

# Balancing AI and Traditional Teaching: Assessing Opportunities and Risk in Education

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## Abstract

The study focuses on assessing how teachers' and students' perspectives on the use of AI in education differ. It also aims to find a practical and ethical approach for the strategic balance of traditional teaching and an AI-based approach. The research area is based on the education institutions in Hetauda Sub-metropolitan city. It uses quantitative data collected with a survey questionnaire from 237 participants, 52 teachers, and 185 students. The data are analyzed using both descriptive and inferential statistics with cross-tabulation, threshold analysis, and a risk opportunity matrix. The results from the data analysis showed students strongly preferred the hybrid model, while teachers struggled to balance AI in their traditional approach. The teachers' confidence and effectiveness closely depend on proper AI training. The findings highlight students' concerns over AI use. Overall, results suggest that policy guidelines for socio-emotional and ethical balance should be considered before integrating AI in the education system for teachers' professional development. Based on the results, this study stresses that the success of the hybrid model highly depends on infrastructural robustness and teachers' preparedness.

**Keywords:** Hybrid approach, AI, Teachers-students' perspectives, Traditional teaching, Human-values

## Introduction

It has been witnessed how AI has reshaped teaching-learning and overall operation of the educational institution. It has made helped teachers on customizing their teaching pedagogy and students on personalizing their learning. But whatever development and advancement realized in machines it cannot reproduce human characters like empathy, socio-cultural interactions, and values. Hence, as a researcher it is felt necessary to analyze how AI and traditional teaching can be balanced. Artificial intelligence (AI), often defined as the science of creating a machine to replicates human intelligence (Morandín-Ahuerma, 2022) to supports teaching and learning

through personalized, data-driven, and efficient instructional tools (Grahan, 1988; Leong et al., 2025). AI help to adjust instructional materials, and assessments in real time, offering personalized learning and intelligent tutoring systems (Pratama et al., 2023; Chris, 2025; Leong et al., 2025). AI has helped transforming education from teacher-centered approaches to learner-centered approaches, revolutionizing traditional pedagogies (Tang, 2024; Al-Hamadi & Yousif, 2025; Mishra, 2024). However, AI cannot fully replace traditional teaching approach, as machines can replicate human intellect, emotions, ethical reasoning (Noddings, 2013; Balliu, 2017; Swamy & Salis, 2021; Chan & Tsi, 2023; Septiani & Ramadani, 2025). Scholars also have concerns on AI, as its overdependence can weaken teacher-student bonding, reduce creativity, with risk of data security and ethical issues (Yadav, 2024; Rochelle & Sushith, 2024).

The debates can be raised on both pros and cons of AI. the use and demerits of AI. For positives AI improves education increasing accessibility, efficiency, adaptability, engagement, and learning outcomes (Zhang et al. 2021; Potter Kaledio et al., 2024). While for negatives AI risks the emotional and moral roles of the teachers (Chan & Tsi, 2023; Septiani & Ramadani, 2025).

To address these issues, hybrid model can be integrated in education. Global prospects show that developed regions like North America, Europe, East Asia have already reached to advanced level in AI use (Reina-Parrado et al., 2025; Shi, 2025). While countries like Nepal and South Asian countries like Pakistan, Bangladesh, are still showing signs of the early stages, especially in overcoming geographical barriers and resource limitations (Vaidya, 2024 and Hossain et al., 2025). India has shown some progress with AI introduction in school curricula (Karan & Angadi, 2023). This shows that AI is not equally accessible to all yet. Hence, the education system, especially in developing countries, must find the application of AI while maintaining the human values that make learning meaningful.

### ***Statement of the Problem***

The key issues are to make use of AI and also maintaining balance on traditional values such as ethics, human emotions and intelligence. This study focuses on how teachers and students perceive AI, and how balance can be maintained to traditional values while integrating AI in educations. The earlier studies basically show the benefits and technical functions of AI (Saira, 2021; Joseph et al., 2024). Also, these studies only advocate for balance, but do not present any clear strategic approaches and the use of methods for balancing AI and traditional techniques, which remains as a gap for this study.

### ***Purpose of the Study***

This study focuses on assessing the techniques for balancing the use of AI and traditional teaching approaches. This technique creates a better learning environment through the use of AI with maintaining human values. This study aims to find practical and ethical methods for the application of AI that empower teachers instead of replacing them, ensuring education remains inclusive, value-based, and holistic.

