



Exploring English Teachers' Perceptions and Experiences With AI-Assisted Module Creation (A Case Study of Perplexity AI in The Merdeka Curriculum Framework)

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Abstract: This qualitative case study examines English teachers' perceptions and experiences with AI-assisted module creation using Perplexity AI within the Merdeka Curriculum framework at MTsN 2 Blitar, Indonesia. The increasing demand for innovative, curriculum-aligned teaching materials and the growing integration of artificial intelligence in education have elevated the importance of incorporating digital tools into teachers' professional practices. The research aimed to explore how Perplexity AI supports and transforms the module creation process, how teachers perceive the impact and challenges of using AI, and to what extent the resulting modules align with the Merdeka Curriculum objectives. Data were collected through semi-structured interviews with three English teachers, classroom observations of the module development workflow, and a detailed analysis of AI-generated and teacher-adapted modules. Thematic analysis revealed that teachers perceive Perplexity AI as highly empowering, reporting substantial time savings, enhanced confidence, and increased motivation to innovate instructional practices. Notably, module preparation time was reduced from several days or weeks to just 1–2 hours. Teachers valued the intuitive design, rapid content generation, and support for diverse assessment types, while emphasizing the ongoing need for critical review and contextual adaptation. Challenges included the need for precise prompts, the requirement for manual integration with local content, and managing the risk of over-reliance on technology. The study highlights the pivotal role of teacher agency and adaptation in ensuring that AI-generated modules are relevant, comprehensive, and contextually appropriate. The findings provide practical insights for educators and policymakers supporting technology integration in English curriculum development and underscore the critical balance between technological affordance and pedagogical expertise.

Keywords: AI-assisted Module Creation, Perplexity AI, Merdeka Curriculum, English Teachers, Qualitative Case Study

Introduction

In an era of rapid digital transformation, the integration of technology in education has become increasingly significant, especially in the development of innovative, relevant, and adaptive teaching materials that support modern curricular reforms such as the Merdeka Curriculum in Indonesia (Burt, 2023) (Psico-smart Editorial Team, 2024). The Merdeka Curriculum emphasizes learner autonomy, competency focus, and project-based learning, thus requiring teachers to create instructional modules that foster contextual and 21st-century skills for students (Kemendikbudristek BSKAP, 2022).

English teachers across Indonesia have faced considerable challenges in managing curricular demands and accessing digital resources, with many relying on self-initiated development and professional networks due to limited institutional support (Silvhiany, 2022) (Hamsiah et al, 2023). These challenges highlight the need for technological solutions that both streamline module creation and ensure curriculum alignment, especially in underserved areas (Khusna et al, 2022).

Artificial intelligence, particularly platforms like Perplexity AI, has begun to address these needs by enabling teachers to generate, adapt, and customize curriculum-based modules efficiently. Perplexity AI is specifically designed to produce concise, referenced content and supports teachers with features such as template uploading and real-time citation, allowing modules to closely follow the structure required by the Merdeka Curriculum (Perplexity Team, 2024). At MTsN 2 Blitar, teachers use Perplexity AI not only to accelerate the creation of materials—from several days or weeks to less than two hours per module—but also to personalize modules, integrate local and cultural values, and maintain alignment with curricular objectives (Teacher Interview, 2025).

Preliminary evidence demonstrates that AI-assisted module creation enhances both teacher motivation and professional growth, providing opportunities for collaboration and innovation while reducing workload (Teacher Interview, 2025). However, the process still demands teachers' skills in prompt engineering, critical review, and contextual adaptation, highlighting a new set of professional competencies required to maximize the effectiveness of AI in instructional design (Fitria, 2024).

Consequently, this research investigates the perceptions and experiences of English teachers in utilizing Perplexity AI to develop modules within the Merdeka Curriculum framework at MTsN 2 Blitar. The specific focus includes: (1) teachers' perceptions and experiences, (2) the comparative process between AI-assisted and conventional module development, and (3) the alignment between AI-generated modules and the Merdeka Curriculum objectives. By providing empirical insights into the integration of AI at the secondary education level, this study contributes to advancing technology-supported curriculum development in Indonesia and offers a reference for policymakers and educational technology developers (Kemendikbudristek BSKAP, 2022) (Burt, 2023).

Methodology

This study employed a qualitative case study design to investigate English teachers' perceptions and experiences using Perplexity AI for curriculum-aligned module creation within the Merdeka Curriculum framework at MTsN 2 Blitar. The qualitative approach was chosen to provide an in-depth, contextual understanding of the integration of artificial intelligence in teaching practice, enabling detailed exploration of teachers' interactions, attitudes, and adaptations concerning AI-assisted module development.

