

GAMES FOR INCLUSION AND LEARNING PROJECT ERASMUS +

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LESSONS LEARNED AND SUGGESTIONS FOR HOW TO USE GAMES IN THE CLASSROOM

Thinking of the game as a part of a bigger educational process is really in the core mind-set that this project wants to promote. Games can do many things very well, but they certainly cannot do everything at once. Especially not without solid supporting structures around them. Through the project and the case studies we built this was true. As each teacher build her or his story these processes were discussed and reflected upon and we will be referring to these and link back to them.

BASIC PRINCIPLES TO THINK ABOUT IF USING GAMES IN YOUR LESSON

An educational process can be thought as encouraging our students to **discover, research, experiment, analyse, and reflect**.

In some cases, we need to try harder to **engage** and **motivate** students. Games can help increase both and provide sustained **attention** to task.

The idea is to start mapping out the parts of the process in which a game could play an important role for a whole class or for particular learners:

A game can **introduce a concept** and help the students **discover** something interesting they want to know more about. It can be a venue for finding out more about a certain phenomenon, a principle, an event, or a person. It can be a platform for **experimentation** and interaction with something they couldn't normally interact with.

"I thought that it would be an innovative way to work on consolidating knowledge. I did not know what to expect and I wanted to experiment. I was curious about how the students would react. It turned out that the students had a good knowledge of computer technology and were able to quickly launch their imagination while learning Spanish language skills and discussing them in pairs. Positively surprised.

So we need to **select a game based on the child's needs** and in many cases the **curriculum constraints**.

Backed by research evidence, here are some lessons we drew from our project;

TIE THE GAME ACTIVITY TO THE PHYSICAL AND SOCIAL SPACE OF THE CLASSROOM

Just like you would when you read a book, watch a movie or a play, or have a field trip with your students – you always want to encourage them to discuss and deliberate on the experience and its meaning both before and afterwards.

Games are not magical environments where students learn automatically, they learn once they start to actively reflect on what they are experiencing or have experienced.

For this they need some structure, like a map or template to follow and guidance throughout.

Some will surprise you (and themselves) with how fast they move along coding and putting the elements or blocks together. They will tell you they learned things you didn't expect: **unintended learning outcomes** are some of the great benefits from using game-based learning.

Use **special interests**, to engage the pupil and increase their attention span for example in Paul's class the movie 'Edward Scissorhands', a favourite of the pupil.

SELECT A GAME

How to select a game can be tantamount to: what do the students need? How will they benefit from it?

For example, they may find words too difficult so imagery is the element to look for in the game and in this case it was Kodu instead of Scratch:

"More pupils will choose Kodu – More pupils will choose Kodu over Scratch and I feel this is because Kodu is a visual based platform that allows pupils with lower reading ages and literacy issues to easily design and create their own game. There is no complex language used and all choices are clear, bright and easy to read. I also believe that more pupils will choose Kodu as it is 3D"

The matter of "what the game needs to represent" is also very important to figure out, and comes down to teaching methods used.

The game does not necessarily have to contain all the details of the subject; for instance you could make sure that the core of the subject is introduced in other classroom activities and then use the game as an environment where students put their knowledge to the test in interesting ways.

But it can also work the other way around – the game can introduce the details of a subject and allow students to experiment and interact with it, which can be followed up with discussions and presentations in the classroom where students get a chance to reflect on what they experienced in the game or by designing it.

"Wide variety of games – Pupils will be a creating a wide variety of games and stories. Pupils will be given the option of creating their own world, characters, terrain, enemies and objects through the aid of their school project booklets".

In the UK coding is already part of the mathematics curriculum as well as ICT skills and in Sweden from Autumn 2018 programming will be incorporated into the revised curriculum, making this project a front runner in how to prepare for it.

WE ASSUME THE TEACHER IS GOING INTO GAMES WITHOUT ANY CONNECTIONS TO DEVELOPERS:

This places more responsibilities on the teacher as an educator. It requires more time playing and planning with games, trying them out and identifying their relevant parts to the subject – in a sense you need to start thinking like a developer and create a good educational tool out of a bigger and bulkier game.

If you are to lead a group that does not have pre-programming skills then you need good knowledge beforehand. Be prepared and read up on programming before you start.

