Adapting LEGO® SERIOUS PLAY® methodology in Higher Education

Ahmed Alzaghoul[1*], Edmundo Tovar [2.]

1: LSIIS
E.T.S. DE INGENIEROS INFORMÁTICOS
Universidad Politécnica de Madrid.
Madrid-Spain
a.alzaghoul@alumnos.upm.es

2: LSIIS
E.T.S. DE INGENIEROS INFORMÁTICOS
Universidad Politécnica de Madrid
Madrid-Spain
etovar@fi.upm.es

Resumen — *The huge amount of knowledge sharing in the process of education is increasing day by day. The typical normal methods of teaching courses remain the same even of the variety of techniques that are been used. This paper presents an attempt to find new learning methods, with the objective of improving the process of learning by measuring the changes in the behaviour of learner. The approach is to apply the LEGO® SERIOUS PLAY® methodology to a designed online task to enhance the quality of learning process which can lead us to capture some quality attributes by studying the behaviour of different learners while performing the task. This involves using techniques rooted in LEGO® SERIOUS PLAY® as exploratory tools for supporting student learning and change his behavior toward solving the task.*

Keywords— LEGO® SERIOUS PLAY®; Open Educational Resources; Kirkpatrick Model; Quality Model

1- INTRODUCTION

The purpose of the paper is to report and explain the method of implementation a quality model by following set of activities, then reporting some results of the performed experiment on tracking the changing in learner behavior while taking an online visual task and performing the actual experience of adaptation LEGO® SERIOUS PLAY® methodology on an Open Educational Resource course. As this work is a part of a Ph.D. thesis and its current status. During this work, the evaluation method is based on the combination of a case study of applying LEGO® SERIOUS PLAY® on Higher Education and the experiment of adaptation of LEGO® SERIOUS PLAY® methodology on an Open Educational Resource course. The experiment was designed in order to enhance the quality of learning process that leads us to capture some quality attributes by studying the behaviour of different learners while performing the task by following a set of activities: (1) The use of LEGO® SERIOUS PLAY® methodology in Higher Education (2) Adapting Kirkpatrick Model behavioral level's requirements to LEGO® SERIOUS PLAY® methodology (3) Adapting LEGO® SERIOUS PLAY® methodology to OER. We are interested in capturing some quality attributes that are the overall factors that can affect the behavior of the learner which can be derived from the learner behavior while taking a task.

2- METHODOLOGY

Once the new model that is based on Kirkpatrick Model behavior's level is defined with all its categories and indicators that will be measured and analyzed during the experiment phase, we will define a followed methodology to capture the quality attributes and obtain the evidence associated with each phase of the experiment to collect the indicators for the quality model definition. From all the collected data, objective and

subjective, we are compiling a database to be analyzed for the different categories of our proposed quality model. Later on, we represented this situation graphically in which the case study is found using workflow diagrams. After obtaining the data, we can analyze the obtained results by identifying those categories of the model to improve. Finally, the model will be tested to prove our objective to enhance the process of learning.

3- OBJECTIVES

The purpose of this project is to increase the level of quality of teaching through new techniques based on gamification strategy so that the student acquires the expected learning results regarding technical competencies as well as common transferable skills. In particular, they have the following a set of objectives that will obtain in upcoming phases:

a. Improve the process of learning by measuring the changes in the behavior of learner and increase the quality level of teaching by enhancing the way we deliver the knowledge.

b. Design of a gamification activity in both facets, face-to-face and blended learning, appropriate for students of different engineering disciplines.

c. Identify actions to improve the student's learning process through the measurement and assessment of changes in their behaviour.

d. Development of common transferable skills for the students of different disciplines, such as problem-solving, teamwork, time management, etc.

e. Having an innovative opportunity in the way we represent knowledge and blind learning materials.

f. Capturing some quality attributes by studying the behaviour of different learners while performing the task that will be designed by following the approach to apply LEGO® SERIOUS PLAY® methodology in order to enhance the quality of the learning process.

