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On-site and online learning paths for an educational farm. Pedagogical perspectives for knowledge and social development

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ABSTRACT

The article try to demonstrate the pedagogical value of the Educational Farm as a resource for learning and as the epicentre for incisive social actions. The learning activities planned for the school visitors within the Learning by Design framework are described. Some *experiencing, conceptualising, analysing and applying* steps are planned, both online and on-site, crossing learning contexts.
The proposal includes gamification-learning activities and specific assessment processes. Thus contributing to activate a transformative learning project.

KEYWORDS: Learning by Design, Transformative Pedagogy, Gamification, Assessment, Educational Farm.

1. The context and the pedagogical value of the educational farm

Educational Farms represent a resource of great interest for the Apulia region. There are 118 Farms in the whole region, distributed in six provincial areas, as shown in the following map.
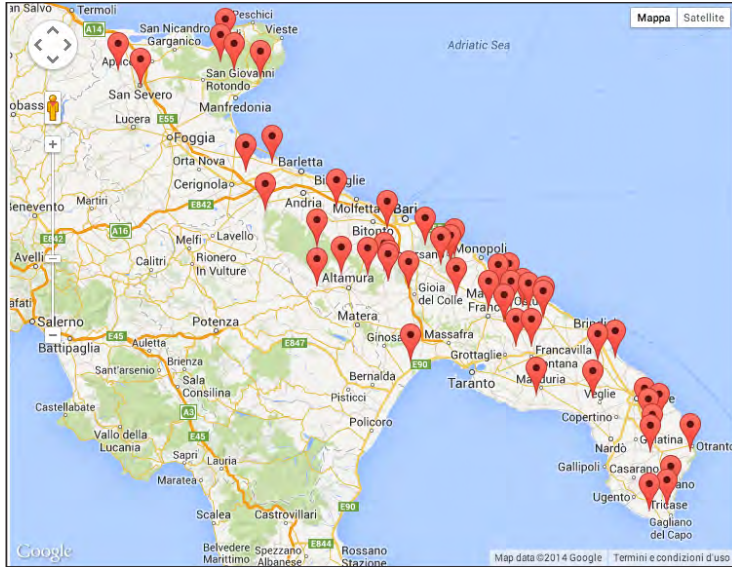
Figure 1. Map of the Education Farms in Puglia[1]

In an area with a strong agricultural tradition, although with peaks of high specialization, Educational Farms can represent at the same time manufacturing, tourism, educational and identitary resources.

Identitary because there we can discover the diverse agricultural productions of the territory, but also typical flora of the countryside, specific elements of traditional and productive settlements, such as underground oil mills and furnishing constructions.

Farms represent a production site in which are conducted activities related to cultivation, harvest and processing local agricultural products, with a strong attention for typical production, up to endangered species recovery actions.

Educational farms are also a tourist attraction, that welcomes school groups, foreign visitors and fans of the rural landscape.

In close connection with three of the aspects described above, there is an *educational aim*. Educational Farms can be a driving force for the territory and for the knowledge of local specialties, but also a platform for educational projects referring to themes of great relevance, such as nutrition education and

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1   Source: http://www.regione.puglia.it/index.php?page=prg&id=17&opz=map

environmental protection, like other national experiences demonstrate (Canavari, 2011).

Last January in Rome, the President of the Apulia Region – Nichi Vendola – signed the Decalogue "Zero Waste Paper" and stressed that the fight against waste – water, energy, food waste – is a positive struggle towards a new model of protection, organization and defense of basic goods (Source: press release Apulia Region[2]).

Also, as part of the battle against food waste, our Region has already implemented a number of projects in collaboration between the Educational Farms network and some primary schools – as explained by the Regional Counselor for Agriculture, Fabrizio Nardoni. In these projects they try to raise awareness in favor of appropriate and balanced diets, food residues re-use (e.g. to make compost) and the selection of local and seasonal products.

In addition, the Region is committed for the second year with the project "Education for healthy lifestyles – SBAM!", which seeks the collaboration among five Regional Departments and the University of Foggia.

