
LIUM
Laboratoire d'Informatique
Le Mans Université

# Generator of Personalized Training Games Activities: A Conceptual Design Approach

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# Outline

- Research Context & Problem
- Related works & Positioning
- Proposal Overview
- Conceptual Modeling Foundations
- The Framework and its Evaluation
- Conclusion

# Research Context

# Research Problem

Declarative Knowledge ✚ Training ✚ VideoGame

requires

Personalized & Repetitive but varied Training Game Activities

solution

**Generation / Generator**
(process / component)

**How to design** and **implement** such component?

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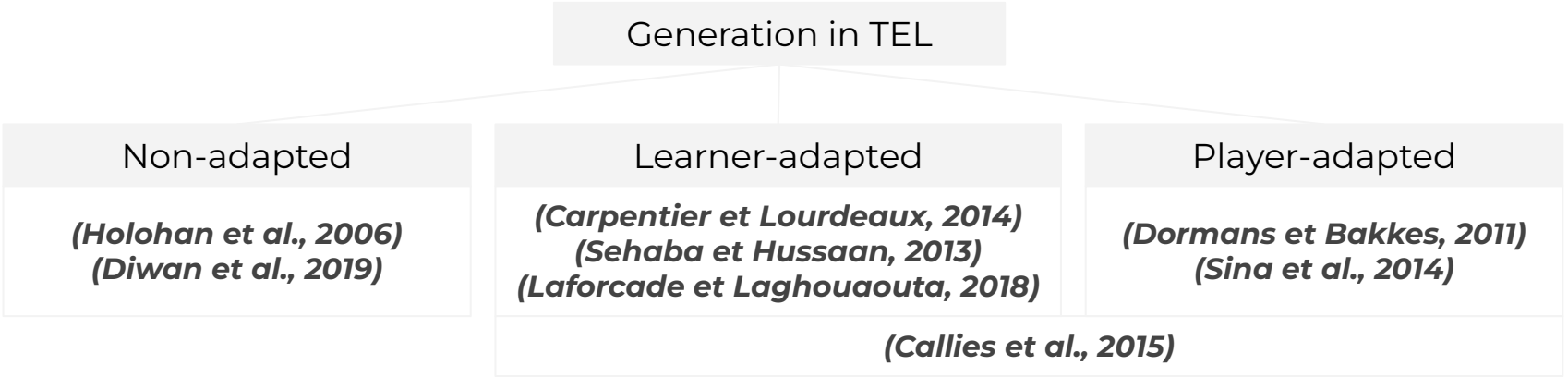
# Related works



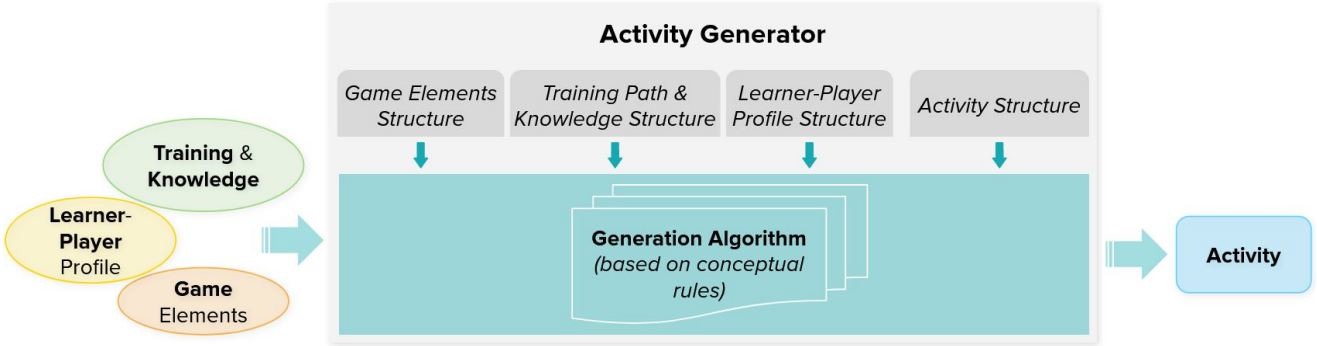

- Observations:
  - use of models to generate and adapt (mostly)
    - knowledge description, learner-player representation, game elements, description, etc.
    - domain-dependent models
  - few works adapt on multiple dimension simultaneously

# Research Positioning

How to design varied & learner-player adapted activities generators for Declarative Knowledge?

