



# LEARNING GAMES IN EDUCATION

This paper is a contribution to the Scandinavian Game Developers project.  
It consists in 3 parts:

The first part is an introduction to the field of learning games in education;

The second part is input on the learning potentials of serious games, and

The third part presents examples of learning games in Denmark after 2000.

The paper aims to be an inspiration to educations and young game designers.

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# PART 1

## Introduction to learning games in education



First comment

### THE CASE OF GAMING

The video game market of entertainment games has grown at an incredible speed throughout the last decades, now worth the double of the film industry.

From both sides of the scene, game designers and educators, the question is: should these great potentials not be exploited for learning and not only for entertainment? This is discussed all over the world now, and the discussions are closely linked to the highly needed innovation in education. Learning games might very well be a very important element in this innovation, especially when it comes about the learning of young people.

As could be expected, many educators are very skeptical towards this kind of innovation. The skepticism is very much linked to a general resistance towards technology in learning.

On the other hand, game designers praise the learning potentials of video games and gaming. Some writers even believe that social gaming can help save the world.

Be that as it may, a certain *romanticism of gaming* can be felt in these debates: video games are in themselves the didactic innovation so badly needed in education, as they are designed to take the learners through a learning process much more powerful than any classroom.

More calm writers stress that only so-called good video games possess this potential, the word "good" not referring to the content of the game, but to the game design of the game: to what extend it allows the gamer to learn and learn together.

More critical writers insist than games for learning should be designed for learning, and that we have not yet seen what that means.

Hundreds of books and websites are devoted to this debate, mostly produced in the US, as Europe is often somewhat hesitating towards such dramatic innovation.

Many of them offers great inspiration, but quite a lot of them escalates into a kind of romanticism that will not convince most educators.

There are many critical and problematic assumptions in the debate:

- › That entertainment is not learning
- › That learning is not entertaining
- › That the apparent common structure between game design and innovative learning is actually real and not just apparent
- › That new game design offer the gamer enough freedom to allow powerful learning
- › That the game world is a valid and useful simulation of reality
- › That learning games and good video games in general really train the gamer's learn to learn skills
- › That video games for learning are still motivating when the shooting stops
- › Etc., etc.

From the educators point of view there is a fundamental bias in the way these things are discussed.

The learning potential of computer gaming seems to emerge from the very existence of an ever growing video game market and not from the principle of: first design

good learning environments, then see what we can use in these learning settings, including technology and video games.

*The lack of systematic innovation in learning didactic turns education either into a conservative field of resistance or into an easy target for popular solutions to the growing disengagement among young learners.*

Neither the computer nor the mobile phone will it themselves produce any kind of learning. But, used in the proper way and interacting with strong learning settings, these technologies might indeed offer new powerful learning opportunities.

*Is this the case for video games? Are they powerful tools if integrated in the proper settings? And, what do proper settings mean?*

Second comment

## THE ENCOUNTER

The classroom and the first person shooter game; an encounter of two very different worlds!

Serious, subject-based education and killing as many bad guys as possible; it seemed from the start as video games were invented to disturb the sound learning of young people: as soon as school is over, we can start doing the real thing.

So, how all of a sudden are video games regarded powerful learning resources for "serious learning"?

The teachers have a case. The typical video games did not seem to accomplish any form of serious learning. On the contrary, more and more young people, and adults, spent more and more time playing the same silly games.

Video games were not invented to produce learning. They were, of course, invented to make money from yet another entertainment source.

The media world at large does not seem to support any kind of immersive learning, on the contrary. As we well know, commercialization of culture seems to contradict deep learning. *So why would video games be any different?*

Basically video games were seen and are still seen as an "enemy" to education, not as powerful learning potential. The first naive approaches between education and video games confirmed this: new content was inserted into primitive game structures to make learning somewhat more entertaining.

These first populist attempts to make video games useful to education were very unsuccessful and did not convince any educators.

It was attempts to insert some entertaining moments in traditional classroom teaching. And many educators still view the case of video games like that: the possibility of using computer games as a kind of variation of the normal classroom routines, especially when it is about topics "suitable for computer games", whatever that might mean. Perhaps some mathematics might work as gaming, perhaps also, to a certain extent, historic topics, using computer games like some sort of story-telling.

But, social science, drama, literature, no.

In short, the first encounter was about using games as a modern tool in traditional classroom teaching, precisely how ICT was introduced in general. Nothing useful came out of this encounter, except perhaps more skepticism on the side of the educators, like nothing has really come out of introducing ICT in the classrooms.

Furthermore, the people who designed computer games were far away from the educations and were in general not interested in learning but in designing powerful gaming. The creators of The Lion King movie were in the same way interested in producing high quality entertainment, not in learning.

This made it even more difficult to imagine a constructive meeting between these two worlds. Actually, none of the two parties were motivated to meet each other.

Then, something new happened - on both sides - making a fruitful encounter more likely and relevant.

Third comment

## BREAKING THE ICE

Education started to change: it became more and more evident that the new generations of digital young learners were not able to learn in the old classrooms. Computer games started to change: interesting examples of new kinds of games, social games, strategic games, online games, etc., demonstrated that games were much more than shooting, crashing cars and Super Mario.

The need for change in education settings and the needed re-thinking of learning on one hand, and new and very "serious" directions in computer game design on the other, opening up a wide range of new gaming competences, seems to make a constructive encounter between the game world and the world of education far more likely and sustainable.

The very idea of learning is now being discussed, and the very idea of gaming is being discussed as well. New designs are being developed on both sides, and these attempts seem to converge: many new forms of gaming fit well into new learning settings and methods.

The sharp opposition between "serious" and "entertaining" has been broken down, but at a higher level. The key word seems to be "motivation".

Game designers are more motivated to take an interest in the field of education, as the market seems to open up. Educations are more motivated to approach the game world, as more and more interesting games and types of games are developed, and as it seems obvious that gaming is a useful way to motivate the new young generations. And the young learners are motivated to learn in new learning settings, including for instance game or game-like activities.

These changes result in new forms of gaming, often developed and played out within innovative collaborations between game companies, educations and for example broadcasters.

*Why is this new wave of serious games different from the first waves of primitive edutainment?* Some of the important reasons are:

- › Many new games are inviting the gamer to be a researcher and constructor of knowledge, ideas, situations
- › The games develop in many new directions, such as scenarios, story-telling, simulations, social quests, long-term strategic challenges, collaborative missions, online live gaming, just to mention a few; thus the very idea of a computer game is changing
- › Many new games are open collaborative gaming, in which the gamer must form teams, share skills and knowledge and ideas
- › More and more serious games are linking to and including action in reality and response from reality, thus breaking the closed world of traditional gaming
- › Games are addressing all sorts of topics, such as climate, political issues, environmental issues, health issues, and even research issues (example: *Games for Health* in the US)
- › More and more serious game designs are based on the immanent plots and mysteries of the material itself: the game design is so to speak exploiting the enigmatic structures of the topic, not importing traditional game plots unmediated into different realities, such as climate or health
- › More and more game designers are also learning designers and more and more educators are studying game design at high level, which produces a strong common language and powerful common approaches to learning games
- › Gaming is in general moving away from the solipsistic setting to a social, collaborative and social setting

- › Even commercial “entertainment” games are moving away from being primitive entertainment tools towards being intelligent, challenging and interesting games

It is easy to imagine that these new directions appear most interesting to educational innovators, as both movements seem to converge into a common mission: *the design of innovative learning settings, based on very different principles than the old classroom.*

This common mission might also be named: *the quest for new powerful learning didactics.* Here we understand didactics as the principles based on which learning processes are organized.

**Fourth comment**

### THE “LEARNING PRINCIPLES” IN SERIOUS GAMES

Actually there are no “learning principles” in serious games. Serious games are based on game design, fully respecting the mantra of game play: offering the gamer an optimal game experience.

Moving into the field of serious games nevertheless tends to put a strong focus on the gamer role and how these roles are acted out during the game and in what kind of settings this should take place.

Serious games tend to make implicit learning strategies more visible.

