Game based Learning And Development Of Skills (GLaDoS)

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18/06/2025

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Which game design features contribute to player engagement and learning effectiveness in serious games, according to literature and developer experiences?
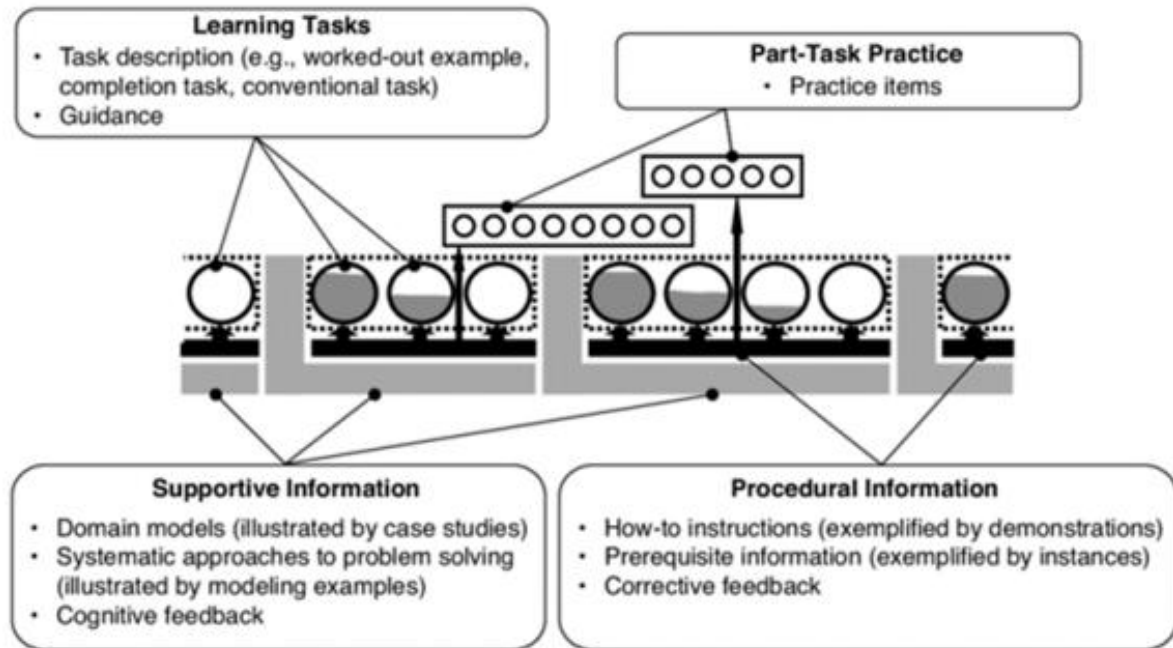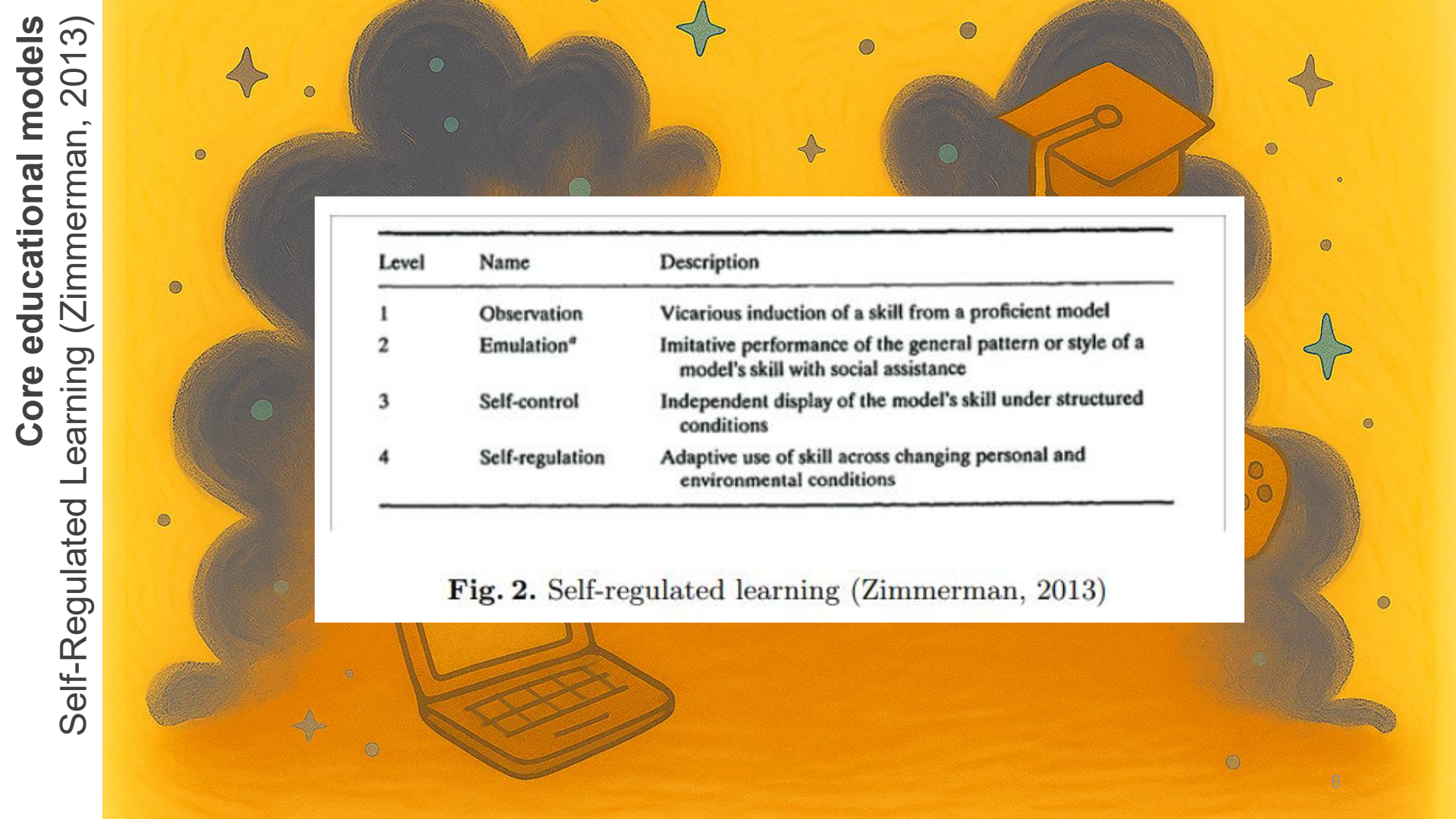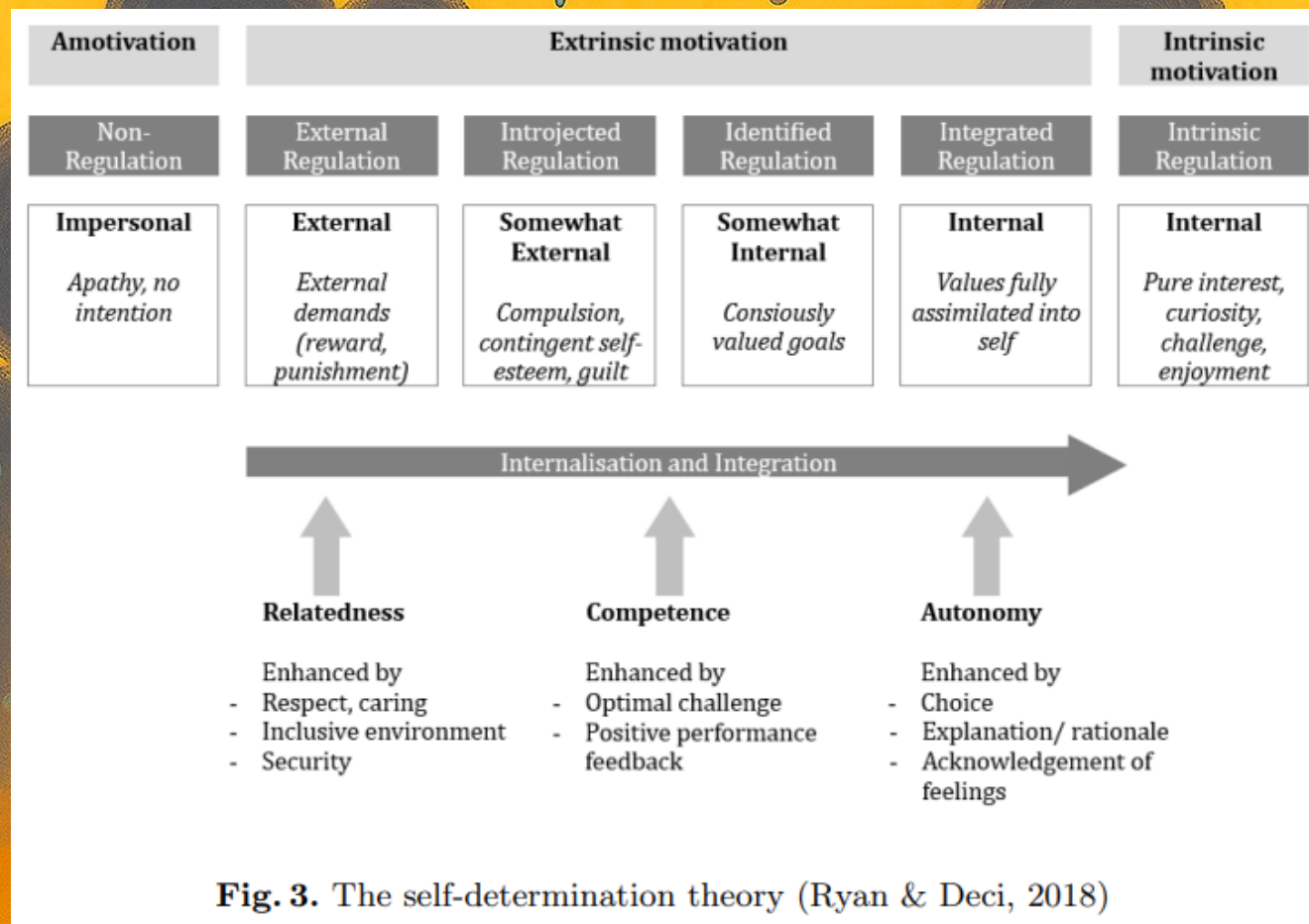
Learning Tasks
- Task description (e.g., worked-out example, completion task, conventional task)
- Guidance