g. Using techniques rooted in LEGO® SERIOUS PLAY® as exploratory tools for supporting student learning and change his behaviour toward solving the task.

h. The designed task which includes innovative teaching strategies such as gamification methodology as an application of learning by visual material offers a facilitated problem-solving process, team working, time management, in which learners are led through a series of questions, explore deeper into understanding the subject.

i. Regarding the pedagogical approach. This experiment will elaborate some materials that will be used to describe this project such as learning techniques, Web learning tools, different OERs, set of reports, educational resources, and a methodology to follow in order to define a quality model.

j. This quality model can be applied to any educational material and increase its quality. Those learning products will be used in order to enhance the learning process and educational material in different OERs.

4- CONTRIBUTION

The main contribution of this work is to enhance the process of learning and offer a better facility of knowledge delivery. The essence of this method is a facilitated problem-solving process, team working, time management, and the use of gamification in education in which learners are led through a series of questions, explore deeper into the subject. As Open Educational Resources gives us the ability to change and modify its different course to create and satisfy students need. This how the builder owns the model [1]. It is a tool for building results. The use of LEGO® bricks simply enables you to take a speedy shortcut to the core and will be used for building metaphors. LEGO® SERIOUS PLAY® can help to enhance the innovation as it can help to enhance the quality of learning. This methodology is effective when there is more than one possible right answer, and when the OER creator wants to blind all available knowledge [2]. Focuses on the learner in order not only to find the best possible solution but also to enhance the way they receive and learn this knowledge, group discussion, knowledge sharing, problem-solving and decision making. This Method is a technique which improves group problem solving by utilizing visual solution, auditory and building skills [3].

5- The Approach of Applying LEGO® SERIOUS PLAY® Methodology to an OER COURSE and to achieve this approach, we have to follow a set of activities:

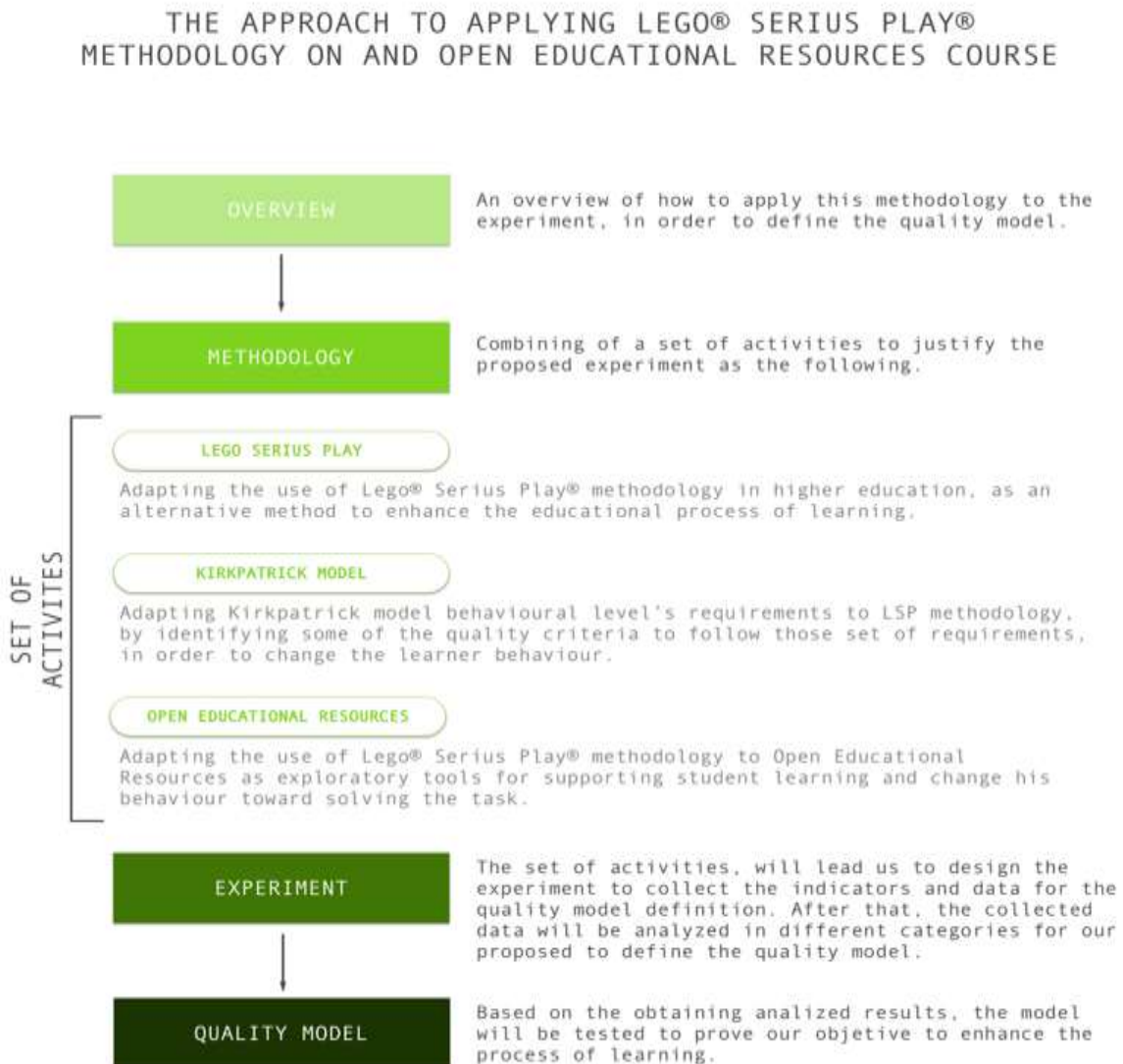The methodology guideline is explaining in the following as shown in figure (1)