The activities planned and developed in collaboration between educational agencies and the Educational Farms network in the area (directed by Angelica Anglani), might be like lifeblood for the territory from the pedagogical point of view by activating the following processes:

– Design of courses that can be integrated to schools educational programs and curriculum. The educational experiences in the farm would allow to activate diverse learning forms, located and "enhanced", beyond sporadic and subsidiary visits. The University could contribute with facilitation activities and co-designing these educational paths, with a methodological support.
– Activation of agreements and development of actions in synergy with other local educational agencies, with museums specialized in local history and traditions, with libraries and archives managed by local authorities, with foundations, research centers and associations promoting the ancient regional culture. Regular meetings and dedicated online spaces could be some possible ways for continuous dialogue and collaboration.
– Platforms to share good practices, even in the spaces created by the regional administration. These spaces could host learning modules and brief courses to be implemented in schools, online resources, a permanent community, social management and promotional activities.

In this context, we do not deal with the management of an Educational Farm, nor its economic model is described – including public funding. What we try to demonstrate here is the pedagogical value of the Educational Farm as a resource for learning and as the epicentre for incisive social actions to be activated on the territory.

A connotation that cannot be activated "by statute", but that could be achieved through negotiated initiatives, planned and (re)designed with schools and cultural operators.

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2   http://www.regione.puglia.it/index.php?page=pressregione&id=16826&opz=display

2. Sant'Andrea Farm

2.1 Supporting actions for local and social development

Social farms and educational farms are developed as a result of a new concept of "rural" that can be understood as the interrelationship between agriculture, education and social services, protection and promotion of the environment and landscape. This multifunctional format in agriculture has had a noticeable importance during the programming period 2007-2013 as part of the RDP (Regional Development Program) and in validating the importance of the social dimension in agricultural practices and professional contexts, in order to promote life's quality improvement. As indicated in the AXIS III – life quality and diversification of rural economy – of the National Strategic Plan for Rural Development (NSP) and the Rural Development Plans activities.

DIMENSION 311 - "Non-agricultural activities diversification"
- ACTION 2: Necessary investments for educational services supplies and population education, making emphasis in the school and in the student while in synergy with the national education system;
- ACTION 3: Necessary investments to supply health services in benefit of vulnerable population groups.

DIMENSION 312 - "Support for enterprises creation and development"
- ACTION 3: services for local population, especially for young children and elderly people (creation of play areas, baby-sitting services, recreation centers for the elderly).

DIMENSION 321 - "Basic services for rural population and economy"
- ACTION 1: educational, cultural and recreational services that benefit young people in school age;
- ACTION 2: social value services as social inclusion for elder people and people with disabilities (pet therapy, horticulture therapy, agrotherapy, art therapy, hippotherapy);
- ACTION 3: childcare services (public playgrounds, "agrinidi" or agricultural kindergardens).

DIMENSION 323 - "Conservation and upgrading rural heritage"
- Recognize the worth of archaeological, architectural, historical and artistic patrimonies and also the landscape of rural areas in order to increase touristic appeal of such areas and to improve the population life's quality.

DIMENSION 331 - "Training and information"

Table 1. Rural Development Policy Overview[3]

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3   Re-elaborated from the website "The European Network for Rural Development (ENRD)".

The innovative combination of agriculture and social development, the so-called "Social Agriculture" had importance just if we consider EAFRD but also taking a look at the regional politics and cohesion politics (ERDF and ESF), in the National Strategic Reference Framework (Quadro Strategico Nazionale or QSN) some of the ten priorities stress the importance of Social Agriculture. It is necessary to take into account "Priority 1 – Improvement and development of human resources" that aims to support professionals' training, which in our case could be referred to those working in the agricultural sector and also the third sector that pretend to innovate through the acquisition of skills in the Social Agriculture field and in the activities attached to it, such as the educational farm. It is interesting also "Priority 4 – Social inclusion and services for life quality and attractiveness of the region", which aims to place value on the underutilized social capital in urban and rural areas by improving the quality and accessibility of social protection services and agreements between training and learning systems. The action is addressed at vulnerable people including people with disabilities and of course those that are not self-sufficient.

Sant'Andrea Farm is located about 1.5 km from Bisceglie city downtown and Corato westwards, in Via Sant'Andrea.

A multiple and varied natural resources' presence, as well as landscapes, social, architectural and cultural resources characterize Bisceglie city and local production is partially used as a development tool, but in part it still has an unexpressed potential. The enterprise system is geographically widespread but not balanced from a sectorial diversification point of view and there is a firms' tendency to act as a single unit. The area has a pronounced *desruralization* resulting in waiving land's care and a clear deterioration of environment and landscape features, in order to build new urban areas.