*Seen from an educational point of view, what are the implicit learning principles in a really well-designed serious game?*

Let's mention some:

- › The gamer will learn to master in the game by playing the game: learning through participation
- › The game offers one or more missions to be completed: the game has a clear aim and the aim is relevant, obtainable and challenging
- › The gamer must construct his own way to complete the mission by making attempts, testing, combining tools and information available
- › The game might invite the gamer to co-construct or change the game by offering open resources and open spaces
- › The game takes the gamer through different levels of challenges and produces progressing competences in the gamer
- › The game offers a variety of expression forms, allowing different learners to progress differently
- › The game offers the game a sense of research, quest, exploration in a universe that appears inexhaustible to the gamer (which the game, of course, is not)
- › The game links closely to the discourse, history and factuality of the topic
- › The game play includes interaction between the game itself and the social context of the game, i.e. knowledge, experience, collaboration
- › The game might link to real time and progress over longer periods of time (i.e. events in reality triggers events in the game)
- › The game might include or require team collaboration, and might link to open social networks contributing to the game
- › The game can include final outcomes to be produced by the gamer or the gaming team
- › The game is open to mentoring and peer learning

**Fifth comment**

### THE LEARNING POTENTIAL OF SERIOUS GAMES

No doubt, really good serious games offer great learning potentials. These learning potentials are based on the following fundamentals:

- › Good serious games are based on powerful “game didactics”: powerful ways of organizing the gaming in and around a **learning context**
- › Good serious games are based on original plot and quest design derived from the topic’s own structures and mysteries: **immanent game design**, not imported from other game genres (i.e. a game about climate changes is based on the mysteries of the climate itself, not on the plot of a first person shooter)
- › Good serious games use hard fun to allow the gamer to construct relevant knowledge, to share relevant knowledge and to collaborate in teams, networks or communities by taking the gamers on exciting missions that will offer **immersive learning** experiences
- › Good serious gaming can take place in long sequences to allow gamer **reflection** and gamer dialogues, thus taking on epic or semi-epic dimensions

Serious games can be very different, from short training games to complicated long-term epic quests, from small scenarios to advanced simulation games.

The *learning potential* of a serious game is closely linked to the following parameters:

- › Time span
- › Relevance of the mission
- › Quality of the plotting
- › Quality of genuine gameplay
- › Clear progression of challenges and results
- › High convergence of gameplay and content learning
- › The ecology of hard fun
- › The learner’s sense of quest, combination and construction
- › The build-in need for and motivation to social dialogue
- › The gaming’s natural integration in learning environments

Sixth comment

## GAME DIDACTICS

This is about the different ways we can integrate serious games or learning games in learning processes, be it in formal education, non-formal education and in different types of settings.

Game didactics was, in the old days, about allowing some hours of gaming in the classroom, or breaking the rhythm of the classroom instructing. Today, game didactics has become a huge field of experiments: from games organizing entire courses of subject-learning to entire schools being designed as a game.

There will always be serious games with limited scope and limited use, both in the form of the learning of specific topics in education and in the form of training sequences in public and private organizations.

From a learning point of view this is not really interesting, as it does not challenge traditional didactics or teaching methods.

The term *game didactics*, on the other hand, signals a higher level use of serious games: the games and the gaming are incorporated in the design of the learning processes from the very beginning and play important roles in problem based learning, media based learning, laboratory learning or other forms of creative learning settings.

The game might represent a certain dimension or stage in the learning, but it might also be the backbone or reference point of the entire learning process.

Learning can integrate and interact with games, but can also be organized by games. In certain cases, the gaming will constitute the entire learning process, but in most cases the gaming will interact with other learning activities, often themselves based on extensive use of media and internet.

In this case the big challenge is to design an open but structured learning space, in which the gaming is integrated, but also interacts with a variety of other learning activities.

This brings us to a more and more important discussion: to what extent should the game or the game world itself allow productive activities, and to what extent can serious gaming interact with productive activities.

*Do you need to produce a quality video to be able to progress in the game? Or a creative sound sequence?*

It seems like game didactics - the way the gaming is interacting with the learning process - is going to be a huge innovation field in the future: gaming as cornerstone, organizer and platform of the entire learning process.

Of course, then, the very meaning of "gaming" will change...

Seventh comment

## THE INNOVATION OF EDUCATION

During the last decade it has become more and more clear that the European classroom is outdated - whether or not ICT has been added to the classroom.

What is really outdated is traditional didactics, the way learning is staged and organized.

We have known that for a very long time, since the end of the industrial era, in fact, but recently it has been made extremely visible - by the new digital generations.

The classroom has always been problematic for disadvantaged youth, as the classroom is based on academic virtues. But today more and more young people are disengaged in the old classrooms. The digital generations' life styles and learning styles expose the degree of outdatedness in the educational systems.

This makes the odds for non-academic youth even worse: now they will face a double exclusion, being both non-academic and digital, whereas some of the more academic young learners are still able to mobilize some kind of discipline and interest.

Everybody agrees to this diagnosis. Some react in a reactionary way: more discipline. Of course, this strategy does not work well with modern youth.

Others are aware what must happen: the classrooms and everything they stand for must be replaced by open learning laboratories, in which learning is based on projects, self-direction and active production of knowledge.

As such learning labs will fluently be using all sorts of media, we sometimes call these settings *media based learning*. In fact, the settings are not at all based on media, but on a set of innovative and constructionist learning principles.

Hence, we hear expressions like media based learning, problem based learning, constructivist or constructionist learning, collaborative learning, team based learning, laboratory learning, game based learning, social network learning, etc.

Most of the basic principles in these approaches are quite similar, especially from a pragmatic point of view.

Let us briefly summarize the most significant lab learning principles:

- › The learners are engaged in all stages of the learning process, from mission definition to production of the final results
- › The learners work in teams and are mentored by the former teachers, and often by other professionals, now appearing in the learning settings
- › Knowledge is not delivered, to be remembered, but is actively produced by the learning teams, often by including learning resources from the community or through online collaboration
- › The learning process is cross-subject organized, similar to the real world; different aspects might be in focus at different stages

- › Specific and focused learning sequences are inserted when needed to allow the projects to progress
- › The learners use all sorts of state of the art media and social communication; the media use is open-ended: learners can learn to use professional tools if they so wish
- › As much as possible the projects are interacting with the physical or virtual community; the projects should be based on real community needs and the outcomes should be useful to groups of citizens or institutions
- › Appropriate assessment methods should be in place and applied

Please refer to the paper *Media Based Learning - The Framework*  
[www.sosuaarhus-international.com/LABlearning.htm](http://www.sosuaarhus-international.com/LABlearning.htm)

As can easily be seen, we use some of the same words to describe good serious games. This is not a coincidence: innovation in education and serious games didactics are converging towards the same basic learning principles.

Such learning principles will highly benefit at risk youth, but will basically benefit any learning group, as the learner will be able to unfold his talents in such settings to a much higher degree than in the classrooms and in the auditoriums, or alone in their Raskolnikov study rooms.

Serious games will in time change laboratory learning, and laboratory learning will change serious games. It can be expected that this common ground will integrate different realities, different communication forms and different social interactions in future game-like learning scenarios.

Eight comment

## PRODUCER OR CONSUMER

One of the great concerns of constructionist learning, which to us represents the most developed learning settings, is closely linked to the evaluation of game potentials in education. Traditional computer games, including serious games, do not allow the learner to produce knowledge, products or services in the real world and to real people.

If at all, such games allow the gamer to construct solutions and to some degree knowledge within the closed virtual world of the computer game.

This is not satisfactory to a genuine lab learning process. In lab learning the learners and teams of learners should be engaged in a mission linked to real life, and the process should result in useful (media) products to be used by people or institutions in the community.

This is not possible in traditional serious games. They do not link in this way to reality.

In fact, most use of computer games is still based on consumption: you buy a game, plug in and play. You might learn much from this game, depending on the game of course. But a good constructionist approach would say: you cannot play computer games here, but you are most welcome to develop your own game.

Consumption, and the object-positions it commands, is a basic problem to all forms of traditional education: you consume theories, knowledge and experience created by other people, including your teacher.

You might be asked to write an essay on other people's work, or on a series of paintings, but you are not going to paint yourself. You are a second hand worker.

The vision of the new lab learning didactics is to allow the learners to be creative and productive themselves and to dedicate themselves to production processes delivering useful material or services to your physical or virtual community.

The constructionist approach is not merely referring to mental constructions, but to the construction of products, knowledge and services in reality. Doing mental

constructions, you need only link to simulations and to yourself, doing real constructions you need to link to the reality and to the community.

Throughout the last decade many examples of new generations of serious games have emerged; games that run through considerable time periods, include real or virtual communities and link to real social problems.

Some of these games might not be defined as games in the traditional sense. They are often more like scenarios, game-like quests or social explorations.

The good ones, though, maintain a strong element of game play: you are on a mission, you have enemies and you can win or lose.

This means that good serious games are more and more interacting with the social contexts, with the educational environments and other environments, and are becoming more and more open to input and co-production, even co-design of the games. This also means that these games become more and more valuable to lab learning and media based learning didactics.