Part-Task Practice
- Practice items

Supportive Information
- Domain models (illustrated by case studies)
- Systematic approaches to problem solving (illustrated by modeling examples)
- Cognitive feedback

Procedural Information
- How-to instructions (exemplified by demonstrations)
- Prerequisite information (exemplified by instances)
- Corrective feedback

Fig. 1. The four-component instructional design model (4C/ID) (van Merriënboer, & Kirschner, 2018)

Level	Name	Description
1	Observation	Vicarious induction of a skill from a proficient model
2	Emulation[a]	Imitative performance of the general pattern or style of a model's skill with social assistance
3	Self-control	Independent display of the model's skill under structured conditions
4	Self-regulation	Adaptive use of skill across changing personal and environmental conditions

Fig. 2. Self-regulated learning (Zimmerman, 2013)

Core educational models

Self-determination theory (Ryan & Deci, 2018)

Amotivation	Extrinsic motivation				Intrinsic motivation
Non-Regulation	External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Regulation
Impersonal *Apathy, no intention*	**External** *External demands (reward, punishment)*	**Somewhat External** *Compulsion, contingent self-esteem, guilt*	**Somewhat Internal** *Consiously valued goals*	**Internal** *Values fully assimilated into self*	**Internal** *Pure interest, curiosity, challenge, enjoyment*

