

Collaborative Learning Using Escape Designs and Pedagogies. A Needs Analysis Protocol

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Abstract. Considerable attention nowadays has been given to collaborative learning as a powerful way of learning, however, the ability to provide student-centered learning, meet student needs and provide them with the opportunity to learn, is a challenging task and has received significant research attention. CLUEDUP proposes an innovative educational protocol that integrates game-based learning with pedagogical approaches that matches students' needs and skills and promotes collaborative interactive and decision-based learning.

Keywords. Collaborative interactive learning, Escape Rooms, Gamification

1. Introduction

COVID-19 and the associated social distance measures have created an unprecedented challenge to medical and healthcare education worldwide. However, this educational crisis provided an opportunity to reformulate current practices, reassess their effectiveness and introduce innovative educational protocols. Despite increasing scientific interest in explaining how gamification supports learning and behavior change, there is still a lack of an integrated framework that could guide and facilitate the online learning process while taking into consideration student needs, skills and capacities.

The value of a Medical Escape Room, using game-based training to enhance engagement, and to create experiential learning opportunities which mimic the challenges faced by professionals in practice has received empirical support. Studies indicate the game-based learning are consistently accompanied by positive behavioral outcomes in education such as increased engagement and participation [1], social collaboration and teamwork [2] as well as cognitive learning outcomes such as increased critical thinking, reasoning, pattern recognition, creativity and application of knowledge and coping with time pressure (see for systematic review [3]).

Despite the overall effectiveness of EscRr (Escape Rooms) there is not "one fit for all approach" that is for every learning objective and students' profile different set of matching goals, and Combined Learning Activities (CLAs) should be considered to meet

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the underlying requirements. This has theoretical support, since behavior changes occur in distinct phases (transtheoretical model [4]) where in each phase diverse psychological processes take place that must be supported to lead to the subsequent stage. Likewise, diverse theoretical foundations support that despite individual differences and abilities, students share similar needs for competence (Self-determination theory [5]). Finally, the importance of scaffolding that is adjusting and structuring tasks to the learner's abilities to support successful learning has been emphasized by the most influential developmental theories (individual constructivism [6]) sociocultural theory of cognitive development [7]. A meta-analytic review conducted by Wouters and van Oostendorp [8] showed that additional instructional support or scaffolding significantly increases learning success in game-based learning. In other words, matching game challenges and mechanics with students' current skills level and adjusting game challenges through knowledge maps [9] and machine learning algorithms [10] is an effective strategy to strengthen students' skills, foster engagement and expand learning. Van Leeuwen and Janssen [11] present an "intrinsic integration" theory that states the importance of game goals and learning goals and analyses the implication of this for the relation between game mechanics and pedagogical approaches (see Figure. 1). The aim of this paper is to present the approach for the development of an educational protocol for the gamification of learning activities in the healthcare sector.

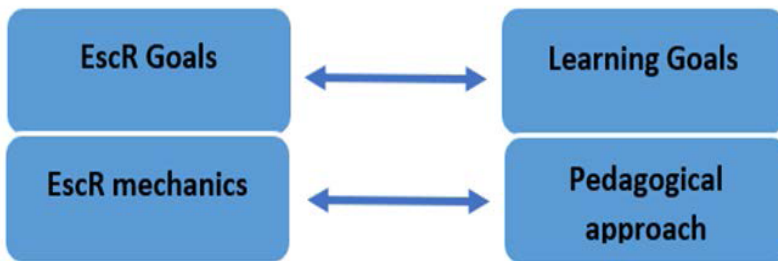


Figure 1. A modified version of the adopted design framework on alignment between the EscR goals, learning goals, pedagogical approach and EscR mechanics proposed by Van der Linden and Janssen.

