# GAMIFICATION? PRACTICES, ADVANTAGES, AND DISADVANTAGES IN TEACHING MEDICAL ENGLISH

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**Abstract:** *This paper explores some questions related to gamification of educational activities with a particular focus on teaching Medical English. The issue of gamification is relatively complex, including mathematical approaches like applications of game theory, but also political and socio-cultural approaches that analyze gamification as the construction of a competitive (or agonic) society. However, despite the interpretations one may use, it is a fact that gamification has become pervasive in contemporary society. This paper gives two examples of game-like activities that were used in teaching Medical English (a Lego-based simulation and a virtual patient type of simulation) and discusses some advantages and disadvantages. The main point is that although gamified activities may contribute to the overall skill development and enjoyment of a Medical English class, they require careful design around very specific objectives and they risk being perceived by students as being mere "fun" due to the inconsequential nature of games in general.*

Keywords: *gamification; Medical English; ESP; medical communication; medical process;*

In the past fifteen years there has been an increase in the number of research papers that deal with gamification in all its applications (Matallaoui et al 4). On the one hand, this is an analytic response to gamification processes that have already been occurring in various social environments. On the other hand, it could be argued that the implementation of gamification in more and more social processes has led to a generalized perception of a gaming society. Simply put, "the integration of game mechanics into a non-gaming environment in order to give it a game-like feel" (Matallaoui et al 5) to enhance enjoyment and engagement has become widespread first as a business tactic and secondly as an educational tool and as a so-called "personal growth" device. Wark uses the term "gamespace" to refer to this society where the game (as praxis) has colonized every other form of social interaction (007-008). Consequently, according to Wark, the game mechanic at play in gamespace/society is competition (*agon*, 009). This is by no means new. Under the guise of democracy and freedom, neoliberal capitalism has been promoting the praxis of competition in all aspects of Western society since the 1980s, including competition between individuals, states, companies, and so

on. Gamification is simply a tool to institutionalize that competition using a system of relatively straightforward rewards and achievements.

In this framework, game theory may be understood either as a utilitarian and primarily mathematical approach applicable to and including subject matters like economics, finance, military science, biology, education, etc. (Barron xvi), or as *gamer theory* (Wark), a social critique of the principle of all-encompassing competition.[1] If "reality is broken," as game designer Jane McGonigal said, and games may help fix it, concepts such as "serious games" and "social reality games" (11) if (and only if) they depart from the established formulae of the entertainment industry. In this paper, I look at forms of implementing gamified activities into teaching Medical English in a way that strips away the competitive aspect of what are now more mainstream forms of gaming, focusing on developing particular language- and communication-related objectives, but also attempting to foster cooperation.

**What is a game?**

According to commonsensical knowledge, down to its core, a game may be simplified as having four components. There should be a goal, an objective, something to fulfill, some sort of finish line. There should be rules that limit how the objective is to be reached, which is to say that a game should pose some sort of challenge. There should be a feedback system in the form of timeframes, achievements, and so on that inform the player of their progress towards the goal. Finally, the participants should engage voluntarily, understand and agree to respect the rules (McGonigal 26). If this is the somewhat traditional description of a game, other definitions provide a few complications. For Goethe, a game is also a model, a paradigm containing the mechanics, processes, rules, and so on, and that is put into practice as a simulation (14-15). The example given by the author to support the claim, Monopoly (Goethe 14), is a good illustration of the simulation aspect of games. In 1903, a lady by the name of Elizabeth Magie filed a patent for Landlord's Game, a board game which she had designed as a teaching aid to help people understand some of the root causes of social inequality (Pilon).[2] Magie developed the game specifically to prove that rentier economy

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[1] "Gamespace wants us to believe we are all nothing but gamers now, competing not against enemies of class or faith or nation but only against other gamers. […] The game might not be a utopia, but it might be the only thing left with which to play against the gamespace" (Wark 024).

[2] Lizzie Magie's board game consisted of two gameplay options, Monopoly, where one was supposed to amass all property, and Prosperity, where winning was achieved by working together as a team. In the 1930s, Charles Darrow started selling Monopoly, the ruthlessly capitalistic version of the game, and thus became a millionaire.

eventually led to an insurmountable social rift between the rich landlords and the poor tenants. In so doing, she created a simulation of social life under the conditions of early 1900s capitalism.

