Enhancing Learning through AI: A Cognitive Framework Framework

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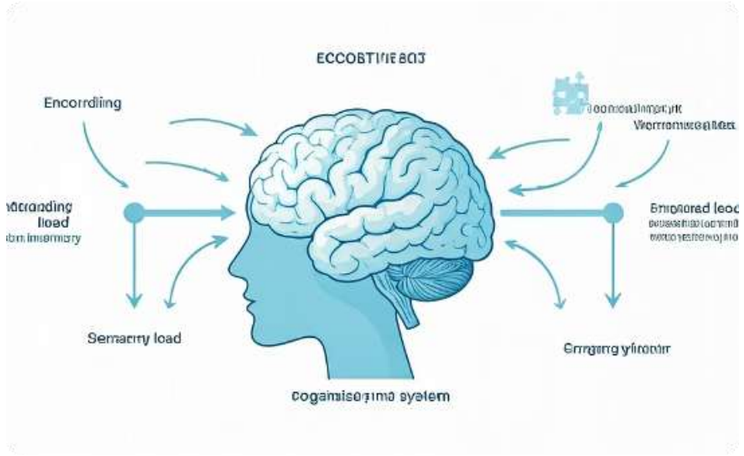
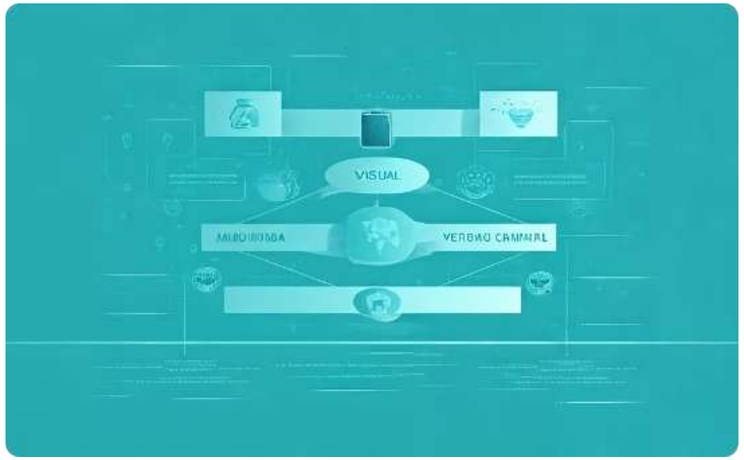
Introduction



Cognitive Load Theory (CLT)

Foundational framework in understanding understanding learning design that focuses focuses on working memory limitations.



Cognitive Theory of Multimedia Multimedia Learning (CTML)

Mayer's theory explaining how people learn learn more effectively from words and pictures than from words alone.

AI Integration in ODeL

My research explores how AI can be integrated into these theories for better learner engagement and cognitive support in support in Open Distance eLearning.

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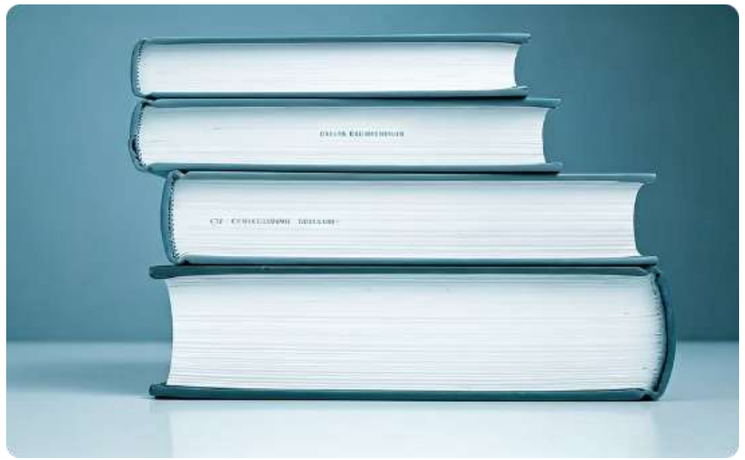
The Research Question

"How can we blend timeless educational theories with emerging AI technologies to make learning more meaningful—especially in ODeL especially in ODeL environments?"



