

Research on the
Implementation of
Algorithmic Thinking
and Sentiment
Analysis by Applying
the BERT-Based and
LLM-Agent
Application

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Outline

Introduction

Theoretical Framework

Pipeline

Challenges, Ethical Considerations, and Potential Solutions

Students Point of View

Conclusion



Introduction

Research problem:

- Explore the Implementation of Algorithmic Thinking
- Conduct the sentiment analysis by applying the BERT-Based models
- Apply the LLM-Agent Applications

Research aim:

- Provide practical and straightforward teachings to enhance researchers' efficiency systematically
- Foreground students' and researchers' AI literacy to become lifelong learning goals

Research method:

- Case study
- **Key elements: kindness is often the key to successful collaboration in research projects and academic writing.**



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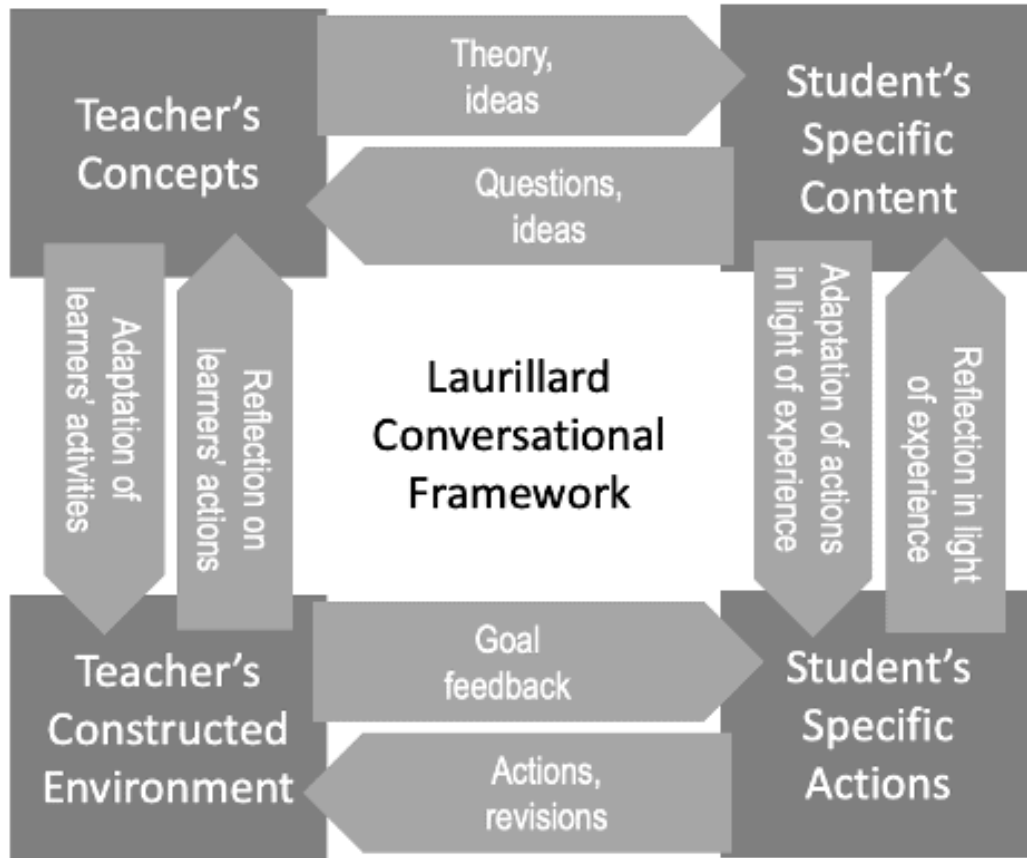
Challenges, Ethical Considerations, and Potential Solutions