This leads to the next comment.

Ninth comment

## GAMING VISIONS

We are quite convinced that the world of serious games and the world of innovative education share important visions - visions about what games could be, and visions about what learning could be.

Let us briefly mention some very interesting visions for serious games and learning that we hope to be able to experiment with in the next decade:

- › Serious games are linked to real life actions
- › Serious games call for productive input from the gamers, such as ideas, videos, sounds, animations, mental constructions, etc.
- › Serious games invite the gamer to co-design the open-ended game
- › Serious games require game design input from the gamer to allow progression in the game
- › Serious games allow learners to construct new game sequences, based on the available elements and rules, but also experimenting with these rules
- › Serious games are taken to a level that allow serious social and psychological gaming
- › Serious games are giving quality feedback to the gamer, especially in the field of action patterns and behavior in social and professional contexts

Tenth comment

## HARD FUN

Most educators confuse gaming with cheap entertainment and easy results. In good serious games, as well as in good video games in general, this is not true.

The best video games are extremely demanding, and only hours, days and weeks of hard work will allow the gamer to prevail and be successful.

The same is true for games in education. Games in education do not represent an easier way to learning than classrooms, books and internet information.

On the contrary, good serious games are quite demanding and often require much team work and the investment of many skills and competences.

If you work with serious games of high quality, and do it within a creative learning environment, you will be challenged with all sorts of problems that you never even came near in the classroom. You have to be persistent, dedicated and work hard. The same is true in media based learning. Creating with professional software, designing and carrying out projects, managing complicated missions - all this was never needed in the classroom.

But it is true: this way of learning is more fun; but only if you work hard. It is not fun to have professional graphic tools at your disposal, if you cannot use them. It is no fun to have a professional video camera, if you cannot use it. It is no fun to produce a video film if nobody likes it.

So, fun it is, or it can be, depending on your dedication.

*Hard fun, though, not fun fun.*

Eleventh comment

## GAMING AND LEARNING LABS

Including good serious games in traditional education might be of value, but good serious games should be integrated in innovative, open and laboratory-like settings, bringing out the full potential of the games.

Attempts to "modernize" outdated teaching with the occasional use of video games have limited impact on the learning of the gamers, including the learning from the game itself.

This also means that serious games, learning games or games for education should be designed by joint teams of game designers and educators. The joint teams should be based on a common language, on common visions and on common understandings of active, creative and productive learning processes.

Serious games in creative learning settings should never be solipsistic games, but social games - linking constantly to the physical and virtual communities. The more the serious games link to the social context of the learning setting and its community, the stronger the long-term impact of the games.

This is why serious games for education cannot be produced for the market. Such games must be developed on location, so to speak, in close connection to the learning environments in which it will be put to work.

Strong learning laboratories should allow an interesting balance between *using* serious games and *designing* serious games.

This means that serious games can play many different roles in a creative learning process:

- › The learners can use a game as one tool among others
- › The gaming is used as organizer of the learning process
- › The learners and mentors can engage in designing games in collaboration with game designers of serious games
- › The learners can design their own games, in the team or through virtual communities
- › The learners can further develop professionally produced games
- › The learners and mentors can be engaged in developing serious games for people or institutions linked to the specific field of education
- › The institution can decide to offer one or more game designers part time or full time employment and use them as mentors in the learning labs

These activities look quite different from what most educators (and game designers!) imagine when discussing computer games.

No doubt, future serious games for education will be developed along these lines. Whether or not they are successful very much depends on three things: active participation from educations, new orientations among young and experienced game designers, and the development of new "business models".

Twelfth comment

## NEW BUSINESS MODELS

Let us briefly examine these three conditions for successful serious games in education.

Very few people in the education sector have paid attention to video games in education. They are aware of the fact that millions of people devote quite a lot of their free time to playing video games, but to educators this is not learning. They are not really aware of the potentials of serious games for learning.

Today, some educators start to take a serious interest in all this. Their problem is how to collaborate with game designers, and how to finance such activities.

It is well-known that designing and producing a high quality serious game on market terms would cost at least 1 million euro.

Few educations can effort that, few managers would take such risks.

Only very large and strong higher education institutions might go along with this. Once or twice. Then what?

Interested educators then try to rise national or European funding, private or public. Sometimes they succeed, but next time?

This means that not only the educations should change their attitude towards serious games, and computer gaming in general, also the game designers, especially the new generations of young game designers, should develop new interests, new visions and new business models in support of their own career.

In fact visionary educations and game designers have a common interest: the expansion of the serious games market and the development of new ways of working together.

As long as serious games are produced on market terms, or market-like terms, very little will happen. A few flagship productions and that's it.

Educations, public institutions and corporate training centers should join forces with young game developers and develop good examples of serious games.

The basic lessons learned are: you can produce commercial games on market terms, but you cannot produce serious games this way.

There are several reasons:

- › Educations cannot finance the costs
- › Traditional publishers are not able or willing to do it, especially not within a limited language market or education sector
- › Young game designers cannot produce serious games for the market, as they cannot finance them and do not have the competences to design such games
- › As clearly stated above, serious games - and learning games in particular - must be designed very closely to the end users, and the end users should in fact participate in the development of the games

This is a challenge not only to the educations, but also to the young game designers! Most of them are not ready to establish such new "business models". Most of them dream about producing competitive commercial games, although very few will be able to do so.

The training institutions as well as the game communities should seriously encourage the young game designers to direct their interest towards such new "business models", and train their competences to engage in long-term collaboration with educations, public institutions and corporate training units. The young game developers must learn to create new needs in these sectors and to approach them with ideas about how serious games can make a difference to the institutions and to their learners.

The game design training institutions at all levels should furthermore establish traineeships in educations, public institutions, etc. to allow the young designers to practice such collaboration as early as possible.

There are several ways of imagining such new business models. Actually they are not "business models" in the classical sense of this term, but more like "collaboration models", or "serious games development models".

- › Young game designers can, while in training, establish traineeships in educations, public institutions or corporate training units (EPC), individually or in teams
- › Young game designers can collaborate with EPC while working in game incubators, individually or in teams
- › Individual game designers or new game companies can establish a collaboration on developing serious games to the organization, funded by the organization
- › Individual game designers or new game companies can establish a collaboration on developing serious games to the organization, funded by the external resources
- › An EPC institution can offer to employ or contract a game designer part or full time aiming to establish a long-term collaboration resulting in one or more serious games
- › An EPC institution can offer to employ a game designer part or full time aiming to participate as a mentor in the institution's laboratory or media based learning settings, also aiming to include game development in the learning processes
- › An EPC institution, or a group of institutions, offer a game designer permanent employment to take game development and media based learning to a higher level

The employment or contracting of young game designers might include participation in for instance nationally funded game projects or European projects funded by the EU Commission.

Of course, some of these solutions can be combined, and new ones invented, but the key point is that *these models are very different from the business models of the open game markets*. The young game designers as well as the EPC institutions need to develop competences to develop and manage such models.

*It is very important now and in the future to demonstrate good practices based on and demonstrating the benefits of such models.*

The game designers cannot be expected to rise funding to finance such serious games initiatives, but they can be expected to promote the further exploitation of serious games projects - both nationally (in the education sector, for example) or at European level, which includes language considerations from the very start of the development process, as they have a strong interest in expanding the serious games markets and marketing their own achievements. The EPC institutions should actively support such exploitation initiatives.

## PART 2

### Input to learning games in education



### What video games have to teach us about learning and literacy?

From James Paul Gee's book

*What video games have to teach us about learning and literacy?*

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#### ACTIVE, CRITICAL LEARNING PRINCIPLE

All aspects of the learning environment (including the ways in which the semiotic domain is designed and presented) are set up to encourage active and critical, not passive, learning.

#### DESIGN PRINCIPLE

Learning about and coming to appreciate design and design principles is core to the learning experience.

#### SEMIOTIC PRINCIPLE

Learning about and coming to appreciate interrelations within and across multiple sign systems (images, words, actions, symbols, artifacts, etc.) as a complex system is core to the learning experience.

#### SEMIOTIC DOMAIN PRINCIPLES

Learning involves mastering, at some level, semiotic domains, and being able to participate, at some level, in the affinity group or groups connected to them.

#### METALEVEL THINKING ABOUT SEMIOTIC DOMAINS PRINCIPLE

Learning involves active and critical thinking about the relationships of the semiotic domain being learned to other semiotic domains

#### "PSYCHOSOCIAL Moratorium" principle

Learners can take risks in a space where the real-world consequences are lowered.