The descriptions above may be considered intrinsic ones. Others have tried to explain games in a negative or perhaps extrinsic manner. Games may also be defined by what they are not. As such, there is a boundary that separates them from whatever it is outside the game (Arlt & Arlt 8). The difference between game and non-game, or between gamespace and non-gamespace, would then be in the meaning of the actions that are performed. This ties in with gamification insofar as actions within gamespace are not perceived as having the same consequences as actions in non-gamespace environments. With gamification (if we accept this line of thought and refuse to criticize it), we are treated to an experience that is separated from real life. However, it is also one that simulates real life in some meaningful yet inconsequential way. It is becoming apparent now that we find ourselves in a bit of a conundrum, especially when we apply gamification to educational activities.

**Gamification in education**

The term "gamification" was apparently coined by computer programmer Nick Pelling around 2002 or 2003 as the application of "game-like accelerated user interface design to make electronic transactions both enjoyable and fast" in things like ATMs or vending machines. In Pelling's terms, gamification was initially all about "making hard things easy" in what user interface and experience was concerned when interacting with industrial and consumer devices. Following this line, Deterding et al proposed the famous definition of gamification as "an informal umbrella term for the use of video game elements in non-gaming systems to improve user experience (UX) and user engagement. In this paper, the authors outlined gamified services in fields such as health, finance, news, and so on implemented systems of rewards using points, badges, levels, or leader boards designed to increase user motivation and engagement (Deterding et al 2426). Werbach defined gamification as "*the process of making activities more game-like*" arguing for the necessity of a deeper design process that goes beyond the mere incentive-based approach of offering points and achievements for the successful completion of some task (267). Finally, Marczewski defines gamification in a similar vein as "*the use of concepts and elements that make games engaging and enjoyable, in other areas of work or life in general*" (12). Marczewski also emphasizes the fact that gamification, while still being a design choice, is not, strictly speaking, game design, noticing the clash between the objectives of user experience development (which is supposed to result in something

enjoyable and simple) and the objectives of games (which are supposed to introduce problems, challenges, and boundaries) (12).[3]

Why gamify educational activities then? There seems to be a certain pervasive idea in academia that gamified experiences of learning strengthen students' motivation, making them more engaged, and eventually leading to better educational outcomes. For instance, Faust carried out some experiments to see how gamified tasks would relate to performance and motivation, albeit not in educational contexts, but in work-related environments, where she found insignificant increases in motivation or performance. However, the author did notice that gamification partially replaces monetary-based incentives (Faust 148), suggesting that the increase in motivation may be unconscious (as opposed to measuring it using a questionnaire).

Elsewhere, gamification of educational activities is hailed as being able to increase motivation and engagement, improve retention of educational contents, trigger behavioral changes, and foster cooperation skills, among other things (Kim et al 5). The authors notice that gamification in educational settings is part of a broader move towards the "experience economy" described by Pine and Gilmore. In short, Pine and Gilmore summarize historical economic development as a move from extraction of commodities to staging experiences (also noticing an increase in pricing, or, we may say, perceived social value). Designing and implementing game-like educational activities then amounts to constructing and staging experiences. This entails that learning becomes more memorable and that the relationship between teacher and student shifts dramatically towards the latter, thus creating a student-centered environment. If (traditionally) education is essentially a service, what changes may come about when it is gamified and turned into an experience? The answers given by Kim et al are enthusiastic: active engagement, deeper learning, personal experiences (31-32).

In terms of how exactly this process of gamification works in education, Toda et al propose two types. Structural gamification, the first type, would be the application of game design and mechanics elements to all contents, all learners, and to the entire course, a sort of macro-level gamification (Toda et al 7). The second type is content gamification, the application of game elements to the contents of a course. In other words, the content is presented in such a way as to include some sort of game design principles. As the authors rightly state, this is more difficult to achieve because there are three components that need to be aligned: the subject being taught, the objectives of the activity, and the potential game elements (Toda et al 7).

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[3] The short but fairly rich history of the concept of "gamification" in academic research and debates, while interesting in itself, is beyond the scope of this paper. However, Faust provides a comprehensive outline of this history [Faust, Anna. *The Effects of Gamification on Motivation and Performance*. Springer, 2021).