### ***Research Questions***

- i. What are teachers' and students' perceptions on AI-integration in teaching and learning?
- ii. What are the opportunities and risks connected to AI-integration in education?
- iii. How can AI and traditional teaching be balanced effectively?

### ***Delimitations***

The study is limited to the selected educational institutions in Hetauda Sub-metropolitan city; hence its result cannot be generalized. The study uses only quantitative analysis, which may not provide the deeper insights related to their experiences, contextual aspects. The study focuses on perceptions and attitudes towards AI-integration, without considering the long-term impact. The study is made on the single frame of time. The longitudinal study would have provided more implementable results.

### **Literature Review**

This section contextualizes the research through the existing theories, model, and empirical findings.

#### ***Conceptual and Theoretical Evidences***

AI in education offers personalized learning enhances learner's engagement, competencies, through digital literacy. According to Leong et al., (2025) AI in education conceptualized as transformative tools. In global scenario, AI it has been designed and promoted as supplement and not replacement of teachers' facets. However, concerns remain for data privacy, overreliance, ethical issues, and socio-emotional development. Theoretically, Vygotsk (1978) learning can be effective through social interaction and experience guided and supported within their Zone of Proximal Development. This has been complemented by (Noddongs, 2013; Siemens, 2005) highlighting AI helps for collaborative, problem-solving and adaptive learning experiences, connecting within resources, information and people. AI can support this by helping learners access and connect to real-time information from vast web of knowledge. The Technology Acceptance (Davis, 1989) and Humanistic Learning Theory (Rogers, 1983) also highlighted holistic development through adopting new technology

#### ***Empirical Reviews***

The empirical findings from multiple contexts with our contents reveal the diverse impact of AI integration in education.

The studies from Nepal, South Asia, and global contexts reveal that AI in education learning outcomes like personalized learning, self-efficacy, creativity, real-time feedback in teaching and learning (Jiménez, 2024; Bye, 2017; Hamdam, 2024; Li, 2024; Kurshid et. al., 2024; Saba et. al., 2024; Karan & Angadi, 2023). But they are concerned for data privacy and security, and also algorithmic bias.

Studies in Nepal further showed positives on AI, like improvement in digital literacy, communication, and information reliability, while also indicated the concerns for teachers'

readiness, technological access and infrastructure limitations (Ghimire et al., 2024; Baskota & Poudel, 2024); Bohara & Rana, 2024; Chapagain & Adhikari; 2024). Studies on Teachers' Perceptions and Readiness in Nepalese and South Asian perspectives shows improved teachers' performance, but also highlights concern to increased workload, pedagogical control, job displacement and lack of proper training and infrastructural support for teachers' readiness (Bohara & Rana, 2024; Ramesh, 2019; Shaoukat, 2024; Kim and Kim, 2022; Joshi et al., 2021; Wardat et al., 2024). Additionally, studies shows AI-integration has several risks associated to data privacy and security, algorithmic bias, reduced creativity, collaboration, and critical thinking with socio-emotional skills. This point out the need for thoughtful and wise adoption of AI in education (Fahirad & Kotamjani, 2018; Assefa, 2024; Svoboda, 2024; Ahmed et al., 2024; Funda & Mbangeleli, Onyebuchi et al., 2024; Wafik et al., 2024). Similarly, studies relating to hybrid approach, the traditional education system with structured instruction and holistic model is assumed to better even today for moral and human values (Achary, 2025). However, Karki (2021) had indicated ineffectiveness of traditional approaches in engaging contemporary learners. Consequently, Global contexts have opinioned hybrid models integrating socio-emotional and ethical balance with improved engagement, personalization, participation, instructional efficiency, and real-time feedback in education (Balliu, 2017; Kushwaha et al., 2023; Adhadi et al., 2024; Mulenga & Shilongo, 2024). This seems to be more appropriate in Nepalese educational system where social-emotional and ethical values weakening. However, the educational institution should be aware that success of hybrid model depends on strong technological infrastructure, innovative pedagogies, and faculty collaboration with professional development (Azizi, 2021; Joseph et al., 2024; Cordero et al., 2024; Gudoniene et al., 2025; Bye (2017); Ray & Ray, 2024); Bamforth et al., 2025; Turdiev, 2025).

