

# The Big Five Game of Personality: a Digital Role-Playing Game to Assess and Train students on Big Five Theory

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**Abstract.** The university institution has recently been making a great effort to affirm the value of an open education accessible to everyone. An example of this intention is the creation of Massive and Open Online Courses (MOOC) provided for a wide audience. In the learning process with MOOCs, learning becomes a dynamic process, within which it is possible to train both declarative and procedural components.

This work is aimed to analyze the use of technology in the learning process. Within a syllabus dedicated to students containing a large number of theoretical lessons, a game concerning one of the lessons of the syllabus (the Big Five Model) was created to test what is learned through the courses. The Big Five Game of Personality has the structure of a role-playing game. The user has to help a recruiter to interview some applicants by asking question appropriately to the dimension of personality. Also, on the basis of the applicant's answers, the user has to evaluate the level of each dimension. The game experience is accompanied by a Tutor who introduces the next steps.

This article shows the specific structure of the game, opening up a space for the potential use of technology in the academic field.

**Keywords:** Open Education, MOOC, Role playing Game, Tutoring Systems, Training, Big Five, Students' skills

## 1 Introduction

This paper introduces a software, available online and for any Android devices, aimed at training and enhance university students' skills and knowledge.

A detailed explanation of the software and of the user's experience will follow in the next paragraphs.

## 1.1 Academic Education and MOOCs

The university institution went from an academic offer reserved for small groups to one intended for a wider audience in order to train updated professionals operating in the current knowledge society. A consequence of this change has been the great effort made to affirm the institutional identity, with the enhancement of suitable didactic models, a wider participation of students and a greater attention to the community as well as to the current market of work.

Open Education represents a reality characterized by political, institutional, pedagogical and philosophical purposes aimed to greater access to education. The concept of "openness" comes from an idea according to which university education must be seen as a part of the global project of continuous education for all and must help integrate all the other levels and forms of education into this project [17].

The phenomenon of MOOC (Massive Open Online Courses) is so described considering the broader contexts of the Open Education, online learning and the currently changes in academic education's domain in a time of globalization and limited economic resources [19]. MOOCs are open courses that can be described as a form of distance learning [2]. The contents are available online by digital platforms through video lessons and written submissions. MOOC courses are often provided by universities, but designed for a large and heterogeneous user audience. At the basis of this type of learning there is the idea according to which knowledge is not a static and individual skill but comes to life through relationships between people and information nodes: learning takes place thanks to the interactions that connect networks of people and resources [15]. In learning processes with MOOCs, metacognition, planning and self-regulation are central skills: students, through MOOCs, can explore knowledge with virtual laboratories and live experiences in shared communication spaces [5].

Based on that, learning is a complex process within which both the theoretical/declarative and experiential/procedural components contribute. Then, the declaratory learning (supported by lessons and didactical materials with a linguistic approach), should harmonize with a procedural learning that refers to experience and laboratorial activities.

In this work, procedural learning is explored through the use of technologies and digital devices. This contribution attempts to explore the potential of using technology associated with MOOCs. Within a syllabus dedicated to students containing a large number of lessons, the project covered the topic related to the Big-Five Model. It represents a shared frame of reference for the evaluation of the personality. It was conceived by Tupes and Christal in 1961 [16], and developed only over the years 80/90 by various authors [6,8,10,12]. The Big-Five Questionnaire [4] is a scientifically based classification and description system. As the name implies, the model identifies five fundamental dimensions for the description and assessment of personality: Extroversion, Agreeableness, Conscientiousness, Neuroticism and Open.

## 2 Big Five Game

The Big Five Game of Personality has the structure of a role-playing game where students can test and train their knowledge about the Big Five Theory through a scenario that simulates reality, in order to improve their skills and competences for both academic and working aims.

It is widely recognized that role playing is a powerful training tool, as it allows to obtain positive results in both training and learning practices, facilitating knowledge and promoting personal skills [14,16].

The concept of "role playing", introduced by Moreno in 1946 [13], describes activities in which two or more people play a part in a hypothetical situation [3] and are involved in an imaginative-creative process to try to solve it [1].

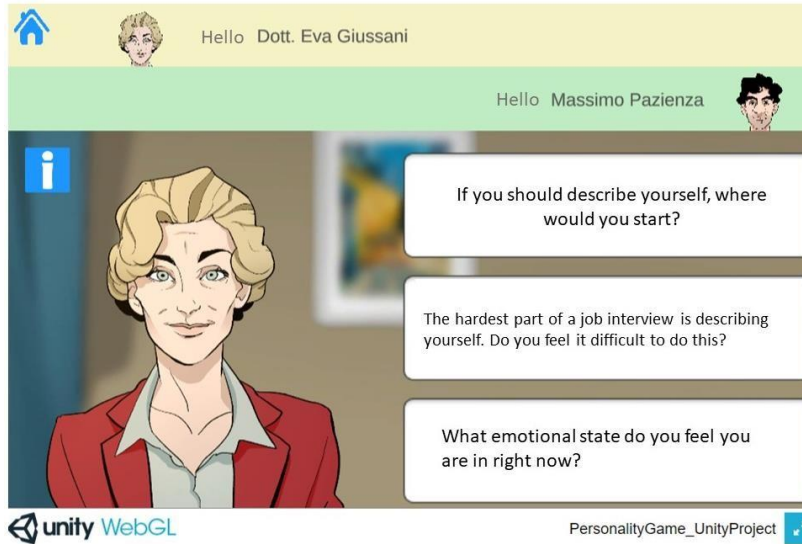
In recent years the development of new technologies applied to artificial intelligence have contributed to the use of role-playing in digital contexts. Role-playing games, applied to e-learning environments, allow the user to live an interactive experience [20], but also a reflective one [21]. For this reason, these simulation training systems based on digital role play are increasingly adopted tools, especially for the development of transversal skills [7].

