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# VALUQUEST A ROLE PLAYING GAME FOR SKILLS ASSESSMENT

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## **VALUQuest a Role Playing Game for Skills Assessment**

### **Synopsis:**

ValuQuest is a class Role Playing Game for skills assessment. The game meant as a teaching tool is a situations-learning mode that require the student to mobilize its resources to find solutions, in which the problematic nature of proposed tasks require to be connected to their significance. The use of educational game is the custody of a task performance related to different fields of knowledge.

# VALUQUEST A ROLE PLAYING GAME FOR SKILLS ASSESSMENT

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This work is Experience Based.

ValuQuest is a class Role Playing Game for skills assessment.

In 1997 the skills has been defined by the Organization for Cooperation and Economic Development (OECD) as "the ability to meet complex demands in a particular context activating psychosocial prerequisites (including cognitive and non-cognitive)". On this perspective "to get a skill not only means to have the resources that form it, but also to be able to properly activate and orchestrate them, at the right time, in a complex situation" [1].

Consequently, "the standardized and regulatory knowledge communications are no longer adequate." Thus acquires a decisive role the prospect of a new humanism to which the whole of humanity, in a globalized dimension, seems to be started. Teachers are encouraged to overcome disciplinary or sectoral barriers and open up with curiosity and confidence to suggestions and stimuli of contemporary culture, learning to work together, forming a professional community linked by the same school educational aims. [2]

Skills are the essential purpose of the whole curriculum; they are a complex construct that consists of knowledge, attitudes, emotions, potential and personal characteristics; they must be the object of observation, documentation and evaluation. [2]

We have chosen Class Interactive Role Playing Games for skills assessment. The educational technology is based on the idea of using language which is closer to pupils to improve the teaching/learning process. The game seems to be a perfect vehicle for education, even more when cooperative, since the acquisition of knowledge and enhancing skills now requires more actual approaches. Use of tablets, smartphones, social networks, etc. is more comprehensible and funny for young people compared to traditional media. We have already realized a role playing computer game called GeoQuest [3] creating at the same time a Role Playing Engine [4] which involves all students to the game through their personal mobiles or tablets giving a total interaction of the whole class to the game. This article is focused on our role playing game experience for the pupils.