### ***Research Gap***

The empirical studies show that several researchers have been conducted on positive and technical aspects of AI in education. These studies also have stresses the need for balancing AI with traditional teaching. But there remains a gap on how the balance can be maintained, basically in the Nepalese educational system. This study tries to highlight the disconnection between teachers' readiness and students' expectations and also how the balance can be established with AI and traditional teaching approach.

### ***Hypotheses***

- H1: There is positive relation between adequate AI training and teachers' confidence.
- H2: AI opportunities have positive influence on students' hybrid model preferences.
- H3: Over dependence on AI reduces socio-emotional development and teacher-student relationships.
- H4: Hybrid model can improve both students' learning and engagement that solitary use.

## Conceptual Framework

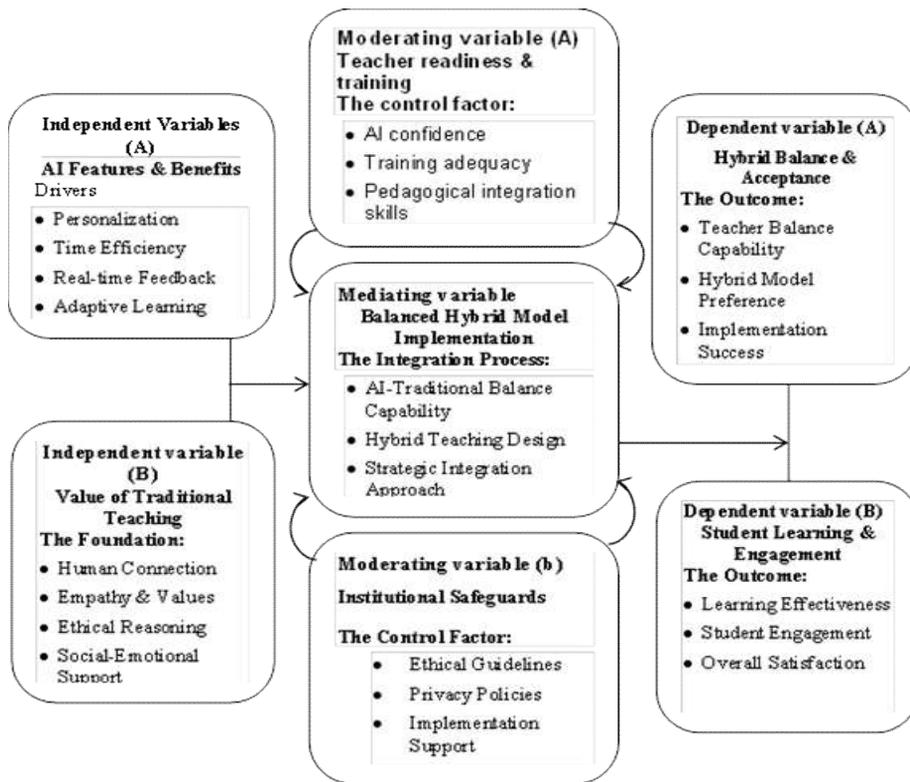


Figure 1. Conceptual framework

## Research Methods

### *Philosophical Foundation and Research Design*

The study basically focuses on teachers' confidence, effectiveness, AI-balance with traditional teaching, efficiency, risk perceived, ethical and training needs. For students the study focuses on leaning effectiveness, engagement, personalization, efficiency, hybrid preferences, socio-emotional and ethical considerations. The study operates on the premise where teachers' and students' perspectives, experiences and outcomes are objective realities and can be quantified and measured. Associated to this the study is grounded in positivist research paradigm. Based on the philosophical foundation, the study adopts a quantitative, cross-sectional, survey design has been used for the data collection and analysis. The collected data are analyzed using descriptive, inferential, and comparative statistical techniques.

### *Sources and Nature of Data*

This study uses primary data. Primary data will be collected from the Colleges/Schools in Hetauda.

### Population

The population includes the teachers, and students from colleges and schools in Hetauda Nepal. This population is selected because they are the primary stakeholders involved in AI-integrated or traditional teaching-learning practices.