#### COMMITTED LEARNING PRINCIPLE

Learners participate in an extended engagement (lots of effort and practice) as an extension of their real-world identities in relation to a virtual identity to which they feel some commitment and a virtual world that they find compelling.

#### IDENTITY PRINCIPLE

Learning involves taking on and playing with identities in such a way that the learner has real choices (in developing the virtual identity) and ample opportunity to mediate on the relationship between new identities and old ones. There is a tripartite play of identities as learners relate, and reflect on, their multiple real-world identities, a virtual identity and a projective identity.

#### SELF-KNOWLEDGE PRINCIPLE

The virtual world is constructed in such a way that learners learn not only about the domain but about themselves and their current and potential capacities.

#### AMPLIFICATION OF INPUT PRINCIPLE

For a little input, learners get a lot of output.

#### ACHIEVEMENT PRINCIPLE

For learners of all levels of skill there are intrinsic rewards from the beginning, customized to each learner's level, effort and growing mastery and signaling the learner's ongoing achievements.

#### PRACTICE PRINCIPLE

Learners get lots and lots of practice in a context where practice is not boring (i.e., in a virtual world that is compelling to learners on their own terms and where the learners experience ongoing success). They spend lots of time on task.

#### ONGOING LEARNING PRINCIPLE

The distinction between learner and master is vague, since learners, thanks to the operation of the "regime of competence" principle listed next, must, at higher and higher levels, undo their routinized mastery to adapt to new or changed conditions. There are cycles of new learning, automatization, undoing automatization, and new reorganized automatization.

#### "REGIME OF COMPETENCE" PRINCIPLE

The learner gets ample opportunity to operate within, but at the outer edge of, his or her resources, so that at those points things are felt as challenging but not "undoable".

#### PROBING PRINCIPLE

Learning is a cycle of probing the world (doing something); reflecting in and on this action and, on this basis, forming a hypothesis; reprobing the world to test this hypothesis; and then accepting or rethinking the hypothesis.

#### MULTIPLE ROUTES PRINCIPLE

There are multiple ways to make progress or move ahead. This allows learners to make choices, rely on their own strengths and styles of learning and problem solving, while also exploring alternative styles.

#### SITUATED MEANING PRINCIPLE

The meanings of signs (words, actions, objects, artifacts, symbols, texts, etc.) are situated in embodied experience. Meanings are not general or decontextualized. Whatever generality meanings come to have is discovered bottom up via embodied experience.

#### TEXT PRINCIPLE

Texts are not understood purely verbally (i.e., only in terms of the definition of the words in the text and their text-internal relationships to each other) but are understood in terms of embodied experience. Learners move back and forth between texts and embodied experience. More purely verbal understanding (reading texts apart from embodied action) comes only when learners have had enough embodied experience in the domain and ample experiences with similar texts.

#### INTERTEXTUAL PRINCIPLE

The learner understands texts as a family ("genre") of related texts and understands any one such text in relation to others in the family, but only after having achieved embodied understandings of some texts. Understanding a group of texts as a family (genre) of texts is a large part of what helps the learner make sense of such texts.

#### MULTIMODAL PRINCIPLE

Meaning and knowledge are built up through various modalities (images, texts, symbols, interactions, abstract design, sound, etc.), not just words.

#### "MATERIAL INTELLIGENCE" PRINCIPLE

Thinking, problem solving, and knowledge are "stored" in tools, technologies, material objects, and the environment. This frees learners to engage their minds with other things while combining the results of their own thinking with the knowledge stored in these tools, technologies, material objects, and the environment to achieve yet more powerful effects.

#### INTUITIVE KNOWLEDGE PRINCIPLE

Intuitive or tacit knowledge built up in repeated practice and experience, often in association with an affinity group, counts a great deal and is honored. Not just verbal and conscious knowledge is rewarded.

#### SUBSET PRINCIPLE

Learning even at its start takes place in a (simplified) subset of the real domain.

#### INCREMENTAL PRINCIPLE

Learning situations are ordered in the early stages so that earlier cases lead to generalizations that are fruitful for later cases. When learners face more complex cases later, the hypothesis space (the number and type of guesses the learner can make) is constrained (guided) by the sorts of fruitful patterns or generalizations the learner has found earlier.

#### CONCENTRATED SAMPLE PRINCIPLE

The learner sees, especially early on, many more instances of fundamental signs and actions than would be the case in a less controlled sample. Fundamental signs and actions are concentrated in the early stages so that learners get to practice them often and learn them well.

#### BOTTOM-UP BASIC SKILLS PRINCIPLE

Basic skills are not learned in isolation or out of context; rather, what counts as a basic skill is discovered bottom up by engaging in more and more of the game/domain or game/domains like it. Basic skills are genre elements of a given type of game/domain.

#### EXPLICIT INFORMATION ON-DEMAND AND JUST-IN-TIME PRINCIPLE

The learner is given explicit information both on demand and just in time, when the learner needs it or just at the point where the information can best be understood and used in practice.

#### DISCOVERY PRINCIPLE

Overt telling is kept to a well-thought-out minimum, allowing ample opportunity for the learner to experiment and make discoveries.

#### TRANSFER PRINCIPLE

Learners are given ample opportunity to practice, and support for, transferring what they have learned earlier to later problems, including problems that require adapting and transforming that earlier learning.

#### CULTURAL MODELS ABOUT THE WORLD PRINCIPLE

Learning is set up in such a way that learners come to think consciously and reflectively about some of their cultural models regarding the world, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models that may conflict with or otherwise relate to them in various ways.

#### CULTURAL MODELS ABOUT LEARNING PRINCIPLE

Learning is set up in such a way that learners come to think consciously and reflectively about their cultural models of learning and themselves as learners, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models of learning and themselves as learners.

#### CULTURAL MODELS ABOUT SEMIOTIC DOMAINS PRINCIPLE

Learning is set up in such a way that learners come to think consciously and reflectively about their cultural models of about a particular semiotic domain they are learning, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models about this domain.

#### DISTRIBUTED PRINCIPLE

Meaning/knowledge is distributed across the learner, objects, tools, symbols, technologies, and the environment.

#### DISPERSED PRINCIPLE

Meaning/knowledge is dispersed in the sense that the learner shares it with others outside the domain/game, some of whom the learner may rarely or never see face to face.

#### AFFINITY GROUP PRINCIPLE

Learners constitute an "affinity group", that is, a group that is bonded primarily through shared endeavors, goals, and practices and not shared race, gender, nation, ethnicity, or culture.

#### INSIDER PRINCIPLE

The learner is an "insider", "teacher", and "producer" (not just a "consumer") able to customize the learning experience and domain/game from the beginning and throughout the experience.

### John Paul Gee on the learning potential of serious games

From James Paul Gee's book

*What video games have to teach us about learning and literacy?*

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#### PLAYING WITH IDENTITIES, PERSPECTIVES

Serious computer games offer the player strong identities. When we learn about a new subject, such as physics or cabinet making, we are required to begin to appreciate work and the world in a new way, namely the way a physicist or a cabinetmaker does. In a computer game, the player is taught to see the virtual world through the physicist's or carpenter's eyes, which means that the player assumes new identities - either through the identities given in the game or through identities that the player has created him- or herself.

#### EXPLORATION

Serious computer games make the player think like a scientist. The game is styled after a cycle of "hypothesis - testing - reaction - reflection - try again for a better result," a cycle that is typical of experimental science.

#### PRODUCE DON'T CONSUME

Serious computer games allow the player to be a producer rather than a consumer. Open games vary for each player. The player co-designs the game through his or her actions and decisions. Furthermore, several games contain software that allows the

player access to modify the game, design new scenarios - or even design a completely new game.

#### TRY IT OUT, DARE TO FAIL

Serious computer games minimize the consequences of errors. When the player fails, the player can try again from the place where he/she failed. This way the player is encouraged to take risks, explore and try new ways.

#### FLEXIBLE WAYS

Serious computer games may allow the player access to customize the game to match the player's learning or playing style. Most serious games can be played at different levels and allow different ways of solving problems.

#### PROBLEM SOLVING

Serious computer games allow the player to feel real ownership, empowerment and control. The player feels that it is *his or her* game.

But the learning can go even deeper in serious games.

Research has shown that if the learner - in traditional learning environments - is left to solve a problem on his or her own, the learner will often come up with creative solutions to complex problems, these being solutions that may not help to solve subsequent problems.

In serious games, problems are structured in a way that allows the solutions to simpler problems to serve as hypotheses for subsequent and more complex problems.

