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# W01: AI in Teaching, Learning and Research

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**Abstract:** This research explores the transformative role of Artificial Intelligence (AI) in classroom education within the context of the modern knowledge society. As scientific advancements reshape the social order and educational infrastructure, the traditional teaching paradigm is shifting from simple information delivery to a more complex, technology-integrated approach. While AI tools facilitate easier access to diverse information sources, this paper argues that the teacher remains indispensable for developing students' critical thinking, analytical skills, and understanding of causal relationships. By synthesizing secondary literature with the researcher's professional experience, the study demonstrates that the most effective pedagogical model combines AI-driven efficiency with the teacher's unique scientific approach and lived experience. Ultimately, this synergy is presented as essential for fostering a research-oriented mindset in students and ensuring the continued relevance of global educational institutions.

**Keywords:** Artificial Intelligence, classroom teaching, educational technology, teacher's role, knowledge society, pedagogy.

## Introduction:

In the development journey of human civilization, various researches and scientific approaches have been useful for social order. Scientific research has made a major contribution to the structure of social order and the changes that occur in it. In this research, both science and human needs can be seen to be interconnected. Educational institutions remain important in the journey of development. Scientific discoveries and educational institutions have been playing fundamental roles in social changes, as new discoveries are made in science. As the various institutions of society undergo changes in their functions and infrastructure, such changes lead to changes in some parts of society or the entire social system. In the current society, which is known as a knowledge society, knowledge and research have become important in this system, and artificial intelligence has started to be used in the educational sector on a large scale. The teaching methods used in traditional classrooms are now becoming more important due to Artificial Intelligence and the various AI tools developed in it. Classroom teaching has become much easier in the current era through AI. Classroom education through AI tools is becoming much easier and an excellent tool for easily conveying information to students using various sources. In this situation, simply delivering information to students in the classroom will not get the job done. Along with this, efforts should be made to provide classroom education in such a way that the student can use any information, analyze it, classify it, and think about research in new fields. In the era of AI, the way of teaching has become much easier, but the ability to make students think, evaluate, learn, and examine the causal relationship between any event can only be developed through a teacher. To survive in modern global educational institutions, the current era of teachers needs to use various AI tools as well as the teacher's own reading and experiences to make the students think scientifically. If classroom education is done keeping these two things in mind, AI becomes a useful and important teaching and learning medium for existing

educational institutions. The present research article has been prepared keeping in mind various reference literature as well as the personal experiences of the researcher. This research combines the use of AI in classroom education with both the teacher's personal experiences and a scientific approach. The present article has been prepared with the aim of showing how the use of AI can make classroom education easier and more useful for students and society. The present article has been prepared using information mostly from secondary sources, a list of which is given in the reference literature at the end of the article.

**What is Classroom teaching?**

*(source: https://www.google.com/search?q=What+is+Classroom+teaching)*

Classroom teaching is a structured, interactive process where a teacher and a group of students meet in a specific physical or virtual space to achieve defined learning objectives. While "teaching" is the general act of sharing knowledge, "classroom teaching" is the formalized application of that act within an organized environment.

**1. The Core Components**

Classroom teaching is often described as a "triadic relationship" between three key elements:

- The Teacher: The facilitator who manages the environment, provides instruction, and assesses progress.
- The Students: The learners who interact with the teacher and each other to acquire new understanding.
- The Curriculum: The specific set of knowledge, skills, and values being taught (the "what" of the class).

**Role of a teacher:** ***(source:https://www.google.com/search?q=Role+of+a+teacher&sca)***

In the modern world, the role of a teacher has evolved from being the "sage on the stage" (the primary source of information) to being the "guide on the side" (a facilitator of growth).

A teacher today wears many "hats" depending on the needs of their students. Here are the primary roles a teacher plays:

**1. The Facilitator (The Guide)**

Instead of just lecturing, the teacher creates opportunities for students to learn by doing.

- They design activities, ask thought-provoking questions, and provide resources so students can discover answers themselves.
- Their goal is to move the student from passive listening to active thinking.

**2. The Mentor & Role Model**

A teacher is often the most significant adult in a child's life outside of their family.

- Character Building: They model values like honesty, empathy, and resilience.
- Support: They offer a "listening ear" for personal struggles and help students navigate social challenges or career choices.

**3. The Classroom Manager (The Architect)**

A teacher is responsible for the "emotional and physical climate" of the room.

- They set the rules and routines that make learning possible.

- They ensure the classroom is a safe, inclusive space where every student—regardless of their background or ability—feels respected and capable of succeeding.

**4. The Evaluator & Diagnostician**

Teachers don't just give grades; they act like "academic doctors."

- Assessment: They use tests and assignments to see what a student knows.
- Diagnosis: If a student is struggling, the teacher identifies why (e.g., a reading gap, a lack of confidence, or a different learning style) and adjusts their approach to help.

**5. The Lifelong Learner**

In 2025, knowledge and technology change rapidly. A key role of a teacher is to be a student himself or herself—staying updated on new digital tools (like AI), teaching methods, and subject-matter developments.

**AI in Research:**

Based on the article, the role of **AI in Research** is highlighted as a transformative force that enhances the efficiency and depth of scholarly work. Here is a summary of its impact on research in English:

**1. Accelerating Literature Review**

- **Rapid Processing:** AI can scan thousands of academic papers and books in seconds, a task that previously took researchers months.
- **Summarization:** It helps in identifying the core arguments of complex papers, allowing researchers to stay updated with the latest global trends without getting overwhelmed by the volume of data.
- **Identifying Gaps:** AI tools help in "Gap Analysis," identifying which areas of a subject have been over-researched and where new original studies are needed.