Medicine is a field of study where gamification has been widely used in recent years. Working within a content-based framework, it is obvious that a Medical English class will take its cues from the broader strategies of teaching Medicine in non-clinical environments. Generally, gamification in medical education is perceived as a form of teaching that yields positive results (van Gaalen et al). Techniques range from immersive technologies such as virtual reality (covered extensively in Brooks et al) to decision-making cards (Pawar & Pawar; Ishizuka et al). In what follows, we will look at two very different activities used in a Medical English class at Ovidius University.

**Two examples of gamified activities in a content-based setting**

A content-based language course is designed around some core skills and bits of knowledge that we want our students to acquire. However, this also means that the presentation of said academic knowledge and the processes of skill development, that is, the form in which these contents are going to be presented is of utmost importance. *Content-based* simply means that language is being used as a tool, not studied for its own sake. As we have previously mentioned, there is a broad spectrum of gamified activities developed for medical education, some of them more appropriate for first- and second-year students and some of them more specialized, for advanced study and skills. During the past few years, we dedicated an entire semester to teaching medical communication and clinical critical thinking and decision-making. As an experiment, we decided to use some gamified activities. In other words, we used content gamification (Toda et al 7) with all the challenges that come with it.

Analyzing theories of medical communication, best practices, case studies, and examples may be instructive, but it lacks the hands-on experience of a real or simulated encounter. Typically, role-playing can be used to provide this kind of experience. It is not without its problems though, mostly having to do with engagement and motivation to participate. To mitigate these issues, we used the game-like scenario proposed by Harding and D'Eon, a brilliant simulation using LEGO bricks to teach patient-centered communication skills. In short, the authors (a hematologist by training, teacher of professional skills, and an education consultant, respectively), faced with the issue of teaching medical communication to first year students, noticed that they seemed more preoccupied with acquiring technical and scientific academic knowledge and less with actually understanding the necessities of practical social interactions. Instead of the usual role-playing, they devised a gamified simulation using Lego bricks. The students are supposed to play the role of doctor/patient. The "patient" is given a Lego construction (a "medical history"). The "doctor" is given a bunch of bricks. Without seeing the patient's "medical history," the

"doctor" is supposed to re-create it by asking questions. In the first stage of the simulation, the "patient" may only use "yes" or "no" as answers, and in the second stage they may use whatever explanations they want. The purpose of the simulation is to convince the students that using open questions and listening to a patient's story is much more effective at re-creating that patient's medical history than trying to direct the patient. The authors conclude that the simulation yielded positive results in communicative skill acquisition (Harding & D'Eon 134).

In our rendition of this simulation, we made a few changes to the original design by using fewer Lego bricks and removing the timeframe for each stage which, according to the paper, was about seven minutes, thus making it easier to successfully complete the task. This choice was motivated by the fact that some students have difficulties understanding the scenario because they are not usually exposed to gamified learning activities. Unfortunately, patient-centeredness and communication are still not the main framework for medical education in Romania (relying heavily on technical academic knowledge and hard skills, not on soft skills), so the students are not really required to engage in such forms of interaction. These challenges make the application of the Lego simulation less likely to be perceived as an educational activity and more as a mere "game." However, the objective of putting forth a practical distinction between doctor-centered and patient-centered communication strategies was fulfilled. The students did find it easier and more efficient to finish the task using patient-centered communication with all of the difficulty that it entails: establishing a common language (to successfully refer to the "medical history"), focusing on asking the right questions (to get relevant information), and cooperating with each other. Obviously, there are many ways in which this activity could be developed further, making it more difficult or establishing other objectives. For instance, color coding could be used as a means to showcase the importance of mutual understanding, tighter time limits may be added, or even more Lego bricks, thus making the simulation more difficult, not just for difficulty's sake but for a deeper learning experience. One potential drawback of this activity is, in our opinion, that the students may not understand or refuse to accept the metaphor around which it is designed. Ultimately, the success or failure of such an activity rests solely in their willingness to participate.

