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## A Game Based Learning Model for Entrepreneurship Education

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### Abstract

Entrepreneurship Education aims to help students acquire skills and knowledge that are crucial for the development of an entrepreneurial mindset. The article describes a blended model based on the use of a serious game within the framework of the EU-funded project "I can ... I cannot ... I go!" Rev. 2 (PNPV project). The learning model and the serious game was designed in order to build a learning space that fosters learner's entrepreneurial mindset through experiential learning.

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### 1. Introduction

A dynamic economy requires a greater number of young people who are willing and able to become entrepreneurs [1]. Starting from this assumption, the Communication from the European Commission entitled "Entrepreneurship Action Plan 2020" highlights the role of Entrepreneurship Education (EE) as a key strategy for stimulating economic growth in Europe and promotes a plan to foster the integration of EE into the European education systems.

In fact, at the present time, EE is not yet sufficiently integrated into the school curricula in European countries, particularly in Italy [2]. In order to promote the integration of entrepreneurship education strategies in curricular activities there is a need to clarify what EE is and what its role is at the different levels of education.

Recent research activities concerning entrepreneurship education have mostly focused on the following topics:

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- equipping individuals with the necessary skills, knowledge and attitudes to enable them to take responsibility for their own learning, career and life;
- promoting awareness of and alertness to the outside world, the economy and opportunities in general;
- encouraging and supporting entrepreneurial and enterprising behaviour and hence innovation.

According to Hytti[3], EE can be investigated with reference to three different goals: learning to understand entrepreneurship, learning to become entrepreneurial and learning to become an entrepreneur. From this point of view, EE is both a method of learning and a subject of learning [4].

In the context of secondary school, entrepreneurship education aims to help young students develop skills and knowledge that are crucial for the development of a more general entrepreneurial mindset.

Different authors [4][5] highlight the fact that the development of an entrepreneurial mindset requires methodological approaches that promote experiential learning. Kolb [6] defines learning as *"the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience"*.

According to the Experiential Learning Theory (ELT) [6], serious games could be a useful tool for building a learning space in which learners could test experiential learning paths. In fact, serious and simulation games have had a significant effect on classroom education as well as on training programmes [7], increasing the learner's motivation [8], and enabling him to embark on engaging and challenging learning paths.

Moreover, the use of serious games is often integrated into blended educational models, thus creating an opportunity for teachers to exploit their potential in specific parts of traditional learning paths.

The article describes a blended model based on the use of a serious game to develop entrepreneurial knowledge and skills in young students. Both the model and the game were defined and developed within the framework of an EU-funded project. The project "I can ... I cannot ... I go!" Rev. 2 (PNPV project)[9][10] aims to introduce and foster an entrepreneurial mentality among young people with particular focus on small businesses, cooperatives and social businesses.

The following sections describe the PNPV project, the training model, the serious game and the tools available to teachers for monitoring and guiding students.

## 2. The PNPV Learning Model

The PNPV project aims to create a training model for the acquisition of knowledge and entrepreneurial skills, by promoting active collaboration between businesses, education and vocational training providers.

On the assumption that games and simulated environments make learning experiences more effective [11], the proposed training model combines:

- classroom activities centred on a serious game, focusing on the development of those soft skills that are essential for the formation of an "entrepreneurial mindset"
- online learning activities, allowing students to explore the business concepts presented during the classroom activities.

The students are engaged in an educational path, which lasts about 2 months and consists of 8 two hour meetings which take place once a week. In the week between two consecutive meetings, the students have the opportunity to examine in depth the entrepreneurial concepts introduced in the classroom by accessing educational resources through a learning management system.

In order to create a path with incremental difficulty, the number and complexity of the entrepreneurial concepts and the linked game activities increase during the learning process.

The purpose of the game is to manage all aspects of a tourist resort in order to meet market needs. The market is segmented into five standard types of customers with different behaviors and preferences: VIPs, Professionals, Young families, Middle class families and Working class families. The market segmentation was made in order to force the students to explicitly declare the target and thus evaluate all the decisions made in relation to this group of customers.

One of the aims of the learning model is to encourage competitive dynamics among students, developing team work and leadership skills. The research carried out by Mulvey and Ribbens [12] shows that intergroup competition significantly increases group efficacy and group productivity, while it decreases group inefficacy. Although

collaborative learning, also known as "learning teams", hides many pitfalls such as: overdependence on a leader, a tendency to make risky or overly conservative decisions, and social loafing. A. Kayes et al [13] show that these issues can be resolved if the group focuses on learning from experience.

Accordingly, in the serious game students are arranged into groups who compete in a single market. The game promotes intergroup competition and focuses on learning, through the so-called "Experiential Learning in teams" [13].

The research carried out by Wolfe [14], Halstead [15] and Sandmire [16], emphasizes that the choice of appropriate team members is of fundamental importance. An optimal team is made up of 4 to 6 members with a heterogeneous basic learning style.