The case study methodology facilitated the examination of a specific phenomenon—AI-assisted module creation—in its real-life educational context. This aligns with established recommendations for exploring contemporary phenomena where the boundaries between the intervention and its context are not clearly evident and multiple sources of evidence are available (Creswell & Poth, 2018) (Nurhayati, 2020).

The research was conducted at MTsN 2 Blitar, a secondary school in East Java, Indonesia. The school was selected because it has systematically implemented the Merdeka Curriculum and actively supports technological innovation in instructional practice. Three English teachers, with diverse backgrounds in traditional and technology-enhanced instruction, participated in the study. Participants were selected purposively based on their direct involvement in module creation using Perplexity AI and their demonstrated technological literacy, as assessed by the TPACK (Technological Pedagogical Content Knowledge) framework and the Trust in AI-based Educational Technology Scale.

Three primary data collection methods were utilized: semi-structured interviews, observation, and module analysis:

- Semi-structured interviews were designed based on Démuth's (2013) perception theory and the Technology Acceptance Model (TAM), focusing on initial perceptions, implementation experiences, and professional growth (Tristiana et al., 2024).
- Observations were conducted as teachers interacted with Perplexity AI during the module development process, emphasizing prompt engineering, output adaptation, curriculum alignment, and technological-pedagogical integration (Koehler & Mishra, 2006).
- Module analysis applied a systematic rubric derived from the Merdeka Curriculum, curriculum design theory, and constructive alignment framework to evaluate the structure, content, pedagogical quality, assessment alignment, and integration of AI and teacher modifications (Kemendikbudristek BSKAP, 2022) (Kholid et al, 2024).

Data triangulation from interviews, observations, and document analysis ensured credibility and comprehensive insights into teachers' experiences.

Instruments

The instruments comprised:

- An interview guide mapped to Démuth's theory, TAM, and the genre-based approach of the Merdeka Curriculum.
- An observation checklist focusing on the interaction with Perplexity AI, module development workflow, curriculum integration, and language skills development.
- A module analysis guide assessing module structure, content, pedagogical approach, assessment variety, local wisdom integration, and the quality of AI-human collaboration.

Data Analysis

All data were analyzed using thematic analysis (Braun & Clarke, 2006), following these six phases: familiarization with the data, generation of initial codes, theme searching, review, definition and naming of themes, and report production. The process included iterative coding, categorization, and synthesis of findings across the data sources. The critical involvement of teacher modification in AI-generated output was documented to capture the interaction between human agency and technological affordances.

The study adhered to research ethics, including informed consent, confidentiality, and unbiased interpretation. The overall methodology ensured rigor, transparency, and transferability of the findings.

Result and Discussion

This section presents the results of the study, organized thematically according to the research questions, and is immediately followed by relevant tables after each major result. The discussion is integrated below each result, contextualizing the findings and linking them to prior research and theoretical frameworks.

1. Teachers' Perceptions and Experiences with Perplexity AI

All participant teachers perceived Perplexity AI as a highly valuable tool that enhanced efficiency and professional motivation in module creation. The primary benefits included significant time savings, intuitive interface, and increased confidence in instructional design. Teachers also identified challenges, notably the need for precise prompt formulation and critical adaptation of AI-generated content.

Table 1. Key Perceived Benefits of Perplexity AI by English Teachers at MTsN 2 Blitar

Benefit	Description	Frequency
Time Efficiency	Reduced module creation time from days/weeks to 1–2 hours	3 (all)
Ease of Use	Intuitive interface, easy prompt-based generation	2 (T1, T3)
Increased Motivation	Greater enthusiasm and willingness to innovate	3 (all)
Pedagogical Variety	Broader activity/assessment types, more systematic module design	3 (all)
Professional Confidence	Boost in teacher self-efficacy, willingness to experiment	2 (all)

Teachers' comments, such as "The AI generates drafts instantly, allowing me to focus on refining content," underscore Perplexity AI's ability to shift teachers' roles towards curation and customization (Venkatesh & Davis, 2000; Mishra & Koehler, 2006).

2. Professional Growth and Motivation

The use of Perplexity AI led to greater professional enthusiasm, openness to technology, and confidence in materials creation, as indicated in Table 2.

Table 2. Professional Growth and Motivation Experienced by Teachers

Aspect	Interview Evidence	Frequency
Increased Enthusiasm	"I am more enthusiastic and feel more professional..."	3 (all)
Openness to Innovation	"I am more open to trying new things in teaching..."	2 (T1, T3)
Confidence in Design	"I feel more confident designing diverse modules with AI."	2 (T1, T3)

Aspect	Interview Evidence	Frequency
Enhanced Instruction	“My modules are now more structured and student-centered.”	3 (all)

Increased motivation aligns with self-efficacy theory (Bandura) and technology acceptance (TAM).

3. Observed Practices: Adapting Perplexity AI in the Classroom

Teachers actively engaged in prompt editing, peer collaboration, and careful adaptation to student needs. Multimedia and workflow efficiency also emerged as notable features of their practice.