#### MASTERY STEP BY STEP

Serious computer games let the player face challenges that the player is allowed to attack until the player masters the challenges. Then the game will throw a new type of challenge at the player, forcing him/her to reflect upon and analyze the achieved mastery. Once more mastery is achieved, but only to be challenged again ... This interaction between challenge and mastery is the model for the development of expertise in any new field of knowledge or action.

#### PLEASURE-FILLED FRUSTRATIONS

Serious computer games remain inside, but on the outer edge of, the player's current competences. Therefore the problems seem manageable even if challenging. This way the problems are made frustrating in a pleasurable way.

#### CONSEQUENCES OF ACTION

Serious computer games invite the player to think in terms of relationships instead of isolated events, facts or skills. In serious games, the player is forced to consider the consequences of current actions and choices in relation to later challenges.

Moreover, the player is made to consider how his or her actions affect other players and their choices and actions.

#### NONLINEAR INTELLIGENCE

Serious games operate with a set perception of intelligence. Many people believe that it is about approaching the goal as quickly and efficiently as possible. However, serious games invite you to consider actions carefully before they are implemented, to think laterally and not only linearly, and to apply this interdisciplinary and exploratory way of thinking to reassess your goals and mission from time to time. These are valuable skills in a world full of risky and complex systems.

#### TEAM LEARNING

Serious computer games put together smart tools, knowledge and interdisciplinary teams in the same way modern knowledge workplaces do. The virtual figures that are handled in computer games are such smart tools. They contain skills and knowledge that they offer the player. In multiplayer games, the game is played in teams in which each team member has specific skills. Each player masters a certain

kind of skill, but he/she has enough knowledge about the other players' skills to coordinate actions with them.

In such situations, the players' relationship is motivated by the game's mission, not by ethnicity, class or gender.

In these types of games, the essential core knowledge is shared among many players and their "smart tools" in the same way as in modern laboratories or at modern workplaces.

#### NOT KNOWLEDGE BEFORE ACTION BUT KNOWLEDGE THROUGH ACTION

Serious computer games are based on the principle of presentation before competences. The player is able to act and perform before he or she is competent. This is made possible due to the way the game is designed and because of the "smart tools" in the game. Moreover, it is made possible through dialogues with more experienced players in social networks.

#### MEANINGFUL LANGUAGE

Serious computer games use language in a specific way. Many people find it difficult to handle a lot of words without context - i.e. abstract language. Games often use language "at the right time and place", i.e. when the player needs it and is able to understand it, and "on demand" when the player him- or herself asks for it.

Research shows that people often only know the meaning of a word when they can relate it to the various types of experiences that the word is linked to such as actions, pictures, dialogues.

It gives the word a situational meaning and not a merely verbal one. Games always give words situational meaning and show how they change through actions, images and dialogues. Games do not only provide definitions - one word for another.

## Why is virtual gaming producing extreme learning skills in young people?

Jan Gejel, 2011

### WHY ARE VIRTUAL GAMES SO ATTRACTIVE TO YOUNG PEOPLE?

Examples:

- › They send the gamer on a clear mission, often an important mission
- › The gamer must use all her skills and talents to work through the game world
- › The challenges cannot be foreseen, not be predicted
- › The gamer can work together with lots of other young people online
- › The gamer can take pride in her accomplishments and share the pride with other young people
- › The gamer is not dependent on external rewards, but on internal satisfaction
- › The gamer feels part of a story, of a narrative, and as its driver
- › The game allows the gamer to explore complex systems freely and voluntarily
- › The game offers meaningfulness to the gamer
- › The gaming is independent of all kinds of formal settings, educational rules and regulations

### WHAT KINDS OF LEARNING SKILLS ARE PRODUCED THROUGH ADVANCED GAMING?

Examples:

- › Generic and transversal learning skills that can be linked to all kinds of topics
- › Methodological skills, independent of the content of the play or the theme
- › The ability to be deeply focused for a long time, sometimes for weeks and months
- › The ability to link concrete problem solving to strategic planning

- › Extremely strong explorative skills, trial and error, testing and piloting
- › Intense collaboration with hundreds or even thousands of young people from all over the world, regardless of status or social background
- › Extremely strong team work skills, as these are needed in many social and community game worlds
- › The ability to find and put into play clusters of knowledge, when this knowledge is needed to solve the problems and progress in the game
- › The ability to face, explore and conquer new fields and new topics
- › An extreme capacity to combine all sorts of information and useful elements from a diversity of sources, and an extreme capacity to navigate in these structures
- › Participation, initiative and taking action skills

#### HOW CAN THE WORLD OF EDUCATION BENEFIT FROM THE WORLD OF GAMING?

Examples:

- › Advanced and systematic virtual gaming includes all the key methodological skills for creative learning. It does not matter in what content context these skills are produced: war games, social games, strategic games...
- › Virtual gaming is not depending on formal academic skills
- › Virtual gaming can be used in all kinds of educations, as the learning potential of gaming is not linked to content but to learning methodologies
- › The learning gaming must be interacting with the real world to be efficient
- › It is possible in all educations to define clear missions, clear goals, clear rules, and to rethink the topic to study in epic forms, as a part of a narrative; the specific epics must be extracted from each individual topic or field
- › The learning gaming will benefit heavily from the extremely strong collaborative structures in virtual gaming
- › The good game allows the gamer or the learner to produce solutions, not reproduce solutions, and must be open ended to function in long-term learning communities
- › All the genuine and basic features in virtual gaming must be intact in learning gaming; the game elements should be reinforced and taken further, not reduced
- › The educational settings must be able to offer free space for such exploring gaming activities in the curricula

## Some principles for laboratory media based learning

Jan Gejel, 2011

### SET-UP

LABlearning is not about classrooms and teaching. LABlearning is about establishing a laboratory of learning in which the learners take part in all processes, including defining the learning missions. The laboratory metaphor signals experimentation and exploration and trying out different pathways.

### PROBLEM BASED

LABlearning includes learners' participation in defining and understanding the learning missions, as well as participation in the organisation of the learning activities. LABlearning sets out from a problem or a group of problems, from which the mission can be defined.

Learning based on problems and challenges, and not on the consumption of ready-made knowledge, aims to increase the *learning to learn* capacity and motivation of the learners.

#### LEARNING AS PRODUCTION

LABlearning is about a laboratory in which knowledge and competences can be produced, instead of being reproduced. The production of knowledge and competences encompasses both the mental and collaborative construction of knowledge from a variety of sources, as well as the production of digital and physical products.

#### PRODUCING FOR OTHERS

As far as possible, the learning productions should be made useful to other learners, or other people in the community.

The *producing for others* should not be reduced to simulations, but should as far as possible aim to circulate real and useful knowledge and competences in the community.

#### OWN TALENTS AND ASPIRATIONS

No matter the topics and contents of the learning, the learning should link to the learner's own talents and aspirations: to what the learner is good at, and to what the learner would like to be good at.

This includes technological talents, artistic talents or different forms of technical skills.

#### COMMUNITY APPROACH

LABlearning should open the doors to relevant resources in the community that might be included in the learning mission, or might benefit from the produced knowledge and competences.

#### MEDIA AND TECHNOLOGY

LABlearning should include all sorts of state of the art technologies to allow the learners to be creative and express themselves to the max, collaborate in virtual environments, to enhance the learner's mastery of media technologies, and to exploit the great learning potentials of interactive technologies, including media production and gaming.

#### ATMOSPHERE

LABlearning should not smell like "school", but should offer an open environment, based on mutual interests, trust and respect, in which the different players collaboratively pursue their learning goals and help others reach theirs.

The supportive LABlearning environment should be accompanied by clear and strong challenges, demonstrating that learners and learning missions are taken very seriously.

## Pathways for laboratory media based learning

Jan Gejel, 2011

*Media based learning* and *LABlearning* are our pragmatic names for learning processes using media work as a motivator, driver and organizer of learning outside the traditional classroom.

Our young and adult "digital natives" are experts in social media and media entertainment, but certainly not in *learning with media*. Neither are our teachers; nor are we.

*Media based learning* and *LABlearning* aim to motivate, engage and activate young and adult learners at risk of drop-out or with poor education experience, but can enrich any learning process.

*Media based learning* and *LABlearning* are also very powerful activities in lifelong learning centers and community centers fostering lifelong learning and inclusion through learning.

[The practical examples are linked to the health care and social care sector]

## MEDIA SUPPORTED LEARNING

### *Description*

In different kinds of settings the learners will use digital media on every occasion possible - to search knowledge, to organize knowledge, to discuss knowledge and to present knowledge. Media elements such as internet, social media, Word, Power Point, video tools, etc., can be used by the learners to produce knowledge.

