



# Artificial Intelligence Technology in the Development of Community Education

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**Abstract.** This research aims to analyze the influence of Artificial Intelligence (AI) in augmenting the efficacy of methodologies of learning, training, and skill development in community education. The research method involves literature studies and surveys regarding information related to the use of AI in social learning, particularly community education. The findings of this study delineate several pivotal effects of AI on community education methodologies, including AI facilitates the scrutiny of diverse individual learning progressions; AI technology has the potential to surmount domain-specific impediments, notably pertaining to access to educational and training resources; AI can be leveraged to generate sophisticated and contextually tailored learning content; AI can conduct data analysis, thereby objectively quantifying individual advancements in both assessment and learning progression monitoring; AI-based learning can curtail the costs and duration associated with training; AI can aptly aid educators in discerning the requirements of learners with greater precision. Concurrently, alongside these favorable impacts, an assessment of AI utilization reveals several challenges, encompassing issues surrounding data privacy, disparities in technological access, and apprehensions regarding the displacement of human labor. As AI technology continues its evolutionary trajectory, its role within community education methodologies is poised to grow in prominence.

**Keywords:** Artificial Intelligence, Skill Development, Educational Technology

## 1 Introduction

The utilization of technology is expected to have a more significant impact across various fields. With the rapid and extensive development of technology, new possibilities are emerging in various domains, including education. In the present era, along with the term Industrial Society 4.0 and Industrial Society 5.0, the primary technological focus is on Artificial Intelligence (AI). AI technology is employed to create intelligence as a part of software and hardware, inspired by the neural patterns that operate in the human brain. This product is subsequently developed and applied in various fields such as education, industry, and other aspects of daily life [1][2].

The influence of AI is also evident in the realm of education [3]. It has immediate implications for the general public, such as educational services. Furthermore, it has implications for curriculum and teaching methods, as mentioned [4][5]. They discuss

how AI's impact involves the use of robots as tutors, potentially replacing human roles. This is related to the ongoing revolution within the field of education, where the focus is gradually shifting from humans to robots [6][7].

## 2 Method

This research utilizes a comprehensive approach that includes literature review and experiment, drawing from a wide range of sources such as books, journals, and other supporting literature [8]. Experimental analysis is conducted based on the utilization of Artificial Intelligence, which subsequently serves as the primary dataset to be compared with the literary data. The data derived from the literature review is then subjected to descriptive analysis, particularly in the context of community education method development, and examined for interconnections to attain comprehensive results.

## 3 Result and Discussion

Artificial Intelligence (AI) has ushered in a rapid technological shift, particularly in the community education environment, significantly altering the approach to learning. Here are some description regarding education methodologies shift due to AI technology.

**Table 1.** Difference Artificial Intelligence and Natural Intelligence [9]

| <b>Dimension</b>  | <b>Artificial Intelligence</b> | <b>Natural Intelligence</b>                     |
|-------------------|--------------------------------|---|
| Data Condition    | Permanent                      | Changes Quickly                                 |
| Transfer Data     | Easier to duplicate and deploy | Transfer Process                                |
| Costs             | Cheaper                        | More Expensive because it often involves people |
| Nature of Data    | Consistent                     | Constantly Changing                             |
| Physical Evidence | Can be documented              | Difficult to reproduce                          |
| Work Time         | Faster                         | Slower  |
| Nature of Work    | Can do the job better          | Often less thorough                             |

### 3.1 Utilization of Artificial Intelligence in Education Field

Artificial Intelligence (AI) has been strategically integrated into the field of education to enhance the learning process [7] AI systems are employed to facilitate learning among students. The engagement of AI is instrumental in analyzing the individual learning progress of students, right from the outset of their learning journey. From summarizing the initial steps to the final stages, AI machines can meticulously detail the actions taken by educators in assessing each student's development. For instance, in the creation of teaching modules and assessments, AI can assist teachers in composing content and providing guidance to support each student's learning attainment.

With the assistance of AI, administrative tasks become more streamlined, allowing educators to concentrate on their pedagogical abilities. As a result, students become more actively engaged, and the learning experience becomes more engaging [6]. Examples of AI applications in education include:

1. **Duolingo:** An application for personalized and adaptive language learning. The app identifies and assists students in learning their chosen language, tailoring learning materials to individual abilities.
2. **Grammarly:** An AI-powered writing assistant that detects and corrects grammar, spelling, and writing style errors. It can be used to enhance the quality of students' writing.
3. **Wolfram Alpha:** A computational knowledge engine that provides answers to various questions, including those related to mathematics, science, and other subjects. This application can aid students in problem-solving.
4. **Kahoot! and Quizizz:** Learning apps that create interactive and enjoyable quizzes. These apps help students compete to answer quickly and correctly, with automatic scoring and ranking.
5. **Classcraft:** A gamification-based learning application that utilizes AI to create engaging and collaborative learning experiences. It combines game elements such as characters, points, and challenges with classroom learning to boost student motivation and engagement.