Since there's a limit to how significantly you can change the game itself without its developer to help you, you will need to modify the educational processes around the game. This is a challenge of course but a good one in the sense of re-thinking what is important about learning a concept or subject but also what is the best way to introduce it since you will need to break it down in small parts.

Most games are not designed to teach a very specific thing and can have a lot of content that is superfluous to what you want to achieve in the classroom. In fact it is the opposite: you will need to find a solution that fits the learner: In case of an autistic girl, her teacher managed to create an authentic scenario of designing a game for a client which motivated her as it was a real life situation and she could relate to it.

In general, games want to entertain and engage their players for long periods of time, but as a teacher you're working with very strict time limitations and thus need to focus on the parts of a game that are relevant to your lesson plan:

Scratch has small parts that can be used as blocks and templates are used to help teachers new to it

Minecraft is also a very good example of this because it's a very big game that

many educators have put to good use by focusing on smaller segments of it. Minecraft is the type of game you can spend a lot of time in since it's very rich and varied in its content. As Tom has shown us, you can build and decorate a home, build castles, battle monsters and more.

GET TO KNOW THE TOOL : ALLOW TIME

The teacher's experience and expertise is particularly crucial.

This is where collaboration between teachers (mentoring) is needed. (See for example how Eric mentored the other 3 teachers: Eric's class, Linda's, class, Paola's class and Sara's class)

The teacher needs to understand the game in order to share and plan what students are doing within it, and be able to translate game progress to curriculum progress and learning goals.

The teacher also needs to be skilled at setting up gameplay sessions in a limited amount of preparation time.

Teachers also serve the important role of anchoring the game sessions as learning activities, so they need to know how to contextualize the game content in the subject matter being taught (or vice versa).

The process of a game being designed and then played can also be used to **evaluate student progress** through the curriculum. For example, if you notice a student has become very knowledgeable of something inside the game or is using new ways to problem solve, you need to be able to "translate" that knowledge to progress in the curriculum. By using an existing game as a sandbox to work on and 'correct' the girls were more confident in tackling their own new games but also accepted criticism more easily.

MAKE SURE TO GET TECHNICAL SUPPORT

There is no doubt you will need technicians or the ICT teacher or a colleague whose skills are sharper to help you this. Basic practical necessities like the availability of computers and tablets for preparing and conducting game sessions can be difficult to maintain, but teachers need to be able to trust that the necessary technology is reliable and available and to make checklists of equipment, licenses and software

you will need. This is where the school needs to support teachers and they need to form teams.

EMBED GAMES INTO THE CURRICULUM

Include debriefing and feedback so learners understand what happened in the game and how these events support the instructional objectives.

The best learning outcomes from using a game in the classroom occur when a three-step process is followed.

- **INTRODUCE** the **game and the learning objectives** covered in the game
- **PLAY** the game.
- **DEBRIEF** on what was learned after the game is played

This process ensures that learning occurs from playing the game.

Storytelling strategies were used which helped :

Increase in overall engagement in writing

- in time spent on task
- in the volume of work produced

Reduce the time it took to settle down to the writing task

- the support required to help children form their work

The results in terms of 'subject learning' were impressive:

Games Improved children's ability to link, chronologically, as series of events and ideas and enhanced the levels of description and atmosphere in children's writing

INSTIGATE COLLABORATION

This has been the most common strategy and it is backed by a lot of research.

Ask the children to pair up and collaboratively work on the task. Most teachers use group work to solve issues such as differentiation and mixed ability classes.

Even those who thought they preferred doing it alone and faster have gained by sharing their expertise with others as this example shows in a girls school

The teacher took the risk and was rewarded with the surprising reaction of these girls who 'would not normally admit to enjoying their work nor doing extra work at home'.

By making the game a 'cool' thing to do, she not only increased their motivation but also vocabulary. Moreover the girls became interested in each other's projects and began to collaborate.

It is a good idea to prepare a template of a game for those who are beginners or who seem not interested in continuing with the task so as to bring them to a more interesting step forward.

ALLOW FOR PERSONALISATION

Particularly for inclusion in the classroom of children with special needs and disabilities, we found the using games provides a safe environment from which to operate.

See Jon's class @ World War 2 Trenches and Eric's class.

