

# Enhancing medical translation skills through a gamified experience. Failure or success?

Elena Alcalde Peñalver & Alexandra Santamaría Urbieta\*

**Abstract:** In this paper, a gamification experience applied to a medical translation class will be presented in order to verify whether it is a success or failure as a way to improve students' skills for the translation of texts of this area of specialization. First of all, the theoretical framework and the gamified activities that were developed will be presented. Then, the four research questions will be answered based on the information obtained from the participants' perception of the experience, and we will reflect on the adequacy of this type of methodology for the didactics of medical translation.

**Keywords:** competencies, didactics, gamification, medical translation, specialized texts

**Mejora de las competencias en traducción médica a través de una experiencia de gamificación. ¿Éxito o fracaso?**

**Resumen:** En este artículo se expondrá una experiencia de gamificación aplicada a la traducción médica con el objetivo de comprobar si esta supone un éxito o un fracaso para la mejora de competencias en la clase de traducción de textos de esta especialidad. Para ello, una vez expuesto el marco teórico y las actividades desarrolladas, se dará respuesta a las cuatro preguntas de investigación planteadas en base a la información obtenida de la percepción de la experiencia por parte de los participantes, y se reflexionará acerca de la adecuación de este tipo de metodologías para la didáctica de la traducción médica.

**Palabras clave:** competencias, didáctica, gamificación, textos especializados, traducción médica

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## 1. Introduction

In the medical field, translation is a key factor for the dissemination of knowledge and new scientific progress around the world. To this end, it is vital to promote cooperation be-

tween research organizations at an international level to share results obtained in different projects, tests, or any other type of development. When it comes to the language combination of our study (English-Spanish), this is especially relevant because of the demand of the translation of medical texts in the market (Muñoz-Miquel, 2016; Franco 2010), even though English is the *lingua franca* of this field (Baethge, 2008; Epifani, 2016; Navarro, 2001). However, translation is very much needed in many different contexts in the healthcare industry and other related areas such as academia, government offices, NGOs, associations, etc.. Training in this highly complex field poses many challenges for translation trainers, one of them being the fact that students are not usually familiar with the subject matter and lack the expertise required to understand the content of the texts. This usually creates a situation of anxiety that hinders the teaching-learning process (Dobson, 2012). With this in mind, we believed that gamification techniques could be implemented in the specialized translation classroom to allow students to approach this subject in a way that would not make them feel stressed due to the unknown of the area of study.

These were the research questions (RQ) that we developed for our study:

RQ1. What evidence is there for the effectiveness of gamification applied to specialized (medical) translation?

RQ2. How can gamification be applied to a specialized (medical) translation class?

RQ3. What differences can be observed between a "gamified translation class" and a "traditional translation class"?

RQ4. What effect can a gamified class have on students who are exposed to specialized (medical) texts for the first time in their translation degree?

This paper opens with a review of relevant research studies in the field of medical translation and analyses the possibilities that introducing gamification techniques can have in the classroom. Next, the method is presented with information about the instrument, participants and academic context. The activity implemented will also be described. After that, the results of the study are presented and illustrated with examples from the data. The conclusion will take the form of a discussion of different interpretations of the study.

## 2. Literature review

What makes medical translation different from other types of translation is its highly complex nature, which makes it necessary for prospective translators to have specific training in

\* University of Alcalá (Spain) & International University of La Rioja (Spain). Email: [e.alcalde@uah.es](mailto:e.alcalde@uah.es).

it to be able to successfully perform it (Navarro, 2002). In this sense, Montalt (2010: 80) argues that medical translation has “some specific features that distinguish it from other types of translation”, these being, among others, the specialized terminology, phraseology, textual genres and different communicative situations of it (Mayor, 2002; Durieux, 1998).

Among the different texts that we can find in the specialization of medical translation, there are textbooks for medical students, research papers, case studies, medical reports, and other texts for patients such as information leaflets, consent forms or brochures (Karwacka, 2015). As this author states, the language used in these texts can vary from expert-expert to expert-lay-person communication, and this indicates that there will be different characteristics present depending on the genre, communicative situation, and participants. When it comes to translator training, the three main areas that present difficulty are the following according to Wakabayashi (1996: 356): *a*) students’ lack of medical knowledge; *b*) medical terminology; *c*) medical phraseology. These usually represent the main problems when teaching any kind of specialized translation and therefore it must be any lecturer’s goal to help students be aware of the systems underlying both the terminology and knowledge of the field (Wakabayashi, 1996).