The development of education and training is closely tied to accessing resources in the field. With AI technology, barriers in the field, especially access to educational and training resources, can be overcome [10] [11]. For instance, AI machines can provide learning modules and videos for individuals who cannot access technology. This can be facilitated by tutors who may encounter challenges in providing training simultaneously. Furthermore, AI can provide unlimited access to data that can be accessed anytime and anywhere [12] [13].

With training modules accessible anytime and anywhere, AI can be used to generate more advanced and contextual learning content. For instance, various types of learning materials can be employed, enriching the learning experience for students. The progress of learning can be supported by AI technology through data analysis, enabling objective measurement of individual progress in assessments and monitoring developments during the learning process. This is achieved through the systematic and analytical use of data [14].

The use of AI is foundational to ensure that AI-based learning reduces the cost and time required for training. This is achieved through the recording and storage of training processes, which can save space and expenses associated with transporting materials to the training location. Thus, AI, by virtue of its advantages, should be considered a key supporting element in the educational revolution.

### 3.2 Effect of AI Implementation in Education Field

The implementation of Artificial Intelligence (AI) technology in education field has introduced a new dimension to the revolution in teaching methods. Educators can readily

adopt the use of AI to support the overall educational process. The positive impacts of AI utilization, as exemplified by specific instances, include aiding educators in administrative tasks, providing unlimited data storage, and offering flexible accessibility at any time and from anywhere. However, there are negative repercussions to consider, such as the potential for teachers to become complacent, the risk of misconceptions in the use of information between educators and data, AI's strict adherence to programmatic coding instructions, data security risks, and the inherent maintenance challenges that may lead to malfunctioning [15] [16].

In community education, the use of AI can likewise have both positive and negative effects on the general public. The general populace benefits from AI through the availability of application-based content that can be accessed conveniently at any time and from any location. Conversely, negative consequences may manifest as learners become accustomed to instant application-based learning without undergoing traditional face-to-face learning processes. Training may encounter obstacles when individuals fail to maximize the potential of training content [17] [18].

### **3.3 Competence of Education Personnel as part of responding to the Implementation of AI**

In the utilization of AI, educational institutions must be capable of employing and creating more engaging and efficient processes [1]. Therefore, in the development of competencies, educators should possess skills such as creating compelling presentations using platforms like Prezi.com, Visme.com, Canva.com, or similar platforms; designing quizzes through conventional methods utilizing tools like quizbean, flipquiz, and similar resources; employing remote communication tools such as Skype, Zoom, Google Meet, etc.; implementing classroom management systems like Edmodo, Google Classroom, and similar platforms; recording and editing audio clips using services like Soundcloud.com, and various other relevant skills. As for community learners, particularly, with the assistance of AI, they should develop critical thinking, creativity, communication, problem-solving skills, and other essential competencies. In community education, individuals must enhance both hard and soft skills to achieve competitive competence on a global scale [14] [19].

## **4 Conclusion**

The utilization of technology is expected to have a more significant impact across various fields. For the example, use of AI in the field of education is expected to significantly transform the learning methods between teachers and students. In its implementation, like duolingo, grammarly, etc AI has streamlined the process of both educators and students in achieving learning objectives and has made future learning planning more accessible. Impact in community education, the use of AI can likewise have both positive and negative effects on the general public. The general populace benefits from AI through the availability of application-based content that can be accessed conveniently at any time and from any location. However, while AI offers numerous advantages in terms of data-driven technology, it should not be the sole benchmark for

enhancing the competencies of learners. With the integration of AI, educators and students can concentrate on competency development to support learning outcomes as an integral part of the impact of AI in education. And from the condition, students and teachers must enhance both hard and soft skills to achieve competitive competence on a global scale

