

Games for Media and Information Literacy

Developing MIL skills in children through digital games creation

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“Promoting MIL for child and adult population is of growing importance in a context of digital media convergence and highly complex media and information ecology”

(Livingstone, Bulger, Zaborowski, 2013)

“Games have cognitive learning potentials. Games can be used as educational resources”

(Gee, 2008)



Innovative approach:

- Aims to develop critical and participative dimensions of media and information literacy (MIL) for tweens via the creation and development of games in formal educational contexts;
- Process of game creation as a reflexive process that promote the acquisition of new media and information literacies;
- Addresses multiple literacies - media and information literacy, information literacy, visual literacy, multimodal literacy, and computer literacy/ICT literacy.

Research goal:

- Explores the potential of of game creation activities for children in grades 5 to 7 to foster MIL skills and knowledge.

RQ1. Can we promote and develop MIL skills, such as critical understanding, awareness, creativity, participative actions, interactive practices and empowerment, by facilitating the use of game-based activities in educational contexts?

RQ2. What is the relationship between effective learning, motivation, engagement and game based activities for educational purposes?



Research Design

Exploratory study, children from 9 to 12; grades 5 - 7

Four schools:

- School 1 (CV) Lisbon
- School 2 (RC) Lisbon
- School 3 (PN) Lisbon
- School 4 (COV) Austin

Schools

-Secondary data/school

- Demographics
- Mediatechnology usage

-Interviews & Focus Group

- Teachers, School Director, Parents, Teachers

Field Work

Baseline

- MIL
- SES

GamiLearning classes

- School1 - 22 sessions/ 33h
- School2 - 26 sessions/ 20h
- School3 - 29 sessions/ 22 h
- School4 - 12 sessions/ 21h

Observation - Grid
SNA – Sapo Campus

Endline

- MIL
- SES

- Teachers' Training
- Games content analysis
- SNA analysis
- Focus group

Ethnographic Approach

Script thinking – Robot programming

Game Design Process... in the Beginning:

CODE TO SNACK

Robot make me a Snack!

For the Robot to make my snack, I need to turn it on and program it. Your table is going to be the counter where he will work later on. And you can have some appliances, but don't forget to identify them.

1* Decide what you want to snack.

2* Work on the programming, that is describing each step on the sheet.

3* On each sheet of the notepad, draw what you need to cook or to eat with and identify it. You can create a refrigerator and a pantry shelf to pack the food and the necessary supplies.

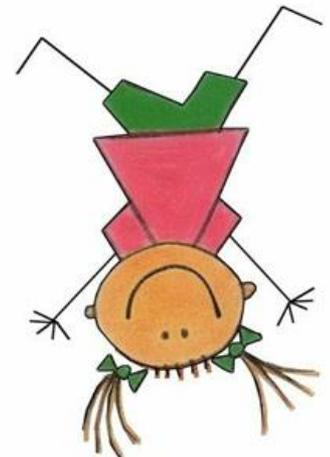
If the programming passes to another sheet of paper, it's necessary to number the sheets, so the robot doesn't shuffle the sequence.