As can be seen in the State's 6th General Census of Agriculture 2010, agriculture is territory's economy leading sector; used land is primarily intended for permanent crops (olive trees, vines and fruit trees). In addition, it is noted that in the last decade, and aligned with regional happenings, there is an increase in organic farms.

The diversification of agricultural activities, such as educational farm, are definitely territory's showcase, of its welfare and its products' as well as being a key strategy for agricultural enterprises as they can integrate both sources to stem the abandonment phenomenon in rural areas.

Sant'Andrea Farm was admitted to be financed at DIMENSION 311 "Non-agricultural activities diversification", ACTION 2: Investments for supplying educational services and population education, with a particular reference to the school context and in synergy with the national educational system, PSR Puglia 2007-2013, GAL Ponte LAMA.

Sant'Andrea Farm promotes nutrition education pathways and promotes awareness and consumption of local dairy products. Moreover, among the educational activities proposed, there are paths of knowledge and experience of the famous cherry of Bisceglie, excellence product, not only for the natives. In 2003, in order to protect, enhance and extend the production and marketing of typical Bisceglie fruit (especially the cherry) has been formed the "Consortium for the protection and appreciation of Bisceglie cherry" which is also part of the OMSAT Company.

3. The learning paths, between on-site and online activities

As shown, Sant'Andrea Farm incorporates heterogeneous elements and resources, which allow the activation of diversified and dynamic learning paths. They can be "physical" and foster strong experiential activities, linked to smells, sounds, colors, flavors, but also to the "handiness" of transformation processes. On the other hand, processes and events that evolve over time are described through the use of simulations and interactive materials.

The instructional design developed during the pilot project is based on two key points, as described below:

Language: *multimodality* as a framework for writing digital texts, through the support of guidelines for teachers and students. A useful scientific and operational reference comes from the Digital Publishing field (Arola, Shepard & Ball, 2014) and from learning activities related to the use of digital media, that Cheryl E. Ball calls "editorial pedagogy".

Learning framework: *transformative pedagogy* (McGregor, 2008; Mezirow, 1978, 1981, 1991; O'Sullivan, 2002; Kalantzis & Cope, 2005, 2010), which emphasizes the personal and cultural growth of the learner through a path made of further steps, from known areas to new areas within a dynamic learning process that leads to an expansion of knowledge. Following Steven Hodge (2014) we will consider here transformative learning and practice-based learning theories as complementary, focusing them respectively on the individual in context and on practice.

The learning actions were planned following the Learning by Design (LbD) model, particularly suitable for the design of complex learning activities, distributed within different contexts. The model:

– allows flexible scheduling, with negotiable and customizable activities that can be integrated, combined and adapted for different situations and learning goals;
– provides activities that invite the learner to perform actions and processes of different type: practice, meta-reflection, classification, processing etc.;
– foster the teacher and learner engagement in different roles: assessing, designing, creating etc.;
– supports reading and writing with digital language;
– allows teacher to recognize actions and principles organized in a systematic way.

The learning paths were designed following two different levels:

Macro-level learning goals
– To enhance the educational farm as a node for transformative learning processes.
– To integrate situated learning with ubiquitous access for educational resources.
Micro-level learning goals
– To learn the elements of proper nutrition.
– To analyze the food waste phenomenon.
– To know products' seasonality, animal and plant biodiversity.
– To learn about nutritional and health qualities of local production.
– To discover food production linked to the region (e.g. Bisceglie cherry).
– To know the different transformative processes related to some local products (oil, wine, bread, cheese, sauce).

