

LIDILEM

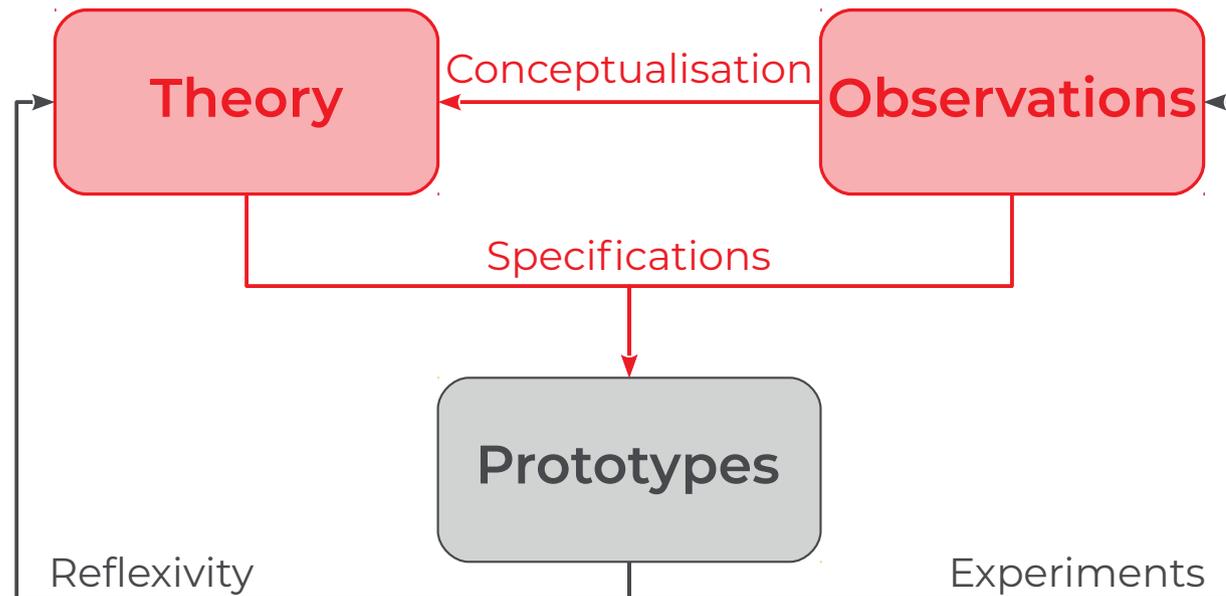
 UNIVERSITÉ  
Grenoble  
Alpes

# Design based research on learning games, the example of Magic Word v2

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# Design Based Research

- Various existing models
  - (Nonnon 1994; Harvey and Loiselle 2009; Barab and Squire 2004)



# Previously...

**A brief summary of our approach**

# Towards a design strategy

- Issues:
  - High costs
    - COTS : 1 to 10 M\$, 20 to 150 year.man (Becker, 2007:4)
    - *Casual Games* : 150 k\$ to 1 M\$ (successful > 500 k\$)
  - Difficulty to provoke playful attitude
    - See “chocolate coated broccoli”  
(Söbke, Bröker et Kornadt, 2013; Bruckman, 1999)

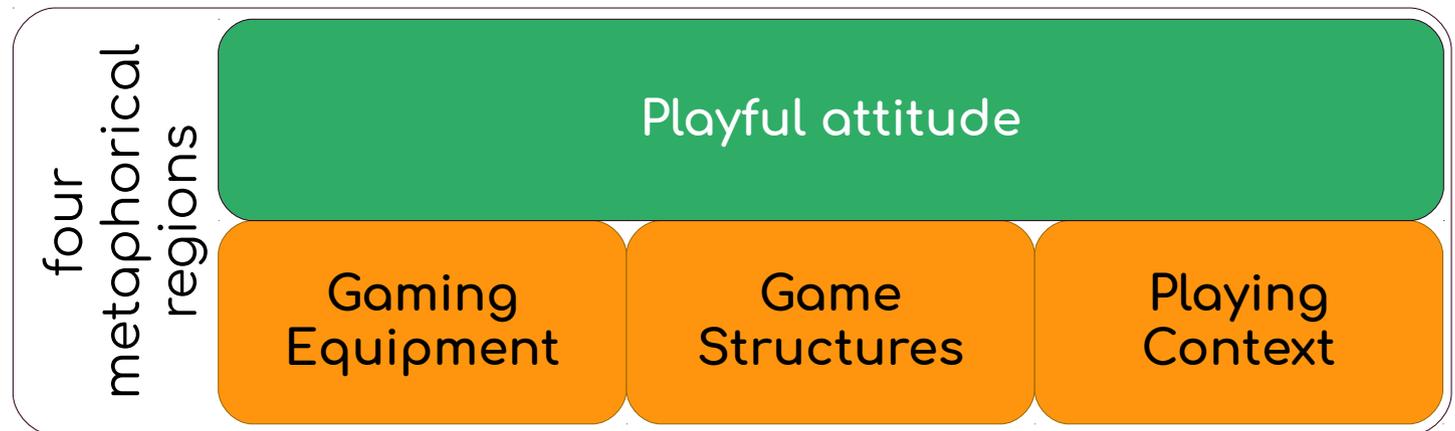
# Strategies

- Costs
  - Agility
  - Limit gaming equipment costs (graphics, metaphor, in the first iterations)
  - Based on generic language resources
- Playful attitude
  - Reuse game structures that work in a purely “playful” context (Söbke, Bröker et Kornadt, 2013)