Timeless Educational Theories

Foundational frameworks like Cognitive Load Load Theory and Cognitive Theory of Multimedia Learning

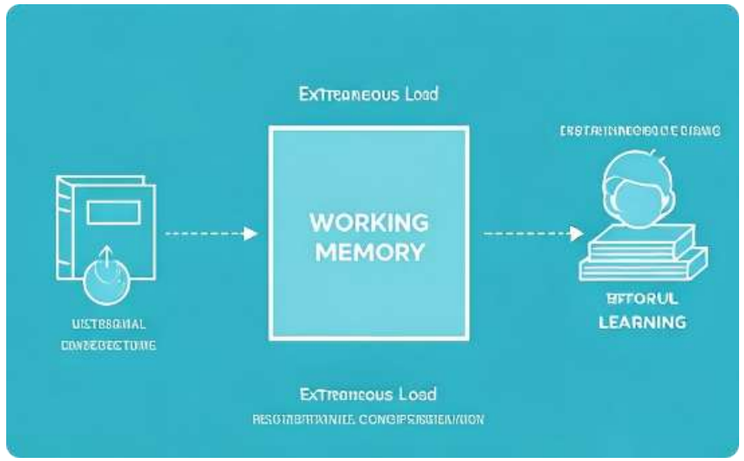
Emerging AI Technologies

Cutting-edge AI systems designed to enhance enhance educational experiences

ODeL Environments

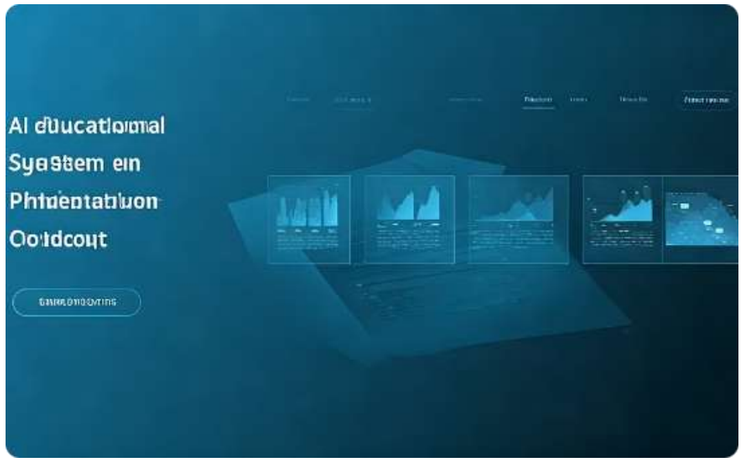
Open Distance eLearning contexts where AI integration can have significant impact

Why Enhance/Update Traditional Theories?



Frameworks

CLT & CTML are effective frameworks that must adapt/enhance to individual learners.



Dynamic Adaptation

AI enables dynamic adaptation based on real-time learner feedback, creating personalized learning experiences.

Pattern Recognition

Generative AI recognises patterns (like the human brain) – making it ideal for multimedia-based instruction.

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Proposed Framework: Three Key Components

1. AI-Enhanced Cognitive Load Management

Intelligent systems that dynamically adjust complexity based on learner capacity, preventing cognitive overload while maximizing engagement.