Table 2. Macro and micro learning goals

The learning intervention designed fits the "seven affordance" for the twenty-first century learning, the so called "New Learning" (Kalantzis, Cope, 2012), that takes place in the digital era. Each affordance relates to a pedagogical choice, whose features are described in the following Table:

New learning affordances	Pedagogical choices for S. Andrea farm
Ubiquitous Learning – learning exceeds a defined time and space for teaching and extends within different time and places.	To provide different sites for learning (museums, schools, farms etc.) and an extended time to discover and understand new themes, objects, contexts.
Active Knowledge Making – "doing" becomes an essential condition of the learning process.	To create, to look for solutions, to propose innovation, to present actions and embedded processes into the learning course.
Multimodal Learning – the cross-media information, the multiplication of a variety of environments and "text" resources pushes towards the use of a very rich and deep language.	To discover themes and concepts across different forms of expression, learning how to decode and encode messages across media.
Recursive Feedback – different assessment systems allow monitoring learning process in a continuous way, through different feedback formats.	To match peer, self-, teacher assessment, but also self-efficacy mechanisms that come from the community, from gaming activities and from experiencing processes.
Collaborative Intelligence – peer feedback and sharing of open knowledge resources are the core of this transparent and negotiated process, where personal and collaborative contribution merge.	To make courses connected with reality and with the territory, in close collaboration with other educational players in the area.
Metacognition – reflection, feedback, self- and peer- assessment dynamics let the students think in a metacognitive way about the nature of the task and of the discipline.	To scaffold learning with actions as comments and reflection on their own and others' work, also through the manipulation, combination and creation of new materials that can be used by others.
Differentiated Learning - different learning needs and objectives are achieved through different learning paths.	To plan courses that include the possibility to choose between similar actions, even in the context of common educational goals.

Table 3. The "seven affordance" for the twenty-first century learning (Kalantzis & Cope, 2012) integrated and adapted for S. Andrea farm

Below there is an image (Figure 2) related to the different elements that make up the learning resources ecosystem designed for the "holistic" experience we designed:
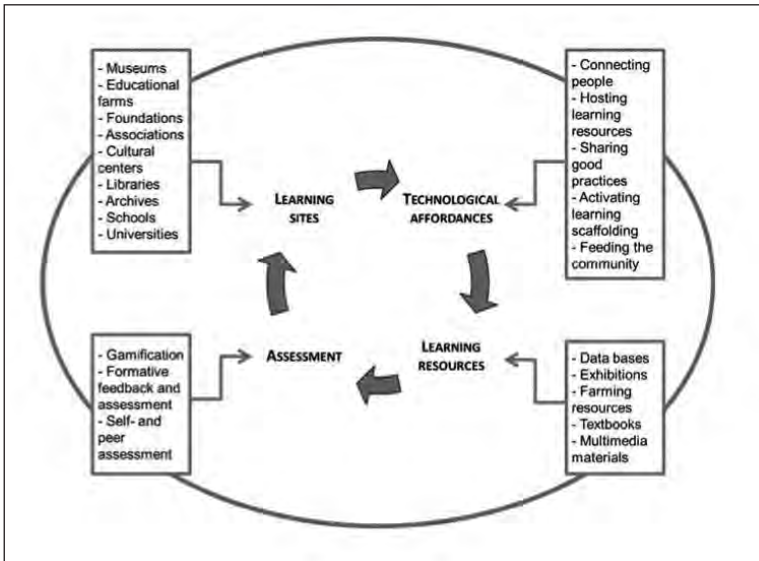
Figure 2. A hypothesis of learning ecosystem map for S. Andrea farm

Resource planning, paths and actions will lead to the creation of more extensive guidelines – printed and online –, containing a sort of open portfolio intended to farms, schools (combining it with the curriculum), museums, as part of the educational services planned by Region. This would be an open cross-media project to be implemented with educators and learners' suggestions and proposals.

EXPERIENCING		APPLYING	
KNOWN Focus: to recognize learner's prior knowledge	**NEW** Focus: to introduce learners with new experiences	**APPROPRIATELY** Focus: to apply independently what has been taught	**CREATIVELY** Focus: to adapt knowledge and capabilities from one setting to a different one.
KEYWORDS: assessment, engagement	KEYWORDS: meaning making, learning materials, feedback	KEYWORDS: writing, creating	KEYWORDS: taking learning into the real life
The learner learns from prior experiences and information connected with familiar contexts; discovers new knowledge elements, with the support of different types of resources and materials. *The teacher* creates connections between the "already known" and new items to be learned, assesses learner's prior knowledge, activates forms of dialogue and opens to new experiences and learning materials.		*The learner* learns through activities that require the application of knowledge to real-world situations and problems; he applies knowledge to new situations and contexts. *The teacher* invites to write, to produce projects; leads learned elements in new contexts.	
TACIT AND EXPLICIT LEARNING THROUGH DISCOVERING, CREATING, SHARING			
Learning goal To recognize the elements and signs related to food waste.	**Learning goal** To discover trails of this phenomenon through different types of available resources.	**Learning goal** To create a presentation about food waste, for families and schools (individual or group work).	**Learning goal** To draw up guidelines for food retrieve. To elaborate a communication project related to food retrieve.
Set of activities To participate to a brainstorming session. To build a box of scattered thoughts. To create an online Tag Cloud. To develop a photo collection.	**Set of activities** To read and discuss online resources. To search waste trails in your area. To make a library research. To interview an older relative (in-person or online).	**Set of activities** To create a proposal against food waste. To present a "no-waste spot".	**Set of activities** Set of activities To design a project as educator: from waste to recycling.