Students Point of View

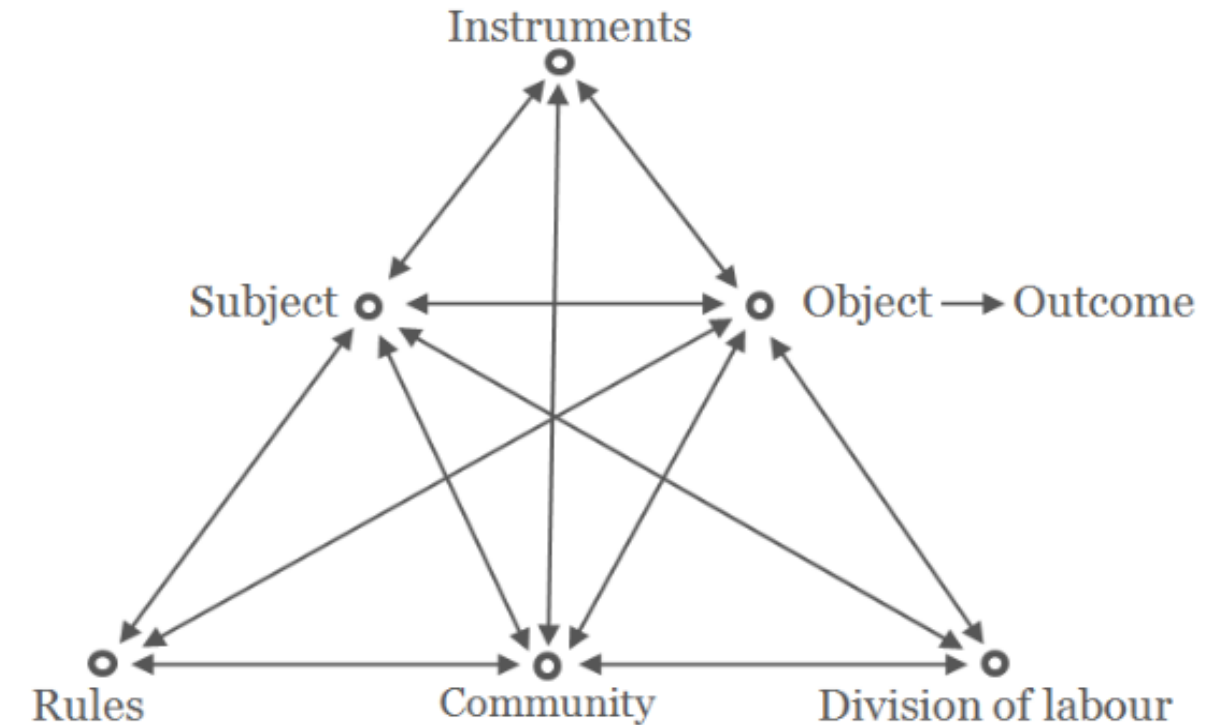
Conclusion



Theoretical Framework



**Conversational Framework,
Laurillard, 2002**

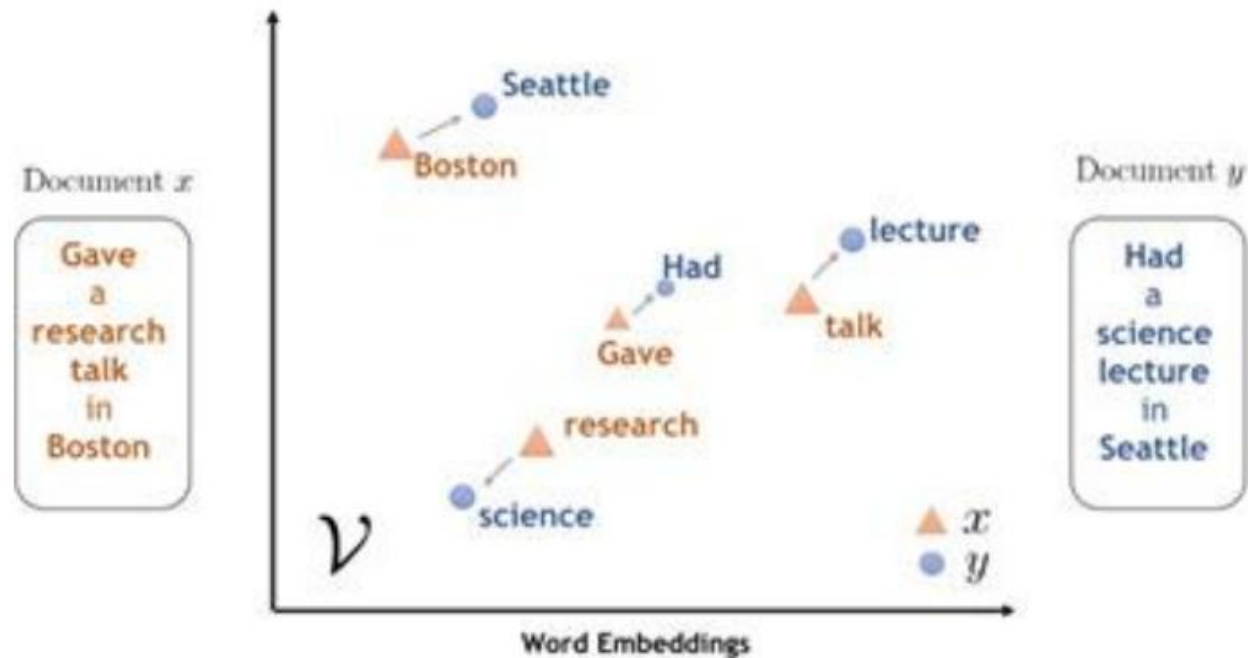


**Activity Theory,
Engestorm, 2015**



Neural NLP