# Conceptual tool

## Metaphorical regions of “jeu”

- How to “ludicize” (Genvo, 2013:445; Bogost, 2014) learning? (Silva, 2008)



# Conceptual tool

## Rule levels

- Rule levels (Silva, 1999 : 277)
  - *Metaludic* rules underlie the design of a game;
  - *Constitutive* rules are formulated as rules of the game;
  - *Normative* rules describe the activity of a good player;
  - *Evolutive* rules emerge through usage.

# Case study #2



**Magic Word**

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**A letter game**

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[http://wiki.lezinter.net/index.php/Projets:Magic\\_Word](http://wiki.lezinter.net/index.php/Projets:Magic_Word)

<http://magicword.lezinter.net/>

# Letter game

- *Metaludic rules* (Silva, 1999)
  - 4×4 grid
  - Inflected forms
  - Contiguous letters (any direction)
  - Each cell used only once (per word)
- Success in the game depends on
  - Lexical knowledge
  - De la comprensión de las reglas morfológicas del idioma
  - De la habilidad para localizar palabras en la cuadrícula
- Reglas normativas (Silva, 1999)
  - Búsqueda de zonas de afijos
  - Identificación de la categoría morfológica de la forma encontrada
  - Optimización de cada uno de los lemas encontrados con todas las formas flexionadas asociadas



# An iterative design process

## MAGIC Word

find as many words

316 Words to find

R <sub>1</sub>	W <sub>4</sub>	A <sub>1</sub>	I <sub>1</sub>
H <sub>4</sub>	S <sub>1</sub>	E <sub>1</sub>	N <sub>1</sub>
T <sub>1</sub>	E <sub>1</sub>	I <sub>1</sub>	F <sub>4</sub>
U <sub>1</sub>	R <sub>1</sub>	A <sub>1</sub>	R <sub>1</sub>

0:39 <sup>202 points</sup>  
<sub>10 word</sub>

### Words found

<del>RF</del>	
FAIR	32
RAI	13
<del>RAF</del>	
RARE	29
<del>RARES</del>	
WEN	16
SEW	16
SAW	16
HET	16
SHE	16
<del>RF</del>	
FINE	32
FIN	16
<del>FIES</del>	

# An iterative design process

M

Click on any word to see its definition.

**ml**

**Result :** 202 points

**Number of words found :** 10 / 316 words

**Words found :**

FAIR	32
FINE	32
RARE	29
FIN	16
HET	16
SAW	16
SEW	16
SHE	16
WEN	16
RAI	13
FIES	
RAF	
RARES	
RF	
RIF	

**All words**

AE	7	FEST	32	REEN	29	SWAIN	38
AERIE	35	FESTER	49	REEST	35	SWAN	32
AERIES	46	FEW	19	REI	13	SWEET	38
AERIEST	57	FI	10	REIN	29	SWEIR	38
AFIRE	38	FIAR	32	REINFEST	71	TE	7
AI	7	FIE	16	REIS			
AIN	13	FIN	16	RES			
AIR	13	FINE	32	RESAW			
AIRT	29	FINES	38	RESEW			
AIRTH	38	FINEST	49	RESH			
AIRTS	35	FIR	16	RESIN			
AIS	13	FIRE	32	REST	29	THE	16
AN	7	FIRFS	38	RET	13	THEE	32

**find as m**  
316 Words to find

R<sub>1</sub>

H<sub>4</sub>

T<sub>1</sub>

U<sub>1</sub>

**Add word**

1. (transitive) To infest again.  
*My attempts at fumigation failed to stop the rats from **reinfesting** the barn.*

# An iterative design process



any word to see its definition.

202 points  
 Number of words found : 10 / 316 words

Words found :