CONCEPTUALISING		ANALYSING	
NAMING	**THEORISING**	**FUNCTIONALLY**	**CRITICALLY**
Focus: to use the experiential learning to define and draw out new concepts/ ideas/ themes/ understandings/vocabulary, and identifying numeracy and literacy strategies.	Focus: to generalize and synthesize concepts by linking and drawing them together, exploring them in depth, deepening understanding and practicing skills.	Focus: to examine the structure, functions and effects of a subject.	Focus: to design proper messages for different audiences, with multiple perspectives for diverse individual, social, cultural and environmental conditions.
KEYWORDS: concept and ideas to define issues	KEYWORDS: deep understanding	KEYWORDS: functions and affordances	KEYWORDS: critical analysis
The learner discovers new concepts, ideas, themes, definitions and achieves a deeper understanding of concepts, through processes of synthesis, analysis and elements' connections.		*The learner* understands the practices, examines what the object can do, what effects it produces in the environment; learner analyzes the relevance, the cause and effect process and implications for personal, social, cultural and environmental contexts.	
The teacher structures educational activities focusing on concepts and ideas to understand, hypothesizes scenarios and helps to generalize.		*The teacher* chooses the tools, invites to use different languages and helps to understand specific functions.	
EXPLICIT TEACHING THROUGH MODELLING, SHARING AND GUIDING			
Learning goal To present a "Waste gallery": names, images, concepts, behaviors related to the phenomenon.	**Learning goal** To create scenarios and inductive-deductive reasoning.	**Learning goal** To understand causes and effects of food waste.	**Learning goal** To summarize wasting process.
Set of activities To participate to a brainstorm session about analogies and metaphors on the subject. To create a conceptual maps or synthesis on the theme. To write a glossary of waste. To play with food waste words and concepts.	**Set of activities** To create scenarios: e.g. "if I were the mayor of my municipality", "a world without waste plan".	**Set of activities** To make a photo album, or a text, or a hypertext, or a multimedia project where the cause and the effects of food waste process are explained.	**Set of activities** To explain with multimedia format food waste and water, energy and land resources waste.

Table 4. Learning Plan, adapted and integrated for S. Andrea farm, starting from a model of Rita van Haren, Curriculum Resource Developer at Common Ground Publishing and member of the Learning by Design Project Group

The food waste issue – which is just an example – is analyzed through different resources and paths. The aim of the learning actions is the achievement of different skills: *Experiential* – to familiarize with themes and objects in their own context; *Conceptual* – to recognize terms and ideas related to the subject; *Analytical* – to identify cause-effect relationship and to distinguish key functions and roles of the elements related to the topic; *Applied* – to have the ability to re-elaborate, even with complex textual forms (digital storytelling, comics, short audiovisual recordings) basic concepts and to be able to recognize the impact of these topics and elements in everyday life.

Game activities were planned as part of the instructional design and they enhance aspects of students' engagement, but mostly they constitute one of the richest learning resources included in the learning plan for S. Andrea farm.

4. Farm Ludens

Fostering effective interventions to promote childhood's nutritional well-being, it is necessary to consider the different changing scenarios and education innovation that the school is going through, this in order to propose strategic actions centered on the student. Teaching technologies represent a valuable resource, an opportunity not to be missed but use to change in a deeper way learning modalities, to develop new cognitive skills and to expand the population share that has access to education.

The school today is undergoing a major change that puts it as the protagonist of new teaching experiments and innovation proposals where digital technologies and strategies are integrated to media literacies in order to promote significant learning by responding to training needs of a new generation of students.

