

Research Hotspot and Front Visualization of the Shadow Education System: Data from Web of Science

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Abstract: This scientometric review takes 351 documents from 1992–2021 as the research object based on the Web of Science database. With the help of CiteSpace, this study aims to construct visualization mapping knowledge domains, display the research status in shadow education more intuitively, contribute opportunities for further research, and provide a more visual basis for dialog among researchers, policymakers and interested actors in the field. This study, by building coauthor, coword, and cocitation knowledge visualization maps, demonstrates cooperation among authors, research hotspots and frontiers in the field. Our results show that shadow education has experienced a rapid expansion over the last decade but that the scope of the collaborative circle of academia needs to be further expanded. Furthermore, because of shadow education's variable forms, researchers need to pay extra attention to the scope of its definition. Parents are involved in too many of their children's educational choices; learning requires more self-drive and improved self-learning ability.

Keywords: shadow education, visualization, hotspot, frontier

Introduction

Regarding shadow education, which is widely known as private supplementary tutoring, the term 'shadow' has been used as a metaphor for how the curriculum changes as mainstream education changes (Bray, 2017); as schooling becomes increasingly global, so does shadow education (Yung & Bray, 2021). Almost one-third of all students aged 15 years from 64 societies worldwide are involved in shadow education (Entrich, 2020), a phenomenon that has become an inevitable and universal integral part of the learning culture worldwide and progressively evolved into an important sector that can share the functions of the mainstream education system (Kim & Jung, 2021). East Asia is probably the most notable shadow education region worldwide (Zhang & Yamato, 2018); for example, South Korea has the highest participation rate for shadow education globally, though such education is also especially prominent in Japan, Chinese territories, Singapore and so on (Kim & Jung, 2021). Shadow education in Western societies has also expanded visibly, for instance, in Australia (Watson, 2008), North America, and Europe (Kim & Jung, 2019). It is noteworthy that Denmark, which places a strong emphasis on equality in its pedagogy, has also witnessed recent growth in the use of shadow education (Mikkelsen & Gravesen, 2021). Although this phenomenon dates back centuries, its continuous growth is unavoidable (Baker, 2020).

Relevant research has become explosive and profound across societies, although this field has been neglected for quite some time (Gordon Györi, 2020).

Zhang and Bray (2020) took the first global comparative study of shadow education as a starting point and summarized the changes in focus and research methods in the associated research worldwide, characterized by an increasing refinement of research themes and scientific approaches. However, given the global diversity of shadow education, which varies across contexts and cultures, more than 20 related terms describe the phenomenon in English only (Kobakhidze & Suter, 2020). Moreover, regulations for shadow education vary, with many governments adopting a laissez-faire approach (Bray & Kwo, 2014). However, the rapid expansion of shadow education and its increasing diversity, in some cases going beyond the 'shadow' metaphor itself, poses the threat of more multifaceted impacts and complexity (Bray, 2021), such as those on educational ecology (Luo & Chan, 2022). Furthermore, learning culture is also affected, as Kim and Jung (2021) pointed out, with students acting like nomads, learning across the boundaries of mainstream schooling and shadow education. Shadow education is now an essential subfield of educational research, with a broad range of sub-disciplines associated (Hajar & Karakus, 2022), which is one of the focal points that need to be increasingly confronted by all actors.

A systematic review and analysis of the literature on shadow education can help us understand the existing research findings and provide ideas for further research, especially concerning insights into research frontiers and trends, which helps narrow the gap between the rapidly proliferating and changing reality of shadow education and subsequent research. However, traditional literature review methods are labor intensive and somewhat subjective, lacking a more visual mapping of the current state of shadow education research and its development. By analyzing and visualizing the scientific literature with the help of CiteSpace +- a free Java application, the rapidly growing study topic identification and research trends presented through the automatically labeled clusters' terms of cited articles (Chen, 2004) not only helps improve time efficiency and enhance visual readability but also provides researchers with more solid evidence of the interpretation and evaluation of research dynamics in the field. Big data plays an essential role in education; for example, Ye (2018) provided a scientometric visualization of the development profile and latest trends of big data research in education with the help of CiteSpace, not only showing the dynamics of the category of big data technology in the education sector but also pointing out the relative lack of research related to educational management, which provides a reference for which future topics need to be strengthened in the field. Moreover, Rawat and Sood (2021) applied CiteSpace and conducted visualized knowledge mapping on information and communications technology (ICT) applications in educational research. The structure of education research using ICT is demonstrated, indicating that higher education (categorized by formal education), distance education (categorized by nonformal education), and mobile devices are presently the most active topics in the field, contributing to the relevant personnel to further grasp the appropriate research path.

Given this, we present the research agenda through a more visual knowledge map based on the database with which we are working and through objective scientific bibliometrics with the help of CiteSpace and answer the following questions. (1) How is the research on shadow education progressing? (2) What does the research focus on regarding shadow education and its evolution? (3) What are the cooperation trends among authors in the shadow education field? (4) What are the research fronts, intellectual base and emergent trends of the shadow