Indeed, regarding the first area, it must be said that when translating specialized texts, students might have a situation in which they fear the unfamiliarity of the context in which the translation they have to deal with is framed. This is because the subject matter expertise that is required to understand the text is something they lack and therefore they are faced with a new area of knowledge that was until then unknown to them. In this sense, we believe that the thematic competence, area knowledge, subject knowledge/competence or specialized knowledge as it is named by different authors in the existing literature (Górnicz, 2013), can be divided into different sub-skills

that are especially relevant in the translation profession: critical skills, ability to find appropriate information and the ability to develop knowledge in a subject field in a short period of time (Paputsevich & Karatkevich, 2011).

As for medical terminology, Wakabayashi (1996) argues that it is the most obvious problem that students have. However, this is not necessarily the most difficult one. This is also in line with what Montalt et al. (2018) state, since they believe that “medical terminology is one of the core conditions for successful communication” (p. 29). However, at least for the language combination English-Spanish there are many resources available that help in this regard. This is the case of *Diccionario de dudas y dificultades de traducción del inglés médico* (Navarro, 2019), many of the articles published in the *Panace@* journal that provide glossaries of medical terms (Saladrigas et al., 2008; Saladrigas & Claros, 2002; Claros & Saladrigas, 2003), or other glossaries provided by international organizations such as the WHO (2020).

Finally, medical phraseology is a part of medical translation that needs to be acquired through intensive reading of specialized books (Wakabayashi, 1996). This author also defends the need that lecturers inform students of the conventions of medical English (in terms for example of the conventionalized structure of certain texts, use of figures, prepositions, acronyms, or abbreviations).

The table below summarizes the acquisition of skills related to medical translation as Górnicz explains in his study (2013: 133).

One possible way of overcoming the difficulties of introducing students to medical translation is presented by gamification, which can be defined as “the use of game design elements in non-game contexts” (Deterding et al., 2011). As stated by Johnson et al. (2016: 90) “gamified systems usually employ motivational features like immediate success feedback, con-

**TABLE 1.** Acquisition of skills in a specialized (medical) translation course (Adapted from Górnicz 2013: 133)

Skill	Translation student
Thematic competence	Acquired in their second language rather than in their first language from reading specialized texts.
Technolectal linguistic competence in the first language	Acquired in class and with additional reading at home (mostly focused on specific translation tasks).
General linguistic competence in the second language (English)	Acquired in previous courses of the translation degree to an upper-intermediate/advanced level.
Technolectal linguistic competence in the second language	Acquired during the course and by self-study efforts intended mostly to help with specific translation tasks.
ULTIMATE COURSE OBJECTIVE	Enable students to render the content of a text written in their second language to their first language in a functional way.

tinuous progress feedback, or goal-setting through interface elements like point scores, badges, levels, or challenges and competitions”. Moreover, according to Richter et al. (2015), a successful learning process should always meet the following three requirements: autonomy, competence, and relatedness. These authors define autonomy as “the ownership of one’s behavior” (p. 32), competence as “the ability to produce desired outcomes and to experience mastery and effectiveness” (p. 33) and relatedness as “the feeling of being connected to others”. If these three needs are not satisfied, negative emotions may arise and intrinsic motivation undermined (Wang et al., 2008). The opposite situation, that is, an environment where students feel autonomous, competent, and related to complete a task, would trigger development and growth results as well as an increase in motivation. In this sense, meeting these requirements is a very important step of the learning process in a situation in which students have to deal with the translation problems of a text that is part of an unfamiliar communicative situation to them. Thus, even though gamification techniques have become increasingly popular in language learning contexts, where many studies have already been published on the topic (Santamaría & Alcalde, 2019; York & William, 2018; Foncubierto & Rodríguez, 2014), this is not the case of specialized translation. In this context, the effectiveness of introducing games in the specialized-translation classroom during the learning process of students has not yet been proven.