2. Methods and Rationale

The CLUEDUP project³ proposes an innovative educational protocol that integrates game-based learning with pedagogical approaches that matches medical students' needs and skills and promotes collaborative, interactive and decision-based learning. This is in line with the paradigm shift in educational practices, to move away from strict memorization of didactic materials and passive learning and move towards the principles of active learning with an emphasis on collaborative, interactive learning. In that context this work presents the methodological protocol for exploring the needs, cataloguing curricular realities and identify pedagogical paradigms that support the development of innovative and impactful CLAs in the healthcare sector.

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Phase 1: *Pre-intervention phase Research & Reporting* utilizes a sequential mixed method design: stakeholder analysis through semi-structural interviews (qualitative) and administration of a set of questionnaires (quantitative). Data obtained from the semi-structured interviews with around 50 relevant stakeholders and program managers will provide a thorough understanding of their capacities, resources and training needs. Stakeholders were selected based on their key expertise and experience on CLAs. The analysis of stakeholders' needs regarding online collaborative learning, opinions on engagement levels, technological sophistication and the reality of embedded Escape room features will provide basis for expert consensus building process.

Phase 2: *Expert Consensus* builds an iterative process through which experts from partner institutions will propose specific themes / virtual scenarios which can be applicable in multiple curricula of their institutions and design a Combined Learning Activity (CLA) integrating pedagogical approach (PBL, TBL and Flipped classroom) with an Escape Room scenario. Data obtained from the surveys with relevant stakeholders will provide the basis for the consensus building process by creating a "map" of the training needs and will be available as a "blueprint" document for referencing when creating new CLAs.

The whole process was ethically approved by the Ethics Committee of the Aristotle University of Thessaloniki (Greece), no. of vote 25277/2022, chairperson: Dimitrios Stamovlasis.

3. Results: A protocol for mapping Combined Learning Activities (CLAs) to healthcare education realities

The proposed methodological protocol follows a straightforward sequential process from needs assessment, curriculum inventory, adoption of proposed pedagogical frameworks from the addressed institutions, as well as the mapping of teaching and learning objectives and evaluation of virtual scenario. CLUEDUP focuses on the development of innovative Combined Learning Activities templates by integrating contemporary pedagogical approaches such as PBL, TBL, and Flipped Classroom, that conceptualize learning as an interactive collaborative process, with the effective utilization of Escape Room elements.

3.1 Implementation details

Stakeholder mapping

This step involves the identification of the target group that will be consulted. The stakeholder selection criteria will be: a) Policy makers, educators and healthcare professionals who formulate and implement online learning; b) Gamification experts, technologists and creative industries veterans who routinely participate in the construction of the EscRs; c) Healthcare learners in their dual role, both as core targets of the CLAs and as core participants in EscR activities as part of their leisure activities.

Consultation Strategy

Based on the above protocol design and the specifics of the stakeholder mapping, the process of consultations with the stakeholders will gather evidence, information, data and knowledge to:

- Identify existing trends of online collaborative learning and outline current deficits in the partner programs of collaborative learning and online contexts.
- Outline and explore key features of EscR and online collaborative learning (OCL) that align well together, testing different EscR features
- Apply this framework by populating it with options and suggestions for the diverse themes – scenarios which can form the basis for expert discussions
- Draft – based on the feedback received – an overall final report consisting of the proposed themes – scenarios involving the three different pedagogical approaches TBL, PBL, FC embedded with EscR for each theme – scenario.

Discussion

This work outlined the methodological underpinnings and the plan for a detailed needs analysis regarding the integration of gamification, EscR features in healthcare education. The pedagogical and methodological features presented here will further be refined to fully map to the specific sector of healthcare education, where the CLAs will be deployed.

The goal of this rigorous environment is the widespread adoption of Competence-Based Medical Education and entrustable professional activities, which are verifiable, results-oriented activities that reliably produce a capable and effective healthcare workforce [12]. This level of rigor for curricular integration makes this preparatory work essential, especially in the case of a novel conceptual merger. It is the goal of the CLUEDUP project to configure the final blueprints of the CLA that will be both useful, impactful and at a later point integral to healthcare curricula.

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