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FROM CHALKBOARD TO CHATBOT: A THEORETICAL STUDY ON THE ADOPTION OF GENERATIVE ARTIFICIAL INTELLIGENCE FOR LESSON PLANNING AND CLASSROOM TEACHING AMONG SECONDARY SCHOOL TEACHERS IN MAHARASHTRA

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ABSTRACT

This paper theoretically examines how secondary school teachers in Maharashtra are likely to adopt Generative Artificial Intelligence, commonly called GenAI, for lesson planning and classroom teaching in 2026. Grounded in the National Education Policy 2020, the study builds an integrated framework that combines the Technological Pedagogical Content Knowledge model with the Unified Theory of Acceptance and Use of Technology. It explores how tools such as ChatGPT, Gemini, and other language-based assistants can support content creation, differentiated instruction, and multilingual teaching in Marathi and English medium schools. The paper also identifies structural barriers, including infrastructure gaps, limited digital literacy, and policy inconsistency, that may slow adoption in rural and semi-urban Maharashtra. The paper concludes by proposing directions for future empirical validation of the framework.

KEYWORDS: ***Generative Artificial Intelligence, Lesson Planning, Secondary Education, Maharashtra, National Education Policy 2020, Technology Adoption, TPACK***

INTRODUCTION

The classroom in Maharashtra is quietly changing. A teacher preparing a lesson on the water cycle for a Class Nine section no longer depends only on the textbook and a decade-old chart. Increasingly, she may open a generative artificial intelligence tool on her phone, type a simple instruction, and receive a ready draft of explanations, questions, and even a short story to make the concept relatable for her students. This shift, still uneven and largely informal, forms the starting point of this paper. Generative Artificial Intelligence refers to computer systems that can produce new text, images, or ideas in response to a prompt, rather than simply retrieving stored information. Unlike earlier educational technology, which mostly digitised existing content, GenAI actively creates material, which makes it especially useful for the repetitive and time-consuming task of lesson planning.

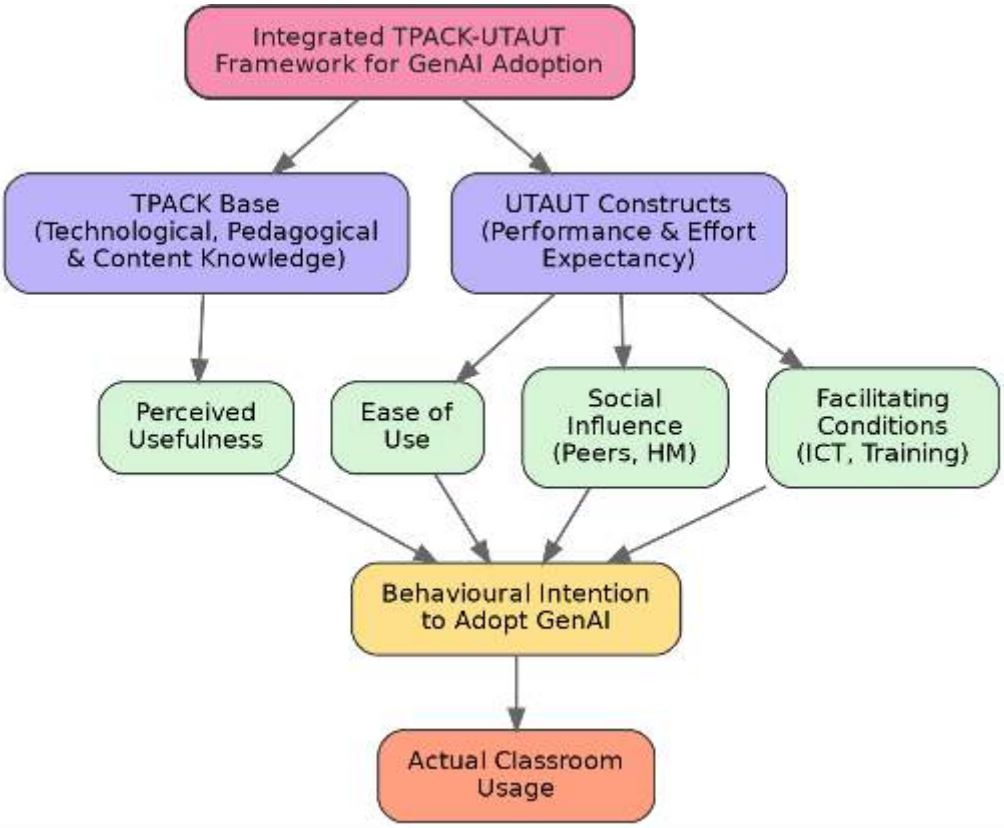
The National Education Policy 2020 explicitly encourages the use of technology to improve teaching quality, reduce teacher workload, and personalise learning for diverse learners. Maharashtra, being one of the largest state education systems in India with a mix of Marathi medium, English medium, and semi-English schools, offers a rich and varied context for examining this adoption. Secondary school teachers in the state work under considerable