**Table 1**  
*Population*

Category	Respondents' Numbers	Justification
Teachers	400	The estimation is based on the average number of faculty members across approximately 20 colleges and schools, with each institution employing at least 15-25 staff.
Students	1500	In general colleges and schools in Hetauda enroll students between 200-600, taking an average of 75 students from each institution.
Total	2000	

### Sample Size

The sample size was calculated by using Cochran's Formula (Stamatopoulos, 2019). This was chosen because it provides statistically reliable sample sizes for large populations.

The formula to calculate sample size for finite population:

$$n = \frac{n_0}{1 + \left(\frac{n_0 - 1}{N}\right)}$$

Where:

$n$  = adjusted sample size for finite population in the study.

$N$  = size of the population for the study = 2000

$n_0$  = initial sample size for an infinite population (384)

Calculation of sample size:  $n = \frac{384}{1 + \left(\frac{384 - 1}{2000}\right)} \approx 323$

The proportional stratified sample sizes are calculated and determined by using Proportional Formula;

$$\text{Group Sample Size} = \frac{\text{Group Population}}{\text{Total Population}} \times \text{Total Sample Size}$$

**Table 2**  
*Sample Size*

Groups	Group Population	Total Population	Sample size
Teachers	400	2000	$\frac{400}{2000} \times 323 = 65$
Students	1500	2000	$\frac{1500}{2000} \times 323 = 243$

However, responses were received only from 52 teachers and 185 students. These missing participants didn't complete the Google-form or responded.

### ***Sampling Method***

The quantitative data collection sample is determined by using a non-probability convenience sampling technique was used due to accessibility and willingness of participants within the study frame. Convenience sampling was appropriate for this study, as it focuses for quantitative data which can be collected efficiently from the participations who involved directly with AI-integrated instructional practices. This pattern is also suitable as it can be used for examining patterns, trends and relationships among measurable variables within the specified study framework.

### ***Data collection Procedure***

The primary data is collected directly from teachers, and students through online and/or paper-based questionnaires. The participation was voluntary, anonymous, collected over defined period. The respondents are well-informed about the purpose of the study. Questionnaire were selected to allow quantifiable measurement of perceptions, attitudes, readiness and attitude; while interviews were chosen to gain deeper insights into experiences, challenges, and contextual factors. Data were collected through a structured questionnaire for survey using Rensis Likert's 5-point Likert scale with 1 -5, strongly disagree to strongly agree (Likert, 1932). Likert-scale questionnaires support quantitative analysis.

## **Data Analysis, Results and Discussion**

From the total samples of 323 only 237 responded the survey questions. These responses are analyzed to examine teachers and students' perspectives for the use of AI in education. These responses were received from 52 teachers and 185 students using 5-point Likert Scales. The use of teachers and students who are directly involved in AI and traditional teaching and learning, provide deeper insights to our study. It also increases reliability and validity for the study on opportunities, risks, and balance with multiple perspectives.

**Table 3**  
*Teachers' Descriptive Statistics (Mean, Standard Deviation, and Agreement)*

<b>Variables</b>	<b>M</b>	<b>SD</b>	<b>% Agreed (4-5)</b>
Teachers Confidence	3.98	1.09	69.2
Perceived Effectiveness	3.52	0.93	51.9
Hybrid Balance	3.00	1.15	26.9
Time Efficiency	3.88	0.99	67.3
AI Risk Relationship	3.37	1.21	46.2
AI Ethics	3.29	1.46	50.0
AI Training	3.19	1.20	38.5

\* *M = Mean, SD = Standard Deviation*

Table 3 shows teachers are confident in using AI in education settings and also perceived as e it as time-saving tool. While the result also shows the teachers' struggle with balancing AI with

traditional teaching and ethical aspects of AI. Also, the lower agreement for AI training and professional preparedness indicated that the teachers should be provided proper professional training.