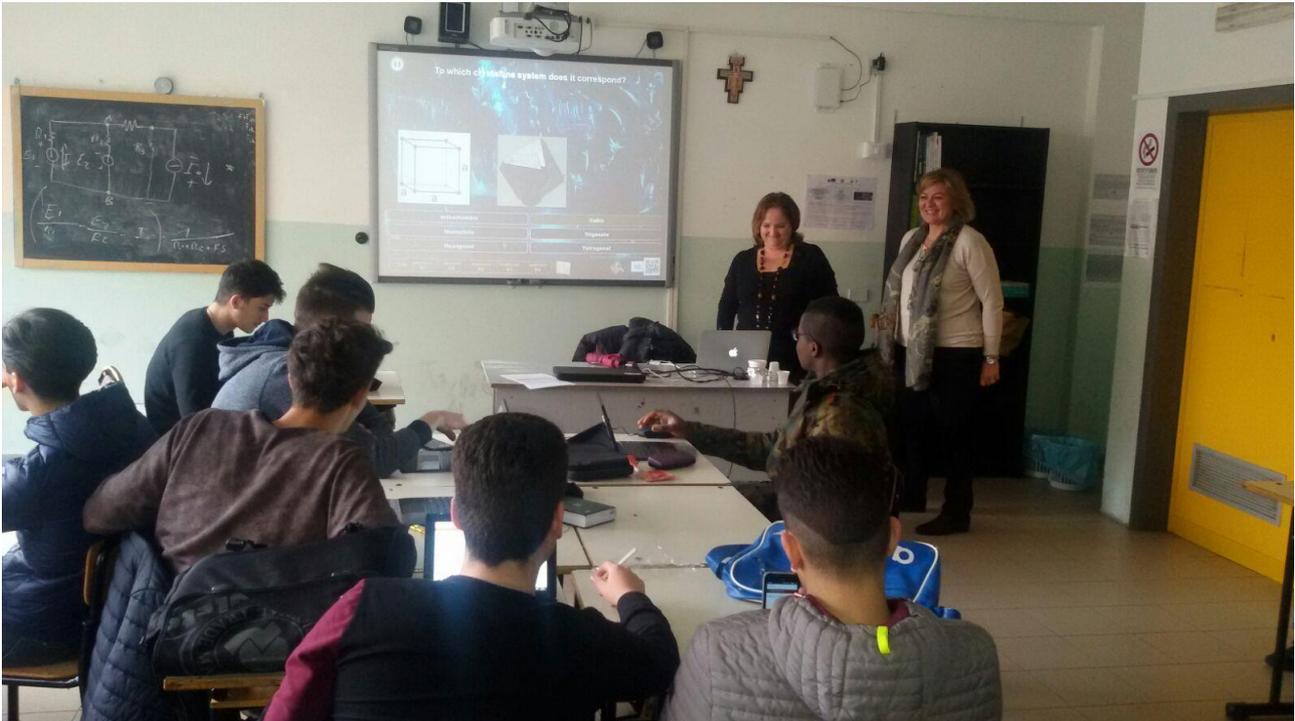
## Introduction

The debate on skills, so relevant today, entered the school when it was necessary to rethink systematically and systemically the relationship between the dimension of knowledge and the one of education.

From learning the basic skills (reading, writing and arithmetic), it moved to the competence, as an expression of the value of socialization and the promotion of valid models for the future citizen, over the family ones. In the era of digitization competence is defined as the "creative and intelligent capabilities of knowledge, to make them the generative source of others" direct to operate in certain situations.

## Skills assessment in primary school

The problem of school in general and specifically of primary school is, therefore, in being able to envisage the most suitable tools for individualizing generative pedagogical opportunities to employ, as well as strategies useful to transfer, but also the possibility of being able to evaluate them in



students.

Considering the various schools of psychology, from behaviorism to cognitivism, we come up to constructivism, for which knowledge does not exist independently from the person. Constructivism considers the complex tasks not only cognitive, characterized by non-linear forms of rationality, and it considers learning as interaction, operation and set of continuously processed performances.

The experience moves according viewpoints, individual history, emotion, personal styles that persist even in the rational stage; therefore, in this perspective the significance of competence assumes a great depth and responsibility for the person and for any practical action whether occasional or deliberately willed.

Guy Le Boterf [5], as part of the definition of the concept of competence, proposes the “experiential cycle” as putting focus on dynamics of commissioning situation, formalization, conceptualization, transfer, contextualization and re-contextualization of personal experience. These variables evolve from two centers of reference:

- One of situations characterized by repetition, simplicity, execution of the order, strictly prescribed steps where competence is limited to the knowing how to do it and to knowing how to play out;
- One of situations characterized by unexpected, innovation, need for quality, complexity, resourcefulness, where you can define *knowing how to act and react*, what to do, when and how, that is the operating way of knowing how to be.”

### **The role of the teacher**

About teaching and education, De Benedetti [6] claims that competence in school is developed as a task dilated over time, so that the students, with their different intelligences and abilities find all the



conditions of learning. This task presupposes a sequential development, from the proposal to the product, the introduction of necessary knowledges, of techniques and materials, the organization of the working set, the definition of product and training results, the selection of the strategies to be adopted and relevant information, the heuristic error handling.

Then the teacher, who as a trainer supports and *model* student's behavior, with examples and suggestions, enables the development of metacognition, provides information as positive *feedback*, facilitates in students the construction process of knowing how to act in the situation, compares learning

ways of the other students.

According to this perspective, the competence may be defined as an operational or behavior pattern, a set of experiences and inference processes which allow to adapt to situations and to the many complicated contexts you may face. Then you realize the competence when knowledge, skills, qualities, culture, emotional resources, formalized cognition intersect and make an operating plan that must be first *thought* and then realized [5] [7].

### **What to evaluate?**

In socio-cultural constructivist context, the learning provides a project proposals made education, efficient laboratories, involving experiences so as to encourage the non-stop restructuring of mind through continuous exploration, experience, reflection; it must be able to promote forms of self-awareness which involve the student constantly renewed capacity to interpret reality. So the strategies of teaching suggested by constructivist education are cognitive/conceptual maps, models network, timelines and procedural structures, stories/biographies cognitive, cooperation moments between the various contributions of disciplines.