The environment in which the game is set is an HR-Recruitment office. Here, the user has to help the recruiter of a multi-national society to interview some applicants for a job position. User's work and aim is introduced by a Tutor that follows the user step-by-step, giving feedbacks to orientate his choices all the interviews long.

The homepage offers the possibility to take a look to the five dimensions of the Big Five Theory before starting the game by clicking the info button: here, the Tutor explains each dimension according to the student's choice.

When the Game starts the Tutor introduces himself, the recruiter and the aim of the interview. In the following step the user can choose which applicant he wants to interview. Applicants and their features are showed by labels. Once the applicant is chosen, the Tutor suggests the recruiter which dimension of personality he have to focus on.

The user has to complete four interactions choosing, among three questions to do to the applicant, the most representative of the interview's construct object (*Figure 1*).



**Figure 1.** The figure shows the alternatives among which the user has to choose appropriately, according to the construct considered (in this case the dimension was Extroversion).

Each question is followed by an answer of the applicant according to his personality features (*Figure 2*).



**Figure 2.** The figure shows the question chosen by the user previously and the answer of the applicant, according to his personality features (in this case the dimension was Extroversion).

For the selection of the questions asked by the avatar controlled by the user to the bot, the authors used the International Personality Item Pool (IPIP) [10] which is public-domain personality measures translated from English into more than 25 other languages [11]. The authors used a table<sup>1</sup> developed using IPIP items and their associated trait labels. In this table, there is a relation between a statement, the IPIP item, and the construct using Cronbach alpha reliability coefficient of scale on which the item is scored. We selected the statements for each personality trait, and we generated the script of both avatars. The statements that correlate positively with a trait were used for the correct questions and answers and the statements that correlate negatively were used for the incorrect questions. We added neutral questions with sentences that are external to this framework. After the generation of the script, we performed an expert review with for a speech harmonization.

At the end of the interactions of each dimension, the Tutor provides feedbacks about user's questions to evaluate their accuracy, giving the user the opportunity to think about his answers (*Figure 3*). Then the Tutor asks the user to evaluate the level of the personality dimension of the applicant formulating another feedback according to the evaluation before introducing the next dimension. The interaction's structure is the same for each personality dimension and for each applicant interviewed.

At the end of the interview of each applicant the Tutor asks the user to give a general description of the interviewed applicant's personality and gives a feedback on the user's answer. Then the game restarts and the user has the possibility to choose another applicant. This screen also allows the user to take a look at the statistics, by clicking on the stats button.

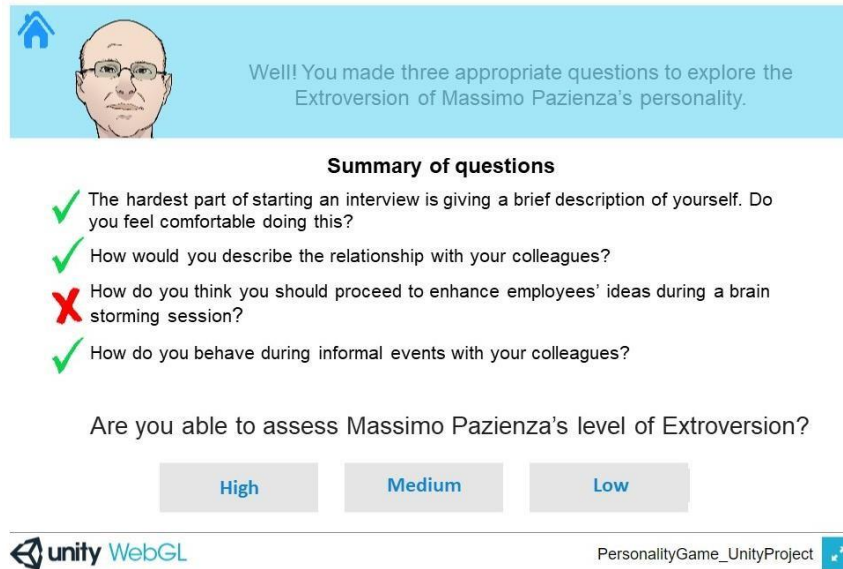
The game is playable online from any device<sup>2</sup> and it is downloadable as an App on Android devices too<sup>3</sup>.

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<sup>1</sup> <https://ipip.ori.org/TedoneItemAssignmentTable.xlsx>

<sup>2</sup> <https://ssg-static.quing.biz/PersonalityGame/>

<sup>3</sup> <https://play.google.com/store/apps/details?id=it.smarted.b5g>



**Figure 3.** The figure shows the feedback given by the Tutor at the end of the interaction between the recruiter and the applicant.

### 3 Conclusions and future directions

The Big Five Personality Game is a serious game thought to train and improve student's knowledge and skills supporting a theoretical learning with a laboratorial and digital one in order to remark the experiential side of learning. This feature has the asset to bring the user in the taking of consciousness of his capabilities and skills. This is also possible thanks to a tutoring system that make knowledge an always flexible and dynamic process.

This paper shows the structure of the game and focuses on its potential application in the academic field. One of the main future directions is to conduct empirical studies to test the validity and reliability of the tool in order to explore new learning horizons. At the same time, it would be interesting to analyze students' data by comparing academic results in both conditions of presence and absence of the serious game in a MOOC in order to understand how much the presence of the serious game can influence and potentially improve learning methods.

Finally, it would be highly desirable to extend the field of application of the game to other contexts and topics of study, so as to obtain further data to study and analyze the strengths and weaknesses of the game.

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<sup>4</sup> <https://www.federica.eu/>

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