As we have already mentioned, our course was designed to develop communicative skills, on the one hand, and critical thinking and clinical reasoning, on the other. In short, clinical reasoning (and critical thinking in medicine) refers to the accurate process of diagnosing patients in such a way that medical error is minimized. Although it is beyond the scope of this paper to discuss what exactly critical thinking is in a medical setting, we must notice that, for instance, Hayes et al lists some strategies to help students acquire this

essential skill: making the thinking process explicit, discussing cognitive biases, teaching inductive reasoning, stimulating critical thinking using questions, and so on (570). Diamond-Fox and Bone identifies two processes (dual process theory) of clinical reasoning, one that uses pattern recognition and is faster, the other being slower and more analytical (528). Such a highly theoretical process may be gamified in the classroom using decision-making cards. Ishizuka et al, for instance, analyzed the effectiveness of gamification in clinical reasoning (and also awareness of medical costs) using sets of cards detailing the aspects of a medical case: the presenting complaint, medical history, physical exam results, test results. The same paper lists a number of advantages of this method, such as the fun factor, increased engagement and enjoyment, and the fact that it is a simulation of a real-life process.

In our application, we devised three sets of cards: one containing medical histories, examination results, and test results; one for diagnosis options; and one for treatment or management options (see the table below). All of these cases were based on real-life situations found in Rakel (ed.). Obviously, some grading was necessary to adapt the content to the somewhat limited medical knowledge of first- and second-year students. In teams, the students had to match the cards so as to identify the patient's information (history, physical exam results, etc.) and match it with the proper diagnosis and management. After the completion of the procedure, they must argue why and how they reached those conclusions. Essentially, this makes the activity a kind of multiple choice or matching test. There are a lot of things at play here from the point of view of Medical English practice. Firstly, the students have to carefully read through the information on the cards. Secondly, they must use some form of clinical reasoning (inductive and deductive) to meaningfully connect patient histories, etc. with the proper diagnosis (which also helps them understand evidence-based practices in current medical processes). Thirdly, they must explain the thought process, thus making it explicit. Finally, they must work as a team, employing peer-based learning whenever necessary. All these requirements make this activity extremely useful and valuable. However, its scope is limited by the students' technical knowledge and can only use a narrow range of cases that are depicting more common and easier to understand medical conditions. For instance, first- and second-year students will find it more manageable to identify a case of an upper respiratory tract infection as opposed to a case of multiple sclerosis. As with the Lego activity mentioned above, some students may be reluctant to engage due to a perceived lack of technical knowledge. To preempt such situations, we usually preface this activity with a brief explanation of Vygotsky's theory of the zone of proximal development and how it is applied in our particular case, also explaining that the contents are graded and adapted to their level of academic proficiency in medical matters.

The table below presents a set of three cards as an example of how this activity is carried out. Firstly, the patient history part presents the case with details such as the history of the current complaint, the general history, and some results of a physical examination and other tests. Secondly, the diagnosis card contains a short explanation of the medical condition (to make things a bit easier for first- and second-year students). Finally, the management section presents the treatment option. Using between six and eight such sets in one practical activity may work well. Fewer than six sets per activity would be too easy and would remove any challenge, while more than eight would probably be too difficult for most students. In terms of content, as we have previously mentioned, the cases within these sets should be understandable and approachable. It may also be helpful to note that these activities are more or less a follow-up on one semester where students are exposed to fundamental concepts and basic knowledge regarding anatomy, physiology, and pathology.

| Hx |
| --- |
| The patient is a 43-year-old female complaining of abdominal pain for the pa[st] week located under the ribs and in the back. The pain started less intensely i[n] the last week but has since increased in intensity to the point where it [is] unbearable. The patient reports that she has not eaten anything for the past fou[r] days because every time she eats, she vomits undigested food and the pai[n] increases dramatically. The pain is sharp and intermittent. She reports no bloo[d] in urine or stool. No chest pain, no shortness of breath, no constipation, n[o] diarrhea, no headache, no visual changes.<br><br>Her past history includes migraine headaches, GERD, appendectom[y,] tonsillectomy, and trauma as a result of a motor vehicle accident. She has tw[o] teenage children.<br><br>She takes omeprazole [anti-acid]. She is allergic to penicillin.<br><br>O/E<br><br>37.9 C; HR 95; BP 120/70; RR 18; oxygen saturation 100%.<br>She is obese. No heart murmurs; lungs clear; abdominal tenderness in the right upper quadrant, reacting to palpation.<br><br>Abdominal ultrasound shows thickening of the gallbladder wall. |
| Dx |

| Acute cholecystitis |
|---|
| Acute cholecystitis is an acute inflammation of the gallbladder, usually associated with gallstones. Risk factors include being female, fertile, fat, and over forty years of age. Gallstones block the bile duct and the gallbladder continues to fill but cannot empty. |
| Management |
| The patient is started on IV fluids and broad-spectrum antibiotics, then laparoscopic cholecystectomy. |

