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Role of Artificial Intelligence in Enhancing Student Engagement

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Introduction

One of the most important factors in today's educational system is maintaining student engagement. Students who are genuinely involved pay close attention, participate in class discussions, do their work on time, and typically perform higher on tests. It takes more than just sitting quietly in a chair to be engaged. It indicates that the pupil's mind is engaged. Here's the issue, though. Conventional teaching approaches frequently treat every student equally. Everyone is expected to learn at the same pace when the teacher speaks. For many kids, that doesn't work. Some people become disinterested. Some people fall behind. Some people become totally disinterested.

Artificial Intelligence (Al) comes into play here. Al is no longer merely a concept from the future. It is currently in use in actual classrooms. Al assists teachers in meeting each student's unique needs. Lessons become more dynamic, engaging, and adaptable as a result. For this reason, Al is being used more often in schools, colleges, and universities to increase student participation.

Meaning of Artificial Intelligence in Education

A computer system with artificial intelligence is capable of doing tasks that typically require a human brain. It is able to make decisions, solve issues, comprehend language, and learn from data.

Al's inclusion in education is beneficial in a variety of real-world ways. It offers individualised learning programs that modify instruction for every pupil. Intelligent tutoring systems that function similarly to private instructors are part of it. Additionally, Al provides automated evaluation tools that evaluate papers and verify responses. Learning analytics, which examines a student's learning style and areas of difficulty, is another helpful tool. Lastly, at any time of day, chatbots and virtual assistants respond to enquiries from students. Together, these resources help students stay engaged and motivated to learn.

Meaning of Student Engagement

The degree to which a student pays attention, is curious, motivated, and actively participates in their education is known as student engagement. It's not just one thing. It consists of three key components.

1. Engagement in Behaviour

The most noticeable kind is this one. It entails being on time for class, raising one's hand to respond, doing assignments, and abiding by the rules. Learning cannot even start without this.

2. Emotional Involvement

This has to do with emotions. Does the pupil find class enjoyable? Do they have any interest? Are they interested in the topic? Students do not feel compelled to learn when they are emotionally engaged. They are eager to learn.

3. Cognitive Engagement

The deepest level is this one. It indicates that the student is applying critical thinking skills, making connections between concepts, solving problems, and challenging themselves to grasp challenging subjects. Here is where actual learning takes place.

As we will see later, artificial intelligence enhances all three forms of involvement.

Role of Artificial Intelligence in Enhancing Student Engagement

The following are some significant and practical ways that artificial intelligence contributes to increase student engagement.

1. Personalized Learning for Each Student

Every student learns differently. While some people struggle with reading, others pick up maths fast. Al observes these variations. Depending on the student's performance, it modifies the

questions' level of difficulty, recommends other learning resources, and even adjusts the lesson's tempo. Students are far more engaged when they believe the instruction is tailored to their needs.

2. Intelligent Tutoring Systems as a Personal Helper

Consider an Al tutor as a patient, never-tired helper. When a student makes a mistake, the Al does more than simply mark it incorrectly. It demonstrates the proper approach and explains why it is incorrect. It simplifies difficult subjects into manageable chunks. Students feel encouraged rather than ashamed as a result. They gain self-assurance and stay interested for longer.

3. Quick Feedback Without Waiting

It is annoying to have to wait a whole week to receive a test sheet back. The student has already forgotten what they wrote by that point. Al provides feedback right away. When a student completes an assignment or assessment, they immediately see what went well and poorly. They may immediately correct their errors. This keeps learning active and continuous.

4. Interactive and Fun Learning Environments

Al turns education into a game rather than a punishment. It introduces instructional games, online tests with scores and prizes, smart classroom tools, and virtual lab experiments. For instance, a science student can safely mix chemicals in a simulated lab or carry out a virtual dissection. Students are motivated to participate in these activities.

5. Spotting Learning Challenges Early

Al silently observes a student's problem-solving techniques. It is able to recognise patterns. For example, the Al highlights a student who consistently makes fractions mistakes but performs well in addition. When additional assistance is required, the teacher is alerted and can provide it. This prevents minor issues from growing into major setbacks. Instead of being ignored, students feel understood.

6. Giving Teachers More Time for Real Teaching

A teacher's day is spent grading assignments, creating report cards, and keeping track of attendance. Al does a lot of this repetitive labour automatically. After that, the instructor is free to do what only a human can do: engage students in conversation, provide gentle explanations, share tales, and create a welcoming classroom atmosphere. Class becomes more engaged when the teacher is less exhausted.

7. Flexible Learning Anytime, Anywhere

Not every student learns best in a packed class at eight in the morning. Some people are better at concentrating in the early morning or late at night. Al is in favour of distance education and internet learning. At midnight, a student can solve challenges, view a video lesson, and ask a chatbot a question if they want. This flexibility brings in many students who otherwise might have dropped out. Many students who might have otherwise dropped out are drawn in by this flexibility.

8. A Real Life Example

Imagine a classroom where a reading software based on Al is used by the teacher. One student has trouble learning new words and reads slowly. The software reads challenging words aloud and provides him with easier ones. Another student reads quickly and becomes disinterested. The software asks more in-depth enquiries and presents him with more difficult stories. Because the work suits both of them, students remain engaged. The teacher merely moves around, offering assistance when required. Al is quietly working in the background.

Benefits of Al for Student Engagement

In the field of education, artificial intelligence offers numerous benefits. It respects each student's pace and makes learning feel individualised. By lowering boredom and irritation, it boosts motivation. Al gives students rapid feedback so they may get better right away. It helps delayed learners without making them feel excluded. Teachers save hours on paperwork and

marking because to Al. It motivates students to take responsibility for their own education. Lastly, it enhances general academic performance and test scores.

Challenges in Using Al in Education

Al is not a magic solution. When employing Al in education, an institution encounters numerous challenges:

1. Data Privacy and Safety

AI systems gather a lot of data about students, such as their test results, mistakes, scores and even how long they take to answer or respond. This data may be abused if it is not protected. Schools need to use extreme caution for it.

2. Inadequate computers and internet

Many schools lack adequate computers, internet access, and dependable electricity, particularly in rural towns and villages. Al cannot operate without this fundamental configuration.

3. High Cost

Expensive Hardware and software for Al are costly. They are just out of reach for less affluent schools and universities. A digital divide results from this. Rich schools improve by getting better AI while underprivileged schools continue to lag behind.

4. Teachers Require Appropriate Training

Installing an Al system and expecting instructors to be proficient with it is not feasible. The majority of educators are unaware of this. The Al tool will either go unused or be misused if it is not properly trained.

5. An excessive reliance on machines

If students spend all their time learning from Al, they may lose human connection. They need to talk to teachers, argue with friends, work in groups, and learn social skills. AI should help, not replace, real human interaction.

Suggestions for Effective Use of Artificial Intelligence

Here are some practical ways to get most out of Al while avoiding the challenges. Teachers should be trained in educational institutions initially. Spending time and money on teacher training should come before purchasing any Al tool. Institution must adhere to stringent guidelines regarding the collection and storage of student data. Prior to bringing in Al, basic infrastructure such as computers, internet, and dependable electricity must be improved. Al should be used by teachers as an assistant rather than a supervisor. A human teacher should always make the final decisions. All students must have access to Al tools, according to their institution policies. Al tools for underprivileged institutes might be funded by governments and non-governmental organisations. Lastly, keeping a balance is important. Al can be used for practice and feedback, but face-to-face teaching, storytelling, and group discussions should still be the main focus of the classroom.

Conclusion

Artificial intelligence is gradually altering both how teachers teach and students learn. Enhancing student involvement is its most potent function. It accomplishes this by providing courses offered to each student, providing immediate assistance and feedback, making learning enjoyable and engaging, and assisting educators in identifying issues early on. The advantages are obvious. Pupils become more engaged, less irritated, and more eager to work hard. Teachers are freed from monotonous work so they may concentrate on deep conversations and meaningful discussions.

But we can't ignore the challenges that arise. Real obstacles include expensive costs, inadequate infrastructure, privacy concerns, and the requirement for appropriate teacher preparation. However, none of these issues are impossible to solve. Al can be used sensibly with thorough preparation, sincere effort, and a well-rounded strategy. Governments, educators, parents, and institute administrators need to collaborate. They have to make sure that Al is introduced

gradually rather than all at once. Additionally, they have to make sure that no student falls behind just because their school cannot afford the newest technology.

There is no need to choose between humans and machines in the future of education. The ideal future is one in which human teachers do their finest job while Al takes care of the mundane tasks. Teachers are compassionate, empathetic, and aware of their pupils' emotional needs. Al is not able to smile warmly or offer words of encouragement. It is unable to comprehend the reasons for a child's sadness or distraction. That can only be done by a human teacher.

Therefore, replacing instructors with technology should never be the aim. AI should be used as a helpful, silent assistant that operates in the background. Classrooms will become more engaging, inclusive, and genuinely focused on the needs of every student if this balance is reached. At the appropriate level, students will feel heard, noticed, and challenged. Instead of feeling overburdened, teachers will feel encouraged. The true potential of artificial intelligence in education lies in this. It has nothing to do with ostentatious technology. It is about assisting each and every student in maintaining their interest, curiosity, and learning.

References

Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K 12 settings. AI and Ethics, 2(3), 431 440.

Baker, R. S., & Inventado, P. S. (2014). Educational data mining and learning analytics. In Learning analytics (pp. 61 75). Springer.

Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial intelligence trends in education. Procedia Computer Science, 136, 16 23.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. IEEE Access, 8, 75264 75278.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.

Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of artificial intelligence in education. Computers and Education: Artificial Intelligence, 1, 100001.

Kulik, J. A., & Fletcher, J. D. (2016). Effectiveness of intelligent tutoring systems. Review of Educational Research, 86(1), 42 78.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson Education.

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development. UNESCO Publishing.

Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. Research and Practice in Technology Enhanced Learning, 12(1), 22.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. International Journal of Artificial Intelligence in Education, 26(2), 582 599.

Schmid, U., & Ragni, M. (2019). Artificial intelligence in the classroom. KI Künstliche Intelligenz, 33(4), 317 320.

Tegos, S., Demetriadis, S., & Karakostas, A. (2015). Promoting academically productive talk with conversational agent interventions. International Journal of Artificial Intelligence in Education, 25(4), 533 565.

Woolf, B. P. (2010). A roadmap for education technology. Computing Community Consortium.

Zhang, K., & Aslan, A. B. (2021). AI technologies for education: Recent research and future directions. Computers and Education: Artificial Intelligence, 2, 100025.

Zawacki Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. International Journal of Educational Technology in Higher Education, 16(1), 39.