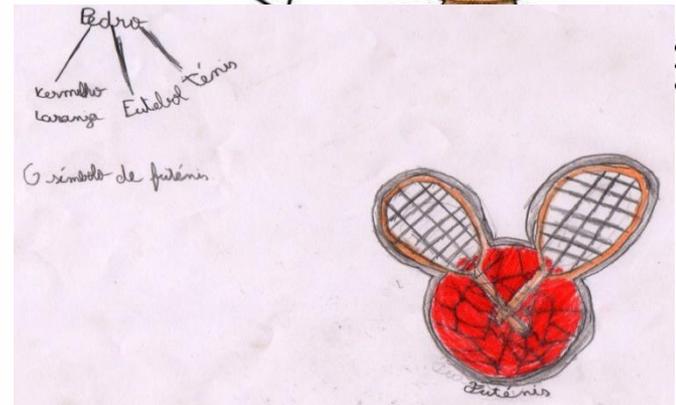
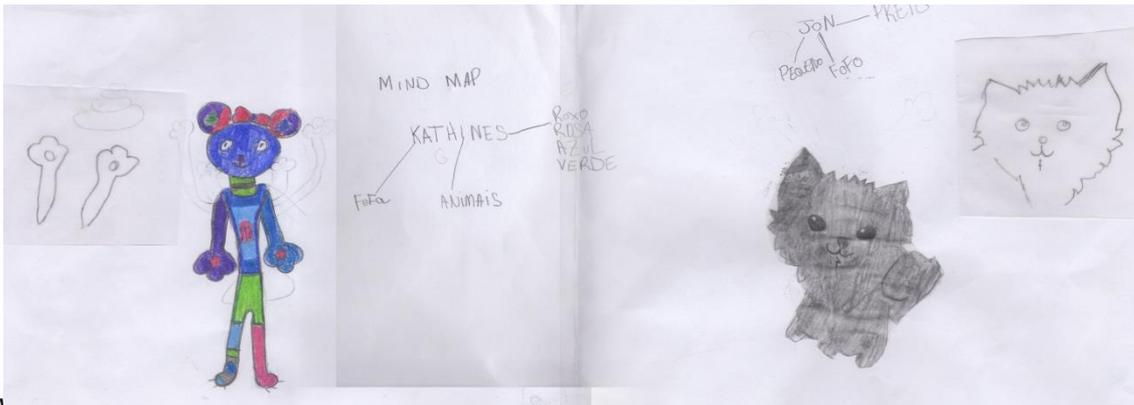
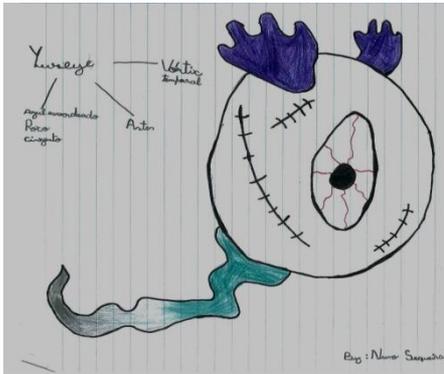
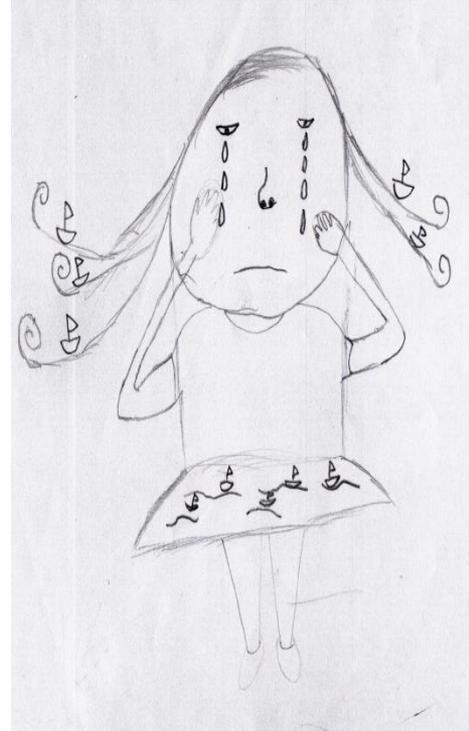
4* Turn on your robot to test your code, so you can find out if there are any bugs that you need to put straight.

Material needed per student:

- 2 sheets of paper (A4)
- pencil and eraser
- 1 sticky blank notepad



Online identity - avatars

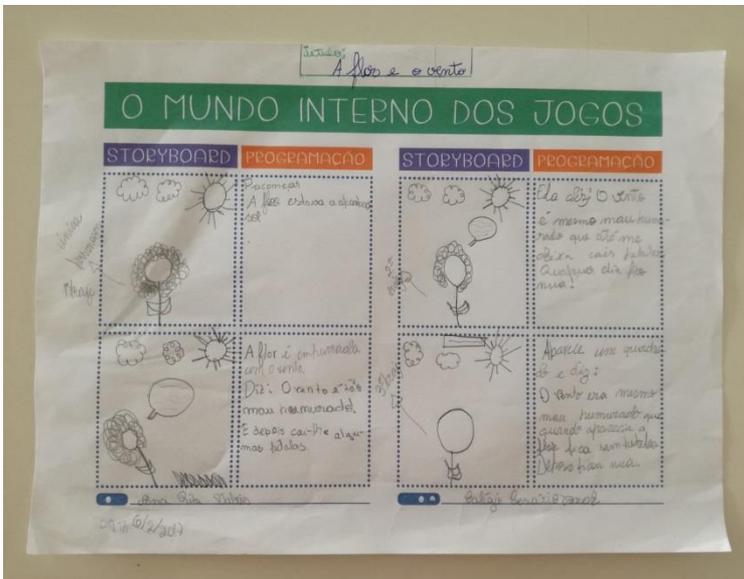
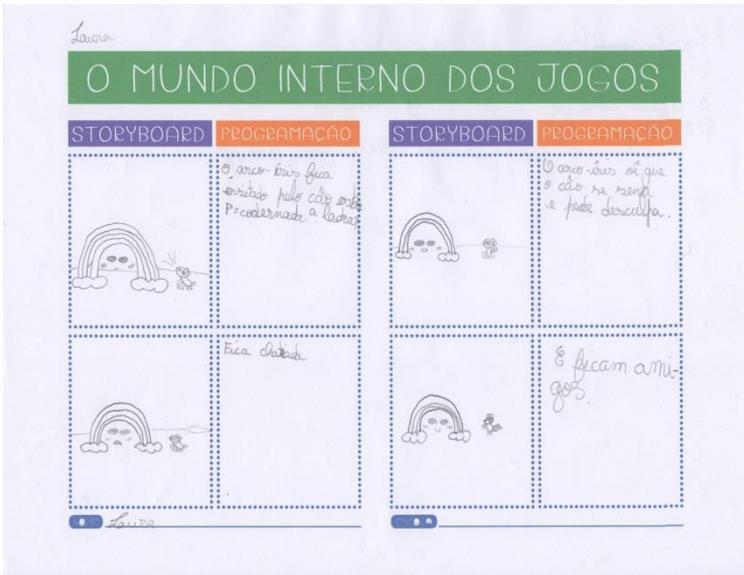


Hackers/ Crackers

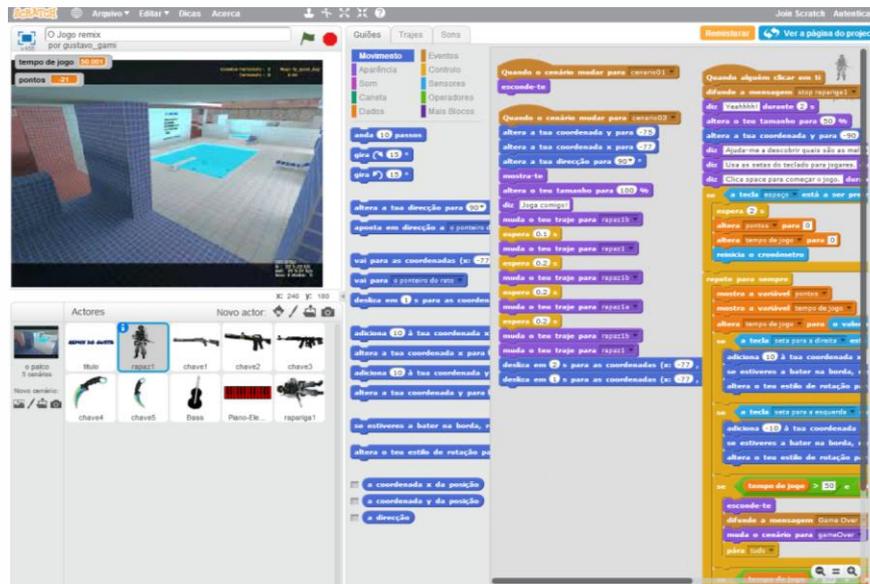
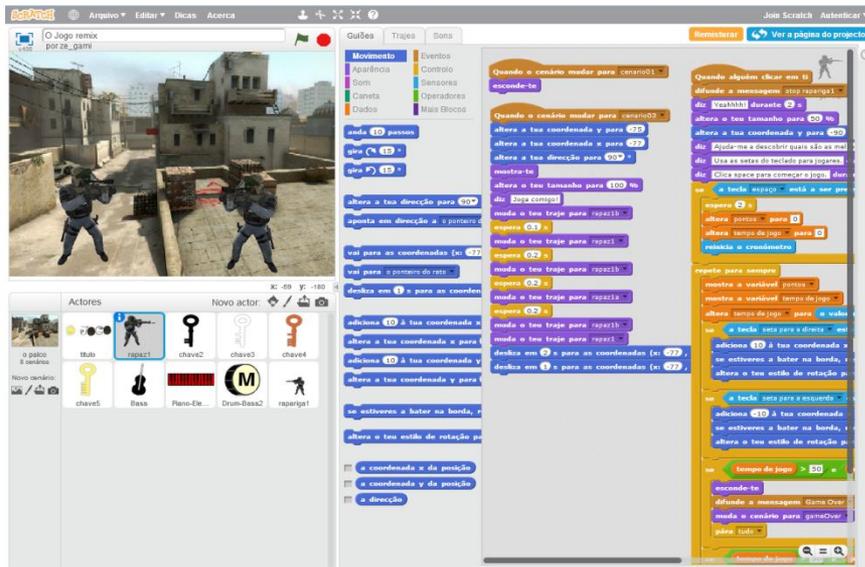