1. *What are the elements involved in an activity generator?*
2. *What are the relationships between these elements?*
3. *How can the elements and their relations be structured to construct such generators?*
4. *How to consider DK independently of a specific didactic domain?*

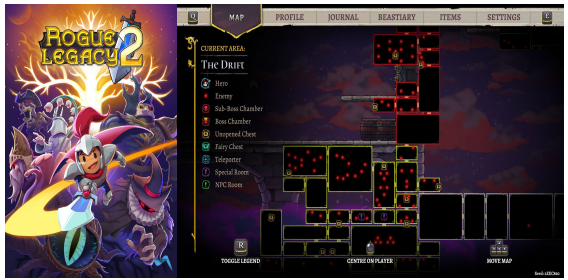
**Step 1 :** Choose a game genre

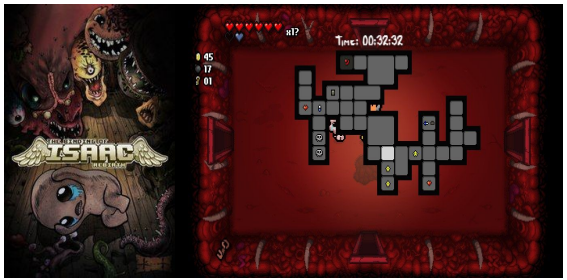


# Roguelite for Declarative Knowledge

- Roguelites dungeon-like games
  - procedural generation with randomness (variety)
  - perma-death (repetitive mechanic)
  - item retention (progress)

⇒ suitable for Declarative Knowledge Training *(Lemoine et al., 2023)*



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# Proposal overview

**Proposal**

A **framework** to guide the implementation of activity **generators**

**Research object**

Generators (software component that produces XML descriptions of activities) not *game player* (component that interprets theses descriptions)

**Framework characteristic**

**Domain-independent** (extensibility)

**Context**

- **Declarative knowledge** training
- **Roguelite** genre ***(Lemoine et al., 2023)***

**Personalisation considered**

- Teacher's viewpoint on training
- Learner's progress/results in training
- Player's game preferences

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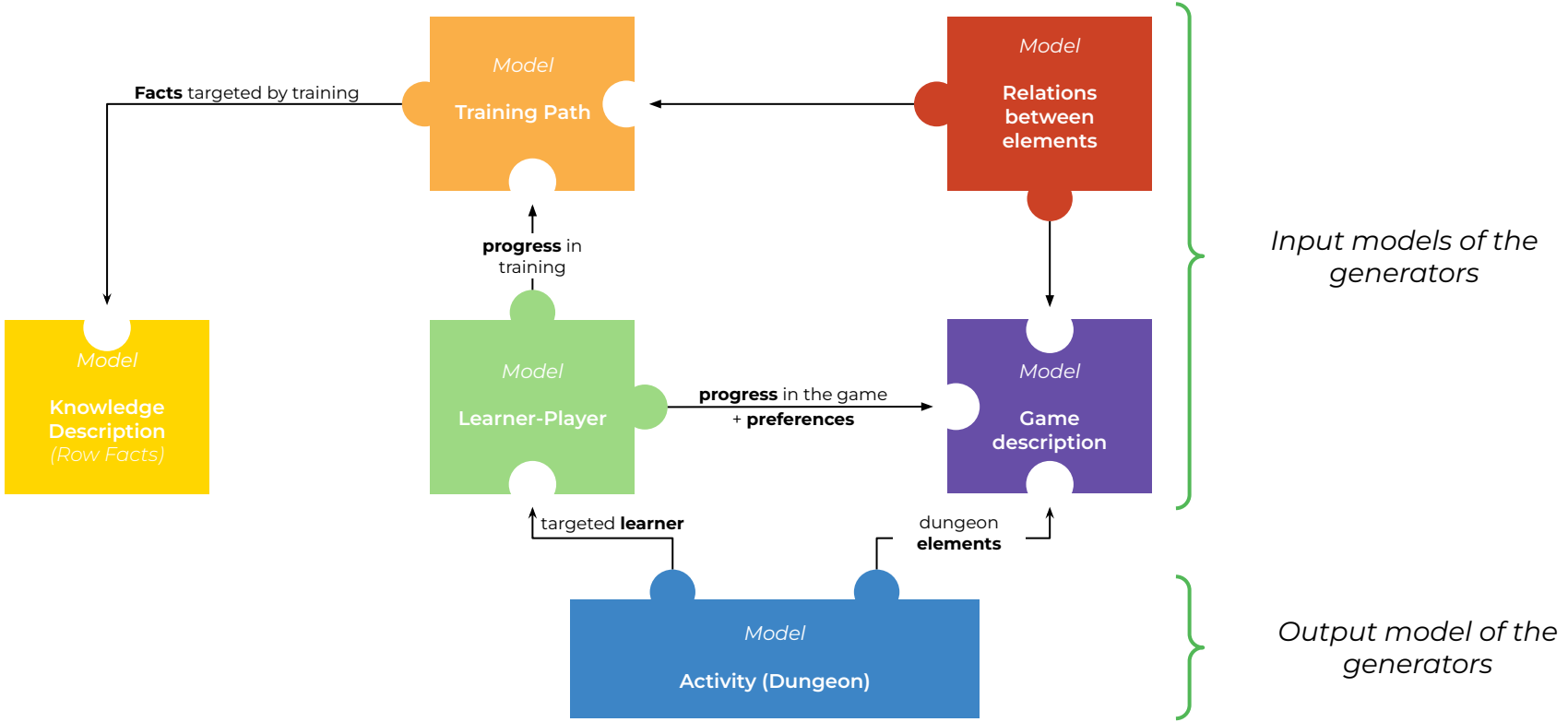
# Conceptual Modeling Foundations