*Table 1. Example of a set of three cards used in a gamified activity. (the content is reworked and adapted from Rakel [ed.])*

Sometimes, a variation of the activity described above may be used. The example in the table below presents a set of three cards: signs and symptoms, diagnosis, and drug therapy. This variation works best when more sets are used (we usually do this activity with 14 sets). Just as before, a smaller number of sets would decrease the challenge, thus rendering the activity ineffective.

| 1 Signs and symptoms | 2 Dx | 3 Drug therapy |
|---|---|---|
| Chest pain that spreads across the chest, angina Shortness of breath Fatigue Sweating Weakness Tachycardia | Coronary artery disease <br><br> [the narrowing of the blood vessels that supply the heart] | Statins [cholesterol lowering drugs] <br><br> Anticoagulants [drugs that inhibit blood clotting] <br><br> Vasodilators [drugs that help the blood vessels relax] |

*Table 2. Example of a variation of the activity described above. (content by the author)*

**Final considerations**

The question that we should address is whether there is any educational value in gamifying the contents of a class or a course. Let us remember that gamification is essentially the creation of a simulation of real life in a

meaningful way. However, this simulation is also inconsequential. Whether or not students manage to successfully complete the challenges posed by the activities described above depends on a multitude of factors. From language skills to academic knowledge, teamwork, and the mere willingness and motivation to participate in the activity (to be willing to play the game), there is an interplay of things that may threaten the completion of such tasks. Simply put, a lot can go wrong in establishing a simulation. From our point of view, it is extremely important that this process of creating a gamified activity with certain educational objectives is made explicit for the students. By explaining what the activity is in terms of content, why we chose to gamify the content, and how it works on a deeper educational level, that is, disclosing the design, may help reluctant students to understand the general and specific purpose of the gamified activity. In other words, students should understand that the gamified activity is not a game, even though it has absolutely no consequences in real life and that it may develop some of their academic skills. In our experience, it is not at all uncommon for students to perceive the activities presented in this paper as "playing games" and to exclusively appreciate their value in terms of "fun."

This ties in with the question of whether the objectives can be achieved. As we have mentioned above, Toda et al suggests that the subject being explored (that is, the content), the objectives, and the game elements must be aligned. However, when carrying out gamified activities with clear objectives, it is easy for students to interpret them as having fun. Unfortunately, the fact that simulations are inconsequential in real life is a double-edged weapon. On the one hand, it provides a fun and safe environment where students can make mistakes and learn from them. On the other hand, the educational objectives may be difficult to reach precisely because of the fun factor.

Herein lies the complex issue of gamified educational activities, at least in the sense proposed in this paper. While there are obvious potential benefits, ranging from increased motivation, better presentation of content, the fact that they may be more engaging than "traditional" classroom work, and the fact that they may promote and improve teamwork, there are also a number of disadvantages that cannot be overlooked, with the main ones being that these activities fall outside common medical school educational praxis and can be easily misunderstood as mere games. The informal curriculum, as theorized by Apple and Giroux among others, emphasizes hard academic skills and individual work, subjecting students to very rigidly structured "disciplines." In this context, it is not at all surprising that students will be more inclined to see gamified educational activities as "games" to be played in order to escape the daily grind. At the same time, designing gamified activities is difficult, especially when keeping in mind the alignment of content, objectives, and

game elements. Whether the effort put in by the teacher is worth it or not in terms of educational achievement is not yet clear. Do the benefits of gamification outweigh the disadvantages? This is a question that will remain open, as it is beyond the scope of this paper. One thing is certain though. The success of gamified activities depends on so many factors that different instances of the same process can have wildly different results. To conclude, gamification in education should be taken with a major grain of salt, which of course does not mean that we should not try it at all. As ESP teachers, we should include some form of gamification in our courses, while also keeping in mind that there is no universal recipe and no guaranteed success.

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