School Policies for Integrating AI in Classroom Practices

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Executive Summary

Recent shifts in the delivery of learning experiences have accelerated the importance of emerging technologies in schools and classrooms. The urgency for educators to become familiar with emerging technologies such as Artificial Intelligence (AI) necessitates additional policies including specific safeguards for all. Educators are in a position of responsibility and should be fully aware of the latest technologies, such as AI, so they can make good decisions and educate students as informed citizens and future workforce. Educators must be considered and supported as full partners in developing and implementing these tools in all learning environments. Current research shows that educators need to become much more aware of AI technologies [citation]. Further, they should be in positions of responsibility where they advocate for the technologies and its uses in a classroom setting. The goal of this policy brief is to delineate areas that require educator attention around AI so they are empowered to develop recommendations that support literacy on AI that work within their contexts. In this context, we define literacy as general competency around how AI works, the types of data it collects, and how that data can be used. By doing so, we aim to provide useful guidance to build additional knowledge and skills, including the ethical and unbiased decisions by educators in selecting and using AI systems and technologies in classroom environments.

Teaching with AI

Educators are frequently asked to adopt educational software powered by AI [citation], yet many are unaware of the important factors related to integrating this type of technology within the classroom. There are aspects of implementation for which the educator is directly responsible (e.g., how they tie the technology in with their instruction and assignments), as well as factors that may be completely outside of their control (e.g., what data are tracked and used within and outside of the system). Evidence of effectiveness as well as implementation constraints should be provided for all educational technology, especially when it involves AI. Educators who implement AI within the classroom should be made aware of these factors and be able to make informed choices about adoption and integration practices [citation].

First and foremost, educators implementing AI technology within the classroom should be familiar with the system's effectiveness, implementation constraints, pedagogical design approach, and intended (and potentially unintended) uses of the AI system. Understanding these pieces of information will help educators understand answers to questions like, "How does the AI work? For whom? What potential biases might it have related to my students?" Since AI-enabled tools and systems are designed and evaluated under specific settings, such contexts should be shared with the educators adopting the technology so that they can make informed decisions of implementation feasibility that leads to effective use. This is particularly important for AI-powered technology that has highly tuned algorithms that were trained under specific constraints for which it operates most reliably. Training constraints during technology development create potential biases within design decisions made by the development team, and may be amplified by the population data used to test the system, the distribution of people's data used to score example content, etc. These biases could be intentional based on a highly targeted use of software (e.g., training a system with ESL students for technology that provides language support during math classes) or unintentional when a system is trained on a convenient group of people but the intended use is with a larger market (e.g., software developed primarily with upper elementary school

students but used for 3rd-8th grade students). Evidence of effectiveness and implementation constraints should be provided to allow educators to make the best use of the AI-powered technology.

One of the key roles of an educator is to make decisions that maintain student safety while increasing the likelihood that students learn, understand, and retain important concepts. It is important for educators to know what decisions are made by an AI system and which decisions they can adjust to better fit student needs. In addition, these systems are designed for specific purposes (e.g., identifying specific reading strategies that will accelerate student growth based on strengths); however, educators must also be aware of the potential for unintended uses of information from these systems (e.g., over interpretations of scores at a specific snapshot in time, or even teacher evaluation based on student performance). It is essential that AI developers commit to working with educators to design for the needs of practitioners with a focus on clearly identifying and communicating how the AI was designed (including what intended context), what data is being collected, and how that data will be used and stored. Additionally, AI developers must be transparent about what their algorithms will learn and how they will use that information to partner with educators to adapt, promote equitable instructional practices. Being aware of the underlying educational approach and (un)intended outcomes will allow educators to proactively address these issues, advocate for themselves and their students, and make the best use of educational technology.