### 3. Academic context

The gamified experience was implemented in a Specialized Translation course (Scientific-technical) of the third year of the Degree in Translation and Modern Languages at the University of Alcalá (Spain). This is a compulsory course in the first semester of the third year and it is the first chance that students have to develop their translation skills with specialized texts. As stated in the syllabus, the aim of the course is “to introduce students to scientific and technical translation from a theoretical, terminological, and documented approach. The main features of scientific and technical language will be presented and different text typologies will be analyzed and translated” (University of Alcalá, 2019: 2). Students who enroll in this course usually have no formal specialized background and generally know little about medicine or other scientific and technical fields. The course is divided into two different parts. The first part of the semester (eight weeks) is devoted to the introduction of students to the translation of medical texts and in the second part of the semester, students work with technical texts. Because of time constraints, specific teaching of background knowledge is not incorporated in the classroom and thus students need to acquire the specialized knowledge of the texts as they mine for information to complete their task. The texts that were used in the classroom were mostly articles from medical journals since this represents a real demand in the translation market (Wakabayashi, 1996).

### 4. Gamification experience

The gamification experience that will be explained in the following sections was completed in the last class of the semester, as a way to review the medical translation part of the course in which scientific articles on medical topics and a medical case were included. It consisted of a pilot experience to test the results first and, if successful, design it for the following academic year in more medical translation classes. The activity consisted of a breakout experience, which as defined by Negre i Walczak (2017), is a game derived from the popular Escape Rooms in which the aim is to obtain a code after solving different problems guided by a narrative in which the participants become a series of characters who have to solve a mission. In this case, the narrative focused on the mission of saving the world from the spread of the Zika virus.

### 5. Methods and participants

A questionnaire with open and closed questions was adapted from a previous study on gamification in an English as a foreign language (EFL) class (Santamaría & Alcalde, 2019) to evaluate to what degree the breakout experience helped students develop new skills in the field of medical and scientific translation in the classroom. The adaptation was done in accordance with our literature review and the Competence Framework of the European Master’s in Translation (2017) since this document has become “one of the leading reference standards for translator training and translation competence throughout the European Union and beyond, both in academic circles and in the language industry” (p. 2). Questions, as can be seen in Annex 1, included items related to competences students perceived they had used the most and if they thought the activity was effective in terms of learning and their perception of the game. The questionnaire was validated by three professors from different Spanish universities who completed it and checked that the questions were correctly formulated. It was distributed in printed form in class to ensure participation by all the 26 students who took part in the game. The descriptive statistical data from the survey were also triangulated with qualitative information obtained from the open questions. This method, as Creswell and Plano Clark (2007: 5) state, “provides a better understanding of research problems than either approach alone”. Therefore, we consider that the results obtained from our survey give a general overview of how the incorporation of this breakout experience works in the classroom and will allow other translation lecturers to replicate the methodology that in this same area or even adapt it to others.

### 6. Description of the activity

In 75 minutes, students had to solve six different challenges that would lead them to the discovery of the virus. They were organized in six different groups (5 of them had 4 students and

one had 3). At the beginning of the class, a website with a count-down was shown to students so that they were always aware of the time they had left. Each group was given a folder with instructions and the material of the different challenges, which they had to solve in any order. This is one way of carrying out a breakout activity, as there are other modalities in which there are stations through which the students have to go in order to solve the different challenges. The chosen modality for this breakout allows students to develop their cognitive thinking skills, as they have to reason and prepare a strategy to solve the mystery faster than the rest of their classmates. The materials included in each of the folders given to the students were a code sheet, an invisible ink pen, red cellophane and some printed documents. Also, some videos were shown for describing the breakout experience, as well as for putting an end to it. Both videos were produced in Spanish.