David W. Shaffer and Mitche Resnick (1999) found that there are four kinds of authentic learning:

1. learning that is personally meaningful to the learner;
2. learning that relates to the real-world outside school;
3. learning that provides an opportunity to think in the modes of a particular discipline;
4. learning where the means of assessment reflect the learning process.

These scholars argue about the important value of achieving all of these to support engagement, learning and deep understanding.

The ongoing changes affect not only the students, but also to the spaces, tools, languages and teaching methodologies that the teacher has in order to project the educational intervention. As Douglas Thomas and John Seely Brown (2011) say, «the educational needs of the 21st century pose a number of serious problems for current educational practices. First and foremost, we see the 21st century as a time that is characterized by constant change. Educational practices that focus on the transfer of static knowledge simply cannot keep up with the rapid rate of change. Practices that focus on adaptation or reaction to change fare better, but are still finding themselves outpaced by an environment that requires content to be updated almost as fast as it can be taught. What is required to succeed in education is a theory that is responsive to the context of constant flux, while at the same time is grounded in a theory of learning».

In the ubiquitous learning context, such as new learning affordances, the design of learning activities that moves *outside the classroom* is becoming a well-established teaching practice as it seems to promote significant learning through direct experience (Braund & Reiss, 2006). Science learning sites as museums, science centers, zoos and botanic gardens (Amos & Reiss, 2006) can be considered in a within a well-structured teaching program, as these places can promote learning of specific topics, particularly scientific subjects.

New occasions occur in out-of-school environments because activities are less inhibited by school bells, times and spaces. Work can be more extensive and exhaustive and encourage more autonomy for learners. There are chances for learners to take responsibility for themselves and others, by working in teams and for active consideration of the environment. According to Dillon and colleagues (2006), «to be effective, fieldwork needs to be carefully planned, thoughtfully implemented and followed up back at school. In planning activities, teachers and outdoor educators need to take account of factors such as students' fears and phobias, prior experience and preferred learning styles» (ivi, p. 110).

Learning in out-of-school environments is often perceived as stimulating, challenging and enriching. In these places, new technologies and advances in our understanding of learning in informal settings have been put to good use (Braund & Reiss, 2006).

The wide availability of various forms of digital media, especially in everyday life informal contexts, strongly influences the way people communicate, but also how they learn and build their own identities, this is more specific for the younger "hypersocial" generation as defined Mizuko Ito (2009). With the concept of "hypersocial", this author refers to ways in which new generations are using media to manage their relationships between them and their peers, also considering sharing gaming experiences.

Playing digital games has become an established practice that belongs as to informal contexts and entertainment, as to formal and professional contexts.

Anne Collier (2013), editor of NetFamilyNews.org and founder and executive director of Net Family News, Inc., in a recent article entitled "Why kids need more, not less, play" published in this magazine, replaced the well-known definition of "digital natives" with "playful natives." In particular, Anne Collier argues that «they are born to learn through play, including social play».

Many scholars assert that games capture players' attention and connect them with complex thinking and problem solving competences (Barab & Dede, 2007; Gee, 2003; Jenkins, 2009; Shaffer *et al.*, 2005). The peculiarity of learner's characteristics, for example, prior knowledge and self-efficacy, has been exposed as a mean to mediate learning in games.

4.1 Designing gamification-based learning activities in the educational farm

Starting from these assumptions and following numerous studies that confirm the potential of digital games as tools to promote meaningful learning (Shaffer *et al.*, 2005), games' proposal provided by the farm's instructional design puts a set of gamification activities in order to enable collaborative and metacognitive processes. This educational challenge involves tasks of engaging students, stimulating their interests, holding their attention, and retaining a positive attitude in a nurturing environment. According to James P. Gee (2008), gamers voluntarily invest countless hours in developing their problem-solving skills within the context of games.

With the term *gamification* we refer to the possibility to add game elements and mechanics to things that aren't designed to be games.

The reason gamification works is because it can simplify otherwise lengthy processes. Surveys or training can be broken down into smaller stages with a simple reward mechanic after each stage. This approach makes it easier to re-

spond to laborious tasks by helping to map out the process and encourage progress.

Wendy Hsin-Yuan Huang and Dilip Soman (2013) define a five part process for applying gamification to the instructional environment.

