

## Open Large Language Models in Higher Education

A Systematic Literature Review of Governance, Adoption, and Organizational Impact

Systematic review of 551 peer-reviewed studies (2020–2025)

Scopus + Web of Science

Educational Management, Governance, and Technology-Enhanced Learning

### INTRODUCTION & AIM

- Generative AI is rapidly transforming higher education by reshaping decision-making, governance, and technology-enhanced learning ecosystems.
- Open Large Language Models (OLLMs) are emerging as accessible infrastructures that can support scalable, inclusive, and sustainable innovation in educational contexts.
- However, there is still limited systematic evidence on their organizational impact and governance implications in higher education.



**Aim:** To analyze how OLLMs are used in educational management and technology-enhanced learning environments, with emphasis on governance, adoption, organizational outcomes, and risks.



Governance



Decision-Making



Institutional Innovation



Learning Ecosystems

### RESULTS & DISCUSSION

- OLLMs are primarily conceptualized as cognitive infrastructures that augment institutional decision-making rather than replace it.



#### AUGMENT

Enhance human capabilities and decisions



#### REPLACE

Substitute human judgment and decisions

- Predominant applications are strategic planning, performance evaluation, and administrative optimization.



#### Strategic Planning

Scenario analysis, goal setting, and resource alignment



#### Performance Evaluation

Analytics-driven assessment and benchmarking



#### Administrative Optimization

Process automation, workload management, and efficiency

- Adoption is concentrated at exploratory and unit levels, suggesting emerging but uneven institutional integration.

#### Adoption Maturity Levels



Institutional (Scaling)  
Low

Departmental (Integration)  
Moderate

Unit (Implementation)  
High

Exploratory (Early Use)  
Highest

- Governance discussions emphasize transparency, accountability, and risk management.



#### Transparency

Clear processes, explainability, and open communication



#### Accountability

Defined responsibilities, oversight, and ethical use



#### Risk Management

Policies, controls, and continuous monitoring of risks



#### Bias

Potential for biased outputs and unfair outcomes



#### Data Protection

Privacy, security, and compliance challenges



#### Automation Dependence

Over-reliance may undermine human judgment and skills

- Organizational value depends strongly on institutional digital maturity and managerial capabilities. Higher digital maturity and stronger managerial capacities enable greater value realization and sustainable impact.

### CONCLUSION

- OLLMs should be understood as enabling infrastructures for institutional intelligence in higher education.
- Their value lies not only in technical accessibility but in alignment with governance structures and organizational capabilities.
- Responsible deployment requires balancing innovation, accessibility, and risk mitigation.
- OLLMs can support technology-enhanced sustainable learning ecosystems when embedded within accountable institutional frameworks.

### METHOD



#### Identification

Databases: Scopus and Web of Science  
Time span: 2020–2025  
Initial corpus identified: 616 articles



#### Analysis Approach

Structured qualitative content analysis



#### Screening

Title and abstract screening for relevance



#### Review Focus

Five research questions examined:

- Managerial domains
- Governance models
- Levels of adoption
- Organizational outcomes
- Associated risks



#### Eligibility

Full-text assessment against inclusion criteria



#### Included

Final sample analyzed: 551 peer-reviewed studies

### FUTURE WORK / REFERENCES



#### FUTURE WORK

- Develop institution-wide governance models for responsible OLLM integration.
- Examine causal links between digital maturity, adoption, and organizational outcomes.
- Explore longitudinal evidence on sustainable learning ecosystem transformation.



#### REFERENCES

Data source: systematic literature review based on Scopus and Web of Science records (2020–2025).