### *Use of digital media*

The learners use all kinds of available media tools at different levels, depending on their media skills and interests, and on what tools are available.

It is important that the use of media includes being creative with media and the use of a variety of expression forms.

### *Didactic capacity*

Media supported learning does not offer a didactic framework for learning, but it can support and make more interesting different learning approaches, such as problem based learning.

### *Example*

Based on the challenges *Why do some young people suffer from lifestyle diseases*, the teams of learners search basic knowledge on the internet, organize the knowledge in Word or Power Point, discuss the problems in social platforms, produce a few videos with young people and present the full material on the institution's website.

## MEDIA PRODUCTION LEARNING

### *Description*

The learners work in teams to produce learning material on the relevant topic. They plan the production, they search raw material, they organize the content, they design the presentation forms, and they establish dialogues with the people who are expected to use the material.

The learners learn, not from using media material, but from producing useful material to other people, for example younger learners or families.

### *Use of digital media*

The learners use media tools to produce material and therefore they will also have to use advanced media tools, such as graphic editing and web editing. Relevant media tools should be available to the learners and technical training at hand.

### *Didactic capacity*

Media production learning can offer a strong didactic framework, able to organize the entire learning process in different phases.

The didactic drive is the logic of media production, but the subject-related learning outcomes can be very strong.

Often it is necessary to include professional media designers in the process. Sufficient time must be allocated to the learners' media training, if needed.

### *Example*

A team of learners is given a mission: in one month you should produce a high quality multimedia material on dementia and how to communicate with people suffering from dementia.

The material will be used by younger learners and by learners in secondary school.

The learner team designs the material, supported by the teachers, and carry out the needed research and dialogues. They use the most relevant expression forms to present the content.

Finally, and supported by a professional media designer, the learner team produces a high quality material on dementia communication, combining different elements and forms of expression.

## COMMUNITY BASED LEARNING

### *Description*

The learners address the health needs of groups of people in the community and establish a number of dialogues with groups of citizens and with different stakeholders and players in the field.

The learning mission is to provide the community with alternative or innovative information, material or other forms of input that can help groups of people change their situation.

The learner team collaborates with the community all along the process.

### *Use of digital media*

The use of media is not the key focus in this process. But on many occasions the creative use of media tools will improve the quality of the collaboration and the final outcomes. Media tools should be used to communicate with the community, search knowledge, organize knowledge and present knowledge to the community. A special attention should be given to the creative use of media to offer the end users alternative ways of understanding the problems in question.

### *Didactic capacity*

Community based learning is indeed capable of offering a strong didactic platform for the learning process. Community collaboration can cover all the phases of the learning process and offers a clear mission and structure to the learners.

The community didactic is characterized by setting up a mission beyond the world of the learners themselves: they are working and learning to benefit the community.

At the same time this framework offers many opportunities to use media in very creative ways.

### *Example*

The learners are given a mission: school children are spending a lot of time using computers, mobile phones and other electronic devices. Some of them get very little physical exercise. Give the community some new input on, how this situation might be changed.

## PROBLEM BASED LEARNING

### *Description*

The learners are given a team challenge. A health problem in the community or among themselves is described.

The challenge to the learner teams is to find out how they will learn about the problem, and what they are going to do about it...

Therefore the learners need to discuss and to find out, how they are going to organize their learning of this topic. What will you do, who will you talk to, where will you find, how will you discuss, and how will you present the results of the learning.

The teacher acts as mentor and counselor, but does not interfere with the learning.

### *Use of digital media*

In fact, the learners do not have to use media at all in this process. Nevertheless, the process will be far more creative, efficient and interesting if a wide range of media tools are involved. Relevant media tools can support the research, the planning, the communication, and the presentation of the outcomes.

#### *Didactic capacity*

Problem based learning is a strong didactic platform for the organisation of the learning process. The focus is on the *learning to learn* challenges, not primarily on the topics. Yet, strong subject-related outcomes can be expected from such a process.

The teachers and mentors involved need to be confident as to the practical use of this method, as the learning process can sometimes appear quite chaotic and full of roadblocks.

#### *Example*

It is a problem to the primary schools that many migrant families do not participate in the school's family events. It makes it difficult to support the migrant children's learning and integration.

The mission is to plan a learning process through which we will come to an understanding of the problem, from different points of views, and that will eventually propose some possible solutions to the problem.

## GAME BASED LEARNING

#### *Description*

The learners use video games to study a topic, or a mosaic of related topics. The learners can work individually or in teams. The learning process should establish a strong interaction between the video game world and the learning environment surrounding the game world.

The gaming might include analyzing critically the game and the ways in which the game player interacts with the game.

#### *Use of digital media*

Interacting with video games, or learning games, offers a highly concentrated and challenging use of digital media. Many skills and competences can emerge from the gaming activities. However, working with video games is not necessarily that productive, meaning that video gaming should be accompanied by active, productive and designing use of media tools along the learning process.

#### *Didactic capacity*

Only in the case where the games employed are of a very high quality and covers many aspects of the learning process can game based learning offer a strong didactic platform. In most cases video gaming will be an element in the practicing of other didactic principles not specifically related to video gaming.

Good learning games do, though, often offer excellent learning experiences, not obtainable elsewhere in the learning process.

#### *Example*

The learners use a video game offering missions from within the human body: the body is influenced by different environmental sources, and the learner must find out about the impacts on the different elements of the body and try to combat the damages inflicted.

The game is structured in different levels, taking the learner to more and more complex tasks and demanding solutions.

The body game offers experiences that cannot be obtained in the real world.

## GAME DESIGN LEARNING

#### *Description*

Learners can learn, not only from playing video games, but also, and perhaps even more so, from designing video games on different topics.

The process of designing a learning game is very demanding and complex, and it requires a variety of activities, most of them involving the use of digital media.

The design process is balancing between the learning of game design and the

learning of specific topics or knowledge fields.

#### *Use of digital media*

Even though the design of learning games will often set out using paper and pen and a lot of discussion, the creative use of digital media might be very creative and demanding.

To illustrate the gameplay the learners will need to use graphics, progression tools, perhaps web based tools and most certainly elementary game programming.

The learning process might end at the point of the production of a demo, or it might go all the way and include the production of the full game or parts of the game.

In all cases, professional game designers should be involved and collaborate closely with the learners and the teachers.

#### *Didactic capacity*

Game design learning offers a very strong didactic platform, as the learning process can be organized according to the phases of game design.

The teachers involved should collaborate closely with a professional game designer to help the learners organize the process.

Although the learning process seems to be focused on game design, a lot of subject-related challenges will occur along this process, and eventually lots of good learning can result from such processes.

*This leads to a piece of serious knowledge: the didactics of the learning process does not in any way need to be linked to the topics at all to offer strong subject-related learning outcomes.*

Designing learning games is an excellent example of this.

#### *Example*

The learners are challenged with designing a video game on burnout.

Many teachers in primary school suffer from burnout symptoms and in some cases they lose their working capacity for a long time.

The video game should offer a game environment challenging the gamer to find creative ways of avoiding being a burnout victim.

The game should be developed in collaboration with, tested and used by primary school teachers.

## SOCIAL GAMING LEARNING

#### *Description*

The learners engage in online gaming activities, in which they play a significant role in the progression of the game.

The social gaming might take the form of a serial, progressively feeding the learners with new content elements and challenges.

An important part of the gaming is the discussions between learners and players: how to collaborate, how to solve, how to progress...

Such social gaming processes can be established at high level, including long-term planning and plenty of resources, but it can also be designed as small in-school or between-schools scenarios, using quite simple media tools.

A group of teachers should work together to design such social gaming processes.

#### *Use of digital media*

The social gaming activities are mostly focused on the use of social media and communicative tools, but might include missions of producing media elements to progress in the game world.

The social gaming environments offer strong media based virtual collaboration competences, being key competences in the knowledge society.

Different forms of text based or video based synchronous communication might also be included.

#### *Didactic capacity*

The social gaming learning might simply be an element in learning processes

organized by other principles, or it might constitute a regular element in any learning process.

But, in fact social gaming might also, at different levels of ambitions, be used as an organizer of the entire learning.

The teachers and mentors need to be familiar with such learning tools and be highly motivated to participate themselves.

*Example*

A game series in 12 episodes is produced by a group of schools in collaboration with a social game designer. The process will take 12 weeks and is about why many young people drop out of school and what happens to them afterwards.