Table 3. Observed Teacher Practices in Using Perplexity AI

Practice/Behaviour	Description / Example	Frequency
Prompt Editing	Frequent revision to achieve output fit	3 (all)
Peer Collaboration	Exchanging prompt strategies/feedback	3 (all)
Adaptation to Student	Personalizing activities and levels for class context	3 (all)
Multimedia Integration	Adding videos, media, digital resources	2 (T1, T3)
Workflow Management	Efficient time/task organization	3 (all)

4. Challenges and Limitations

Despite the positive impacts, teachers encountered the following challenges, summarized in Table 4.

Table 4. Challenges and Limitations in Using Perplexity AI

Challenge	Description / Example	Frequency
Prompt Specificity	Need for clear, detailed prompts for best results	3 (all)
Manual Editing/Integration	AI outputs often need significant manual adjustment	2 (T1, T3)
Over-reliance Risk	Need to avoid depending too much on AI	3 (all)

Teachers stated, “If the instructions are too general, the module becomes less suitable for my class. I have to experiment with different prompts to get what I need.” (Teacher 2).

5. Perplexity AI-Assisted vs. Conventional Module Development

Compared to conventional methods, Perplexity AI provided dramatic efficiency gains, streamlined workflow, and easier content adaptation and assessment design.

Table 5. Comparison: Perplexity AI-Assisted vs. Conventional Module Development

Aspect	Perplexity AI-Assisted	Conventional (Manual)
Time Required	1–2 hours per module	Several days/weeks per module
Content Generation	Instant, structured, easy prompt-based edits	Manual/fragmented from multiple sources
Assessment Creation	Auto-generated, varied, easily customized	Manual, time-consuming, less varied
Workflow Adaptation	Fast revision/adaptability	Rigid, time-consuming to adjust

6. Pedagogical and Technological Integration

Perplexity AI enabled easy integration of multimedia and diverse assessments aligned to the curriculum and prompted strong teacher adaptation for local relevance.

Table 6. Pedagogical and Technological Integration by Teachers

Aspect	AI-Assisted Module Evidence	Frequency
Varied Assessments	Multiple types, rubric-based, curriculum-aligned	3 (all)
Multimedia Integration	Videos, audio, links—easier and more frequent	2 (T1, T3)
Curriculum Alignment	All modules mapped to curriculum standards	3 (all)
Local Adaptation	Teachers customize content to class/culture	3 (all)
Interactive Activities	AI helps suggest collaborative/group work, role-play, projects	3 (all)

7. Module Structure and Alignment

Module analysis demonstrated strong alignment with Merdeka Curriculum standards, clear objectives, and interactive, student-centered activities.

Table 7. Structural and Content Features of AI-Generated Modules

Feature	AI-Generated Modules Evidence	Frequency
Clear Objectives	Always present, aligned with curriculum	3 (all)
Sequence/Scaffolding	Logical flow from intro to assessment	3 (all)
Appropriate Time	Time guides included, sometimes adjusted	3 (all)
Varied Assessment	Formative, summative, self-assessment	3 (all)
Interactive Activities	Projects, discussions, reflections	3 (all)

Feature	AI-Generated Modules Evidence	Frequency
Local Context	Local examples used but can be improved	3 (all)

8. Areas for Improvement

Certain areas require attention for future module enhancements.

Table 8. Areas for Improvement in AI-Generated Modules

Aspect	Notes (from analysis/interviews)	Frequency
Cultural Authenticity	More integration of local wisdom/culture needed	3 (all)
Time Allocation	More explicit, consistent time breakdowns recommended	3 (all)
Multimedia Integration	Expand use of digital, interactive media	2 (T1, T3)
Prompt Specificity	Better prompts = higher quality content	3 (all)
Teacher Adaptation	Greater critical revision needed when time allows	2 (T2, T3)

Discussion

The findings of this study offer valuable insights into how English teachers at MTsN 2 Blitar perceive, utilize, and adapt AI-powered tools, specifically Perplexity AI, during the module development process within the Merdeka Curriculum framework. This discussion explores the major empirical results, highlights their significance in light of relevant literature and theories, addresses critical challenges, and identifies practical and theoretical implications.

Perplexity AI as a Catalyst for Teacher Efficiency and Professional Growth

The substantial reduction in module preparation time—down from several days or weeks to merely 1–2 hours per module—demonstrates Perplexity AI's capacity to revolutionize English language instructional planning (see Table 4.1.1). Consistent with the Technology Acceptance Model (TAM), teachers' perceptions of high usefulness and ease of use significantly contributed to the adoption of the tool in their routine workflows (Venkatesh & Davis, 2000). This echoes findings from recent studies, which suggest that teachers' confidence in their ability to operate technology (self-efficacy) and recognition of its pedagogical value are pivotal for successful digital integration (Bandura, 1977) (Fitria, 2024).