Outcomes in Huda's Class:

● increased language
● increased self esteem
● tolerating of peers
● emerging compromise skills
● turn taking
● more positive language used in groups

A teacher was able to link up his work with other teachers and as a team they could find a common thread linking the student's learning outcomes into a **cohesive learning path personalised** and **spanning several subjects**.

Not all pupils are equally ready to accept new projects/criticism etc but most are interested in peers' work. Allow for **diversity** through making each level a separate goal so it feels **achievable**.

Evaluation skills are higher order and therefore we would expect them to be the most difficult to achieve.

GAMES MUST INCLUDE INSTRUCTIONAL SUPPORT

Such as: elaborative feedback, pedagogical agents, and multi-modal information presentation. All classes included these and teachers commented on their use.

'There is an element of competition as well as fun which enhances the experience and the more difficult skills is decomposed and demystified.'

In games without instructional support, participants will tend to learn how to play the game rather than learn domain-specific knowledge embedded in the game or indeed the processes and skills learned along the way. This takes careful planning.

(e.g. Tom's class, Linda's class. Sara's class, Paola's class).

Instructional support to help learners understand how to use the game, and its features, increases the effectiveness of the designing and gaming experience by allowing them to focus on the instructional information rather than only the requirements of the game. Ros' class and in a different way Huda's LEGO class.

ENSURE GAME OBJECTIVES ALIGN WITH CURRICULUM OBJECTIVES

Learning outcomes achieved through computer games depend largely on how we align learning (such as learning subject areas and learning purposes), learner characteristics, and game-based pedagogy with the design of a game. In other words, if the game objectives match the curriculum objectives, disconnects are avoided between the game design and curricular goals.

Equally the curriculum is continuously extended and updated to include 21st century skills and games fit right into that extension.

Story telling, for instance, is a powerful motivator and when used to design with Kodu and tell the story through PP presentation a number of these skills are involved. Of course writing skills are the most difficult to achieve without careful planning and structuring the material. Using Kodu in this visual way of producing backgrounds introduced structure and sequence which are important elements in writing. Also, by creating the game first the story and writing come as a bonus.

Storytelling using Scratch combines Swedish with art in LEXBY school:

"I thought it was a fun way to work with the picture (art) and Swedish together. I expected that it would take some time for the students to take care of it, but that they would think it was fun. I expected it to deepen their memory of their fairytales they wrote".

"In the Swedish language and literature curriculum, it says that you should work with text and picture and how they are linked together. By using Scratch for our story, we took the writing process one dimension further. Most importantly they thought it was fun."

The more closely aligned curriculum goals and game goals, the more the learning outcomes of the game will match the desired learning outcomes of the student. This is quite hard to achieve and the topic of debate in both countries

THE ROLE OF TEACHER

When attempting to incorporate games in current teaching practice, we considered the question: **what roles should teachers take on?**

We agree and found similar results with two studies carried out using the game *MinecraftEdu* in Swedish schools which showed different roles that the teachers play throughout the process of using the games in the classroom (Marklund & Taylor 2016). They found that teacher would serve as

Gaming anchor aiming to support students' digital play experiences; here *teacher-developer* 'skills may be needed.

Authority and enforcer, in charge of redirecting students who become distracted back to educational- focus play; and

Subject matter anchor, trying to maintain the established subject matter.

But the most important role is that of

Facilitator: tackling all the problems and helping students complete game playing as well as routine learning. In the process of facilitating, various techniques would be adopted by different teachers including giving examples, providing scaffolding and raising questions and for children with SEN '**prompting**' which is explained below.

SOME EXAMPLES OF STRATEGIES USED IN SEN

Specifically, for autistic children, "prompting" is widely used as a term to describe auxiliary or artificial stimuli used to increase the likelihood children will respond adequately.

Prompts or prompting procedures could be classified into different categories by different standards. According to MacDuff et al. (1993), commonly used prompts include:

- a) Verbal prompts, such as words, questions and verbal demonstrations used to help learners engage;
- b) Modeling prompts, showing an example or demonstrating the appropriate response;

c) Gesture prompts, such as pointing, nodding towards somewhere to indicate some information;

d) Manual prompts, including physical contact to direct learners to display certain behaviors.

Some other prompts like visual or photographic prompts, textual prompts are also being widely used. Prompts are often combined for best results.

