

**Table S1.** Overview of the operational elements of the proposed AR-supported LA system.

Section	Category	Classification	Values	Objectives	Input	Analysis		Visualisation	Stakeholders
					Machine	Human	LA Machine	LMS	D = Developers E = Educators S = Students
Technology	Apparatus	General Purpose Equipment	Desktop PC	System Usability	System-log	-	Statistics	Graph	D
			Laptop					Statistical	
	AR Equipment	Wearables	Tablet	User Experience	Sensed	-	ML / EDM	Timeline	E, D
			Smartphone					Word cloud	
			Internet Speed					Matrix	
		Augmentation Method	AR Lenses / Glasses		Mobile Communication	-	Statistics	Circular	E, D
			Smartwatch					Graph	
			Headset / EarPods					Bubble plot	
Pedagogy	Discipline	Field	Physical Objects	-	System	-	Statistics	Concept map	E
			Pointers / Markers					Glyph	
	Intervention	Tasks	Tabletop	Knowledge & Skills Comprehension Understanding Enhancement Knowledge / Skills Retention	Camera Transaction	Educational Resources	ML / EDM	Geomap	E, S
			Computer Science					Statistical	
			Info. Technology					Graph	
			Engineering					Heatmap	
Psychology	Psychometrics	Motivation	Mathematics	Progress Monitoring	LMS-log	Educational Resources	ML / EDM	Radar	E, S
			Observation					Timeline	
	Multimodal	Engagement	Problem Solving	Satisfaction	LMS-log	Administrative	Statistics	Word cloud	E
			Experimentation					Glyph	
			Content Creation					Statistical	
			Formative					Heatmap	
Psychology	Psychometrics	Motivation	Summative	Intention to use AR	Sensed	-	ML / EDM	Timeline	E
			Survey					Bubble plot	
	Multimodal	Engagement	Eye Tracking	Intention to use AR	Sensed	-	ML / EDM	Heatmap	E
			Facial Expressions					Timeline	
			Gesture Tracking					Bubble plot	
			Noise Levels					Heatmap	