The learners take active part in the discussions of the scenarios presented, and work together in teams competing on finding the best solutions and how to make the social game progress.

The winning teams might be offered an opportunity to produce a new social game in collaboration with the professional social game designer.

Alternatively a group of teachers can work together and produce such a series of scenarios at lower level and using the school's own web environment or online forums.

Social gaming learning might be carried out within popular virtual worlds, such as Sims or Second Life.

## SOCIAL NETWORKING LEARNING

*Description*

The learners engage in online platforms, game-like or not, with learners from other schools or even countries. The learners are constantly challenged with problems, situations or scenarios they have to find out about and communicate about.

The discussions and activities in the platform might include media productions to be discussed with other learners.

Social networking learning is different from social game learning as it does not include gaming, but is focused on exploration and collaboration in virtual platforms.

*Use of digital media*

The learning process will be focused on the use of virtual communication and collaborative tools, but the learner missions should also include the production of small media products, such as Power Points or videos as integrated elements in the virtual collaboration.

Different forms of text based or video based synchronous communication might also be included.

*Didactic capacity*

Social networking learning might be used as an organizer of the learning process, but in most cases social networking would be an element in a learning process organized by other principles. In such cases social networking might offer a strong collaborative dimension.

Social networking learning also offers strong and interesting opportunities for the learners to collaborate with learners from other schools, from the community and from other countries (for example in the case of language learning).

*Example*

The learning teams in a Danish college are challenged with collaborating with a Spanish college exploring and discussing the alcohol habits among young people in the two countries.

The learners are expected to collect evidence and produce multimedia material explaining the different alcohol habits, and to discuss the problem and the material in English and in Spanish.

In advanced cases such learning processes might result in the production of a joint website with relevant material.

## SCENARIO BASED LEARNING

### *Description*

Scenarios are very different from games. Games are quite demanding as to rules, progression and programming, whereas scenarios are short narratives demonstrating a life situation or a fictive situation.

Scenarios can be produced with simple tools like Power Point or any digital storytelling tool available, it can be set up as a website - or it can be a series of small videos.

The learner teams' mission is to work with the scenarios, respond to the scenarios - and to produce new scenarios taking the topics in question further.

If resources are available, scenarios might also be produced at high level with professional media tools. Normally this would include collaboration with media designers.

### *Use of digital media*

The learners engage in learning with simple media tools and communication tools, but they should also respond to the scenarios presented by developing new scenarios with a variety of simple or advanced media tools.

The focus might be put on expressing oneself with the most relevant media available, and to explore how different media could be used to develop scenarios.

### *Didactic capacity*

Depending on the ambition level of the scenarios such activities might form the backbone of a good learning process. It might as well, though, simply be a learning activity among others in settings based on other principles.

In advanced cases the scenarios might work as an organizer of a full learning process.

Scenario based learning offers the teachers and learners a variety of simple and more complex opportunities to simulate real life challenges.

### *Example*

An elderly citizen suffers from severe diabetes.

A series of dramatic scenarios are developed, using drawing, text and small videos, in which the elderly citizen is not caring well for her diabetes, but bringing her in difficult situations.

The learners will work with the scenarios, and produce new scenarios to present their solutions to the difficulties.

Advancing this example might mean the production of a series of video based scenarios.

## VIRTUAL SIMULATION BASED LEARNING

### *Description*

Simulations are not games. They present a part of life in digital format to explore. Many such virtual worlds are simulations. The freedom of action for the learner can be very different, but the basic idea is to allow the learner and the team to explore often complex situations that cannot be explored directly in real life, for different reasons.

The simulated world might include challenges and tasks, and even larger missions. The virtual world might represent a very small part of real life, or it might be historical simulations over time.

A simulated world might be about how to communicate with a citizen suffering from dementia - or it might be about the functioning of an entire hospital or work place. Quality simulations are quite demanding to design and produce and therefore quite expensive.

It is, in some cases, possible to construct such simulated worlds in existing platforms such as Sims or Second Life.

#### *Use of digital media*

The learners will be working a lot with media in virtual worlds. They will learn to construct, problem solve and navigate and collaborate in virtual environments. Usually they will not produce with digital tools themselves, but it is possible to include digital production in the missions of the virtual worlds, or in connection with the activities in the surrounding real-life learning environment.

#### *Didactic capacity*

Simulation learning might be used as elements in different kinds of learning processes organized by other principles, but in the case of a high-level ("epic") virtual world, the entire learning process might be linked to and embedded in such a structure. In this case virtual simulation based learning might constitute a strong didactic platform.

#### *Example*

The human body has been animated into a simulation world and the learners can travel along the natural transportation infrastructure of the body to explore different elements in the body, such as the heart, the liver, the blood, etc. The simulation world can offer open exploration, or it can include different emerging challenges and missions, for instance emerging from outer world incidents impacting the functioning of the body. In fact, there are no limits to the scope of such simulations and missions, but such simulations should be targeting large-scale audiences, as they are very expensive to produce.

## TRAINEESHIP BASED LEARNING

#### *Description*

Many educations include periodically traineeships in which the learner practices skills and competences in real life work situations. During the traineeship the learners might be challenges with producing evidence of their experiences. They might use different media tools to explain what they are learning and what problems they encountered. The media products might be discussed with other trainees from time to time and be presented to new learners to prepare them for the traineeships. In fact, the media products might also be presented to the work places to invite them to learn to better mentor and support the trainees. The same is possible in learner mobility activities.

#### *Use of digital media*

Besides online communication with people from the education and the work place, the learner will be challenged with finding out how to best organize and present the work place experience: how can I make others understand my learning and my problems by using the most expressive and relevant media? Should I use texts, pictures, drawings, videos - or should I combine different expression forms? And how to illustrate and express different forms of experience?

#### *Didactic capacity*

Structuring and presenting ones experience might very well be a strong organizer of the traineeship. The entire traineeship could be organized into challenges linked to structuring and presenting what you learn and what kind of problems you have during the traineeship. Presented in this way, the experience would be more interesting to people involved in the traineeship, and to new learners. Of course, media work in traineeships might also simply be carried out at lower level at milestone points, or as post festum reflections on the traineeship outcomes.

#### *Example*

A young migrant is engaged in a traineeship in a centre for elderly.

Some of the elderly have great difficulties with the young migrant's language and accent, as they suffer from reduced hearing and concentration.

The young migrant agrees with the school mentor to illustrate and present these experiences by video interviews with some of the elderly and by producing a media log during the traineeship.

## RESEARCH BASED LEARNING

### *Description*

This learning pathway focuses on using digital media to search useful knowledge, to review useful knowledge critically, to organize useful knowledge and to present useful knowledge in user-friendly ways.

The internet is the basic tool, and the mission is to find the most relevant knowledge on the topic in question, but also to identify different expression forms in which this knowledge has been successfully delivered. This, then, includes critically media reflection: how is this knowledge presented in the best way to people expected to use the knowledge?

This critical reflection leads to the second part of the mission: how can we organize the knowledge in a new way, using different media, to allow a better understanding of the topic among the users?

Actually, the title of this pathway might be: how to work with and form knowledge?

### *Use of digital media*

The learner will use the internet in many different ways, and become an "expert" in the quest for relevant knowledge.

But the learner will also engage in critical reflections on different forms of media expressions: how might the users of the knowledge benefit from certain forms of presentations and not from others?

Finally the critical reflection should lead to a process in which the knowledge elements are combined and presented in a new way, taking into account the profile and needs of the users. In this part of the process, the learner will choose the most relevant media and produce a media product presenting the knowledge in a new way.

### *Didactic capacity*

It is obvious that such activities can be integrated in many different learning processes, governed by different principles.

But in fact, research based learning might offer a strong didactic framework, as the knowledge work might structure the entire learning process.

In this case research based learning provides a very strong didactic platform.

### *Example*

Cancer patients in hospitals are often presented with piles of information. A lot of this information is bureaucratic, unorganized and very difficult to digest for a patient in the middle of a serious crisis.

The team of learners is challenged with this mission: find the relevant knowledge that need to be transmitted to the cancer patients (or a sub-group of cancer patients), analyze critically the quality of the information taking into account the situation of the users, and produce an alternative way of making the patient aware of this content.

Discuss the outcomes with the hospital staff responsible for the production of cancer patient information.

## "COMPUTER CLUBHOUSE INSPIRED LEARNING"

### *Description*

A Computer Clubhouse setting is not a "didactics" -or, is it?

In a Computer Clubhouse the media interest is not linked to a specific topic forming part of the curricula, as in formal education. Instead the media interest is linked to... media. And, especially to the personal interests and talents of the people

working in the clubhouse.

