

GAMIFICATION IN LANGUAGES FOR MEDICAL AND HEALTHCARE PURPOSES CLASSES: THE OUTCOMES OF A EUROPEAN SURVEY

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Abstract: *Gamification techniques have long been applied by the business and marketing world to encourage explicit behaviours and increase customers' incentive and commitment. However, in the past ten years in education, especially in language teaching and learning the benefits of this technique have also been realized as it provides an alternative to engage and motivate students in the classroom. The motivation and involvement of today's digital generation can easily be increased by the integration of various digital tools and applications providing further opportunities for students to collaborate and communicate as well as to obtain extra scores, which can later be turned into grades or even exam grades. This methodology and pedagogy assist language teachers in finding the balance between achieving their teaching goals and meeting students' needs. Therefore, in education today it is crucial to be resilient and flexible and be able to modify and adopt instructional methods and activities in order to meet the needs of the digital generation, and be ready to respond instantly to emergencies, or global pandemics, as it was and still is the case with COVID-19. The present paper aims to provide an insight into an international research that was carried out in the spring of 2019 involving 547 medical and healthcare students from seven European Higher Education institutions. The goal of the study was to gain some understanding of the use of gamification techniques applied in Languages for Medical and Healthcare Purposes (LMHP) classes as well as to shed light on students' attitude towards its use. As the results suggest, gamification tools are highly applied in medical and healthcare education across Europe, and gamifying LMHP classes contributes to students' motivation, provides them with a genuine sense of achievement and enhances their communication and collaboration skills. The authors conclude that the success of gamification lies in making the learning experience engaging and interactive, irrelevant of whether we are applying this methodology during face to face classes or online sessions due to COVID-19.*

Keywords: Languages for Medical and Healthcare Purposes (LMHP); gamification; motivation; collaboration; communication skills; COVID-19.

*Work
There is no point in work
unless it absorbs you
like an absorbing game.
If it doesn't absorb you
if it's never any fun
don't do it.*

D. H. Lawrence: „Work“ Pansies, 1929

1. Introduction

One could not agree more with what D. H. Lawrence had to say about work back in 1929 (Lawrence, 1994: 367). His timeless thoughts perfectly capture the essence of not only work, but also education today. The best learning and teaching practice is enhanced through motivation, engagement and entertainment. In the authors' experience, both the teaching and the learning processes should be absorbing and fun, otherwise we will not enjoy them, and at the same time lose our audience, the students of the 21st century.

Games are an essential part of our life, and the majority of people love to play, once given the opportunity. This is something we have been carrying along since our childhood or even babyhood when our parents first played peekaboo with us. In his book, Cohen (2018) underscores the importance of play in our lives and claims that adults, including teachers and students of Higher Education, should play more. One way of achieving this goal is through gamification. However, as Lee and Hammer (2011) claim, gamification has been primarily conducted in marketing or various business fields and less in education. While there are studies suggesting the use of gamification in the classroom (Kapp, 2012; De Freitas & de Freitas, 2013; Hanus & Fox, 2015; Sánchez-Mena & Martí-Parreño, 2017), there has been little research on gamification utilised in second language education, and even less in Languages for Specific Purposes (LSP) classes.

2. Defining gamification

British programmer, Nick Pelling coined the term gamification in 2002 (Pelling, 2011). He claims that he created this deliberately ugly word to apply game-like accelerated user interface design to make electronic transactions both enjoyable and fast. As he reasons, his intention was simply to “make hard things easy” (Pelling, 2011: 2). He also argues (ibid) that he was trying to express a pair of sharply contrasting ideas with “gamification”, which are the following: “games-platform-publishingification”, or in other words turning electronic devices into publishing platforms (iTunes, App Store, Kindle, etc.) and “games-interface-ification”, i.e. making device interfaces more responsive and interactive (Web2.0, Ajax, etc.).