- ❖ Word embedding: representing words as vectors of real numbers

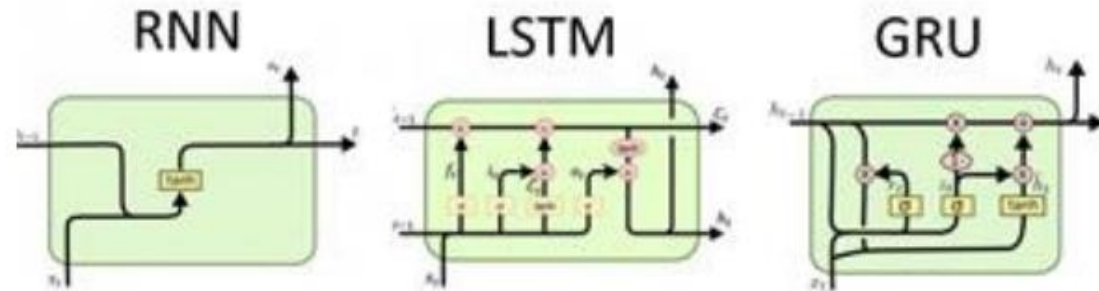


- ❖ End-to-end learning: instead of a pipeline of intermediate tasks

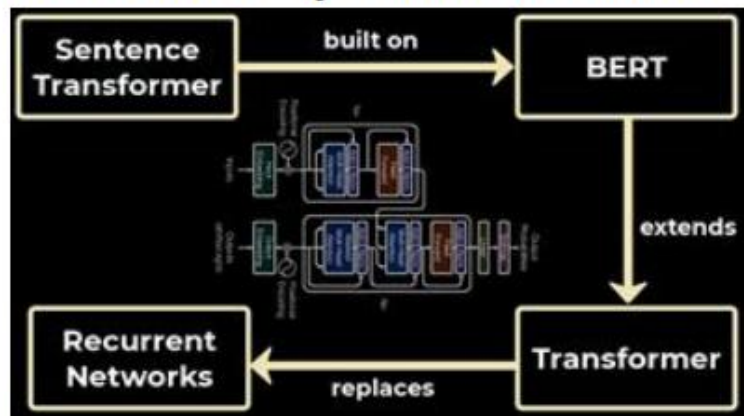


Neural NLP

- ❖ Used to be dominated by recurrent neural networks (RNNs)