Additionally, the increased professional motivation and willingness to experiment with new teaching approaches suggest that AI is not only a facilitator of efficiency, but also an enabler of teacher growth. The results are especially relevant in the Indonesian context, where teacher workload and limited resources often hinder curriculum innovation (Silvhiany, 2022) (Khusna et al, 2022). Perplexity AI provided rapid access to various

instructional materials, assessments, and activity typologies, enabling teachers to focus on curation, adaptation, and reflective practice rather than routine content generation.

Critical Role of Teacher Agency in the AI-Enhanced Module Creation

Despite substantial advantages, the study finds that Perplexity AI is neither a replacement for pedagogical expertise nor a standalone solution. Instead, teacher agency—manifested in the form of prompt engineering, content adaptation, peer collaboration, and contextual revision—remains the critical determinant of instructional quality. This conclusion aligns strongly with the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006), in which meaningful technology integration requires the dynamic blending of content knowledge, pedagogical strategies, and technological skills.

Teachers reported frequent use of detailed prompts and manual editing, particularly to ensure that AI-generated modules met both institutional requirements and local cultural/contextual needs (see Tables 4.1.3 and 4.2.2). This iterative, collaborative dynamic suggests a shift in the teacher's role—from being a passive content receiver to an active instructional designer who leverages AI as a co-creator. Such professional autonomy is essential to preventing the risk of uncritical reliance on technology and is cited in the literature as a hallmark of successful, sustainable educational innovation (Mali et al, 2023) (Tristiana et al, 2024).

Curriculum Alignment and Pedagogical Improvements

Module analysis revealed strong alignment between AI-assisted modules and the core tenets of the Merdeka Curriculum, including competency focus, genre-based instructional sequencing, and integration of listening, reading, and writing elements (see Table 4.3.1). The presence of clear learning objectives, varied assessment types, and interactive, collaborative activities echo best practices in modern curriculum design and reflect AI's supportive role in scaffolding student-centered learning.

Nevertheless, challenges remain in the integration of authentic cultural elements and multimedia content (see Table 4.3.2). Teachers consistently pointed out that while Perplexity AI produces structurally sound, generally relevant content, local wisdom, real-world references, and digital media integration often require extra manual effort. This finding resonates with prior studies, which underscore the limitations of AI in navigating nuanced local values and the need for teacher adaptation (Keet, 2024; Kholid et al., 2024).

Practical and Theoretical Implications

This study's results contribute both theoretically and practically. On the theoretical front, the findings extend previous research on TAM and TPACK in the Indonesian education context, emphasizing that technology adoption is most successful when it is embedded in reflective, collaborative, and contextually responsive teacher practice. Practically, the evidence supports the continued inclusion of AI tools in professional development and curriculum innovation initiatives, provided that teachers receive adequate training in prompt engineering, critical review of AI outputs, and the integration of local and digital resources.

Limitations and Directions for Future Research

Although the study provides rich qualitative insights, certain limitations must be acknowledged. The participant pool was limited to three teachers from a single institution, possibly restricting the generalizability of findings to more diverse or under-resourced schools. The relatively short observation period also limits the ability to capture long-term changes in teacher practice or student achievement. Future research is encouraged to include larger, more diverse samples; longitudinal designs to assess sustained impacts; and quantitative measures of student learning outcomes related to AI-integrated modules.

Conclusion

This study revealed that the integration of Perplexity AI significantly transformed English teachers' module creation processes within the Merdeka Curriculum framework at MTsN 2 Blitar. By leveraging AI assistance, teachers were able to reduce module preparation time from several days or weeks to just a few hours, allowing for more efficient and flexible instructional planning. The findings indicate that Perplexity AI supported teachers in generating structured, curriculum-aligned materials, while also enhancing their professional motivation, confidence, and willingness to innovate.

However, the research also identified several important challenges. Teachers emphasized the need for clear and precise prompts to ensure that AI-generated outputs met curricular standards and classroom needs. Manual adaptation and critical review remained essential to address limitations in cultural integration, assessment design, and the contextualization of learning materials. The study highlights that teacher agency is crucial—AI is most effective as a collaborative partner when complemented by teachers' professional judgment, pedagogical expertise, and sensitivity to local contexts.

AI-assisted module creation, when thoughtfully adapted and guided by reflective educators, offers great potential to advance curriculum implementation and teaching quality in Indonesian secondary schools. Future initiatives should focus on enhancing teachers' skills in prompt engineering, digital media integration, and contextual adaptation, as well as supporting ongoing professional development. Expanding research to include broader settings and examining the direct impact on student outcomes are recommended to further strengthen the practical application of AI in education.

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