According to Deterding, Dixon, Khaled, and Nacke (2011: 11) gamification is “the use of game design elements in non-game contexts” and Sheldon (2012: 75) has a similar definition, that “gamification is the application of game mechanics to non-game activities. Its underlying idea is to increase engagement”. Games themselves have many different mechanics, and their application to other fields may differ depending on the context. Within an educational context, Kapp (2012) argues that gamification is the application of game-based mechanics to engage and motivate

the target group as well as to promote learning and solve problems. In his understanding (2013), the purpose of gamification is to involve and stimulate learners to become active participants in their own learning process. He also maintains (ibid) that with game elements and game-based thinking, gamification is an approach to instruction, which facilitates learning and encourages inspiration. In the authors' understanding, gamification within educational settings, especially while teaching LSP, means to integrate some game elements into the teaching and learning processes.

Figure 1 demonstrates the trend chart of the term gamification. The trend charts of *Google Trends* (n.d.) analyse the popularity of top search inquiries in *Google Search* across various regions and languages by the use of graphs to compare the search volume of different queries over time. Hence, it can be concluded that gamification was not a popular search term until about 2010. However, in the years that followed, more people were intrigued by it, they googled the concept and its possibilities of implementing it in business training programmes and education. Consequently, it took some time after the term was created in 2002 to understand the rising demand for gamification over the years.



Figure 1: Gamification Trend Chart
Source: Google Trends (n.d.)

2.1. Gamification vs game-based learning

Game-based learning (GBL) is an area that has some overlap with gamification. According to Prensky (2001), it refers to the usage of the entertaining power of digital games to serve an educational purpose. All, Castellar and Van Looy (2016) claim that in GBL the game is the medium through which learning takes place. They also argue that there are two types of games used in GBL: in the first, a game has been created specifically for an educational purpose, and in the other, games developed for entertainment purposes are used in an educational setting. In GBL, learning takes place through the game, whereas in gamification only aspects of games and game elements are used in order to facilitate learning and motivate learners.

2.1.1. Gamification in Higher Education and in LSP courses today

Beyond doubt, Higher Education has experienced dramatic changes and challenges over the past few decades across the globe. As Altbach and de Wit claim (2019), it is characterised by the massification of post-secondary education combined with the emergence of the global knowledge economy, the fast development of information technologies, artificial intelligence and several more features. Prensky (2001) argues that since the last decades of the 20th century

students have changed drastically due to the development and fast spread of digital technology. As he states, "Today's students are no longer the people our educational system was designed to teach" (Prensky, 2001: 1). He also claims that students nowadays have spent less than 5,000 hours reading books, but over 10,000 hours playing video games. As a result, it is no wonder, why this generation thinks and processes information in a profoundly different way from their predecessors. Although, in Füzesi's view (2016), the students today are neither better, nor worse than those fifty, a hundred or even five hundred years ago, they are just different.

Prensky (ibid) presents a list of eight items regarding students' needs for education today, which includes *fast access to information, multi-tasking, active personal involvement, use of graphics, visual aids instead of plain texts, fast access to information, social networking, playing games rather than doing serious work, and being rewarded frequently*. These needs are very different from those of the previous generations. Multinational and global companies, like Google and Microsoft have realized it and construct their latest technology-based educational programmes and mobile apps to serve the above needs. Therefore, nowadays, due to the rapid changes in educational science, which has recently been accelerated by the COVID-19 pandemics, what was once regarded as science fiction, is more and more becoming science reality. Consequently, in education today, it is crucial to be resilient and flexible and be able to modify and adopt instructional methods and activities in order to meet the needs of the digital generation, and be ready to respond instantly to emergencies, or global pandemics, as it was and still is the case with COVID-19.