- ❖ Since 2018, dominated by Transformers





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Related work

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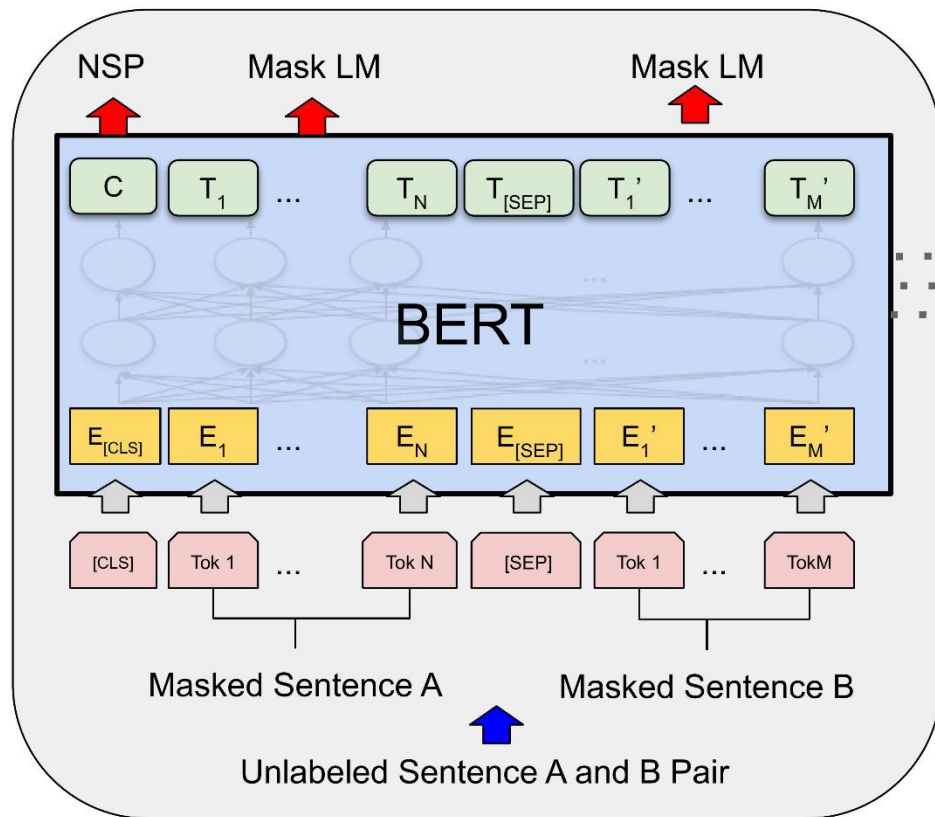
Challenges, Ethical Considerations, and Potential Solutions

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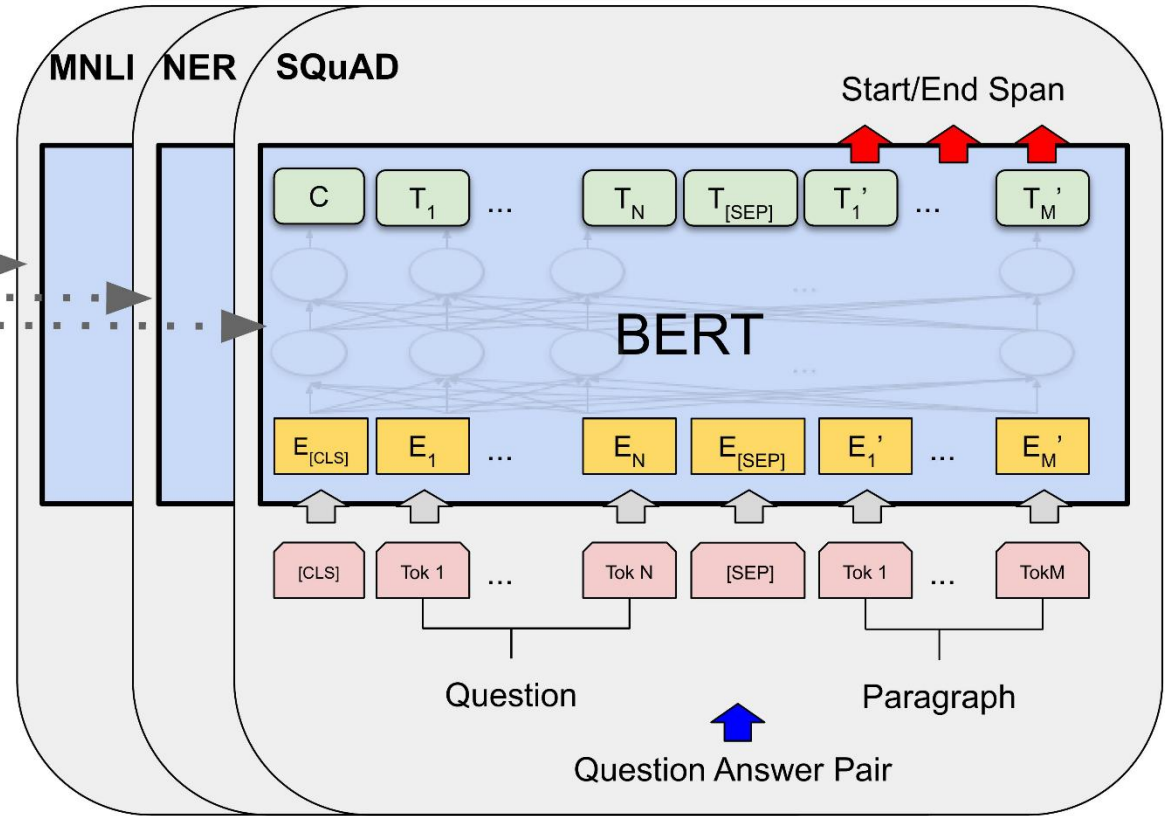
Conclusion



