

AI IN EDUCATION

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Artificial intelligence, “AI,” has developed rapidly in recent years and has become an essential part of our daily lives. And it is having a major impact on the field of education. While the introduction of AI technology into educational institutions is expected to improve the quality of education, the role of school education has been raised as an issue. “Is AI necessary for school education?” Regarding this issue, this paper introduces examples of the use of AI in education and examines the benefits and challenges. To begin with, let us introduce some of the major applications of AI in education. The first is individually optimized learning. This is where AI provides learning that is optimized according to the characteristics and level of understanding of each student. Examples include ICT-based adaptive learning and online learning.¹ The second is an automated grading system. This will enable accurate and prompt grading and improve the efficiency of learning.² Using the above, the expected benefits from the introduction of AI are as follows. First, it will improve student performance through efficient learning methods. AI will analyze students' learning data and clarify areas of weakness in each subject. It then extracts patterns that lead to learning stumbling blocks and improved grades, and offers learning methods suited to each student's level. The system also provides real-time advice to help students learn more efficiently. In addition, the degree of learning and achievement are recorded as data, making it possible to visualize the results of the learning process.

Next is improving the accessibility of education. Online learning powered by AI can provide advanced learning opportunities regardless of region or economic situation. According to the National Statistics Center, it has become clear that there is an educational disparity between rural and urban areas, based on the correlation between the number of learning support systems, the rate of high school graduates going on to higher education, and educational expenses. A major reason for this is the difference in educational resources. Compared to urban areas, where there are many well-equipped educational institutions and highly specialized classes and information available, it is difficult to secure such facilities in rural areas. There are also differences in the proportion of education expenses in individual income. In rural areas, household income levels tend to be lower than in urban areas. For households in rural areas with low incomes, the financial burden of commuting to universities and education/learning support facilities is large. However, online learning using AI makes it possible to provide high-quality learning at low cost even in rural areas where sufficient education is not available. As a result, learning opportunities will be made more uniform, leading to the elimination of educational disparities between regions. It is also expected to reduce the burden on teachers. In addition to automatic grading, AI can also replace teachers' workload outside of the classroom, such as counting student attendance and supervising exams. As a result, this will help to solve the problem of long working hours, which has become an issue in recent years, as well as the shortage of manpower in school institutions.³

While the introduction of AI has many advantages, it also poses the following challenges. The decline in the thinking ability of those who receive AI education is one of them. School education does not only provide us with knowledge. The ability to think of ways to solve problems, to take the initiative in trying to understand what we do not understand, and to broaden our perspectives and absorb diverse ways of thinking through

¹ Britannica Japan” What is Individualized Optimized Learning? ICT Enables learning that leaves no one behind.” *Britannica*, 19 Aug. 2022, <https://www.britannica.co.jp/blog/kobetsusaiteki2/>

² Smiley Editors” What are the advantages and disadvantages of introducing AI into education? Introducing case studies of its use” *AI Smiley*, 24 Feb. 2024, https://aismiley.co.jp/ai_news/what-are-the-advantages-and-disadvantages-of-ai-for-education/

³ Morishita, Tatsunari.” Factors and challenges of the educational disparity between urban and diversified areas.” *National Statistics Center*, 2022, <https://www.nstac.go.jp/sys/files/sites/3/static/statcompe/files/2022/2022H4-katsuyo.pdf>

interaction with people who have different opinions and values. These are non-cognitive abilities, such as the ability to cooperate. These are nurtured in the process of understanding questions. However, if AI provides such opportunities, opportunities for autonomous learning are reduced and these cannot be acquired. In addition, learning will be standardized, and the development of creativity and critical thinking skills will be hindered.⁴

In other words, there is a danger of a decline in autonomous thinking skills, the ability to think and solve problems on one's own, due to dependence on learning support provided by AI. This would undermine the original meaning of study. In addition, since AI handles large amounts of students' personal data, proper data management and privacy protection will be important. At the same time, it will be necessary to take measures to prevent unauthorized use. In this way, AI has brought great potential for change to school education, contributing to the field of education in a variety of ways. At the same time, however, it has also changed the traditional forms of learning and created new challenges. "Is AI necessary for school education?" The answer to this question will depend on our future approach to AI education. This is an issue that both the recipients and providers of education need to consider. We should grasp the essence of school education and make effective use of AI.

⁴ Komura, Shunpei. "Why do we need non-cognitive skills?" Benesse Education Information, 13 Jun. 2024, https://benesse.jp/educational_terms/11.html