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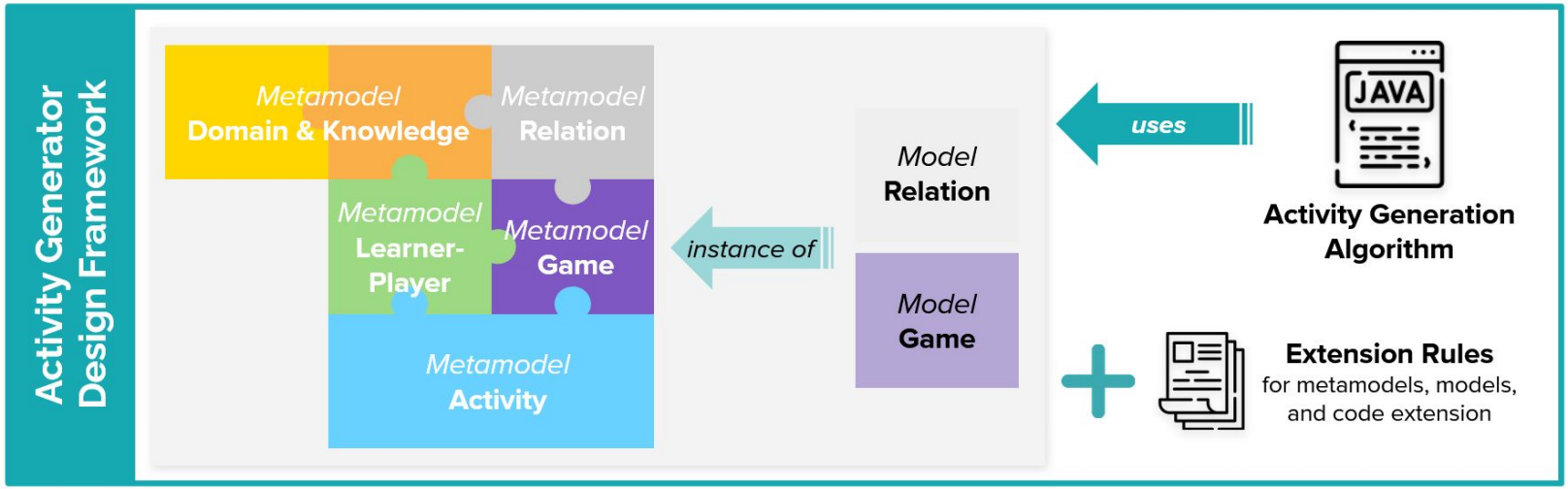
# Framework & Evaluation




Implementation: Java emf

Evaluation: JUnit 5 + Model Checking (EVL)

# Application: Multiplication Tables

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# Conclusion

- Research context — **Training Games** for **Declarative Knowledge**
- Research object — **Generator** of **varied** & **adapted** training **activities**
- Research problem — **How to design** these generators?
- Research proposal — A **framework** to guide the design & implementation of such generators
- Paper focus — The **conceptual modeling** *behind* the proposed framework
- Presentation focus — Understanding the **overall** research work

For more details we invite you to read the paper ☺️


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# Thank you for your attention ☺️

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