the growing demands of the 21st century.

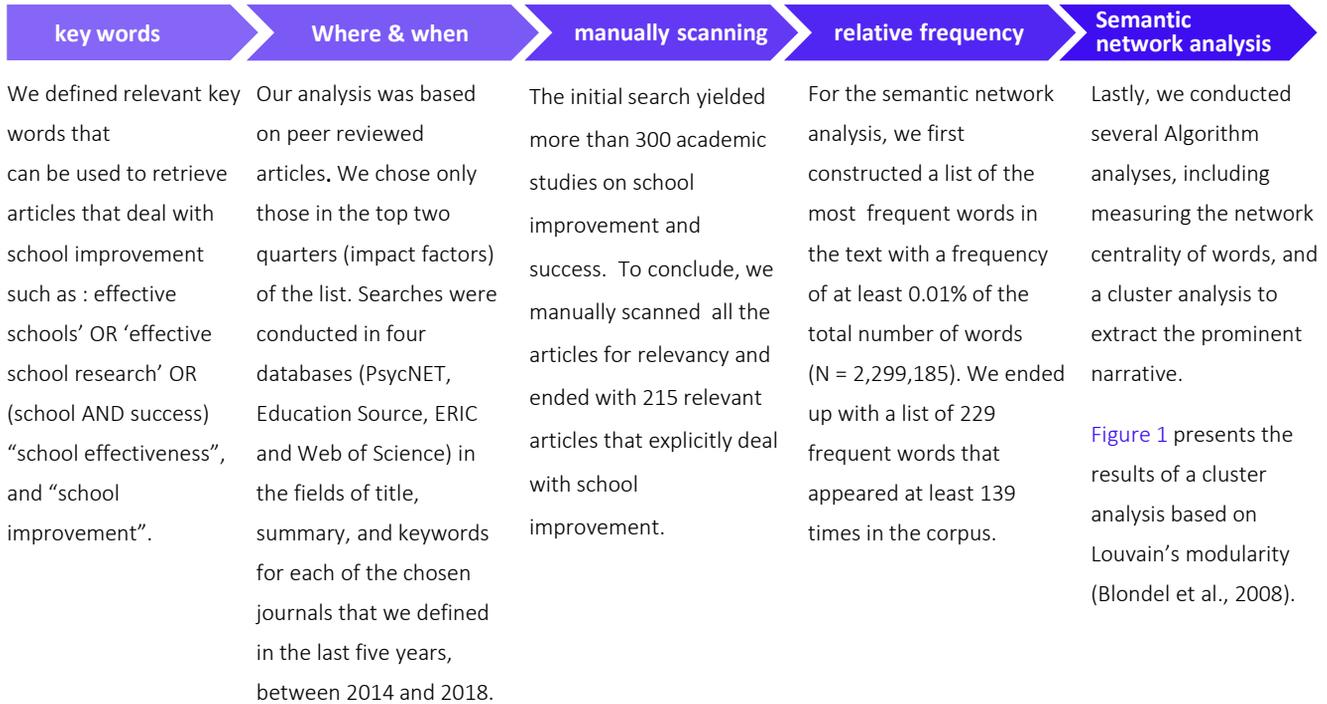
This brief is based on a research led by Addi- Raccah, A., Shahrabani, T. and Segev, E. (2021), A semantic network analysis of the literature on school improvement. The full research is published in "Words and Clusters Applications of Textual Network Analysis" Ed. Segev, E. (2021). Department of Communication Tel Aviv University.

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THE RESEARCH PROCESS FOR IDENTIFYING THE PROMINENT NARRATIVE

As the research literature in the field is extensive, we employ an algorithm to analyze hundreds of academic articles to map the relationships and identify patterns within the field of school improvement, following several steps:



WHAT IS SEMANTIC NETWORK?

Semantic network analysis by Louvain's modularity is an algorithm to cluster nodes in a network based on the density of their links. Groups of nodes with more links among each other will have more chances to be clustered together. The size of the nodes reflects their centrality. The width of the ties reflects the number of sentences in which each pair of words was mentioned.