To reach the conclusion of the name of the virus, students were asked to fill in a code sheet with the following information extracted from the challenges: symptoms, transmission, diagnosis, treatment, and prevention. This information was required to be checked by the instructor before the winning group was allowed to enter the name of the virus on the class computer. These were the different challenges that they had to solve:

1. QR Code. After scanning the QR code printed on one of the paper documents, students could watch a video in which further instructions were given on what they had to do to discover the virus. The video described a fictitious conversation between the people responsible for the spread of the virus, as well as the instructions they had to follow if they wanted to stop it from infecting the entire world (Figs. 1 and 2).
2. Symptoms. Students had to read a medical text with red cellophane that was included in the folder, but they had to guess that the cellophane was needed to find out this information. Through the piece of red cellophane, they could read the symptoms of the virus.
3. Transmission. In their folder, students had a document entitled "Transmission". There was a sentence ("Transmitted by the bite of an infected monkey") in which the term "monkey" was crossed out with an invisible ink pen

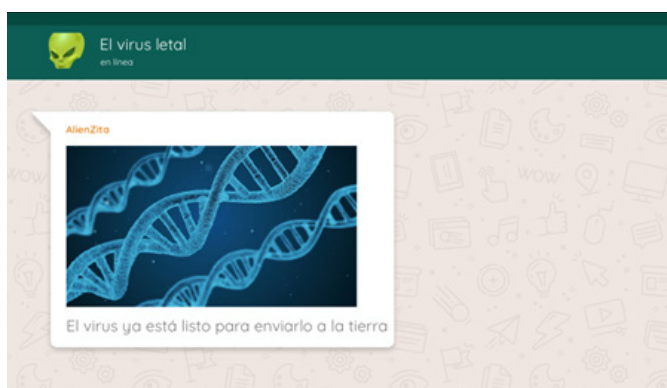


FIGURE 1. Introductory video the breakout activity (by the authors)

and on top of it the term "mosquito" was written. The document had nothing to do with the virus they needed to discover in order to solve the mystery of the breakout, potentially misleading them and making them waste time trying to read and analyze the text.

4. Diagnosis. If students read carefully the title of this document, they could find the words "passive translation", which then led to the clue that this part of the challenge was about translating the passive sentences included in the document into Spanish. This is because in medical texts in Spanish, the active voice is usually preferred.
5. Treatment. After reading the other challenges, students were already looking for information to find out what the virus was. Thus, in this case, students just needed to use their research skills to realize that no treatment has been discovered for this virus yet. This is the information they had to write on the code sheet under the title "Treatment". This challenge focused on the importance that documentation has for translators.
6. Prevention. Students had a document entitled "prevention" in which the following clue was given: "They are not your friends". In this document, three medical false friends were included (constipation, severe, and infant) and they had to properly translate them into Spanish. The words were also underlined with the invisible ink pen in case they were not able to find them by themselves on the text.

While completing the challenges, students were in constant contact with the instructor so that they knew if the information they had provided was correct and to see if they were on the right path. Also, giving constant feedback to the students is key to maintaining their levels of motivation and reducing their stress levels. Some of them had erroneous data so they had to start some of the challenges again. The winning group finished fifteen minutes before the end of the countdown and a video was displayed on the whiteboard of the class, congratulating them and informing about their reward (Fig. 3).

Overall, it can be said that the breakout experience was successfully completed in the classroom, and students welcomed the initiative with great enthusiasm and motivation. In the fol-

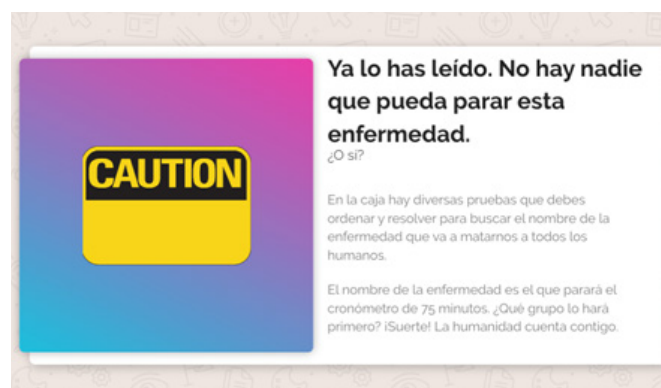


FIGURE 2. Introductory video of the breakout activity (by the authors)



**FIGURE 3.** Final video of the breakout activity (by the authors)

lowing sections, we will analyze the results obtained from the literature review as well as from the questionnaire that we distributed among our students.