The clubhouse offers the learner time and space to explore how media can be used to take your talents or interests further - and to engage in in-depth media learning. The clubhouse is often used to motivate or re-motivate young people, and to allow them to build up a reinforced self-confidence and a number of important basic learning to learn skills.

#### *Use of digital media*

The learner engages in all kinds of media learning, such as graphics, animation, video, music, etc., including social networking, and explores what media can do for the learner and her personal talents, aspirations or secret hopes.

The focus is on media work and how to express oneself and ones "cause" in the most creative way. The clubhouse activities are linked to community networking.

#### *Didactic capacity*

The Computer Clubhouse "didactics" is based on a series of principles allowing the learner to explore media tools and media expressions.

The clubhouse environments are non-formal learning settings and the learners attend out of their free will.

The clubhouse world can be established as an after-school provision, or it could be integrated in formal educations in the form of "free space for media exploration". Very often such provisions are addressing young people not working well in formal education, early school leavers, or learners at risk of dropping out.

#### *Example*

At the Aarhus Social and Healthcare College the drop-out rate is very high. Many young people enroll in the education without really knowing why and what it's about.

Instead of accepting drop-out, the College might establish a "Computer Clubhouse" at the heart of the College or in a neighboring building. The clubhouse should be open every afternoon and can be used by learners at the College at risk of dropping-out, and by learners having recently left the education.

The clubhouse environment is an alternative to dropping-out and to continue to mal-function in the classes.

## "WEB BASED" LEARNING

#### *Description*

This media learning pathway is about changing traditional education material and classroom teaching into media based materials and collaborative team work.

The education produces a "world" of web based multimedia material, in some cases including learning games and social networking platforms, often in collaboration with media designers.

The learners will explore this material, typically organized in sections with facts, narratives, scenarios and links, combine the material in a useful way, and add new elements from online search.

The learners will produce media products as outcomes of the learning and thus contribute to the variety of material in the web based "world".

#### *Use of digital media*

Learners will use all kinds of digital materials in the learning process, including collaborative communication tools.

Learners will train their ability to combine digital material and also combine knowledge embedded in different "languages", such as texts, videos, scenarios, graphics, links, etc.

Last, but not least, they will be encouraged to use media tools to present the outcomes of the learning.

In certain cases, the learners are encouraged to take their media skills further and explore more advanced media tools.

### *Didactic capacity*

The established "world" of web based multimedia material might very well constitute a well-functioning didactic platform, encompassing the entire learning process.

The media didactics of "find-organize-present" can be a strong organizer of the team learning.

The advantage of this pathway is that it can be used at different levels, without compromising the very idea of the principles. And, it can form a part of any learning process governed by other didactic principles.

### *Example*

Working with and supporting people in deep crisis, due to severe illness, can be very demanding and complicated.

To support the learning of the College's care students, sosuMedia - the in house media team - produced a large and very qualified material for the learners to explore. The material was designed in close collaboration with the teachers at the College, and it also included video interviews with people in severe crisis situations. As the College owns the productions, the College can decide to further develop the material, to include productions from the learners or to share the material with other educations.

## A variety of laboratory learning facilities

Jan Gejel, 2011

### A CLASS AS MEDIA LABORATORY

The school can decide that a class, for example a new class, will be organized partly or in full according to LABlearning didactics and principle for a shorter period or for a year.

### A CURRICULUM AS MEDIA LABORATORY

A certain subject for one or more classes or groups might be organized according to LABlearning didactics, for instance English, Information Technology, Communication or History.

### A CROSS-SUBJECT CURRICULUM AS MEDIA LABORATORY

It can be decided that a class or a group will use LABlearning didactics and principles to learn about a cross-subject theme, such as climate change, in a shorter or longer period.

### A CLASS PROJECT AS MEDIA LABORATORY

A class can work in a LABlearning setting on a special project within a curricula subject.

### A PROJECT GROUP AS MEDIA LABORATORY

A group of learners can work in a LABlearning setting on a special project within a curricula subject.

### A PROJECT GROUP AS MEDIA LABORATORY

Within a subject or within the curricula in general a special group of learners (perhaps at risk learners) are formed, and are challenged to work in LAB settings in parallel to the class.

#### A SUPPORT EDUCATION MEDIA LABORATORY

Some institutions offer preparatory or support education for students who are not yet ready to enter a secondary or vocational study, and such support educations might be perfect for laboratory based learning.

#### AN INTERNATIONAL MEDIA LABORATORY

A class or a group of learners are challenged with working with a subject or a cross-subject theme by collaborating virtually with one or more schools in other countries. The project might include language learning and might be set up according to the LABlearning didactics.

#### A SEMI-FORMAL MEDIA LABORATORY WITHIN SCHOOL HOURS

In support of at risk learners, or to get drop-outs back into learning, the institution can establish in-school media lab facilities and invite groups of learners to work in these facilities in parallel to class education.

#### A SEMI-FORMAL MEDIA LABORATORY IN CONTINUATION OF SCHOOL HOURS

The institution might decide to open part of the building for after school media laboratories, especially for youth at risk. The activities in the media lab might be linked to the school work, but it does not have to be. Opening hours might be on work days from after school to 8 or 9 in the evening. Some institutions might even consider opening hours during the weekend.

#### A NON-FORMAL MEDIA LABORATORY IN THE INSTITUTION AFTER SCHOOL

The institution might decide to establish a genuine media lab in its premises - for young people attending the school, and for other young people in the community. This facility might be open in the evening and also in the weekend.

In extreme cases, an educational institution might decide to establish something like a Computer Clubhouse linked to but not controlled by the educational institution.

#### A NON-FORMAL MEDIA LABORATORY IN A COMMUNITY CENTRE

One of the strongest non-formal solutions is to establish a media lab as an integrated part of a community centre - or the use a media lab for young people as a catalyst for establishing a community centre!

The media lab will profit from being directly linked to the community - and several synergies between the activities in such a centre can be expected.

#### A NON-FORMAL MEDIA LABORATORY IN A MEDIA EDUCATION

A media education, such as a multimedia university, a media vocational college or a media based high school, might offer its premises to establish a media lab in support of the learning of youth at risk in the community.

In certain cases such an initiative might develop into a computer clubhouse facility.

#### A NON-FORMAL MEDIA LABORATORY IN A YOUTH CLUB FACILITY

Many communities have some kind of youth facilities or youth clubs. Such facilities might partly or in full be developed into a LABlearning facility, closely linked to the community.

#### A NON-FORMAL MEDIA LABORATORY IN A PRIVATE ORGANISATION

A strong private enterprise might offer to use its premises for establishing creative media laboratories for youth at risk and for young people in general.

Often this will be private companies with strong corporate social responsibility programs - or companies directly interested in youth and media.

#### A NON-FORMAL COMPUTER CLUBHOUSE

The high-end non-formal solution is, of course, to establish a genuine computer clubhouse in the community, supported by major stakeholders in the community. Such a solution requires long-term planning and preparation, but in the long run it represents a very strong and sustainable solution.

## Would you like to know more?

James Paul Gee

[What Video Games have to teach us about Learning and Literacy](#)  
2007

Simon Egenfeldt-Nielsen

[Educational Potential of Computer Games](#)  
2007

Celia Pearce

[Communities of Play](#)  
2009

Ian Bogost

[Persuasive Games](#)  
2007

Ute Ritterfeld (ed.)

[Serious Games](#)  
2009

Marc Prensky

[Teaching Digital Natives](#)  
2010

Douglas Thomas

[A New Culture of Learning](#)  
2011

Simon Egenfeldt-Nielsen

[Understanding Video Games](#)  
2008

Marc Prensky

[Digital Game-based Learning](#)  
2001

Marc Prensky

["Don't bother me mom - I'm learning"](#)  
2006

Diane Carr

[Computer Games - text, narrative and play](#)  
2006

Jane McGonigal

[Reality is Broken](#)  
2011

Jesper Juul

[A casual Revolution](#)  
2010

FURTHER INSPIRATION AVAILABLE ON

[www.sosuaarhus-international.com/LABlearning.htm](http://www.sosuaarhus-international.com/LABlearning.htm)

[www.sosuaarhus-international.com/Gaming.htm](http://www.sosuaarhus-international.com/Gaming.htm)

## PART 3

### Examples of learning games in Denmark after 2000

- To be produced in spring 2012



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Organisation responsible text
Internet address text
Contact name and mail text
Short and clear summary of the example text
More detailed summary of the initiative, if available text
Attached documentation or direct links to documentation text

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