Figure 3. The flow chart for applying gamification to the instructional environment (Image adapted from Huang & Soman, 2013, p.7)

The process starts with understanding the audience (students) and where the course fits into the whole curricular framework. Moreover, context refers to the type of instruction and where it will realize (individuals, groups, face to face, online). Classification of *pain points*[4] will help the instructor identify learning objectives and structure the position of game elements in the curriculum. Then it is possible to identify resources – pre-existing games or ones to develop, which can range from complex to very minimal. At last, it will be possible to implement the gamification strategies.

There are many applications and systems developed in the gamification context, with a particular focus in promotion of health and healthy food. Pharmaceutical companies, for example, are beginning to be very active in the market of digital games for health. Humana, for example, has created a division that specializes in digital games (Humana-Games). Kaiser offers a range of digital games such as "The Amazing Food Detective" that teaches kids to prefer natural food and increase physical activity.

We tried to link any current instances of schools, social researches, websites or games trying to get people to reduce food waste through gaming activities.

Planned Experiencing and Applying activities related to elements and signs recognition of food waste and the creation of resources (a presentation against food waste, for example) can be realized through a range of available applications that allow to gamificate the concept of food waste. A lot of gamification systems provide solutions to accelerate sustainability.

Through these systems, students get points, called "badges", for completing assignments rightly. Students are rewarded for desired behaviors and "punished" for undesirable behaviors using this common currency as a reward system. If they complete well all the steps, students "level up" (Hammer & Lee, 2011).

The gamification activity kit is composed of a series of systems and gaming activities selected on the basis of educational goals related to the food waste concept, to a proper and balanced diet and the usage of food residues.

The gamification-based activities for the educational farm are aimed to the involvement and awareness of the issues of the reduction of food waste through

4   *Pain points* are some real or perceived problems. Educational environments could create opportunities for students by creating solutions to those pain points. Solutions create value for everyone.

the potential and characteristics of the elements of the game. Users are asked to indicate, by clicking on the appropriate icons, such as food waste, how much and why. In return they will know the value in euro of its own waste and will be obtained tips and useful information to reduce it.

All participants can compare their behaviour with that of other activating healthy competition and encouraging good practice.

Gaming applications fall within an online portal where they collected a series of spaces suitably designed and dedicated to educatinal activities to encourage learning through play, collaboration and communication.

We have got a variety of free resources available for the educational farm visitors. All these resources aim to cut down on food waste via better planning.

Some examples of gamified applications:
– a game system that helps to plan daily dinner. Through this game, it's possible to type in the ingredients you have in your pantry and the recipe search engine will find recipes that you can make with only those ingredients.
– a game system designed to help you plan and freeze *a whole month* of meals for your family. You can choose from numerous menu options, including Vegetarian, Whole Foods, Diet, Gluten/Dairy Free, Baby Food.
– a game system that helps to collect recipes using vegetable or general kitchen scraps. An excellent way to save money on food is by making the most of kitchen scraps. «Almost every time we cook a meal a lot of kitchen scraps get tossed»[5]. It's a waste of money and food and many of those scraps can be used to enhance other recipes or can even be used around the house.

One well-known example of a campaign to raise awareness towards food waste reduction was launched for the first time by the non-profit Waste & Resources Action Programme in 2007, with the aim to reduce food waste in the UK and called "Love Food Hate Waste".

In the website dedicated to the campaign there are a number of applications, including a recipes archive for using leftovers, tips to avoid food wasting, to optimize consumption and to pay attention to expiration dates and conservation.

The initiative also provides an easy game system that allows planning one's own spending, leftovers re-use with some recipes and waste reduction.

Among the main features are included:
– My cookbook: lots of great recipes with simple step-by-step instructions.
– Discover recipes that you can make with ingredients you already have.
– Portion Planner: we can help you calculate how much you need.
– Meal Planner: a diary for planning recipes, meals and leftovers up to 14 days in advance.
– My Kitchen: store all the info about what you've got in your fridge, cupboard and freezer.
– Shopping List: track everything you need for your planned meals and get alerts if you have duplicates of any ingredients.
– Achievements: unlock badges and share your culinary accomplishments with friends and family.