pressure, managing large class sizes, board examination preparation, and continuous assessment requirements. This paper argues that understanding how and why these teachers choose, or hesitate, to adopt GenAI tools requires a theoretical lens that combines pedagogical readiness with behavioural intention. The remainder of this paper builds such a lens, applies it to lesson planning and classroom practice, and discusses the structural realities of the Maharashtra school system that will shape the pace and pattern of adoption through 2026 and beyond.

Theoretical Framework: Integrating TPACK and UTAUT

To understand GenAI adoption among teachers, this paper draws on two established theoretical models and merges them into a single explanatory structure. The first is the Technological Pedagogical Content Knowledge framework, which explains that effective teaching with technology requires three overlapping kinds of knowledge, namely subject content, teaching methods, and technological skill. A teacher who understands photosynthesis well but cannot frame a useful prompt for an AI tool will struggle to benefit from it, just as a technically skilled teacher without strong subject depth will produce shallow AI generated material. The second model is the Unified Theory of Acceptance and Use of Technology, which explains technology adoption through four main influences, namely how useful the teacher believes the tool to be, how easy it appears to use, how much colleagues and school leadership encourage its use, and whether the school provides the conditions needed to use it, such as internet access and institutional permission.

When these two models are combined, a fuller pictureemerges. Teachers with strong pedagogical content knowledge are more likely to perceive GenAI as useful, because they can immediately judge whether the generated lessonplanis pedagogically sound. Teachers who see their peers and school heads using such tools confidently, and who

