Rethinking Educational Technology in Bhutan: A Media Ecological Perspective

Jangchu Tenzin[1]

Introduction

Television and the Internet were introduced in Bhutan only in 1999, decades after they had reshaped daily life elsewhere (Rose, 2005). Yet within a single generation, the country has moved from caution to commitment.

Two successive Education ICT masterplans, *iSherig* and *iSherig*-2, set out to equip classrooms across the country with digital infrastructure (Ministry of Education, 2014, 2019). In 2025, Bhutan also finalised its first National Education Policy (Ministry of Education and Skills Development, 2025b) along with a national Education Technology Framework (Ministry of Education and Skills Development, 2025a).

The newest arrival is generative AI. Students are already using it, and policymakers increasingly view it as the next stage of educational modernisation.

Across these developments, technology is most often described as a tool (UNESCO, 2023). It is something added to the existing system to improve quality, widen access, and prepare students for a digital world.

The assumption is additive. The classroom remains what it was and simply gains a new instrument. This article questions that assumption. Following Neil Postman, it argues that a technology is never merely an addition to an existing system. It changes the system. As Postman (1998) put it, "a new medium does not add something; it changes everything" (p. 4).

1 Jangchu Tenzin is a PhD student in Educational Studies at the University of New Brunswick, Canada, where his research focuses on immersive technology in education. Prior to this, he worked in Bhutan as a teacher, instructional designer, ICT officer, and curriculum developer.

The argument here is not that Bhutan should reject educational technology. Rather, Bhutan should adopt it deliberately, with a clear view of what each technology does to the learning environment and not only what it can deliver within it.

The article proceeds in four steps. It first sets out media ecology and the five ideas about technological change that Postman urged societies to keep in view. It then interprets Bhutan's digital turn through those ideas. Next, it reviews what is actually known about AI and Bhutanese students, and where the gap lies. Finally, it offers practical considerations and guidelines for adopting AI in Bhutanese schools.

Media Ecology and Postman's Five Ideas

Media ecology studies media and technologies not as neutral channels for content but as environments that reshape how people perceive, think, and relate to one another. McLuhan's (1964) claim that the medium is the message captures the core idea: "It is the medium that shapes and controls the scale and forms of human association and action" (p. 16), more than any content it carries.

Applied to education, this perspective shifts the question from what a technology can teach to what kinds of learners, teachers, and educational values it produces, and what it displaces.

Postman (1993) argued that "embedded in every tool is an ideological bias, a predisposition to construct the world as one thing rather than another, to value one thing over another, to amplify one sense or skills or attitude more loudly than another" (p.13).

The arrival of a new medium changes the world. For instance, when television was introduced in Bhutan, it did not leave the existing culture intact. It helped produce a different one. Introducing AI may mean a reorganised system in which the meaning of knowing, attention, and assessment may all change.

In a 1998 talk, Postman compressed this thinking into five ideas about technological change: First, every technology change is a trade-off - for every advantage a new technology offers, there is a corresponding cost;

second, the advantages and disadvantages are never distributed evenly across a population; third, embedded in every technology is a powerful idea, a prejudice about what counts as important; fourth, technological change is not additive but ecological - a new medium changes everything; fifth, technologies tend to become mythic, perceived as part of the natural order of things rather than as human-made artifacts open to question (Postman, 1998).

These ideas do not assume that technology is bad. They assume only that its costs are real, unevenly distributed and easy to overlook in the enthusiasm of adoption. The sections that follow read Bhutan's digital turn through them.

Bhutan's Digital Turn Through These Ideas

Postman's first idea is that every technological change is a trade-off. When efficiency and instant access to information become the organising goals of a digital classroom, something is gained - speed, reach, and immediate access to answers. But something is also put at risk. Slower forms of learning depend on sustained attention, discussion, struggle, and reflection, and these habits are harder to maintain once answers arrive instantly.

A student who can find an answer at once has little reason to sit with a difficult question and the patience that understanding requires becomes harder to cultivate. Bhutanese students themselves have begun to name this tension, noting that heavy reliance on AI can weaken their capacity to think and remember independently (Lhamo, 2025).