Animation – create a story and animate it

From paper to digital



Games remix



Data collection and analysis

Baseline assessment

MIL
questionnaire

School
engagement
scale

TIC

GamiLearning curriculum

Participative
Observation

Game creation

Scratch

Sapo Campus

Endline assessment

MIL
questionnaire

School
engagement
scale

Quantitative analysis

- Questionnaire
- Scale

Qualitative analysis

- Observation grids
- Games content analysis

SNA

- Sapo Campus



MIL questionnaire

Part 1 - Skills

- Operation skills
- Organisational skills
- Editorial skills
- Digital identity management skills

Part 2 – Behaviours

- Critical media literacy
- Learning
- Social interaction



Data analysis - MIL

PART I - Skills	PRE - General		POST – General	
Operational Skills	Mean	Std.Dev.	Mean	Std.Dev.
1. Create an avatar	3,89	1,323	3,49	1,337
2. Build a website	1,57	1,092	1,63	1,114
3. Create an app*	1,23*	0,598*	1,66*	1,027*
4. Use software programming tools	2,37	1,352	2,38	1,431
5. Develop levels in a videogame*	2,38*	1,415*	3,06*	1,454*
6. Create a blog	1,74	1,067	1,69	1,051
Organizational Skills	Mean	Std.Dev.	Mean	Std.Dev.
1. Use calendars and/or reminders to organize my schedule	3,40	1,288	3,43	1,596
2. Select the words and symbols that give me the best results when using a search engine	2,89	1,409	2,94	1,282
3. Select the results that are most reliable and useful to me when doing an online search	3,49	1,067	3,37	1,262
4. Use a secure process to store my passwords*	3,44*	1,541*	4,06*	1,162*
5. Bookmark and catalog websites and articles online so that I can find them later	2,51	1,337	2,51	1,442
6. Organize my work, documents, images or photos in my computer	2,89	1,430	3,14	1,517
Editorial Skills	Mean	Std.Dev.	Mean	Std.Dev.
1. Find inspiration in the work of others to do my own creative	3,54	1,039	3,46	1,172
2. Share my creative work online*	2,00*	1,328*	2,85*	1,395*
3. Use charts, graphs and pictures to explain my ideas	2,63	1,239	2,51	1,358
4. Use presentation software and digital tools to share my work	2,74	1,287	2,54	1,482
5. Use editing software to create, edit and share photos or videos	2,35	1,323	2,53	1,285
6. Use software programming language(s) to create some of my work	2,65	1,300	2,77	1,374
Digital Identity Management Skills	Mean	Std.Dev.	Mean	Std.Dev.
1. Think carefully about the way I represent myself online	3,35	1,593	3,83	1,200
2. Assume different roles when playing games online	3,62	1,371	3,69	1,207
3. Manage an online profile to share my interests, ideas, photos or videos *	2,31*	1,491*	1,60*	1,599*
4. Understand the terms and conditions for the sites that I use before I click "accept."	3,00	1,595	3,17	1,618
5. Protect my computer and mobile devices with strong and safe passwords	4,00	1,372	3,80	1,491
6. Protect my data when using public computers, logging off my accounts and not storing passwords. *	2,69*	1,676*	3,46*	1,421*

*significant difference found (95% confidence level)