2. AI-Mediated Schema Creation

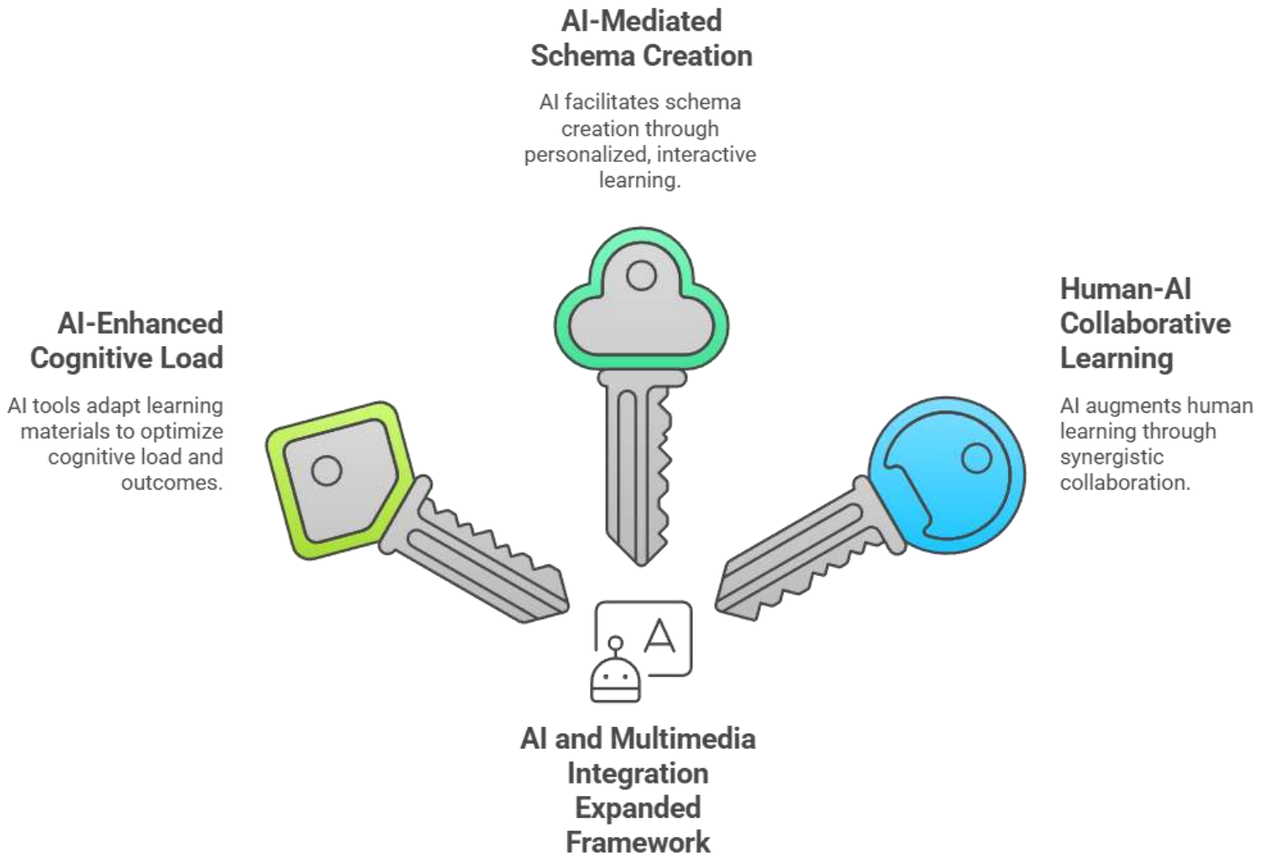
AI tools that help learners build robust mental frameworks by identifying patterns and relationships across educational content.

3. Human-AI Collaborative Learning

Interactive partnerships between learners and AI systems that complement human creativity with computational efficiency.

Proposed Framework

Transforming Education with AI and Multimedia Synergy



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1. AI-Enhanced Cognitive Load Management

How AI technology helps optimize learning by managing cognitive demands:

Real-time Monitoring

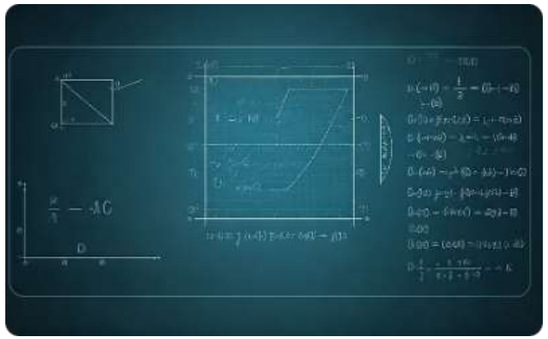
AI monitors learner behavior in in real-time to assess cognitive cognitive state and engagement engagement levels.

Dynamic Adaptation

Adjusts content complexity, pacing, and format based on learner performance and needs. needs.

Optimal Cognitive Zone

Keeps learners in the 'optimal 'optimal cognitive zone' between between boredom and frustration.



Practical Application

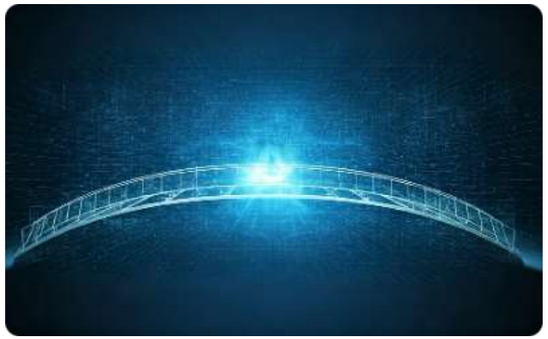
Example: Math tutor simplifying problems when a student repeatedly fails a concept.

2. AI-Mediated Schema Creation

How AI technology helps build meaningful learning connections:

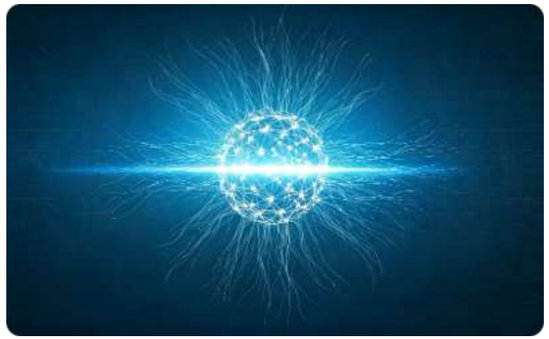
Knowledge Assessment Assessment

AI identifies what the learner already knows, creating a personalized knowledge map. map.