His second point is that the advantages and disadvantages of a technology are never evenly distributed. In Bhutan, geography makes this concrete. A survey of 1,500 Grade 10 students found persistent inequalities in access to ICT resources and in students' confidence and proficiency, and it found that the school is often the only reliable point of access for many learners (Tshering & Phuntsho, 2025).

If AI tools come to be assumed as a baseline of schooling, students in well-connected urban schools stand to benefit first, while those in remote schools risk falling further behind. A technology introduced to widen opportunity can, without deliberate effort, widen the gap instead.

The third idea is that every technology carries an embedded bias. Nowhere is this embedded bias more consequential for Bhutan, and less discussed, than in language. Generative AI systems are trained overwhelmingly in English. Dzongkha, like most smaller languages, is barely represented in their training data, and the tools perform poorly in it when they respond at all. Students who turn to AI for schoolwork turn to English and deepen the already dominant role of English in Bhutanese classrooms.

The fourth idea is that technological change is ecological, not additive. It alters the meaning of what was already there. When the calculator entered the mathematics classroom, for example, it did not simply make mathematics faster; it changed what a mathematics lesson was for, easing the need for manual calculation while quietly eroding mental-math fluency.

Generative AI proposes the same kind of change, but on a far larger scale. While a calculator altered one operation in one subject, a tool that writes, reasons, and explains touches what it means to know something, to show understanding, and to be assessed at all. AI in the classroom is not the old classroom plus AI. It is a different classroom.

Fifth, Postman also warned that technologies tend to become mythic, accepted as a natural and unquestionable part of the order of things. In Bhutan, the tendency shows in how ICT ambition was tied from the outset to Gross National Happiness, the country's development philosophy (Ministry of Education, 2014).

That link was made well before any systematic study had shown that technology integration improves learning in Bhutanese schools. When a technology is enrolled in advance into a national story of progress, the prior question, whether and on what terms to adopt it, tends to disappear. What remains is only the question of how fast to roll it out.

What We Know About AI and Bhutanese Students

A reasonable response to all of this is to ask what the evidence actually shows. The honest answer is that, for Bhutan, the evidence is thin and unevenly placed. This is not unusual.

Globally, good impartial evidence on the impact of education technology is in short supply, and much of what exists comes from those trying to sell it (UNESCO, 2023). What research exists clusters at the higher education level. A mixed-methods survey of 76 lecturers across Bhutanese higher education institutions found that 88.2 percent had observed students using generative AI in academic work, and that three-quarters were concerned about its effects on academic integrity, with plagiarism, over-dependence, and skills erosion being the dominant themes (Dorji, 2026).

A focus group study of 180 students across five Royal University of Bhutan colleges reported a similar duality - students valued quick access to information, personalised support, and even emotional reassurance, but worried about the reliability of AI output and its effects on their creativity and critical thinking (Tamang et al., 2026).

At the school level, the most visible evidence is journalistic rather than scholarly. Reporting from Bhutanese schools shows that students already use ChatGPT, Gemini, and similar tools routinely to verify answers, generate ideas, and manage heavy workloads, often outside school hours when teachers are unavailable.

The same reporting records two things. First, students value these tools, yet they also worry that heavy use weakens their independent thinking. Second, guidance on the ethical use of AI is absent or ad hoc, varying from school to school and teacher to teacher, and most schools lack any means to detect AI-generated work (Lhamo, 2025). In other words, adoption has outpaced policy.

There is one exception in which AI has been introduced into Bhutanese schools deliberately and evaluated. With UNICEF support, the Ministry of Education and Skills Development piloted an AI-powered mathematics platform, Eduten, with 952 Grade 5 students in 32 schools.

The pilot reported an 11.2 percentage-point improvement in mathematics skills and a 4.6 percentage-point increase in arithmetic fluency over a 10-week period against a control group (UNICEF, 2024). The report itself cautions that gains cannot be attributed to the platform alone, and the evaluation was conducted by the pilot's own partners rather than an independent body.