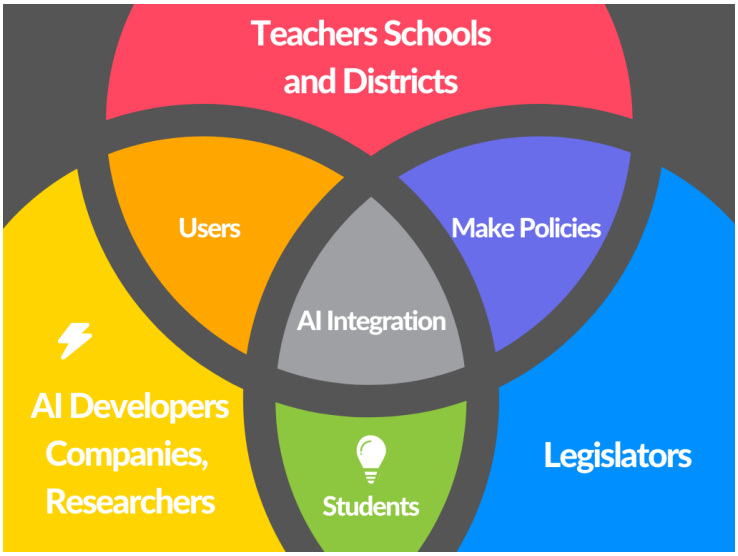
Data Privacy and Use

One area that needs to be better understood as teachers implement AI technology in their classrooms is how teacher and student data is collected and how privacy is managed. This includes a better understanding of what happens in the case of a data breach or inappropriate data use by partners, vendors, or even school districts. Educators and students should know how their data will be collected, how it will be used, and what limitations will be placed on that data. One area of concern is the use

of data for teacher hiring, evaluation, and monitoring. If algorithms used by AI tools are not transparent and companies do not share how their systems are trained, significant issues can arise when data from these systems are used for teacher evaluation. Another area of concern is the use of data for the purposes of student placement or tracking that perpetuates inequities in schools. This concern is similar to police departments' inappropriate use of AI technologies that led to profiling people in their communities, including students [citation]. The unchecked biases that become embedded into the development of AI technologies and selection of training data, must be eliminated. Another issue that needs to be addressed with AI technologies is how personal identifying information (PII) is used and handled. With the prevalence of cloud computing and remote work, it is important to understand who will have access to what data, where it will be stored in addition, and how it will be protected. Not only does the data itself need to be protected, but devices and internet connections of those accessing the data need to be secure. Specific policies may need to be developed and/or expanded for companies who collect data and create target ads, or sell information for the creation of targeted ads. Policies might also require companies to alert users of any changes to their data use policies in understandable ways.

Recommendations and Stakeholder Responsibilities

Here, we make recommendations based on identification of different stakeholders, their responsibilities, and the actions they can take as a part of the policy-making process. The following recommendations are meant to encourage various stakeholders to enhance AI Implementation in education to improve equity and student outcomes.



Legislators

To promote scalable policy, local/district/state-wide processes could be set up to provide consumers with reasonable protections from predatory practices. These processes may come from regulatory agencies that govern and safeguard companies as well as consumers of AI technology products.

Recommendations

Legislators are encouraged to:

I. Pass legislations to provide consumers with reasonable protections from predatory practices

II. Pass legislations to create a regulatory agency that will govern and provide safeguards for both the companies and consumers

AI Developers, Companies and Researchers

AI developers and companies are encouraged to employ a diverse team of developers and seek feedback from diversity auditors. As this process of development of the AI product unfolds, we anticipate that the end-users including school leaders, teachers, students, and parents will be informed about the use of AI in educational settings. Some examples for AI developers or projects that follow this process are ones similar to an upcoming Digital Promise Product Certification partnering with The Edtech Equity Project. The Edtech Equity Project uses a certification model to promote changes in an AI system's overall design and development. As we talk about the interpretability of the system from the perspective of end-users, AI systems that use models such as decision trees, support-vector machines and others are known to be interpretable [Hämäläinen, W., & Vinni, M. (2006, June)]. Using these types of systems and disclosing interpretability would be helpful in terms of understanding how the AI is trained. Research conducted to design the AI system could be elicited with transparent testing processes so that all who are involved are informed when they are involved in testing [citation]. Additionally, transparent reporting is necessary to share the system's efficacy in classroom environments.

Recommendations

AI developers and companies are encouraged to:

I. Employ a diverse team of developers and seek feedback from diversity auditors (who represent and/or have deep knowledge of the target population of technology users)
II. Inform end-users (e.g., school leaders, teachers, students, and parents) about how data will be used
III. Understand how AI was trained to report applicable constraints on appropriate populations and contexts of use
IV. Document and share underlying pedagogical approach (to allow for appropriate classroom application and alignment)

V. Conduct research and provide transparent reports on ecological efficacy

These recommendations necessitate that plans and policies be implemented to ensure connection between AI researchers, developers, and education practitioners. Currently, there are silos between research and practice [citation]. A logical starting point to bridge the gap between research and practice is to ensure that researchers partner with developers to advise on research strands and disseminate knowledge to education practitioners. This would ensure effective implementation of research findings during the product development cycle, integrating ethical practices and empowering education practitioners with appropriate knowledge and understanding of using AI in education for broader decision making purposes. Breaking the silos will ensure transparency, and promote equity and inclusion in AI research.