...	32
FINE	32
RARE	29
FIN	16
HET	16
SAW	16
SEW	16
SHE	16
WEN	16
RAI	16
FIES	16
RAF	16
RARES	16
RF	16
RIF	16

find as many words as possible  
 316 Words to find

R 1

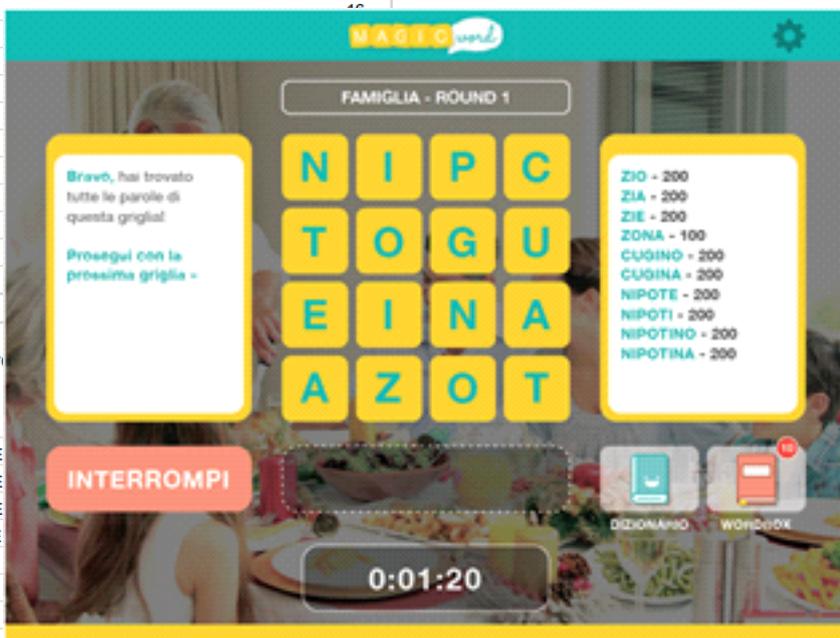
H 4

T 1

U 1

All words found :

AE	38
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AERIE	38
AERIE	38
AFIRE	7
AI	38
AIN	32
AIR	38
AIRT	29
AIRTH	38
AIRTS	35
AIS	13
AN	7
FINES	38
FINEST	49
FIR	16
FIRE	32
FIPES	38
RESEW	38
RESH	38
RESIN	38
REST	29
BET	13
THE	16
THEE	32



My attempts at fumigation failed to stop the rats from reinfesting the barn.

# Experiment

Metrics	Gre.	Bol.	T-test <i>p</i>
Fun	3.2	3.0	< .05
Replayability	3.1	2.9	< .05
Graphics	3.0	3.2	< .05
Learning	2.8	2.9	< .05

- 148 students (20 groups A2-C1) :
  - 85 % would like to play these games in class again
  - 4-level Likert scales:
    - 93% appreciate the competitive element of the Grenoble Game
    - Learning less salient in the Grenoble version (normative rules?)
- **Importance of the playing context: those who did the (tedious) pre-test less inclined to play again**
- Other results of the experiment:
  - Language level, gender, gaming experience HAVE NO EFFECT on the reception (neither version)



- 2 game modes
  - *Rush* : classic game with **COMBO** normative rules



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  - *Conquer* : expectations of teachers / Bologna version (with a competitive element)

- 2 game modes
  - *Rush* : classic game with **COMBO** normative rules
  - *Conquer* : expectations of teachers / Bologna version (with a competitive element)
- Authoring tool (teachers, learners without role distinctino)
  - “*Bologne algorithm*” (Rocchetti, Salomoni *et al.*, 2016)

- 2 ga
- Ru
- no
- Co
- ver
- Auth
- role
- "Bo

EDITION MANCHE MA PREMIÈRE MANCHE IL S'AGIT D'UNE MANCHE QUE JE SUIS EN TRAIN DE CRÉER ET QUI SERA SOUMISE À LA COMMUNAUTÉ

[← RETOUR À L'ÉDITEUR DE PARTIE](#)

Grille & objectifs Divers

OBJECTIFS [SAUVEGARDER LES OBJECTIFS](#)

FindWord Combo Morpho

[GÉNÉRER GRILLE](#) [+ AJOUTER UN OBJECTIF FINDWORD](#)

jeu	L'activité que l'on mène quand on "joue"	Le lemme suffit ?	Non	W	X
jetes	Les dés sont ...	Le lemme suffit ?	Oui	W	X
oie	Volatile qui a un jeu à son nom (et qu'on mange en foie gras)	Le lemme suffit ?	Non	W	X
ludique	Adjectif qui veut dire "qui relève du jeu"	Le lemme suffit ?	Non	W	X
rebarbatif	Indice	Le lemme suffit ?	Non	W	X

GRILLE [AUTOFILL](#) [SAUVEGARDER LA GRILLE](#)

r	i	s	u
q	e	d	l
u	t	j	-
r	e	i	o

ologna

thout

5)

# Current work

- Test in Thailand, FFL
  - Based in existing (gap filling) exercises
- Issues
  - Objectives are not ordered (one can answer to “question” 2 while answering “question” 1)
  - One cannot replay a given game
    - Game literacy...
- Creation of a “teacher’s guide”

# Future works

- Playing context
  - Publication of prototypal sequences
- Gaming equipment
  - Interface improvements
    - Scores
    - Home page
    - Evaluate games
- Language resources
  - Other languages:
    - Spanish? Italian? German? Russian?
  - Question dictionary

# Questions, observations, comments...

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## Project presentation

[http://wiki.lezinter.net/index.php/Projets:Magic\\_Word](http://wiki.lezinter.net/index.php/Projets:Magic_Word)  
Game

<http://magicword.lezinter.net>

## Code

<https://gricad-gitlab.univ-grenoble-alpes.fr/lzbnk/MagicWord>

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