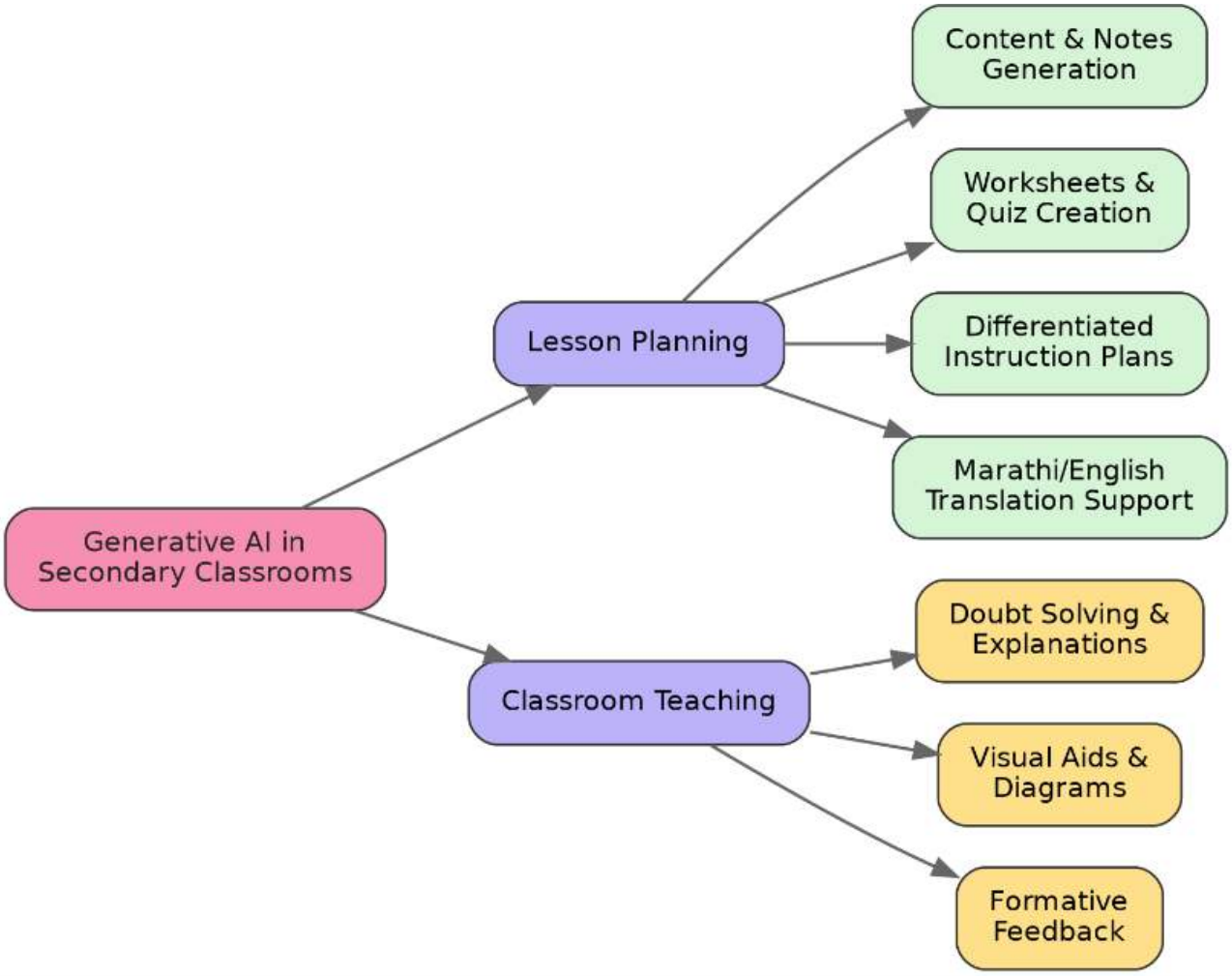


work in schools with

reliable facilitating conditions,reliable facilitating conditions,Figure 1: Integrated TPACK-UTAUT framework explaining GenAI

adoption among secondary school teachers.

are more likely to movefrom



occasional curiosity to regular classroom use. This integration suggests that adoptionisnot simply a matter of access to technology, but a combination of professional confidenceand institutional encouragement, both ofwhich vary considerably across Maharashtra'sdiverse secondaryschool landscape.

Figure 2: Applications of Generative AI across lesson planning and classroom teaching activities.

Emerging Applications in Lesson Planning and Classroom Teaching

Generative Artificial Intelligence offers secondary school teachers a range of practical applications that extend across the full teaching cycle, from preparation to delivery. In the lesson planning stage, teachers can use GenAI to draft structured notes, generate worksheets and quiz questions aligned with the Maharashtra State Board syllabus, and design differentiated tasks for students of varying ability levels within the same classroom. This last function is particularly valuable in Maharashtra, where a single section often includes students with widely different learning paces, and manually preparing separate materials for each group is rarely feasible given teacher workloads. GenAI tools can also assist with translating or adapting content between Marathi and English, which supports teachers working in semi-English schools where students are gradually transitioning between languages of instruction.

Within the classroom itself, teachers report using such tools to quickly generate alternative explanations when a student does not understand a concept the first time, to produce simple diagrams and visual aids for topics in science and geography, and to design short formative quizzes that provide immediate feedback during a lesson rather than only at the end of a unit. These applications do not replace the teacher's judgement but function as a supporting assistant that

reduces preparation time and expands the variety of teaching material available. The theoretical significance of this pattern is that GenAI use is concentrated in tasks that are repetitive and time-intensive, freeing teacher effort for tasks requiring human relational skill,

such as classroom management, mentoring, and emotional support, which aligns closely with the aspirations expressed in the National Education Policy 2020 regarding teacher workload reduction.