In conclusion, it is possible to suggest a complex definition appeared in last researches about education: competence is not only technique dexterity performance and not only abstract knowledge, but it comes out from an agreement of knowledge and actions, personal dynamic factors, efficient-effective forms of control over procedures, over adopted tools, over results achieved.



### **Design an educational path for the evaluation of skills**

From this definition it emerges that: to design a teaching program based on the skills to achieve and to evaluate them, you need to understand two conditions:

a) that skills are the result of paths where students acquire knowledge and skills, but also bring into play as people in their ways to reuse and repurpose those knowledge and skills in a personal way;

b) that assessment of skills springs from qualitative and quantitative sum of surveys and investigations carried out during the training path.

Taking up a psychoanalytic suggestion, some authors have proposed to represent the competence like an iceberg, in order to highlight the duplicity of components in its detection: a visible component, explicit, expressed through observable performance that refer mainly to the property of knowledge and skills possessed from the subject; a latent component, implied, which requires an exploration of inner dimensions related to motivational, volitional, social-emotional processes of the student. Then evaluate the skills means to adopt modalities and tools by which to go *under the surface* and probe the subjective and internal components of the learning process.

### **How to evaluate the skills?**

The traditional docimological instrumentation encounters great difficulty in facing skills assessment-linked challenges: the learning tests, more or less structured, provide useful devices to verify the knowledge and skills possessed by the student.

But Pellerey argues that the recognition of a complex reality requires activation and comparing of several levels of observation, to allow an articulated and multi-perspective reconstruction of the object of analysis. The polymorphic nature of the concept of competence thus provides, in observation aimed at assessing the competence, more dimensions. This perspective of the competence assessment also requires that the rules for construction of the evaluative test are directed to consider reality tasks and complex and meaningful contexts. In fact, the traditional forms of assessment (both through not structured tests than through structured ones):

- tend to be retroactive, ie based on the assessment of what the student has learned, and not proactive, able to guide the student towards the improvement of his own learning;
- are based almost exclusively on extrinsic factors of motivation (score, academic achievement, competition between classmates etc.) than intrinsic factors (interest, pleasure of learning, curiosity, etc.);
- tend to be centered on an *inert knowledge*, not much transferable and applicable to real-life contexts. Consequently, the assessment is poorly predictive of what the student is able to do with what he knows. From that the need to assess the skills no longer based on the reproduction of knowledge, but on active development of knowledge favored by authentic and challenging tasks, oriented to require students to use their knowledge and skills, to elaborate responses to meaningful and real contexts-linked tasks.

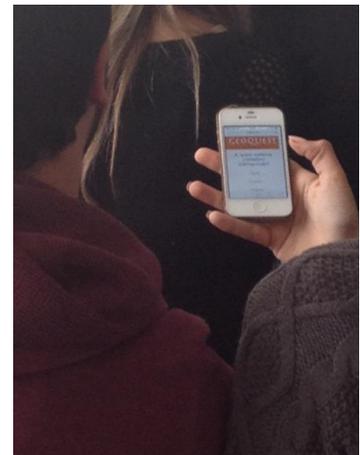
### **Assess skills with educational game**

The educational game mobilizes demanding learning situations for the student, which contain a challenging dimension in relation to his knowledge and experience, and which solicit the activation of his resources and lend themselves to different ways of solution.

This form of learning is based on the definition of a *complex thought*, not purely reproductive or mechanical, where the path of action is not fully specified a priori, since it involves self-regulating processes of thinking.

Through the game you can evaluate:

- content knowledge, ie declarative knowledge at the disposal of the subject on cultural objects that have to be evaluated;
- processes and skills, or procedural knowledge related to both dealt with cultural content, and to more general methods of knowledge processing (reflection, creativity, cooperation with other ones, decision making, etc.);
- provisions or habits of mind, ie the meta-cognitive, motivational and attributional processes that affect the ways in which the subject is placed into the learning experience.



## Computer Class Role Playing Game

Our goal is to create an innovative methodology [8] based on the game, that enhances the interdisciplinarity, the informations retrieving and their decoding, for all levels of school.

In the obligatory school levels, like in the longline learning, the game is an essential element and activity for the development of everybody's personality, especially in the perspective of learning to learn (Key Skills) [9].