THE APPROACH TO APPLYING LEGO® SERIUS PLAY®
METHODOLOGY ON AND OPEN EDUCATIONAL RESOURCES COURSE

OVERVIEW
An overview of how to apply this methodology to the experiment, in order to define the quality model.

METHODOLOGY
Combining of a set of activities to justify the proposed experiment as the following.

SET OF ACTIVITES

LEGO SERIUS PLAY
Adapting the use of Lego® Serius Play® methodology in higher education, as an alternative method to enhance the educational process of learning.

KIRKPATRICK MODEL
Adapting Kirkpatrick model behavioural level's requirements to LSP methodology, by identifying some of the quality criteria to follow those set of requirements, in order to change the learner behaviour.

OPEN EDUCATIONAL RESOURCES
Adapting the use of Lego® Serius Play® methodology to Open Educational Resources as exploratory tools for supporting student learning and change his behaviour toward solving the task.

EXPERIMENT
The set of activities, will lead us to design the experiment to collect the indicators and data for the quality model definition. After that, the collected data will be analyzed in different categories for our proposed to define the quality model.

QUALITY MODEL
Based on the obtaining analized results, the model will be tested to prove our objetive to enhance the process of learning.

Fig. 1. Example of the methodology to be applied.

As we can see, this methodology is combined with a set of four entities as the following:

a. The overview is to explain the steps to follow in ordered to adapted this methodology to the experiment. That will define the quality model.
b. The second entity is consisting of three sub-entities. This is how a gamification strategy was designed based on the combination of case studies of the application of techniques as the first one to describe the use of LEGO® SERIOUS PLAY® in Higher education. Second, adapting Kirkpatrick Model behaviour's level to LEGO® SERIOUS PLAY® methodology by adapting its requirements to the designed gamification strategy. The third, step to follow is to adapt LEGO® SERIOUS PLAY® to the development and use of Open Educational Resources. This produces

to the preparation of materials that support the performance of the gamification experiment as part of blended learning.

c. In order to design the experiment, applying those three sub-entities help us to achieve one of the main goals for the design methodology of experiments under the premises of the described innovation and analysis to collect data.

d. The improvement of the quality is reflected on the improvement of the academic fees that are used by the information of follow-up of subjects of this experiment, as part of creating the online task, it is intended to have better success rates, performance and absenteeism compared to previous years. The change of behaviour in students, with innovative materials and resources, the dynamics of games and the reference of what factors influence the quality of the process will result in obtaining better academic rates. This will lead us to define our proposed quality model as the last step to perform in our methodology.