## 7. Analysis of results

Regarding the first RQ of our study, it must be stated that no previous specific literature on the degree of effectiveness of gamification techniques in medical translation has been found. Therefore, some of the questions on our survey allowed us to obtain data in this regard. First of all, only 3 students (1.15%) stated that they had not enjoyed the experience. This means that it was a success in terms of making students like and feel part of the learning process. Furthermore, only two students stated that they had already participated in an in-class experience of this kind, which also shows that it is not a widespread methodology in Spanish university classes of this kind. Regarding the effectiveness of this type of game for learning terminology, 61.5% agreed that it was effective, whereas the rest (38.5%) felt neutral about it. In this sense, Table 2 shows some of the students' general positive qualitative answers about the activity (no negative answers were gathered from the survey):

**TABLE 2.** Participants' comments on the effectiveness of the gamified activity (by the authors)

"A useful, interesting and interactive way of learning"

"A new way to practice the skills learned in class"

"Effective because we had to revise and remember how this type of translation is done" (2 answers)

"It is effective because we have to think about what we have learned in class"

"It is a good way to translate some parts of a medical text and also what you need to avoid such as the passive voice and false friends"

"It is a good way to integrate different skills needed for medical translation"

As for the effectiveness of the gamified activities for learning medical phraseology, the highest percentage of students (86.9%) felt neutral about it and only three of them answered affirmatively. In this sense, we believe that more emphasis should be placed on activities to learn phraseology since it is one of the most important aspects to develop while being trained in this type of specialization. However, 100% of students felt that the activities had been effective for familiarizing themselves with different medical topics and for using resources for research purposes and these were some of the qualitative answers that they provided in this respect:

**TABLE 3.** Participants' comments on the effectiveness of the gamified activity for familiarizing themselves with different topics and for using resources (by the authors)

"We were required to find different pieces of information (treatment, symptoms, diagnosis) and the activity made us check resources on many websites and use the right tools for it"

"We had to check the right sources to get to the information we needed"

"We had to compare the information on different official websites to get the right answer"

"We needed to look for the right information to continue with the different challenges"

"Finding the right information helped us to become familiar with the disease and this made us use the skills learned in class"

The second RQ that we posed was related to the application of gamification to a specialized (medical) translation class. In this sense, and based on the data that we obtained, it would seem that the activities that we described above allowed students to develop mainly thematic (91.3%), strategic (82.6%), methodological (65.2%), personal and interpersonal (56.5%) competencies. Moreover, the most frequently chosen words to describe the activities were enjoyable (73.9%), communicative (65.2%), fun (65.2%), cooperation (43.5%) and motivating (43.5%). Regarding the activity that students liked the most, 73.9% chose the second one ("Symptoms", for which they were

required to use red cellophane to discover the symptoms of the virus in the document) and 26.1% preferred the third one (“Transmission”, for which they had to use the invisible-ink pen to read a key term on the document). Students mainly disliked the last activity (“Diagnosis”, for which they were required to translate passive sentences into Spanish in the active form) (86.9%) and 13.1% did not like the last activity (“Prevention” for which they were required to find three false friends and translate them). This also provides information on how to improve these activities for future classes so that we can make them more enjoyable and meaningful for their learning experience. Regarding the level of difficulty, 4 students strongly agreed that the game was too difficult, 2 of them felt that it was difficult, 10 felt neutral about it, and 7 disagreed. However, 86.9% strongly agreed that it was fun to play, and the rest agreed. In this sense, we believe that maybe more instructions could be prepared, and more feedback could be provided during the game so that it is easier for everyone and does not generate any kind of stress.

The third RQ was based on the differences that can be observed between a “gamified translation class” and a “traditional translation class”. First of all, one of the differences was regarding group work, since 96.1% of students stated that they found it effective compared to the traditional class, and only one had a neutral opinion about it. These were some of the positive qualitative answers that were gathered from this question (there was only a negative one, from someone who had declared a neutral opinion, stating that it was stressful):

**TABLE 4.** *Students’ qualitative answers on group work after completing the gamified activity*

“We had to collaborate in a more relaxed atmosphere”
“Working in a more relaxed way always improves communication”
“It felt more like teamwork”
“There was constant negotiation with the members of the groups”
“It makes us have fun while working and not worry about the grade”
“It was a relaxing way to work in groups”
“It is really motivating because you talk more with the other group members”

Moreover, 73.9% of the participants agreed that this game helped them develop new skills, 8.7% strongly agreed and only 17.3% of them felt neutral about it. When asked if they thought that they could learn more with this method than with traditional methods, 65.2% of them agreed, 26% strongly agreed and

only 8.7% felt neutral about it. Again, results are positive about using gamification techniques in this class.