Learning to learn is recognized as a meta-skill which evolves with the student and becomes the thread that guides him to a successful assumption of responsibility for its own learning process. The most effective mode of realization of metacognitive teaching, it seems to be the self-regulating approach, in which students are helped in the process of recognition of the skills necessary for learning tasks and they are encouraged for the choice and for the most productive application of appropriate learning strategies. [10]

Computer game means a game that makes use of a computer as the main support and it is played using a keyboard, a mouse or a joystick and a screen. Computerized games are a formidable gym to exercise the "core capacities" involved in cognitive enhancement activities, because reaching the game objectives calls for the simultaneous and coordinated application of a large number of mental processes such as visual attention, processing visus- space, executive function, learning ability and memory, in addition to experiment with their coordinated use in the situation [11].

## Our game features

Students have freely access to materials that they found along the way, including original texts created on purpose, as notes about specific topics. Their consultation is easy and immediate since it's realized as synthetic PowerPoint presentations or PDF files full of icons and pictures. [12]

Texts are spoken by an high quality synthesised computer voice in several different languages, so it is perfect for CLIL compliance.



Sound effects enhance the sensations during the gaming and there are several recited classic texts and original music tracks (diversified communication codes).The students interact with the system using their own smartphones and tablets with a new technology [3] which collects the individual answers. Students can follow their personal score, related to their role in the game, on their devices.

The game can be followed by the whole class with a IWB (Interactive White Board) or a projector. It can be played in a laboratory to accomplish one or more hands-on activities or in a classroom simulating a workshop activity. The path of play can be followed by students with different levels of knowledge and skills using the note book as compensatory measures. The iconographic contributions, the use of different communication codes (visual and auditory) and the structuring of the questions are ideal for a personalized didactic, even in the case of Special Education Needs.

## Conclusions

The game meant as a teaching tool is a situations-learning mode that require the student to mobilize its resources to find solutions, in which the problematic nature of proposed tasks require to be connected to their significance.

The use of educational game is the 'custody of a task performance related to different fields of knowledge, useful to re-read the highlighted characters in relation to:

- ask students to recover their previous knowledge;
- encourage the use of complex cognitive processes (reasoning, transfer, critical thinking, creative thinking);
- be inserted into meaningful and real contexts;
- stimulate students' interest;
- be open to solving different paths;
- challenge students' the ability.

## References

- [1] D.S. Rychen, L.H. Salganik, "Agire le competenze chiave"[Progetto DeSeCo], 2007.
- [2] MIUR, Linee guida per la certificazione delle competenze nel primo ciclo di istruzione, CM n°3, 2015
- [3] Maraffi S., Sacerdoti F.M. "EVO-RPGE an Interactive Role Playing engine", Granada (Spain), ICEILT International Congress on Education, Innovation and Learning Technologies, 2015
- [4] Sacerdoti F.M. et al. "Autonomous system to use web educational contents in a classroom", Patent Pending NA2013A000048
- [5] Guy Le Boterf, "LA PROBLÉMATIQUE ACTUELLE DE L'ÉVALUATION DES COMPÉTENCES", in Éducation Permanente, Supplément EDF-GDF, décembre, 2000.
- [6] De Benedetti M. "Personalizzazione e apprendimento", 1998.
- [7] Pellerey M. "L'approccio per competenze: è un pericolo per l'educazione scolastica?", 2002
- [8] Maraffi S. et al. "GeoQuest, an Interactive Role Playing game", Wien (Austria), EGU European Geosciences Union General Assembly 2015, Poster Session EOS3, 2015.
- [9] Maraffi S., Sacerdoti F.M, Scamardella A., "GeoQuest VESUVIUS a Class Role Playing Game", 2016 Hawaii University International Conferences on Science, Technology & Engineering, Arts, Mathematics and Education (STEAM), Honolulu, Hawaii, USA, 10 - 12 June, 2016.
- [10] <http://www.pavonerisorse.it/meta/gioco/gioco2.htm>
- [11] Greenfield P.M. "Mente e media. Gli effetti della televisione, dei computer e dei videogiochi sui bambini", Armando, 1995
- [12] Maraffi S. & Scamardella A., "GeoQuest Vesuvius an interdisciplinary Role Playing Game", International Conference "New Perspectives in Science Education", Florence, Italy, 2016, <http://conference.pixel-online.net/NPSE/files/npse/ed0005/FP/2534-NTST1624-FP-NPSE5.pdf>, 2016