On the basis of these findings, the platform was rolled out to all Grade 4 students nationwide, extending to Grade 5 in 2025 and Grade 6 in 2026 (UNICEF, 2025). It was aligned with the national curriculum and accompanied by teacher training, coaching, and parental involvement.
Taken together, the evidence concentrates at the tertiary level, while the school-level reality is one of widespread, unguided student use. This gap is not a reason to wait. Rather, it is a reason to adopt cautiously, to evaluate as Bhutan goes, and to build guidance before practice hardens into habit.

Towards Guidelines for AI in Bhutanese Schools

What, then, should Bhutan consider as it weighs the use of AI in schools? The following considerations draw on Postman's ideas and on the limited evidence above.

- **Ask "whether" before "how fast"**
  Before a tool is adopted, teachers should be able to state the specific learning problem it is meant to solve, who has that problem, and what new problems it may create. Postman (1999) distilled this into a checklist of questions to ask of any technology: What is the problem to which it is the solution, whose problem is it, who will be harmed, what new problem will be created by solving the old one, and who gains new economic and political power from the change? Asked plainly of every proposed tool, the checklist is a practical instrument any school or policymaker can use.

- **Teach AI's limits, not only its use**
  School AI literacy should give as much weight to what AI cannot reliably do as well as how to use it (UNESCO, 2024a). Students need direct, age-appropriate experience of AI producing confident but wrong answers, reflecting bias, and fabricating sources, so that scepticism becomes a habit rather than an afterthought. The goal is a learner who interrogates AI output, not one who defers to it.

  UNESCO's AI competency frameworks offer a ready scaffold, placing a human-centred mindset and the ethics of AI ahead of technical facility for both students and teachers (UNESCO, 2024a, 2024b), and Bhutan's Education Technology Framework has already begun

adapting the teachers' standards to the national context (Ministry of Education and Skills Development, 2025a).

- **Treat equity as a design requirement**
  Given the documented urban-rural gaps in ICT access and confidence (Tshering & Phuntsho, 2025), any AI initiative should be assessed in advance for its distributed effects. Tools that assume reliable connectivity or a personal device will favour students who already have the most. Where access is uneven, school-based, offline-capable provision, together with additional support for under-resourced schools, should precede rather than follow rollout.

  The Education Technology Framework itself lists access, equity, and inclusion among its guiding principles and pledges that no learner is left behind (Ministry of Education and Skills Development, 2025a).

- **Establish integrity and ethical-use guidance now**
  Students report that guidance on the acceptable use of AI, on plagiarism, and on attribution is largely absent or inconsistent, present in some classrooms and missing in others (Lhamo, 2025). Clear, simple, age-appropriate expectations, developed with teachers and students rather than imposed on them, should be in place before AI becomes routine, not after. Guidance framed around honesty and learning is more durable than detection software, which most schools are unlikely to be able to rely on.

- **Keep the teacher at the centre**
  AI should augment the teacher's judgement, not substitute it. The Eduten experience suggests that outcomes depend heavily on teacher training, coaching, and the human relationships around the technology (UNICEF, 2024). Investment in teacher capacity matters more than the sophistication of any particular tool (UNESCO, 2024b).

  A well-supported teacher can model critical use and step in where tools mislead. Ongoing professional development for all teachers is already a stated goal of the Education Technology Framework (Ministry of Education and Skills Development, 2025a).

- **Anchor adoption in Bhutanese values**
  AI in schools should be weighed against Bhutan's own educational aims, including those expressed through Gross National Happiness, rather than imported wholesale on the assumption that what suits other systems suits Bhutan. The country's history of deliberate, value-led adoption is a resource to draw on, not a limitation to overcome.

Conclusion

Interpreting Bhutan's educational technology through a media ecology lens does not lead to a verdict against technology; it culminates in a discipline of attention.