Internalisation and Integration →

Relatedness

Enhanced by
- Respect, caring
- Inclusive environment
- Security

Competence

Enhanced by
- Optimal challenge
- Positive performance feedback

Autonomy

Enhanced by
- Choice
- Explanation/ rationale
- Acknowledgement of feelings

Fig. 3. The self-determination theory (Ryan & Deci, 2018)

GLEEE-model (Game-based Learning Experience, Engagement and Effectiveness)

Game Design Features or Gameplay Experience

Player Engagement

Learning Effectiveness

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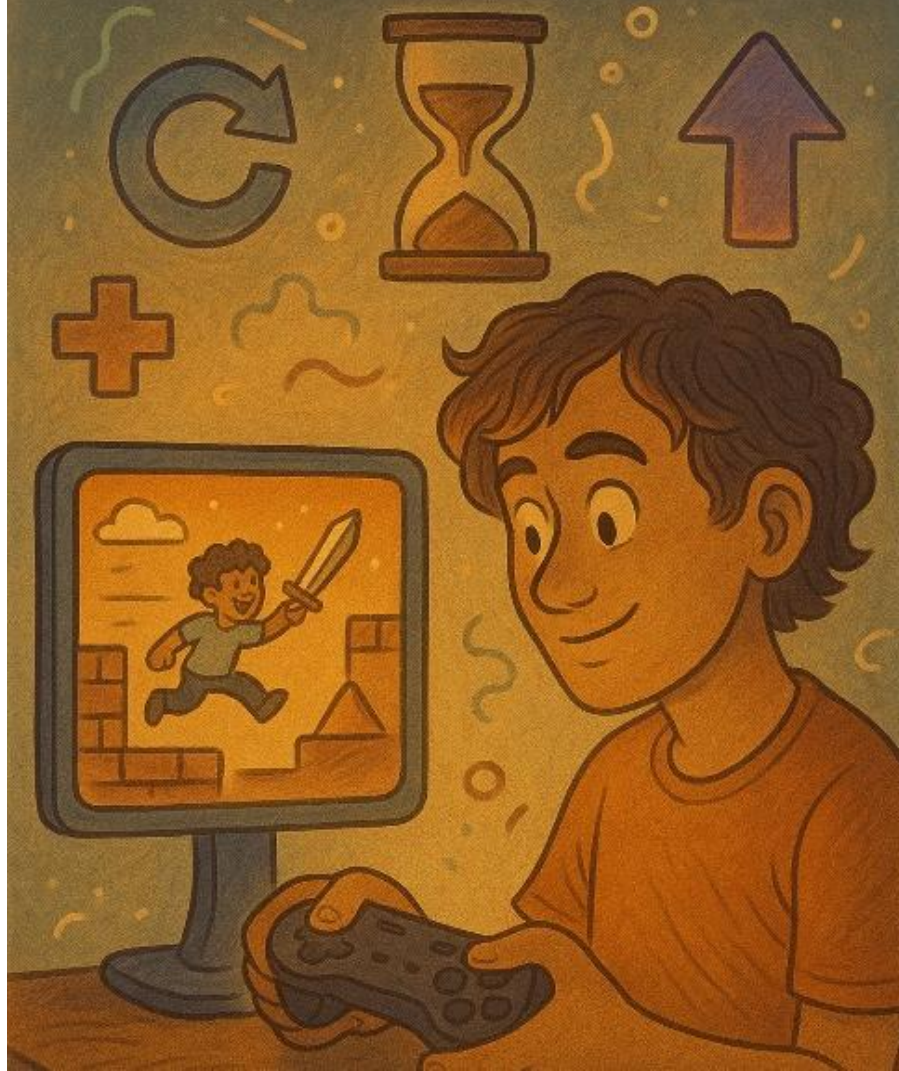
Learning Effectiveness

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