Figure 1. Semantic network of words related to school

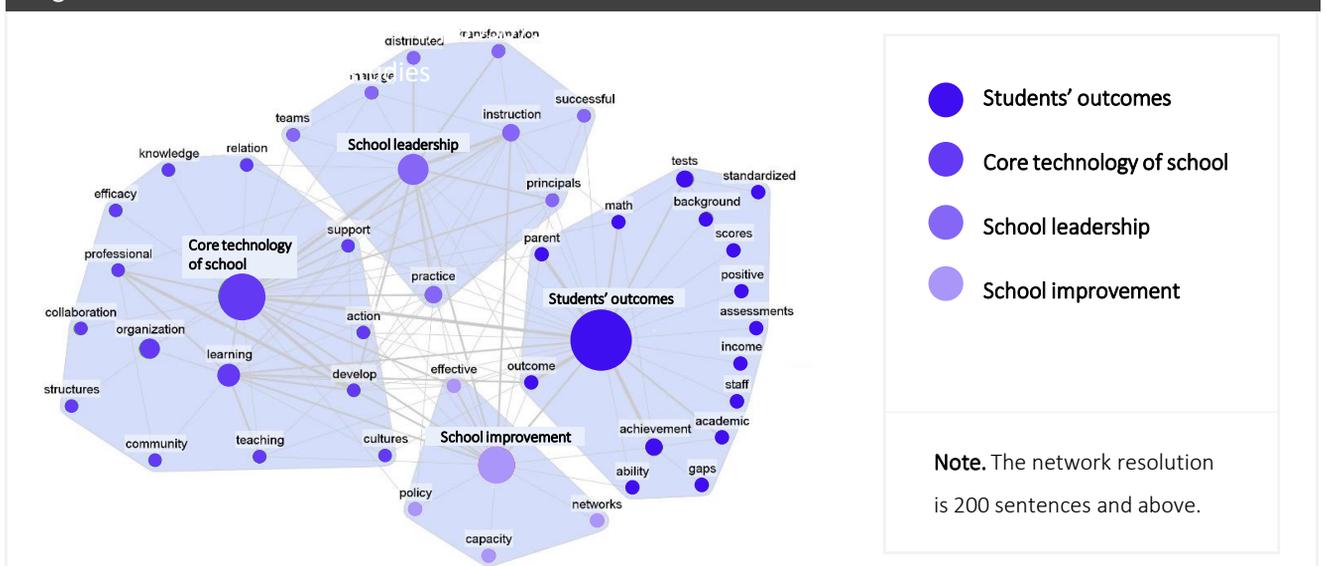


Figure 1 shows that the articles dealing with teacher improvement and school improvement are related to three significant players as reflected in the following words: 1. “Teacher”, which is prominent, and related to words of professional development and prospective learning, suggesting that school improvement involves investment in human resources in the workplace. 2. “Student” that is surrounded by words that focus mainly on educational products and academic achievements (such as “tests”, “scores” and “assessments”). 3. “Leaders” that focuses on three dimensions of leadership: “distributive”, “transformational” and “instructional” leadership. As this cluster is located in between the teacher and student clusters, it seems that leaders are responsible for enabling the work of teachers and students, and more generally for leading to school improvement.

KEY FINDINGS

Using the algorithm to analyze hundreds of academic articles – we identify the dominant narrative in school Improvement Research in the last five years

- 01 The main narrative on school improvement is a conservative one - The responsibility for school improvement lies in the hands of the school staff: teachers and school leaders, through the process of development, learning or teaching. The students are presented as more passive in this process with emphasis on their academic achievements or test scores.
- 02 A relative weak relationship exists between leaders and students compared to teachers and leaders, or teachers and students- These findings corroborate with prior studies showing that the impact of school leaders on students’ outcomes (mainly achievements) is mediated through teachers and their improvement practices.
- 03 Teachers’ improvement practices, was found to be at the center of the narrative for school improvement, we further focus on their specific sub-network in greater detail and identify three clusters in their role as responsible for school improvement:
 - a. **“Facilitating factors”** - Their relationship and cooperation with other teachers, and relationship with the management.
 - b. **Teachers’ practices and learning processes**- Teachers’ diverse practices that are assumed to be related with students’ outcomes.
 - c. **Assessments and students’ outcomes** - The underlying assumption of most studies on school improvement is that improvement could be quantitatively measured through regular assessments and tests of the students. Looking in-depth at the articles, however, we did not find many articles that actually measured students’ outcomes and also referred to teachers.



THE NARRATIVE GAP

Using the algorithm for semantic analysis, school improvement research not only reveals the dominant narrative, but also the gaps in the field:

- 01 We revealed there is hardly any emphasis on life skills, social capital, or social and universal values in the context of research dealing with school improvement . While achievements are significant, there is also a need to address the students' wellbeing, social, and emotional outcomes, which are essential for their future success.
- 02 New directions of research on school improvement may be needed in order to encompass the changes occurring in schools and in teachers' work, take into account more broadly the relations between teachers and school principals, expand the investigation of external actors, including: parents' representatives, municipal authorities, NGOs, community organizations, etc...
- 03 The relations between the different enabling factors were found to be weak, indicating that studies often choose only one of these foci, and do not offer a comprehensive analysis of the different elements.

LESSONS LEARNED



COMBINATION OF FILTERS

=



EXPERT KNOWLEDGE

+



TECHNOLOGY

- 01 Semantic network analysis that is based on a large body of articles yields a very large number of words. As the decision on which articles and words are to be included in the analysis is crucial, experts in the field have to be active in this stage.
- 02 It is important to define the central dimensions of the semantic analysis. In our case, we address three dimensions: actors, school process, and school outcomes. This helps to disclose the dominant focal points related to the topic of school improvement, while leaving space for aspects of a diversity and expressions related to these dimensions.
- 03 As our semantic network analysis was based on articles, a meaningful interpretation of the networks could be combining a content analysis of a sample of articles. This suggestion, although not presented here, was employed in this study to exemplify and provide an in-depth insight of the words and relations between words emerging from the networks. The content analysis of the article provided a broader narrative of the topic being studied.