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5 Source: Cooking with Kitchen Scraps, and Other Uses, Huffpost (2012, September 07), http://www.huffingtonpost.com/2013/08/28/cooking-with-kitchen-scraps_n_1654589.html

The kit features a set of applications that allow to create original products that participants can continue to develop even after the visit to the farm. In this sense, it fosters a connection between what happens in the context of informal learning and the educational course to be continued within school settings.

5. Educational activities assessment

Gamification processes are based on a set of keywords that inevitably recall the concept of learning assessment from which they develop all subsequent stages of the game.

Keywords to which we refer are: points, levels, leaderboards, badges, quests, social engagement and feedback loops. As part of the literature on gamification in education, the concept of feedback is quite debatable.

According to James Paul Gee (2012), games fundamentally are a form of assessment; but in digital games learning and assessment are not separated. «Gamers do not just do things and make decisions. They must learn things and then master them. If they don't, they don't leave the first level of a game. Imagine a book that constantly had quizzes and tests at the end of each section (oops, that's a textbook). Few people would consider it fun (few people consider textbooks fun). But games constantly assess players. Every action is a test with feedback, and the boss at the end of a level is a final exam for that level. Games have found that both learning and constant assessment of that learning are a turn-on for people» (ivi, pp. xvii-xviii).

The ability to use gamification systems' logic to support and enhance learning in contexts outside the school, but linked to the school curriculum, should be clearly linked to the need to ensure an evaluation system that is, as claimed by Valerie J. Shute and FengFeng Ke (2012) «valid, reliable, and also pretty much invisible (to keep engagement intact). That is where stealth assessment comes in» (ivi, p. 52).

Feedback is a key element in teaching and learning systems. Valerie Shute (2008) conducted researches on formative feedback and she identifies the features of effective formative feedback (e.g., feedback should be nonevaluative, supportive, timely, specific, multidimensional and credible). Immediate feedback that results from a direct manipulation of objects in the game offers useful information to guide exploration or improve interaction strategies. The availability of ongoing and recursive feedback may perhaps influence motivation and the quality of the evidence created by the system.

Through systems integration of self and peer assessment, possible thanks to required gamification systems, can be activated a series of reinforcement learning processes with assessment for learning perspective. Gamification systems allow the creation of a strong sense of community where players can share the results and discuss about strategies.

We think that using gamification to engage and motivate, enhance formative assessment and better inform personalised learning could be a way to obtain great benefits from learners.

Points and leveling up for our gamification activities could be tailored for each student. We know this is a very ambitious plan but we would like to try using

gamification to engage and motivate, enhance formative assessment and promote personalised learning.

Formative assessment represents a process of feedback that improves student learning. This assessment method is based on the idea that students should learn to take control of their learning and that it is a way to improve self-reflection in learners.

For students, gamification provides the idea of reducing negative emotions that they usually encounter in conventional settings of education. According with Wendy Hsin-Yuan Huang and Dilip Soman (2013), «it lets them approach knowledge and skills, using the learn-by-failure technique that is popular in game-like environments, without the embarrassment factor that usually forms a part of classroom education. Instructors on their part can efficiently achieve their set objectives and use currency-based tracking mechanisms to get feedback on their students' progress» (ivi, p.24).

Even if it is not simple to productively implement gamification in education systems, a mindful approach – using the five steps process presented in the flow chart of the Figure 3 – could improve the possibility of creating a successful education gamification strategy. Furthermore, it is suggested that instructors remember that gamifying education may require long periods of fine-tuning and most definitely should not substitute the original value of human teaching. «Gamification in education can be a powerful strategy when implemented properly, as it can enhance an education program, and achieve learning objectives by influencing the behaviour of students» (*ibid*.).

6. Ending notes

The design of teaching and learning activities within the educational farm Sant'Andrea is and could be an important occasion for matching academic research and educational policies managed by local authorities. The challenge is to combine the true vocation of the territory with the processes of innovation supported by national and European programs.

Our region is heavily investing in Smart Specialization strategy, with a particular reference to the "digital, creative and inclusive communities". These communities could be strategically developed through the creation of networks among educational actors, also with the help of digital media. In this scenario the University assumes a social function, linking policy, cultural and economical stakeholders.

Finally, effective learning models, processes and materials could also be used and tested in other contexts and occasions. Towards an "intelligent digitalization", which could guarantee sustainable actions enriching the entire territory in a long period perspective.

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