Finally, the fourth RQ asked about the effect that a gamified class has on students who are exposed to specialized (medical) texts for the first time in their translation degree. Based on the information provided, we can generally state that this kind of methodology helped students deal with medical texts in a different kind of atmosphere, working under pressure but in a motivating way.

## 8. Conclusions

We believe that the implementation of a breakout experience in the medical translation classroom opens the door to discovering many new possibilities of the teaching and learning of this type of specialization. Although this pilot study needs to be followed up to obtain more results that would allow us to expand the answers to our research questions, it would seem that, all in all, it is positive for students to realize that a difficult and unknown area of translation can be approached differently. The four research questions that we asked in the introduction were answered based on the information from our literature review and the survey. First of all, no previous studies have been found on the effectiveness of this kind of methodology applied to a specialized (medical translation) class and based on the data we obtained it would seem that it is effective for learning mainly terminology, getting familiar with the topic and applying research skills. In this sense, more emphasis should be placed on the design of activities to develop medical phraseological skills, which is key in this area of specialization. As for the second question, the description of the gamified experience allowed us to show how it can be implemented in the classroom, which allows other teachers to replicate it and adapt it to their own students’ needs. However, according to the data we obtained, some improvements need to be made to activities to make them clearer and thus more enjoyable for all participating students. The main differences observed between a traditional class and a gamified class were in terms of group work, which seems to be more relaxing in the latter and how they felt more positive about learning new skills compared to in a traditional class. Finally, we believe that this type of class helped students learn in a different way and make them feel that what would seem like a very difficult area of specialization at first can be approached in a more familiar and fun way. Thus, even though this experience was only implemented in one class, we believe that the application of more gamification techniques could help translation trainers introduce students in the medical field in a way that makes them feel less stressed due to their unfamiliarity with this area of specialization and make them realize that it is possible to successfully get to the translation solutions that they need.

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### Annex 1

#### BREAKOUT EXPERIENCE

1. Have you ever participated in breakout experience in a classroom?  
Yes  
No
2. Did you enjoy taking part in it?  
Yes  
Neutral  
No  
Explain why:
3. During the breakout experience, which competences did you think were the most important ones? (You can choose more than one)  
Language and culture  
Strategic  
Methodological  
Thematic  
Technological  
Personal and interpersonal  
Service provision (client awareness, negotiation through to project management and quality assurance)
4. During the breakout experience, which competences did you think were the least important ones? (You can choose more than one)  
Language and culture  
Strategic  
Methodological  
Thematic  
Technological  
Personal and interpersonal  
Service provision (client awareness, negotiation through to project management and quality assurance)
5. Do you think the activity was effective for LEARNING how to translate medical terminology?  
Yes  
No  
Neutral  
Explain why:
6. Do you think the activity was effective for LEARNING how to translate medical phraseology?  
Yes  
No  
Neutral  
Explain why:
7. Do you think the activity was effective in helping you familiarize yourself with different medical topics?  
Yes  
No  
Neutral  
Explain why:
8. Do you think the activity was effective in getting you to use resources to get to the information you needed for the translation (research purposes)?  
Yes  
No  
Neutral  
Explain why:
9. Do you think the activity made a more effective use of group work compared to other group activities in the classroom?  
Yes  
No  
Neutral  
Explain why:
10. Which activity did you enjoy the most?
11. Which activity did you least enjoy?
12. Which of these elements would you choose to describe the activity? You can choose more than one or none of them.  
Enjoyable  
Meaningful  
Relaxing  
Communicative  
Boring  
Fun  
Stressful  
Purposeful  
Cooperation  
Natural  
Novelty  
Pressure  
Motivating  
Individualistic



13. Choose one option for each statement:

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The game was too difficult.					
It was fun to play the game.					
The activities were difficult.					
I think this game helped me develop new skills.					
I think I could learn more translation skills with this method than with traditional methods.					
I felt more relaxed with my classmates during the game than during previous activities in the class.					

Other comments:

