

Predictive Analytics in Education

Category: Artificial Intelligence in Education

Predictive analytics in education uses historical and current data to estimate a future educational outcome or the probability of an event, such as course completion, achievement or need for support. Statistical or machine-learning models identify patterns, but their outputs are probabilities rather than facts about individuals.

Prediction is a specialised use of learning analytics and should be linked to a justified, supportive action. Model accuracy alone is insufficient: institutions must examine whether the target is educationally meaningful, errors are fairly distributed and interventions genuinely help ([Sghir et al., 2023](#)).

Responsible Prediction Cycle

1. **Define:** Specify the outcome, time horizon, intended benefit and decision the prediction may inform.
2. **Validate:** Test data quality and performance across relevant cohorts, contexts and time periods.
3. **Communicate:** Present uncertainty, limitations and appropriate interpretation to authorised users.
4. **Intervene:** Offer proportionate support without labelling, penalising or reducing learner opportunity.
5. **Audit:** Monitor error, drift, unequal effects, learner responses and the impact of interventions.

Examples in Practice

A university model may flag students who could benefit from an academic check-in. Advisers treat the flag as an invitation to conversation, consider information the model cannot see and offer support without changing grades or access. Students can ask how the prediction was used.

Why It Matters

Prediction may help institutions offer earlier support, but false positives can stigmatise and false negatives can exclude. Responsible practice therefore evaluates the complete decision process—including the intervention and learner experience—rather than celebrating predictive accuracy alone. Non-predictive support should remain available to all learners over time ([Namoun & Alshantqi, 2021](#)).

Further Reading

6. Sghir, N., Adadi, A., & Lahmer, M. (2023). [Recent advances in predictive learning analytics](#). *Education and Information Technologies*, 28, 8299–8333.
7. Namoun, A., & Alshantqi, A. (2021). [Predicting student performance using data mining and learning analytics techniques](#). *Applied Sciences*, 11, 237.
8. Ifenthaler, D., & Yau, J. Y.-K. (2020). [Utilising learning analytics to support study success in higher education](#). *Educational Technology Research and Development*, 68, 1961–1990.

Related Terms: Learning Analytics | Early-Alert Systems | Educational Data Mining | Algorithmic Bias