## References

1. M.H. Batubara, Kampus Merdeka Seri 1: Menilik Kesiapan Teknologi Dalam Sistem Kampus **53** (2020)
2. L. Ferrari, A. Macaudo, A. Soriani, V. Russo, Form@re - Open Journal per la formazione in rete **20**(3), 68–85 (2020). DOI 10.13128/form-10038. URL <https://oaj.fupress.net/index.php/formare/article/view/10038>
3. J. Butler-Adam, South African Journal of Science **114**(5-6), 1 (2018). DOI <https://doi.org/10.17159/sajs.2018/a0271>
4. Y. Liao, E.R. Loures, F. Deschamps, G. Brezinski, A. Venâncio, Production **28**, e20180061 (2018). DOI <https://doi.org/10.1590/0103-6513.20180061>
5. L. Chen, P. Chen, Z. Lin, IEEE Access **8**, 75264 (2020). DOI 10.1109/ACCESS.2020.2988510
6. M. Chassignol, A. Khoroshavin, A. Klimova, A. Bilyatdinova, Procedia Computer Science **136**, 16 (2018). DOI <https://doi.org/10.1016/j.procs.2018.08.233>. URL <https://www.sciencedirect.com/science/article/pii/S1877050918315382>. 7th International Young Scientists Conference on Computational Science, YSC2018, 02-06 July 2018, Heraklion, Greece
7. W. Holmes, M. Bialik, C. Fadel, *Artificial intelligence in education promises and implications for teaching and learning* (Center for Curriculum Redesign, 2019)
8. E.I. Supriyadi, D.B. Asih, Jurnal Rasi **2**(2), 12 (2020). DOI <https://doi.org/10.52496/rasi.v2i2.62>
9. T. Sutojo, E. mulyanto, V. suhartono, *Kecerdasan Buatan* (Andi Offset, Yogyakarta, 2011)
10. M. Adri, Rusdinal, R. Zainul, Darni, Sriadhi, N. Wahyuningtyas, Khaerudin, Nasrun, Rahmulyani, Nuranjani, Nurmaniah, A. Wedi, E. Surahman, E.N. Aisyah, H.I. Oktaviani, R.S.M. Meilanie, S.N. Purnamawati, Hapidin, W.D. Listyasari, Irsyad, Syafril, Anisah, Y. Santoso, Muhandi, A. Kristanto, L.H. Susarno, D. Kuswandi, R. Wardani, E. Adnan, Journal of Physics: Conference Series **1594**(1), 012022 (2020). DOI 10.1088/1742-6596/1594/1/012022. URL <https://dx.doi.org/10.1088/1742-6596/1594/1/012022>
11. S. Ali, B.H. Payne, R. Williams, H.W. Park, C. Breazeal, (2019). URL <https://api.semanticscholar.org/CorpusID:199457395>
12. S.J. Yang, H. Ogata, T. Matsui, N.S. Chen, Computers and Education: Artificial Intelligence **2**, 100008 (2021). DOI <https://doi.org/10.1016/j.caeai.2021.100008>. URL <https://www.sciencedirect.com/science/article/pii/S2666920X21000023>
13. S.F. Ahmad, M.K. Rahmat, M.S. Mubarik, M.M. Alam, S.I. Hyder, Sustainability **13**(22) (2021). DOI 10.3390/su132212902. URL <https://www.mdpi.com/2071-1050/13/22/12902>
14. T.N. Fitria, in *Prosiding Seminar Nasional & Call for Paper STIE AAS* (2021), pp. 134–147
15. X. Chen, D. Zou, H. Xie, G. Cheng, C. Liu, Educational Technology & Society **25**(1), 28 (2022). URL <https://www.jstor.org/stable/48647028>
16. H. Khosravi, S.B. Shum, G. Chen, C. Conati, Y.S. Tsai, J. Kay, S. Knight, R. Martinez-Maldonado, S. Sadiq, D. Gašević, Computers and Education: Artificial Intelligence **3**, 100074 (2022). DOI <https://doi.org/10.1016/j.caeai.2022.100074>. URL <https://www.sciencedirect.com/science/article/pii/S2666920X22000297>

17. O. Zawacki-Richter, V.I. Marín, M. Bond, F. Gouverneur, *International journal of educational technology in higher education* **16**(1), 1 (2019). DOI <https://doi.org/10.1186/s41239-019-0171-0>
18. G. Yulianti, B. Bernardi, N. Permana, F.A.K.W. Wijayanti, *Journal of Information Systems and Management (JISMA)* **2**(6), 102–106 (2023). DOI 10.4444/jisma.v2i6.1076. URL <https://jisma.org/index.php/jisma/article/view/1076>
19. D. Schiff, *AI & society* **36**(1), 331 (2021). DOI <https://doi.org/10.1007/s00146-020-01033-8>

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