

Educational Big Data Initiates a New Era in Education Development

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*“Data is the new oil.”
-Clive Humby*

OVER THE past more than ten years, big data technology has posed profound impacts to almost all sectors including education. This state-of-the-art technology prompts changes in educational notions, pedagogy, and the roles of teachers and students. Educational big data proliferates with the improvement of school digital infrastructure, popularization of campus networks, increase in educational applications, widespread use of learning management systems (LMS) and other terminal devices (Chaurasia & Rosin, 2017). There is a consensus among researchers that judicious exploitation of educational big data is beneficial for optimizing education resource distribution, reaching scientific educational decisions, and elevating the quality of instruction (Cui, 2023). The benefits of big data application in education have also been well recognized by educators; schools and other education institutions are increasing endeavors to integrate big data technology into instruction.

Currently, research on big data’s involvement in education at various levels is growing. Feng’s (2024) study suggests that visualized learning diagnosis based on big data has positive impacts on primary Chinese language teaching. Li et al. (2022) conducted an empirical study of the intervention outcomes of big data-based precision instruction in the senior secondary math classroom to find that this teaching method is effective in improving math performance of the students and sustaining dynamic precision intervention from the teacher. Zhang (2023) developed a big data-enabled, online case library-based teaching model for the course of jurisprudence. It proved helpful in improving students’ understanding and application of basic knowledge of jurisprudence. To provide teachers with effective guidelines for big data-assisted classroom instruction, Wang et al. (2024) summarized nine data-based indicators of high-quality classroom teaching on the basis of

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research findings of previous studies, including educational beliefs, creative questions, critical questions, reflective knowledge, and more. Qian and Zhao (2023) conducted a systematic analysis of the roles of educational big data in teaching quality evaluation, noting that there remain issues with current evaluation systems, such as the low data literacy in evaluators, the lack of high-quality data support and a framework of criteria for evaluation, algorithm limitations, and data ethics-related constraints, despite the progress made in terms of diversification of evaluators, evidence collection, execution, and feedback. These issues hamper the across-the-board application of big data in education as well (Bai, 2021).

Therefore, while educational big data has showcased positive effects in enhancing the quality of education, the technology also faces many challenges regarding data security, data quality, application problems, etc. Researchers need to undertake more theoretical and practical explorations of this relatively new area. Also, successful cases of educational big data application deserve more attention from academics. *The Application of Big Data-Based Precision Teaching in Chinese Education: Using Xichuan Experimental School in Chengdu City as an Example* in this issue encapsulates popular application modalities of big data-based precision teaching in China and expounds on its implementation procedures, using the practice of Xichuan Experimental School as an example (Chen & Zhou, 2024). The study exhibits the advantage of big data-based precision teaching over traditional precision instruction in increasing teaching outcomes. Further observations and validations of its effects are clearly warranted.

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