Pipeline



Pre-training



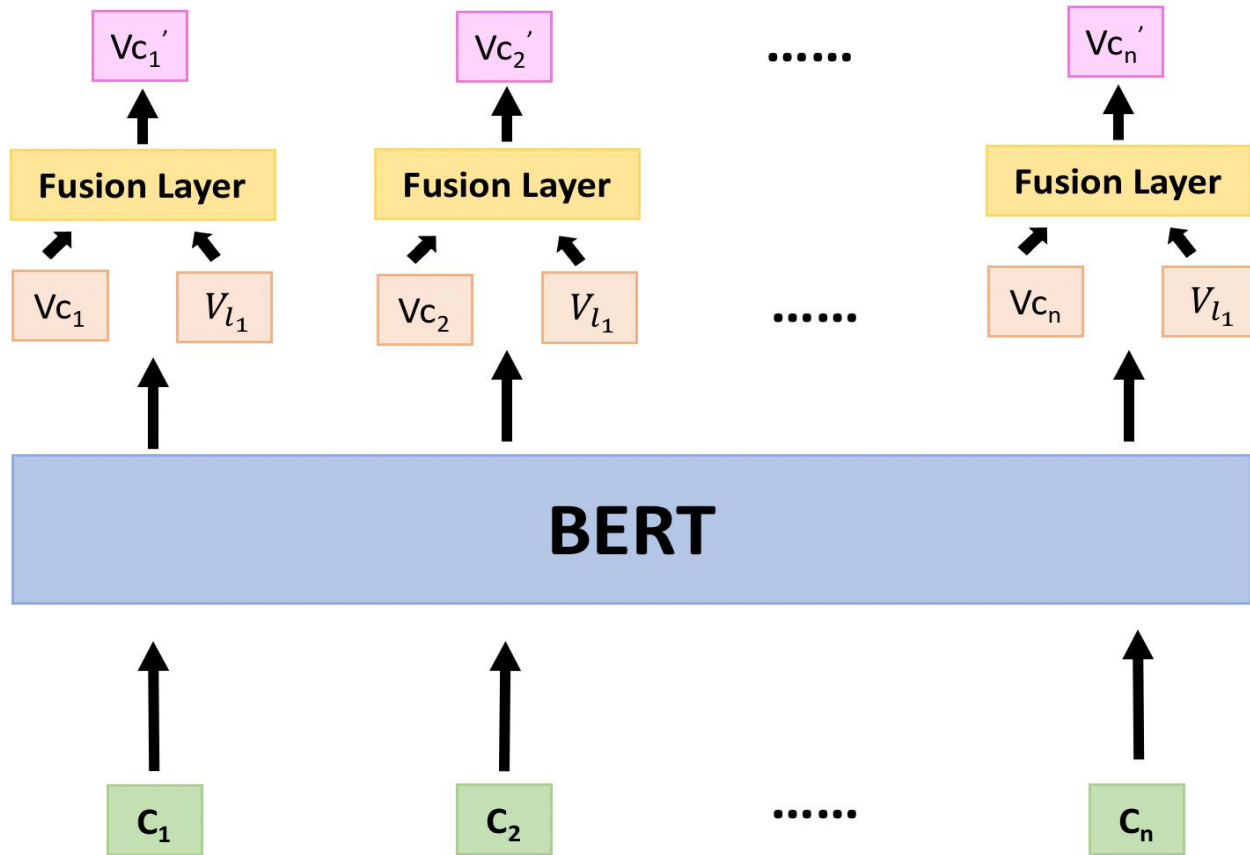
Fine-Tuning

BERT



Pipeline

Technical Route

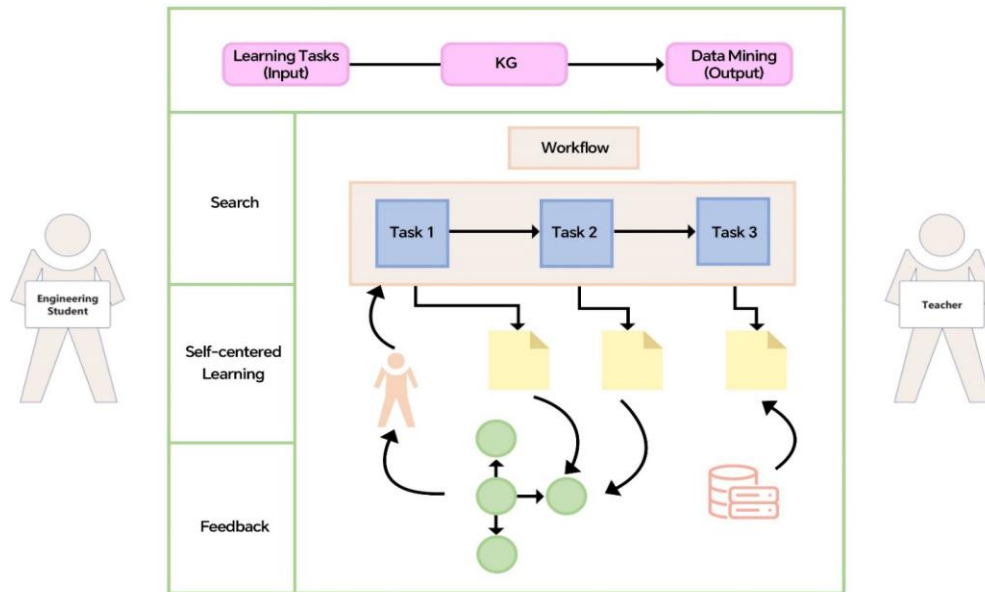
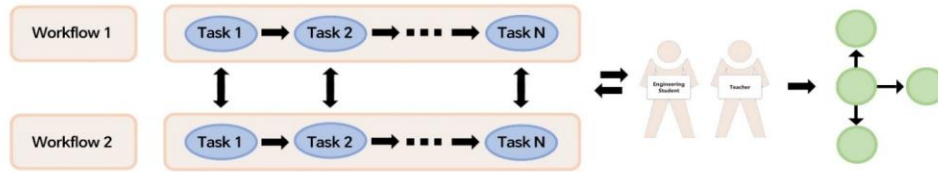


Text encoder model structure



Pipeline

Technical Route(sample 2:system-based algorithm)