Recommendations

AI Researchers are encouraged to:

I. Partner with AI developers to advise on a variety of research strands:
    A. Evaluate Products and their application - is it working as intended
    B. Development of product based on ethical guidelines
    C. Impact of scale and reach
II. Disseminate their findings by:
    A. Connecting with the education practitioners to communicate innovative practices and research findings
    B. Developing accessible blogs, newsletters, and reports or partnering with research communications professionals to do this work

Districts, Schools and Teachers

In the absence of other policies, schools and districts are encouraged to create and enforce policies to provide teachers, students, and families with reasonable protections from predatory practices. These could include but are not limited to the practices described in the section on Data Privacy and Use (above). In these policies, special attention will also need to focus on teacher training to better understand and use these new technologies. Practitioners, including district/school administrators and teachers, are encouraged to fully understand appropriate use through ongoing training sessions. In these trainings, teachers should learn to evaluate technologies and their ability to promote equitable educational practices, learn how to integrate it effectively, know whose and what types of data are being captured, how data are stored, how data and tools are used, and what information is shared. Policies should be specific in data both to protect the privacy of students and teachers, and not allow for the data to be used for purposes other than explicitly stated. For example, if an AI system is used to help with parent communication, that data can not be used to evaluate a teacher's performance. Policies should allow teachers and parents to opt-out of specific data use.

Recommendations

Districts and schools are encouraged to:

I. Create and enforce policies to provide teachers, students, and families with reasonable protections from predatory practices
II. Allocate training dollars to incorporate continuous professional development for teachers to better understand and inform them about AI systems, ethical practices, risks, and benefits

The best way to support teachers is through administration. It is important for teachers to understand the appropriate use of the technology in a classroom setting. AI-based classroom orchestration tools are becoming common and can support interactive

learning experiences in classrooms [citation]. However, in some cases, these systems can be cheated by students, such as seen in the case of simplistic models that are available in Autograder systems which use keyword searches under-the-hood in the name of AI implementation [citation]. Considering these factors, it is possible to say that AI is a powerful tool that has to be wielded with caution. Teachers and administrators that use AI technology must be aware of appropriate practices. This could be encouraged by training about technological advances and establishing collaborations with administrators to promote equitable educational practices when deploying AI in classrooms. Effective integration of AI technology in education could only happen with the team efforts of teachers and administrators.

Recommendations

Teachers are encouraged to:

I. Understand the appropriate use for AI technology
II. Receive ongoing trainings as technology advances
III. Understand how to evaluate if the technology is promoting equitable educational practices
IV. Integrate it appropriately and effectively
V. Be supported by administrators and districts in the process
VI. Know whose and what types of data are being captured, stored, used, and shared

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Consulted or Recommended Sources:

1. Ethics of AI (Imagine AI: Exploring the Ethics of AI Stacey Forsyth) - ref provided by AI4K12 team members
2. Teaching AI in school (https://en.unesco.org/artificial-intelligence/education)
3. AI resources (List of Resources – AI4K12)
4. Advantages and challenges of AI in Education (Advantages and Challenges of AI in Education for Teachers and Schools)
5. Adoption of AI (How K–12 Schools Have Adopted Artificial Intelligence)
6. Challenges and opportunities of AI in Education (UNESCO): https://en.unesco.org/news/challenges-and-opportunities-artificial-intelligence-education [Download the working paper for further details]
7. How countries and organizations around the world are approaching the benefits and risks of AI (Future of Life Institute - Global AI Policy)
8. Institute for Ethical AI in Education, UK: https://www.buckingham.ac.uk/research-the-institute-for-ethical-ai-in-education/
    a. Interim report: https://www.buckingham.ac.uk/wp-content/uploads/2020/02/Summary-The-Institute-for-Ethical-AI-in-Educations-Interim-Report-Towards-a-Shared-Vision-of-Ethical-AI-in-Education.pdf
9. Selecting Tech Tools for your Organization: https://skillrise.org/article/selecting-technology-tools-your-organization-easy-abc
10. IBM AI Education: https://www.mindspark.org/ibm-ai
11. CoSN* primer for AI in the K12 environment and summarizes a lot of what we have discussed. It also has links to other useful resources: https://drive.google.com/file/d/1Rb5vqMYiAjNx89RyFRSSJ2jymxkFCqaZ/view?usp=sharing

12. STEM For All Video Showcase: Helping States Plan to Teach AI in K-12
13. Hands-On AI Projects series in English, Spanish, and Arabic at (additional ethics volume to be released later this year) http://iste.org/ai or edsurge.com/research/guides/ai-is-for-everyone-everywhere
14. Artificial Intelligence for All: A Call for Equity in the Fourth Industrial Revolution - Our World
15. Hämäläinen, W., & Vinni, M. (2006, June). Comparison of machine learning methods for intelligent tutoring systems. In International Conference on Intelligent Tutoring Systems (pp. 525-534). Springer, Berlin, Heidelberg.

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