Postman's ideas urge societies to recognise that every new medium reorganises the environment it enters, that its costs fall unevenly, and that its benefits are easiest to see while its losses are easiest to ignore. Applied to AI in Bhutanese schools, that discipline yields practical guidance: Pilot before scaling, teach AI's limits, design for equity, set integrity expectations early, keep teachers central, and stay anchored in Bhutanese values.

The same deliberation that once kept television and the Internet at the border until 1999, the willingness to ask "whether" before asking "how fast" is what this moment calls for again. For a country that has built its development around weighing progress against wellbeing, the task is to measure each new medium against its own commitments rather than to accept it as an imposition from elsewhere. Bhutan's educators still have the choice to cross this new threshold thoughtfully.

References

Dorji, K. (2026). The impact of generative artificial intelligence on academic assessment in Bhutanese higher education: Lecturers' perspectives. *Asian Journal of Contemporary Education*, *10*(1), 72–88. https://doi.org/10.55493/5052.v10i1.5907

Lhamo, S. (2025, April 5). Students and teachers weigh the use of AI in education. *Kuensel Online*. https://kuenselonline.com/news/students-and-teachers-weigh-the-use-of-ai-in-education

McLuhan, M. (1964). *Understanding media: The extensions of man*. Sphere Books Limited.

Ministry of Education (2014). *iSherig: Education ICT master plan 2014-2018*. Ministry of Education, Royal Government of Bhutan.

Ministry of Education. (2019). *iSherig-2: Education ICT master plan 2019-2023*. Ministry of Education, Royal Government of Bhutan.

Ministry of Education and Skills Development (2025a). *Education technology framework*. Ministry of Education and Skills Development, Royal Government of Bhutan. https://education.gov.bt/download/education-technology-framework-etf/

Ministry of Education and Skills Development (2025b, January). *National education policy: Empowering the future*. Policy and Planning Division, Ministry of Education and Skills Development, Royal Government of Bhutan. https://education.gov.bt/download/national-education-policy/

Postman, N. (1993). *Technopoly: The surrender of culture to technology*. Vintage Books.

Postman, N. (1998, March 28). *Five things we need to know about technological change*. https://web.cs.ucdavis.edu/~rogaway/classes/188/materials/postman.pdf

Postman, N. (1999). *Building a bridge to the 18th century: How the past can improve our future* (1st ed). Alfred A. Knopf: Distributed by Random House.

Rose, E. (2005). The wiring of Bhutan: A test case for media ecology in the non-Western world. *Proceedings of the Media Ecology Association*, *6*.

Tamang, T. O., Daker, S., Gurung, B., & Dorji, U. (2026). Students' perspectives on integrating generative AI tools into teaching, learning, and assessment in higher education: A case of the Royal University of Bhutan. *Journal of Research in Education and Pedagogy*, *3*(2), 130–154. https://doi.org/10.70232/jrep.v3i2.153

Tshering, G., & Phuntsho, T. (2025). Examining grade 10 students' ICT utilisation in Bhutan. *Journal of Global Education and Research*, *9*(2), 155–171. https://doi.org/10.5038/2577-509X.9.2.1365

UNESCO (2023). *Global education monitoring report 2023: Technology in education: A tool on whose terms?* GEM Report UNESCO. https://doi.org/10.54676/UZQV8501

UNESCO (2024a). *AI competency framework for students*. UNESCO. https://doi.org/10.54675/JKJB9835

UNESCO (2024b). *AI competency framework for teachers*. UNESCO. https://doi.org/10.54675/ZJTE2084

UNICEF (2024). *Educational technology use in Bhutanese schools: The outcomes of a 10-week pilot introduction of a Mathematics learning platform in 20 schools*. UNICEF. https://www.unicef.org/innovation/media/22426/file/Bhutan%20Digital%20Learning%20Study%20Report.pdf

UNICEF (2025, February 28). *Bhutan expands EdTech innovation for children nationwide after successful pilot*. https://www.unicef.org/digitaleducation/blog/bhutan-expands-edtech-innovation-children-nationwide-after-successful-pilot