University
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SE(i)T lab

Integration of AI in FL models: Redefining language pedagogy

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Paper Overview

This paper explores the transformative impact of Artificial Intelligence (AI) integration with Flipped Learning (FL) in language pedagogy.

FL carries multiple benefits. The addition of AI technologies offers new opportunities to further personalize and optimize language instruction.

By exploring the practical applications of AI in Flipped classrooms, this paper highlights the **pedagogical benefits** and addresses **potential challenges**.

Combining AI with FL offers a dynamic approach to language teaching, fostering a more engaging and personalized learning experience.

FL in a nutshell

Pre-class: Direct instruction and content delivery

Class time: More meaningful and productive application-based interaction

Core principles of FL

- Flexibility
- Active engagement
- Responsiveness
- Self-paced learning
- Higher-order cognitive skills
- Deeper understanding
- Critical thinking
- Collaboration (scaffolding, ZPD)
- More personalized learning experiences
- Targeted guidance and feedback

Requirements

Careful planning in order to be optimal
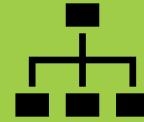
High-quality, well-structured content aligning with LOs

Tasks that encourage active knowledge application, critical thinking and synthesis

Tasks should focus on developing all language skills and consider learners' diverse competency levels

Integration of AI in FL models

Powerful tools that can enhance efficacy and personalization of FL

More efficient, flexible, learner-centered experiences

In language classrooms, where practice and feedback are essential, AI's adaptive capabilities significantly enhance flipped models

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AI during pre-class

- **Adaptive learning platforms**

Learners can access content tailored to their proficiency levels and learning pace

e.g. Duolingo, Babbel use machine learning algorithms to adjust content based on learners' previous performance

- **Content-creation tools**

NLP automatically generates vocab exercises, grammar drills or pronunciation guides in alignment with learner profiles

e.g. GPT-4 generates context-rich practice sentences or role-play scenarios that suit learners' needs

AI in assessment and feedback

- **Real-time feedback**

AI-driven assessment tools provide real-time immediate feedback on pronunciation, grammar, fluency and vocab use

e.g. ELSA Speak uses AI to analyze pronunciation accuracy, providing detailed feedback

- **Targeted practice**

AI-generated insights can help instructors develop tasks addressing specific language competencies

- e.g. Squirrel AI analyses learner behavior, identifies gaps in knowledge and predicts future performance, generating detailed learner profiles

Enhancement of class activities

- AI-powered language practice apps can simulate real-world conversational scenarios >>> Learners can practice speaking in controlled environments

e.g. Virtual assistants or chatbots (Gemini) can role-play scenarios like asking for directions or ordering a pizza

- Speech recognition and NLP tools can correct pronunciation and syntax >>> better accuracy

e.g. Sentiment analysis (Lexalytics) can assess learners' emotional engagement, helping instructors adapt activities in real time

Personalization with AI

- **Custom learning materials**

AI can create tailored materials, adjusting complexity based on learners' proficiency >>> unique experience for every learner

- **Adaptive learning pathways**

Using algorithms that track learner progress, AI can suggest optimal learning activities >>> alignment of in-class discussions with learners' prior knowledge and skills

- **Engaging content delivery**

AI enhances how content is delivered, utilizing multimedia and interactive resources >>> maintains learner interest and facilitates better outcomes

AI-driven insights for instructors

- AI provides instructors with deeper insights into learners' learning patterns and progress

- Advanced analytics generated by LMS offer data on learner engagement, time spent on tasks, and areas of improvement

- Instructors can adjust pre-class content and in-class tasks accordingly, leading to more informed decisions

Challenges

CHALLENGE	DESCRIPTION	IMPLICATIONS
Digital Literacy	Variability in digital skills among educators and students.	Hinders effective AI use in classrooms.
Instructor Training	Need for comprehensive training programs for teachers.	Inadequate training may lead to underutilization of tools.
Privacy Concerns	Issues around data security and student privacy.	Must comply with laws and regulations to protect learner data.
Cost of Implementation	High costs associated with procuring and maintaining AI tools.	Financial strains may limit access for some institutions.

Solutions

- Schools and institutions must ensure equitable access to devices, reliable internet, and tech support to prevent disparities among learners and maximize possible benefits

- Well-prepared instructors are key to integrating AI into FL models

- Need for a balanced approach that incorporates AI as a supplement while maintaining instructor-led, interactive elements that foster authentic language practice

- Institutions must ensure compliance with data protection regulations and implement strict security protocols to safeguard user data

- Institutions must evaluate whether costs align with their objectives and ensure that any investment meaningfully enhances teaching and learning

Conclusions

- AI integration in FL models
    - provides dynamic, engaging, efficient and innovative framework for enhancing language pedagogy
    - fosters personalization, instant feedback and adaptive learning
    - enhances pre-class content preparation
    - optimizes in-class tasks
    - supports learners individually

- The future of FL lies in the continued integration of AI

- By adapting to the unique needs of learners, AI is shaping the evolving landscape of education

Q & A

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