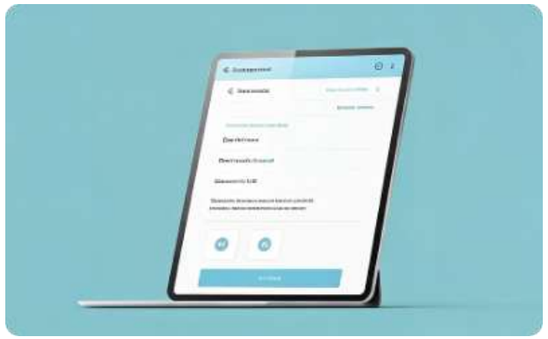
Knowledge Building

Structures new content to build build effectively on prior knowledge foundations.



Deep Learning

Promotes deeper retention and and effective knowledge transfer transfer to new situations.



Practical Application

Example: Adaptive grammar lessons in language learning tailored to address specific weak areas.

3. Human-AI Collaborative Learning

Partnership, Not Replacement

AI supports instructors, not replaces them, creating a collaborative educational environment.

Administrative Assistance

Automates grading, curates personalized feedback, and analyses learning data to identify patterns.

Enhanced Human Connection

Frees up educators to provide emotional and metacognitive support that only humans can deliver effectively.

Benefits of AI Integration

Personalised learning experiences

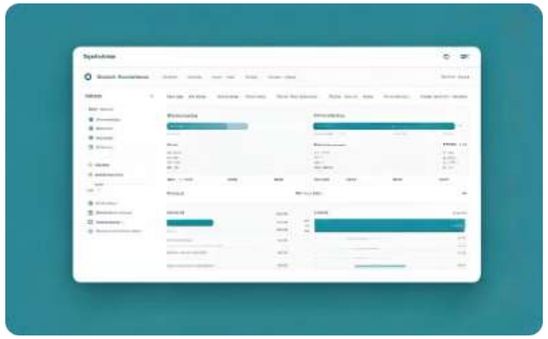
AI tailors education to individual needs and learning styles

Adaptive content pathways

Content that adjusts based on learner performance and preferences

Improved engagement and retention

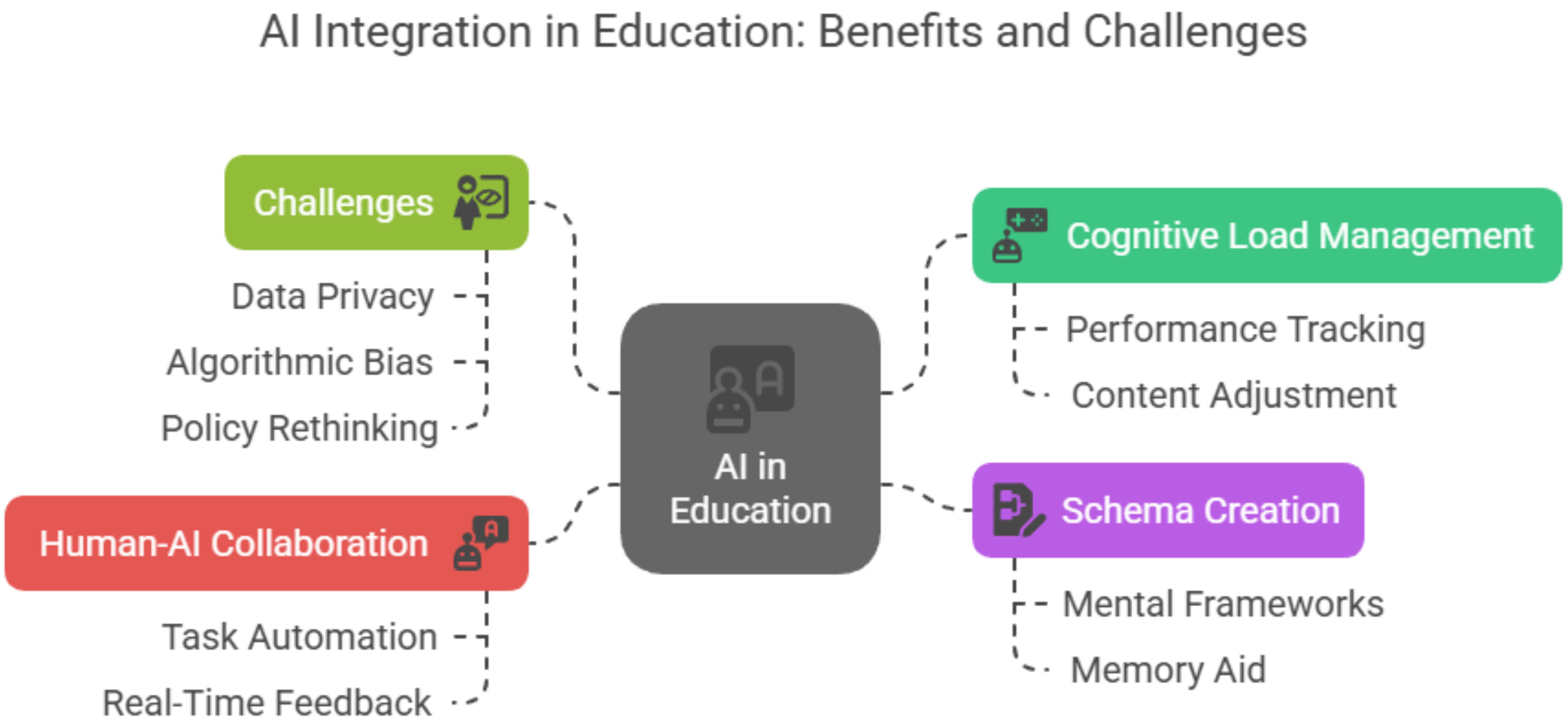
Higher student involvement leading to better knowledge retention