Barriers and Contextual Challenges in the Maharashtra Setting

Despite these possibilities, adoption of GenAI among Maharashtra's secondary school teachers is unlikely to be smooth or uniform. The most immediate barrier is infrastructural. Many Zilla Parishad and rural aided schools continue to face inconsistent internet connectivity and limited access to smartphones or computers during school hours, which restricts real-time use of GenAI tools even when teachers are personally willing to experiment with them. A second barrier concerns digital literacy specific to artificial intelligence, which differs from general computer literacy. Writing an effective prompt, evaluating whether the generated content is accurate, and adapting it appropriately for a particular classroom are skills that require targeted training, and such training remains limited within existing in-service teacher development programmes across the state.

A third barrier is institutional and policy related. While the National Education Policy 2020 provides a broad supportive vision, clear operational guidelines on acceptable GenAI use, data privacy, and academic integrity at the school level are still developing, leaving individual head teachers and school managements to interpret appropriate use largely on their own. This creates inconsistency between schools, and even between sections within the same school. A fourth consideration is linguistic and cultural fit, since many widely used GenAI tools are optimised for English and may generate less accurate or culturally relevant content when working in Marathi or in the mixed-language style common in many Maharashtra classrooms. Finally, concerns around data privacy and the ethical use of student information add a layer of caution among teachers and administrators alike. Taken together, these barriers suggest that adoption will likely follow an uneven pattern, growing faster in urban and well-resourced schools while

requiring deliberate policy intervention to reach rural and under-resourced institutions.

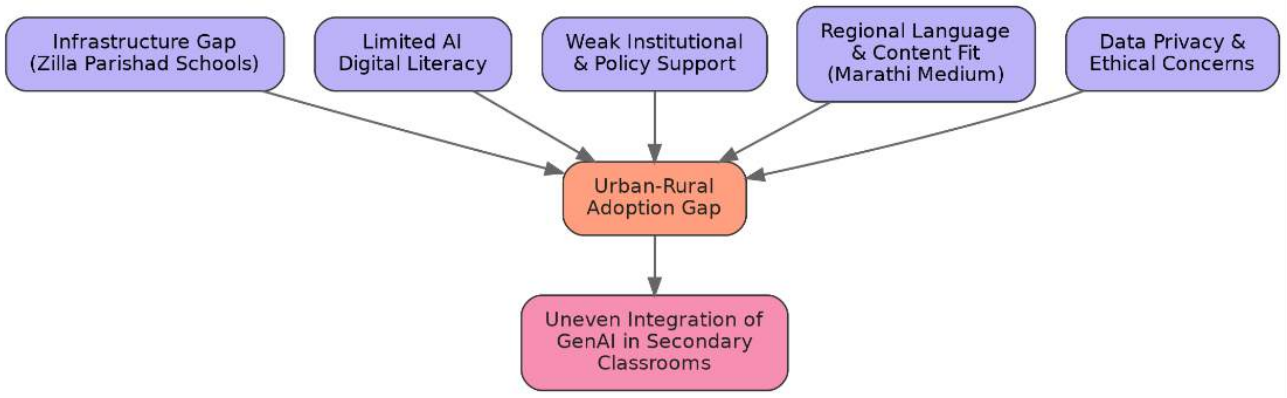


Figure 3. Structural barriers shaping uneven GenAI adoption across Maharashtra's secondary schools.

Conclusion and Future Scope

This paper has proposed an integrated theoretical framework, combining Technological Pedagogical Content Knowledge and the Unified Theory of Acceptance and Use of

Technology, to explain how secondary school teachers in Maharashtra are likely to adopt Generative Artificial Intelligence for lesson planning and classroom teaching. The analysis suggests that adoption

depends jointly on teachers' professional confidence, institutional support, and infrastructural readiness, and that GenAI applications are most valuable for repetitive preparatory tasks, allowing teachers to redirect their effort toward the relational and mentoring aspects of teaching. At the same time, meaningful barriers around infrastructure, AI-specific digital literacy, policy clarity, and linguistic fit will shape how evenly this adoption spreads across the state.

Future research should move from this theoretical foundation toward empirical validation, through structured surveys and classroom observation across urban, semi-urban, and rural secondary schools in Maharashtra, to test the strength of the proposed relationships and to measure actual usage patterns rather than intention alone. Such empirical work would also help policymakers design targeted teacher training programmes and infrastructure investment that align with the vision of the National Education Policy 2020, ensuring that the benefits of Generative Artificial Intelligence in education reach teachers and students across the full diversity of Maharashtra's school system.

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