Developing a Participatory Design Framework for Transparent and Ethical AI-Driven Predictive Learning Analytics in Higher Education

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The Transparency Problem

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The Context

✅ Universities use Predictive Learning Analytics (PLA) to identify at-risk students

✅ Analyse attendance, grades, engagement → Forecast outcomes → Enable interventions

The Problem

PLA prioritises accuracy over transparency

Critical Gaps

✅ **" Black Box" Algorithms** - Stakeholders can't understand decisions

✅ **Reduced Trust** - Educators and students doubt the systems

✅ **Exacerbated Inequities** - Hidden biases harm marginalised/protected groups

The Need: Human-Centred Learning Analytics (HCLA)

Research Aim: Address transparency and ethical challenges through participatory design

Opening the Black Box

Research Objectives

✅ **Explore HCD Methods** Meaningfully involve non-technical stakeholders

✅ **Develop Practical Framework** Guide universities in transparent LA/PLA design & deployment

✅ **Ensure Equity** Align with values, promote equity across diverse populations

Participatory Design

Actively involving end users in the design process—designing WITH, not FOR

Stakeholders

Human-Centered Design Methods

Insights

HCD enables meaningful participation

✅ Stakeholders articulate values, concerns, contextual needs

✅ "Transparency" means different things to different groups

✅ Co-design surfaces and reconciles diverse perspectives

Participatory design builds trust

✅ Systems designed WITH stakeholders are more trustworthy

✅ Better alignment with actual needs

✅ Higher adoption rates

✅ Built-in transparency vs. post-hoc explainability

Equity can be embedded

✅ Identifies potential biases early

✅ Ensures fair outcomes across diverse populations

✅ Prevents "design for" → shifts to "design with"

Emerging Framework

The Participatory Framework: 5 Stages

✅ Identify

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✅ Engage

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✅ Co-design

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✅ Implement

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✅ Evaluate

What It Provides:

✅ Structured process for universities

✅ Alignment with institutional values

✅ Practical tools (templates, guides, workshops)

✅ Equity focus throughout all stages

Emerging Framework

Traditional Approach	Participatory Approach
"Built FOR you"	"Built WITH you"
Post-hoc explainability	Built-in transparency
Top-down deployment	Co-created implementation
Technical optimisation	Human-centered design

Why This Matters: The Ripple Effect

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For Students

- ✅ Transparent systems they can trust
- ✅ Voice in tools affecting education
- ✅ Protection from biased algorithms
- ✅ Equitable outcomes

For Educators

- ✅ Interpretable predictions they can act on
- ✅ Tools aligned with pedagogical values
- ✅ Confidence in recommendations
- ✅ Effective interventions

For Institutions

- ✅ Ethical, trustworthy LA/PLA
- ✅ Mission/values alignment
- ✅ Risk mitigation (bias, privacy)
- ✅ Higher retention rates

The Path Forward

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Framework Development & Validation

- ✅ Continue development
- ✅ Test in multiple institutional contexts
- ✅ Refine based on feedback
- ✅ Measure effectiveness (trust, interpretability, equity)

Expand Engagement

- ✅ More diverse voices & international perspectives
- ✅ Different institutional types

Evaluation

- ✅ Impact on stakeholder trust
- ✅ Student equity outcomes over time

Key Takeaways

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Moving from

✅ Black-box prediction → Transparent systems

✅ Technical optimization → Human-centered design

✅ "For" stakeholders → "With" stakeholders

✅ Post-hoc explainability → Built-in transparency

Final Thought

"We can have BOTH accurate predictions AND transparent, trustworthy systems— but only if we design WITH stakeholders, not just FOR them."

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