Kolb [17] suggests that there are 4 basic learning styles: Diverging, Accommodating, Assimilating and Converging. The diverging style's dominant abilities are Concrete Experience (CE) and Reflective Observation (RO), the assimilating dominant abilities are Abstract Conceptualization (AC) and RO, the converging dominant abilities are AC and Active Experimentation (AE) while the accommodating dominant abilities are CE and AE [6]. The relationship between the abilities and the learning model developed will be described in the next section.

### 3. Experiential Learning Theory (ETL) and the PNPV training model

The PNPV training model was designed in order to activate a learning cycle where *"the learner 'touches all the bases' - experiencing, reflecting, thinking, and acting - in a recursive process that is responsive to the learning situation and what is being learned"* [17].

The game activities are performed during the meetings in the classroom. The following figure shows the general scheme of each meeting.

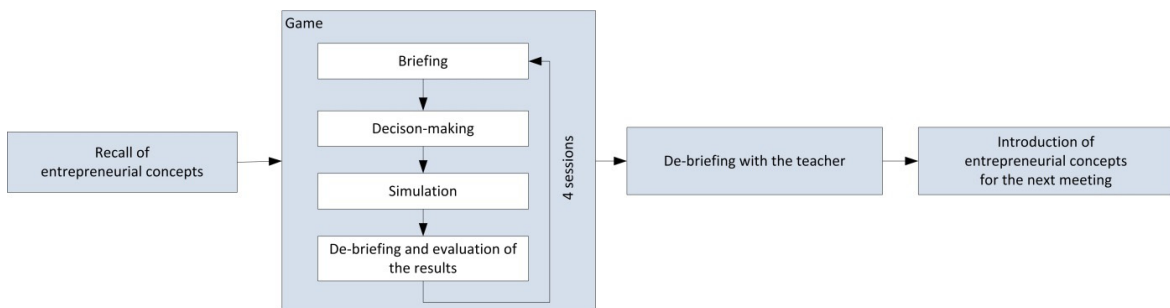


Fig. 1. Scheme of classroom activities

At the beginning of the meeting, the teacher briefly revises the entrepreneurial concepts that the students have been studying during the curricula activities and have examined in depth by accessing the learning resources available in the learning management system.

The game phase consists of 4 play sessions; each session simulates a virtual period of three months for a total of one virtual year.

In each session the team is engaged in the following activities: briefing, decision making, simulation and analysis of the game results. Repetition of these phases is necessary to create *"a conversational space where members can reflect on and talk about their experience together."* [18].

In fact, each group has to translate their knowledge into appropriate game decisions in order to test and improve their ability to represent reality, to plan and implement strategies. The briefing and decision-making activities allow learners to activate the Active Experimentation (AE) mode of ELT while the market simulation allows students to cope with a Concrete Experience (CE). Learners are also engaged in the abstract conceptualization (AC) of the simulated market as well as in transforming experience into new strategies through reflective observation (RO).

In order to support students in the decision-making process various tools have been included in the game. In fact, the learners can access different sources of information (e.g. market research, diagrams and reports) in order to analyse their village status, the market structure, consumer behaviours and also the status of competing villages. Moreover, the students are helped by an NPC (Non-Playing Character) whose purpose is to explain the rules of the

game, to introduce the levels and to provide information and suggestions. The NPC character, represented graphically as a comic figure to attract the attention of young students, also plays the role of informer, giving an overview of the budget available and providing information about the support instruments of the game such as in depth explanation tables and quizzes on additional fund raising. He also focuses the students' attention on specific problems concerning the market and resort management.

At the end of the play session each group has the chance to analyse the results of the whole virtual year. The students have at their disposal a summary report of their game produced by the system and downloadable from the platform. The students still have to draw up a “record of their meeting” including an analysis of their results, and a summary of the strategy to be followed in successive game sessions. At this stage the teacher is actively involved in the class analysis of the results obtained by each group of players. For example, the teacher can use different tools to evaluate the decisions taken by each group, such as the Business Intelligence tool and the Bayesian Network [19].

Finally, the teacher makes a brief presentation of the topics that will be the focus of the next meeting and provides access to relevant learning resources.

## Conclusion

As stated in [20] “Given the wide range of skills, knowledge and attitudes addressed by entrepreneurship education, it follows that entrepreneurship education needs to be embedded in a coherent and comprehensive manner in the national curricula”. For this reason, the proposed model is an attempt to foster entrepreneurial transversal skills through a blended approach based on a serious game; the model will be integrated into curricular activities and validated in an experimental phase to be carried out in several schools in Italy, Finland, Spain and Slovenia with a target of about 200 students aged between 17 and 20 years old.

The serious game described in the paper allows students to progress from a simple scenario to a more complex one with a step by step approach, analysing the main concepts of company management, taking decisions to improve competitiveness and results and to promote experiential learning (Kolb et al, 2000).

Finally, when playing the game, students are guided efficiently and effectively in the management of their virtual companies, receiving the necessary information by means of different sources as the market research, the diagrams and reports and the educational resources. In this way, students can enjoy the game and at the same time study topics in depth to improve their educational results and game scores.

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