Real-time feedback and analytics

Immediate insights into learning learning progress and performance

AI Integration with CLT and CTML



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Challenges/Concerns and Ethical Implications

Cognitive Overload

Risk of mental fatigue and reduced learning effectiveness from overuse of AI systems

Reduced Human Interaction

Potential decrease in critical social learning experiences and human connection

Algorithmic Bias

Bias and data privacy risks that that can perpetuate inequalities inequalities (Binns, 2018)

Human-Centered Design

Need for transparent, ethical AI AI systems that prioritize human human values and agency

Policy and Practice Implications

Update curriculum and ODeL policies

Adapting educational frameworks to incorporate AI-enhanced learning approaches

Equitable tuition structures

Supporting AI integration through accessible financial frameworks

Ethical AI guidelines

Establishing standards for responsible data use and algorithmic fairness

Educator training

Fostering skills for effective AI-AI-human collaboration in teaching

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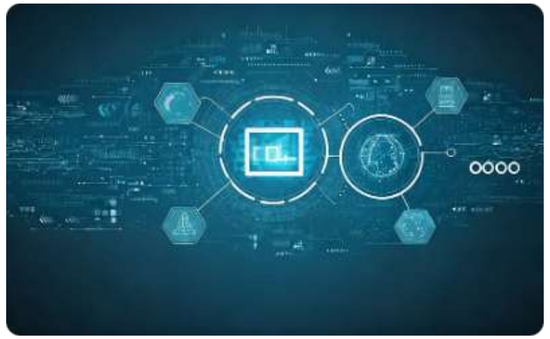
Conclusion



Transformative Learning Model

AI-infused CLT/CTML framework offers a transformative approach to education

Theory Meets Technology

Blends proven theories with adaptive technology

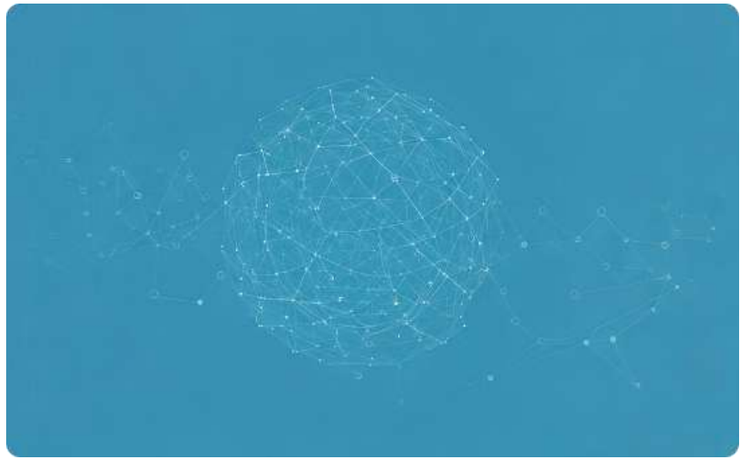
Human-AI Partnership

Empowers educators, supports learners

Future-Fit Education

Builds effective, inclusive, and and future-fit ODeL systems

Thank You!



Questions & Discussion

Contact Us

Future Collaboration

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