**Table 4**

*Students' Descriptive Statistics (Mean, Standard Deviation, and Agreement)*

Variables	M	SD	% Agreed (4-5)
Learning Effectiveness	3.90	1.23	68.6
Engagement	3.61	1.29	63.8
Personalization	4.02	1.13	75.1
Hybrid Preference	4.07	0.98	81.1
Social-Emotional Impact	4.05	1.06	81.1
Ethical Concern	4.07	1.14	80.0
Perceived Efficiency	4.16	1.05	87.0

The above analysis in table 4 shows that students have positive aspiration on AI indicating it improves their efficiency, through personalization learning. But they are also concerned over social-emotional and ethical values. This shows that students have positive perception towards AI use for benefiting their learning outcomes, but they have not completely written off teacher's roles. The table shows students prefer hybrid model that allows for personalized learning as well as interactions with teachers for socio-ethical values.

**Table 5**

*Teacher-Student Comparative Mean Analysis*

Theme	Teachers (Mean)	Students (Mean)	Differences
Confidence/Learning	3.98	3.90	+0.08
Effectiveness/Personalization	3.52	4.02	-0.50*
Hybrid Balance/Preference	3.00	4.07	-1.07*
Efficiency	3.88	4.16	-0.28
Social Risk	3.37	4.05	-0.68*
Ethical Concern	3.29	4.07	-0.78*

*\*\*Difference > 0.5 indicates significant gap*

The above comparative table 5 highlights the gap in teachers and students' perceptions for hybrid model with ( $\Delta=1.07$ ). Students strongly preferred hybrid model while teachers struggle with balancing AI and traditional teaching. It also shows that students are more concerned to social-emotional and ethical aspects. But both teachers and students have similar rating for confidence and effectiveness. The mismatch highlights the core challenge for maintaining balance between AI and traditional teaching.

**Table 6***Teachers' Correlation Matrix (Pearson's r)*

Variables	TC	PE	HB	TE	AI RR	AI E	AI T
Teachers Confidence (TC)	1	0.48**	0.52***	0.62***	-0.23	0.31*	0.67***
Perceived Effectiveness (PE)		1	0.44**	0.55***	-0.18	0.28*	0.41**
Hybrid Balance (HB)			1	0.39**	-0.15	0.22	0.58***
Time Efficiency (TE)				1	-0.26	0.35*	0.49***
AI Risk Relationship (AI RR)					1	0.19	-0.31*
AI Ethics (AI E)						1	0.27
AI Training (AI T)							1

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ ,  $p < 0.05$  (approximated based on typical thresholds)

The outcome of the above analysis shows that AI training improves teachers' confidence, time efficiency and also help them balance AI with traditional teaching approaches. It also shows teachers' hesitation on AI adoption due to risk related to AI, its effectiveness in their work.

**Table 7***Students' Correlation Matrix (Pearson's r)*

Variables	L	E	P	HP	Eff
Learning (L)	1.00	0.71***	0.68***	0.42**	0.74***
Engagement (E)		1.00	0.65**	0.48**	0.63***
Personalization (P)			1.00	0.39**	0.69***
Hybrid Preferences (HP)				1.00	0.41**
Efficiency (Eff)					1.00

\*\*\* $p < 0.001$ , \* $p < 0.01$

The outcome of the above analysis shows the positive relationship among learning, engagement, efficiency, and personalization. Students, who have been guided with efficient and personalized AI-integration, have higher improvement in their learning and engagements.

**Table 8***Cross-Tabulation: Training Adequacy x Confidence Level*

Training level	Low confidence (1-2)		Neutral (3)		High confidence (4-5)		Total
	Responses	%	Responses	%	Responses	%	
Inadequate (1-2)	8	57.1	4	28.6	2	14.3	14
Neutral	2	11.1	10	55.6	6	33.3	18
Adequate (4-5)	1	5	3	15	16	80	20

**Chi-square:**  $\chi^2 = 28.4$ ,  $df = 4$ ,  $p < 0.001$

The outcome shows that teachers who have adequate training on AI are more likely to have high confidence than the one with inadequate training. The professional training and development can help teacher improve their readiness for hybrid AI and traditional teaching models.

**Table 9***Cross Tabulation: Student Learning x Hybrid Preference*

Learning Effectiveness	Low Hybrid (1-2)		Neutral (3)		High Hybrid (4-5)		Total
	Responses	%	Responses	%	Responses	%	
Low (1-2)	9	30.0	12	40.0	9	30.0	30
Neutral	3	10.7	7	25.0	18	64.3	28
High (4-5)	2	1.6	2	1.6	123	96.9	127

**Chi-square:**  $\chi^2 = 67.8$ ,  $df = 4$ ,  $p < 0.001$

The outcome shows that 96.9% of students who participated in this study and experienced effective AI-supported learning prefer hybrid models. Their positive learning outcomes from AI-integration demand for balanced hybrid model of instructions.