What is more, in order to effectively use prompts, besides selecting appropriate prompts, it is also very important to "remove" prompts so that eventually children with difficulties could independently complete the tasks.

There are some prompt-fading strategies:

a) Increasing Assistance, or Least-to-Most Prompts

The instructor offers prompts following progressive order, i.e. starts from minimal assistance and gradually increases assistance if the prompts do not work, until learners respond correctly.

b) Decreasing Assistance, or Most-to-Least Prompts The instructor provides prompts following descending order, i.e. the learners would receive whatsoever assistance needed to complete the task at the outset, then assistance is reduced gradually as long as it could help learners finish the task, until no prompts.

c) Delayed Prompts would be provided some time later after the naturally occurring task has taken place;

d) Graduated Guidance

Manual prompts provided would be changing in intensity or location, from hand-over-hand instruction to less forceful direction.

All in all, selecting the right prompts and prompt-fading strategies would effectively lead to the learner's independent appropriate response. Even if these suggestions are created for SEN they could be used with every student.

ETHOS OF SCHOOL

One of the questions we aimed at answering during the project was :

What are the factors that underline a successful model for adopting digital games in mainstream and SEN classes?

Through our visits in both countries we concluded that the school ethos needs to be one of trust and freedom that encourages teachers to be reflective practitioners as well as researchers in their classrooms. After careful planning of the lessons and allowing for time to play they gained insights into what the children could do.

From Tom's reflective blog :

"Teamwork : I believe that our school core value will definitely shine through during this project. Pupils who are able to access the work and find it easier than others will feel good helping others, who may be struggling accessing the work."

And it did. The results in those classes were particularly significant given the level of students and their difficulties in assimilating academic work as well as simply attending to a task long enough to produce an outcome.

Stepping back and observing children play and collaborate with each other was one of the ways they achieved that. They allowed for surprises.

Through trust and freedom, and time for reflection teachers are more willing to experiment with innovative ICTs and take risks without the fear of an expected outcome from senior management teams.

The school leaders in the participating schools had achieved this through building trusting relationships among staff and between staff and leadership teams and giving them time to experiment with technology.

There was a shared vision and understanding amongst the staff and school leaders about the importance of ICT and games and how they fitted in the curriculum.

The process of experimenting over time and working with their peers led to increase in confidence amongst teachers not only in their own skills but ultimately to improve their self-belief to use games to bring about positive learning outcomes.

This mind-set amongst the teachers was what prompted them and their schools to be part of the project, to be given the chance to take risks, to learn from one another and to innovate.

CONCLUSION

This project aimed as much at using alternative and innovative methods to teach through coding digital games and playing games as part of learning, as at developing the skills of teachers in extending academic goals to understand, support and include the whole child: not only their academic subject skills but also social, emotional and behavioral skills.

Some key factors have been identified which have enabled the teachers at the schools we saw to take steps towards better embedding games into their lessons. Many of these factors have been highlighted as the factors needed to bring about teacher change.

- Senior management leaders team provided teachers with time to learn to use and play with technologies: this is helping to improve teachers' self-efficacy and confidence.
- Giving support to guide the use of technology and help build confidence.
- Giving teachers freedom and trust thus enabling teachers to take risks and experiment with ICT.
- Encouraging teachers to meet and support one another through sharing ideas and knowledge.
- Providing technical support.
- Recognizing and valuing teachers as professionals by giving more responsibility to enable CPD and career progression.
- Creating a culture of shared responsibility at all levels of the school, including the Headteacher, class teachers and support staff.
- Making funds available to purchase ICT.

- Encouraging teachers to use online spaces (Blogs, School websites) to share ideas and scale up.

The examples in our project support these important points.

SUMMARY POINTS

RISK AND SUPPORT: Games, as other ICT tools, should be used when the learning of the content is supported, when teachers feel at ease using them and are confident, ready to risk having a few 'failed' sessions till they get it right.

EMBED AND PLAN: Game choice should involve careful consideration of related theoretical context relevant to curriculum and learning outcomes. There should be clear tangible learning objectives with tasks suitable in supporting students in developing specific skills and knowledge.

NURTURE and TRUST: These innovative pedagogies should be part of the school plan for developing teachers' skills and make happier students.

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