Data analysis - MIL

PART II - Knowledge	PRE - General		POST – General	
Critical media literacy	Mean	Std.Dev.	Mean	Std.Dev.
1. I can identify bias in the media	3,34	1,697	3,82	1,466
2. I can recognize inaccurate or unethical information on the internet	3,17	1,361	3,35	1,323
3. Media can be used to spread false information about people, places and things	3,31	1,728	3,32	1,665
4. I can recognize spam messages and do not respond to them	3,97	1,465	4,24	0,955
Learning	Mean	Std.Dev.	Mean	Std.Dev.
1. I learn to use software by playing around and making mistakes	2,91	1,422	2,97	1,527
2. Media can help me better understand some of the topics I study in school	3,37	1,308	3,38	1,415
3. I use media to help me solve problems and make decisions*	2,41*	1,234*	3,24*	1,521*
4. I interact with other people online to learn new things*	2,17*	1,485*	2,79*	1,513*
Social interaction	Mean	Std.Dev.	Mean	Std.Dev.
1. I use digital media to stay in touch with my friends or family	3,63	1,516	3,71	1,467
2. I interact online with people with the same interests as me*	2,49*	1,560*	2,97*	1,605*
3. I share my work and ideas online	2,46	1,578	2,76	1,415
4. I play videogames that require collaboration with other players.	3,71	1,526	3,76	1,327

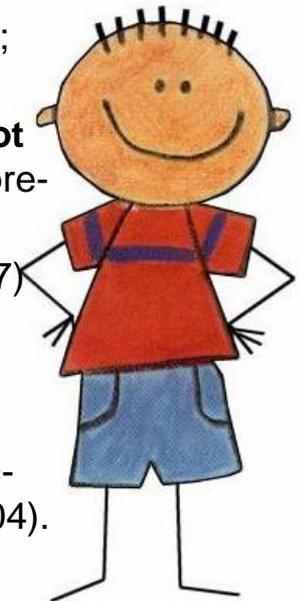
*significant difference found (95% confidence level)



Data analysis

Statistically significant differences were found in the following variables (level of confidence at 95%):

- **Develop videogames/levels in a videogame** (operational skills) ($Z=-2,186$; $p=0,014$) (mean pre-test =2,382; std=1,415 ; mean post-test = 3,057; std=1,454);
- **Create an app** (operational skills) ($Z=-2,232$; $p=0,014$) (mean pre-test =1,2286; std=0,598 ; mean post-test = 1,657; std=1.027);
- **Use a secure process to store my passwords** (organizational skills) ($Z=-2,000$; $p=0,022$) (mean pre-test =3,441; std=1,541 ; mean post-test =4,057; std=1,161);
- **Share my creative work online** (editorial skills) ($Z=-2,937$; $p=0,001$) (mean pre-test =2,000; std=1,328; mean post-test =2,849;std=1,395);
- **Manage an online profile to share my interests, ideas, photos or videos** (digital identity management skills) ($Z=-2,636$; $p=0,004$) (mean pre-test = 2,3143; std=1,491; mean post-test = 3,028; std=1,599);
- **Protect my data when using public computers, logging off my accounts and not storing passwords** (digital identity management skills) ($Z=-2,853$; $p=0,02$) (mean pre-test = 2,685; std=1,676; mean post-test =3,457; std=1,421);
- **Interact with other people online to learn new things** (learning) ($Z=-2,407$; $p=0,07$) (mean pre-test = 2,1714; std=1,485; mean post-test =2,79; std=1,513);
- **Use media to help me solve problems and make decisions** (learning) ($Z=-2,121$; $p=0,017$) (mean pre-test = 2,4118; std=1,234; mean post-test =3,242; std=1,521);
- **Interact online with people with the same interests as me** (social interaction) ($Z=-1,925$; $p=0,028$) (mean pre-test = 2,486; std=1,560; mean post-test =2,971; std=1,604).



Conclusions

- The significant differences found in the data collected before and after the project's intervention indicate higher values in the post-test, indicating an evolution from baseline to endline assessment for the MIL activities – potential impact of the project's curriculum and game creation activities to promote MIL skills;
- During 'GamiLearning' curriculum - videogames creation, programming with Scratch software, securely store their own passwords, use of strong and safe passwords, encryption and decryption processes, profile on a social network for schools and students (SAPO Campus), manage their profile, share ideas, photos, videos, interactions with other colleagues, responsible for protecting their data when using public computers and for ensuring secure login and log out practices when necessary, free to search content online to solve problems and making decisions, as well videogames for inspiration. Positive link between game creation/ learning

Limitations

- Preliminary results from MIL questionnaire need to be integrated with the analysis of the qualitative data gathered from classes' observation and content analysis of the final products created by children
- Two more schools to analyse.



GamiLearning Project

<http://gamilearning.ulusofona.pt/>