**Table 10**

*Threshold Analysis (66.7% Criterion)*

Variables	Agreements %	Status	Required Action
Teachers Confidence	69.2	Adequate	Maintain
Teachers Efficiency	67.3	Adequate	Leverage
Teachers Hybrid Balance	26.9	Critical	Organize training
Teachers Training	38.5	Critical	Organize training
Student Efficiency	87.0	Strong	Continue
Student Hybrid Preference	81.1	Strong	Implement
Student Social Concerns	81.1	High Risk	Address

The result shows that teachers have failed to meet minimum threshold for balancing AI and traditional approach in hybrid model and also showed disagreement on training, highlighting lack of training and development approaches from educational institutions. On the other hand students passed threshold for variables. But they have highlighted the social-emotional concerns for AI use. Hence, educational institutions should organize the training for overall teachers' development. This helps to improve teacher's readiness for implementation.

**Table 11**

*Risk Opportunity Matrix*

Dimension	Evidence	Interpretation
Opportunities	High efficiency, personalization	Strong pedagogical value
Risks	Low balance ability, high concerns	Implementation challenges
Readiness Gap	Training vs confidence mismatch	Lack of TPD
Alignment	Student-teacher mismatch	Structural imbalance

The result in the above table suggest that AI-integration strongly supports for personalize learning and improving students' efficiency. But low hybrid model balance ability and social and ethical concerns related to the AI use, reflect for proper and systematic training for both teachers and students. Likewise, difference in teachers and students' perspectives shows structural imbalance, which may bring negative impact on AI- integration with traditional teaching modules. Balance AI-adoption requires well-structured policy, training and ethical safeguard.

## Discussion

The overall analysis of teachers and students' perspectives highlights that AI-integration to traditional teaching approach can have strong influence for improving students' learning outcomes making it engaging and personalized. The students have positive perception on hybrid model and have emphasized for it, while making teachers interaction for protecting social-emotional and ethical aspects. The teachers have shown confidence on AI but struggle to balance AI with traditional teaching approaches, revealing a preparedness gap. At the same time the analysis also

highlights the opposing, while teachers show confidence but struggle and reported for lack of training. This highlights for the need of clear and practicable approach on balancing AI with traditional teaching. To make this approach effective school and colleges should organize a teachers' and students' professional training sessions on how AI can be used ethically without decreasing the social-emotional values and while protecting data secrecy and algorithmic bias. This can ultimately help for effective integration of AI with traditional teaching to improve pedagogical.

## Implications

The results suggest that AI and traditional teaching-learning approaches are both necessary current scenarios. The educational institutions should think and design appropriate mechanism for its practical implications. This can help educational institutions to improve their pedagogical outcomes, if AI is integrated credibly, reliably and thoughtfully. Institutions must be clear the success of this approach depends on how they make teachers ready through proper professional training. Likewise, hybrid model is appropriate as it enhance the overall outcomes by maintaining human interactions for addressing social-emotional and ethical concerns. Finally, educational institutions need to control the misuse and unethical use of AI through developing clear guidelines and policies.

## Recommendation

Based on the results findings educational institutions should organize teachers' professional development (TPD) training for enhancing skills and improving teachers' confidences and readiness. They should encourage for the use of hybrid model integrating both AI and teachers-led guidance to meet in this 21<sup>st</sup> century teaching-learning expectations. Both educational institutions and government agencies must design and develop clear ethical guidelines and policies for balancing the AI and traditional teaching approaches. They must design regular monitoring mechanism on teachers and students' perspectives and also market requirement and identify gaps to adjust AI strategically.

## Research Limitations

From the targeted 323 participants only 237 participants responded. This may reduce generalization. The study may introduce potential bias due to self-reported data from respondents rather than observations. The study is based on specific educational contexts in Hetauda Sub-metropolitan city, while results may differ across level of education, subjects, and regions. The study is quantitative; hence it may provide only objective perspectives that may not provide deeper insights of the respondents. The new research can be done on qualitative or mixed approach.

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