Overview structure of working flows

System Development



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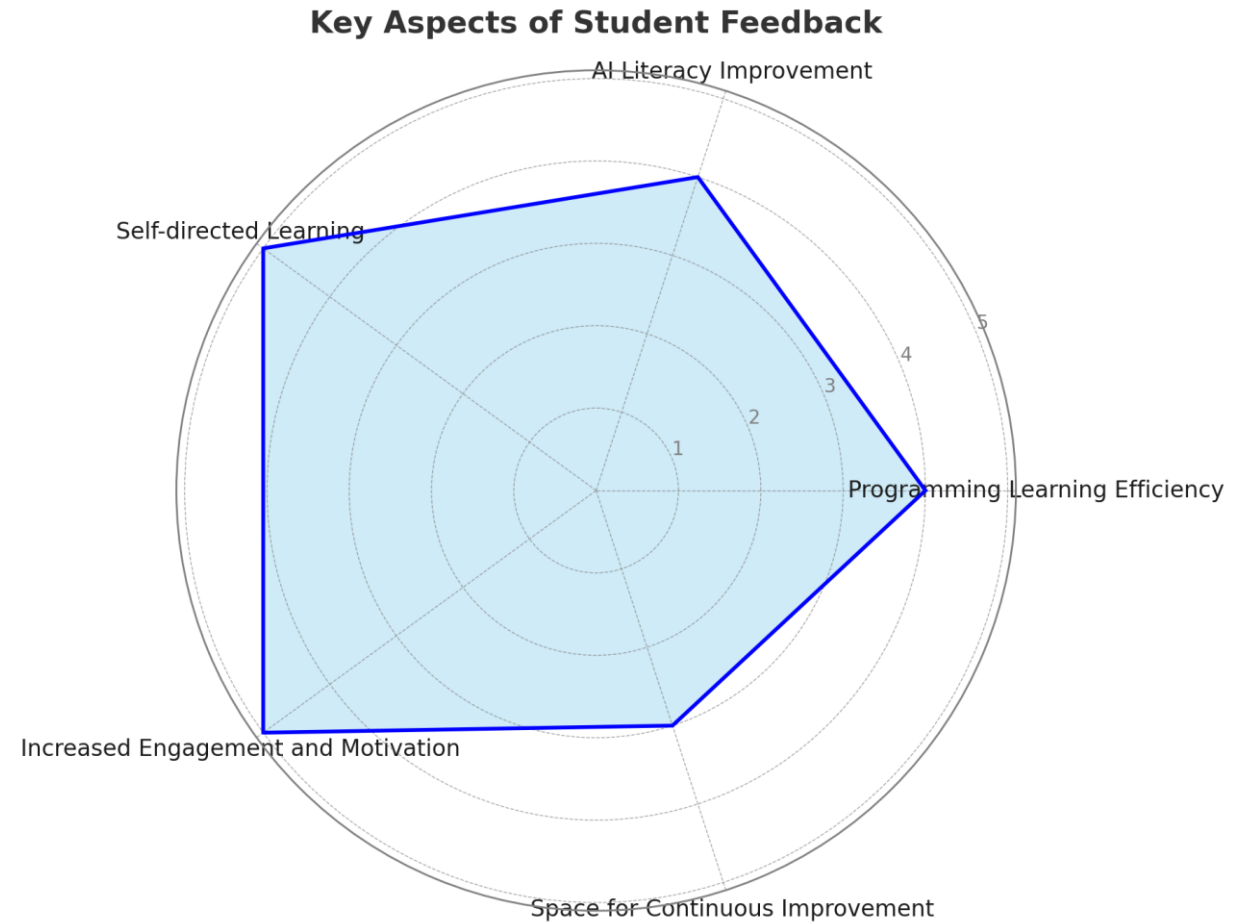
Conclusion



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Students Point of View

- Enhanced **AI literacy**
- Encouraged **autonomous learning**
- Improved **engagement** and **motivation**
- **Challenges** and **areas** for improvement





Conclusion

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- Design the new **BERT-Based System** to support AI literacy learning efficiency
- Support for lifelong learning and cultivate students' and researchers' **AI literacy**
- Make up the research gap in the BERT-Based System and LLM-agent applications in the higher educational area.



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Q&A

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Q&A

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