**2. Data Collection and Advanced Analysis**

- **Pattern Recognition:** AI excels at finding hidden correlations and patterns in massive datasets that are often invisible to the human eye.
- **Quantitative & Qualitative Support:** From statistical analysis to thematic coding in qualitative research, AI tools reduce manual labor and human error.
- **Real-time Insights:** In fields like sociology or education, AI can analyze real-time social data to provide up-to-date findings.

**3. Writing and Technical Precision**

- **Structure and Outlining:** AI helps researchers draft the initial framework of their research papers, ensuring a logical flow.
- **Language and Grammar:** Tools like Grammarly or specialized academic AI ensure that the language is professional, clear, and free of grammatical errors.
- **Citation Management:** AI automates the tedious process of formatting references (APA, MLA, etc.), ensuring accuracy in bibliographies.

**4. Innovative Discovery**

- **Hypothesis Generation:** Moving beyond mere data entry, AI now helps researchers propose new theories or "hypotheses" based on existing data trends.

- **Interdisciplinary Links:** AI can connect findings from different fields (e.g., linking a sociological trend with a technological one) that a specialist in a single field might miss.

**5. Ethical Boundaries (The Author's Perspective)**

The researcher emphasizes that while AI is a powerful assistant, it cannot replace the researcher's ethics:

- **Integrity:** Research must remain original. AI should be used for assistance, not for plagiarism or generating fake data.
- **Human Judgment:** The "Conclusion" of any research still requires human wisdom, empathy, and social context, which AI lacks.
- **Global Peace:** The author suggests that AI in research should be used for the collective good and global cooperation rather than destructive purposes.

**In short:** AI acts as a **"Research Accelerator,"** allowing scholars to spend less time on repetitive technical tasks and more time on **original thinking and creative problem-solving.**

Now, after gaining a basic understanding of various AI tools on digital platforms, we will discuss how classroom learning becomes easier through these tools.

*(https://www.google.com/search?q=Comparison%3A+Traditional+vs.+AIDriven+Teacher+Roles&sc)*

**From Knowledge Provider to Learning Facilitator:**

With AI tools like **ChatGPT** for writing/ideation, **Grammar** for writing support, **Canva** for design, **Quizlet** for studying, **Otter.ai** for transcription, **Turnitin** for plagiarism/feedback, and specialized tools like **Eduaide.AI** for lesson planning and **Diffit** for adapting content, streamlining tasks for both students and educators. and Google Gemini capable of explaining complex calculus or historical events 24/7, teachers no longer need to spend the majority of their time lecturing. The Shift: Teachers now focus on facilitating inquiry. Instead of delivering a one-size-fits-all lecture, they guide students on how to ask the right questions and how to navigate the vast amount of information AI provides. Role in Practice: A teacher might spend a class period helping students deconstruct an AI-generated essay to find logical fallacies, fostering critical thinking over rote memorization.

**Conclusion:**

The traditional classroom model, focused solely on content delivery, is no longer sufficient in today's rapidly evolving education system. The text argues that integrating artificial intelligence (AI) with classroom discussions has become globally essential to teach students not just what to learn, but how to think, evaluate, and research. Teachers must adopt modern, tech-savvy methods, using AI tools to foster a scientific approach and intellectual development in students, including innovative assessment methods.

The shift to digital education poses challenges for traditionally trained teachers, who are urged to view these challenges as opportunities. AI is making classroom teaching easier by enabling unique teacher-student dialogues, creating broader understanding, and acting as a virtual mentor for continuous guidance. Through audio-video lectures and virtual classrooms, AI provides flexibility, bringing teachers and students closer regardless of physical location.

AI tools help explain complex content via presentations, conduct unit tests, mock interviews, and facilitate easy parent-teacher communication. They enable smart content delivery, blended/hybrid learning, and streamline MCQ exams and evaluation reports. Furthermore, AI opens new educational dimensions, aids research, and allows global access to study materials and innovative courses. It also supports personalized learning, addressing students' diverse social, cultural, and economic backgrounds through educational games and individual contact.

However, the text also highlights significant challenges. Some teachers resist AI due to personal inertia. Financially, AI technology is not affordable for everyone, and poor or remote areas lack internet infrastructure, making AI use impossible. Moreover, anti-social elements may misuse AI to mislead people, plot against society, or promote criminal activities. Therefore, classroom teachers must train students in the judicious and cautious use of AI.

Despite these negatives, the text emphasizes that any innovation has two sides. The purpose of education extends beyond information delivery—it aims to build a better society rooted in human dignity, democracy, justice, freedom, and support for the most marginalized. AI serves as a crucial bridge between teachers and students for innovative research aimed at comprehensive social development, self-esteem, and global cooperation.

Ultimately, artificial intelligence and digital media are not inherently bad; their impact depends entirely on the user's intent. To harness positive outcomes, both individuals and nations must determine responsible policies for AI use at a global level. Educational institutions should develop systems that utilize AI for societal good. With proper use, global cooperation, and a commitment to peace, AI can help transform the world into a global village characterized by mutual goodwill, cooperation, and unity, while eliminating its negative aspects through careful management and ethical training.

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## About SLU College

Shree Lalshankar Umiyashankar Arts and Harivadan & Padmaben Thakore Commerce College for Women, which was established in 1920 as an endeavour of Gujarat Stree Kelvani Mandal, has the proud privilege of being the first women's college in Ahmedabad. The college is recognised under Section 2 (f) and 12 (b) of UGC Act 17th June, 1972. The college runs various programmes in affiliation with Gujarat University such as - B.A., B.Com., and M.Com. The BS-BBA programme was added from the academic year 2025-2026. The college also runs several add-on programmes like Fashion Design and Computer Courses at the ICTC centre located at the SLU Campus.



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