6- CURRENT AND EXPECTED CONTRIBUTION

The improvement of teaching quality is reflected in the improvement of the student behaviours, that is to have better success rates, performance and behaviour compared to previous teaching methods. The change of the student behaviour, with innovative materials and resources, the dynamics of games, and the reference of what factors influence the quality of the process will result in obtaining better academic rates and results. The current contrition has led us to the developing of a methodology for the design experiments under the premises of the described innovation and analysis of collected data. In the near future, and out the experiment results and data analyses, we are aiming to define the quality model for the student learning process that suits the designed gamification strategy. We are also conceding a validation phase of this approach in order the make this model solid.

7- REFERENCES

[1] Educause. *"7 things you should know about open educational resources". EDUCAUSE Learning Initiative, Creative Commons Attribution-NonCommercial-NoDerivs* 3.0 Unported (CC BY-NC-ND 3.0), (2010).

[2] *"The Science of LEGO® SERIOUS PLAY™"* (06- July- 2017) *- executive discovery LLC.* www.seriousplay.com

[3] Alex Koohang, Liz Riiey, and Terry Smith, *"E-Learning and Constructivism: From Theory to Application", Interdisciplinary Journal of E-Learning and Learning Objects*, Vol. 5, pp 91-109. (2009)

[4] The Richard Caladine University of Wollongong, Australia, *"Enhancing E-Learning with Media-Rich Content and Interactions"* pp 101, 138. (2008)

[5] Kozinska, K.; Kursun, E.; Wilson, T.; McAndrew, P.; Scanlon, E. and Jones, A. *"Are open educational resources the future of e-learning?" In: 3rd International Future-Learning Conference: Innovations in Learning for the Future*, 10-14 May 2010, Istanbul, Turkey. (2010).

[6] Virginio Cantoni, Massimo Cellario, Marco Porta. *"Perspectives and challenges in e-learning: towards natural interaction paradigms", Dipartimento di Informatica e Sistemistica, Università di Pavia, Via A. Ferrata,* 1, 27100, Pavia, Italy, received 16 March 2003, Revised 16 September 2003, Accepted 16 October 2003, Available, online 7 June (2004).

[7] Marta Peris-Ortiz, Fernando J. Garrigós-Simón Ignacio Gil Pechuán, *"A Proposal for Using Lego Serious Play in Education Article" · DOI: 10.1007/978-3-319-04825-3_10. ISBN 978-3-319-04824-6. Springer Cham Heidelberg New York Dordrecht London Library of Congress Control Number*: 2014934152. (February 2014).

[8] Alison James, *"Journal of Learning Development in Higher Education" ISSN: 1759-667X Issue 6: Lego Serious Play: a three-dimensional approach to learning development.* London College of Fashion, UK. (November 2013).

[9] The LEGO Group. (06- June- 2017) www.seriousplay.com, LEGO SERIOUS PLAY OpenSource.

[10] Kirkpatrick's learning and training evaluation theory: (03- Nov- 2017) http://www.businessballs.com/kirkpatricklearningevaluationmodel.htm

[11] Kaufman, R., Keller, J., and Watkins, R., *"What works and what doesn't: Evaluation beyond Kirkpatrick". Nonprofit Management Leadership*, 35: 8–12. doi: 10.1002/pfi.4170350204. (1996).

[12] Rillo, Kristiansen, (03- Nov- 2017). *"Serious Play Starter Kit Detailed Contents -Serious Play Pro2. [Online].* Available: http://seriousplaypro.com/2014/10/17/serious-play-starter-kit-detailed-contents/.