As Dudeney (2015) also points out, we can make our classes more relevant for students if we integrate 21st century skills, such as digital skills into our methods of teaching. Consequently, from the perspectives of teachers, we can state that these are really demanding and challenging times. Not only do we have to meet the needs of this diverse, multicultural student population, but also provide them with classes, which meet the expectations of the digital natives. The term, *digital native*, was created by Marc Prensky (2001) to refer to those who are all "native speakers" of the digital language of computers, online games and the internet, whilst those, born prior to the mid-nineties, are therefore *digital immigrants* only trying to catch up with the latest developments of new technology. As a result, there is an ever-increasing gap between the two digital generations as the expectations of the digital natives do not always meet the educational know-how of teachers. However, there are teachers who regard it an imperative to integrate digitally mediated activities, games and tools into their syllabus. Certainly, there are those (Lam and Tong, 2012; Taneja et al., 2015) who argue about the distracting influence of digital devices in the classroom claiming that "...although technology in classroom has its benefits, many students constantly succumb to its use during class for non-class related purposes, thereby impacting their learning" (Taneja et al., 2015: 141). Whereas others (Holmes, 2009; Dahlstrom et al., 2014; Németh and Csongor, 2016, 2017; Collins and Halverson, 2018) believe that teachers should implement blended curricula and use web-based digital resources, games and tools in education to serve the needs of the digital native generation. It is, indeed, a hotly debated topic, that often divides opinion. However, in recent times the COVID-19 pandemics have highlighted the significance of web-based digital tools and

therefore may have cast a doubt on those still distrustful of their application in classes.

The main difference between the traditional and the blended learning curriculum, which includes both online and offline materials, is the activity and passivity level of the students. In the 20th century curriculum, teachers were creating a sequence of activities they wanted to involve the students, whereas the activities in blended learning need to be much more engaging, involving, so the students feel some ownership of those processes and they are actively involved. Hence, we can say learning is no longer just about the delivery of educational materials, it is about interactivity with those who are learning. Several researchers (Gerber, 2003; Hartnell-Young, 2006; Németh and Csongor, 2016, 2017, Scott 2019) maintain that digital technology has clearly facilitated a change of dynamics in the teacher–student relationship; it makes the teaching–learning process mutual and shared. They assert that our role as language teachers has gone beyond “only” teaching. We have to keep up-to-date with the latest technological devices and tools to serve the needs of today’s digitally literate student population. Therefore, it is not only us teaching the students, but it is a mutual, reciprocal process, students are also continuously teaching and motivating us. It is amazing to see the huge number of options digital technology can offer in the classroom. At the same time, it also encourages people to continue learning outside of it and keep developing professionally. Teachers cannot afford to overlook it, if they want to produce a quality teaching–learning experience.

Figure 2 below demonstrates search interest of the terms gamification in education and gamification in business. As per the chart, since about 2012-2013 gamification in education has been a more popular search term than gamification in business, implying that it is becoming increasingly more relevant for educational purposes than it used to be.

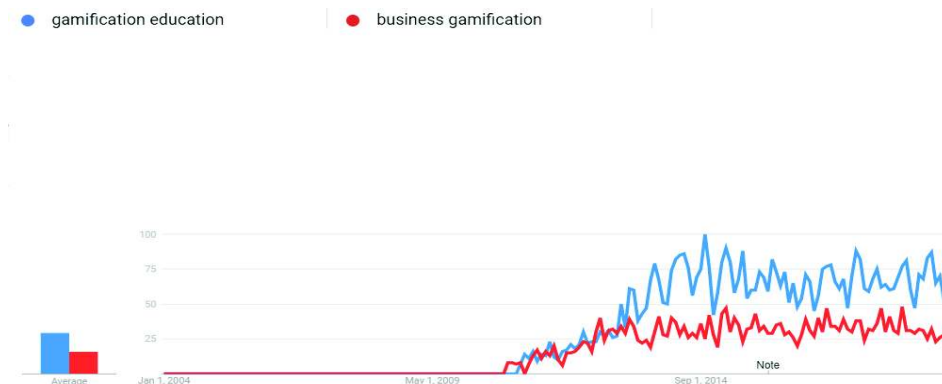


Figure 2: Gamification in Education and in Business Trend Chart
Source: Google Trends (n.d.)

When analysing the use of new methodologies applied in Languages for Medical and Healthcare Purposes (LMPH) classes, the following research questions were raised:

- How common is the application of gamification techniques in LMPH classes in Europe?

- Which specific games are the most regularly applied?
- How satisfied are the students with them?
- What are the advantages and disadvantages of gamified classes?
- To what extent do the students feel motivated and engaged when playing these games?
- Which skills do the students think they can develop while playing these games?

The aim of the present study was to gain a better understanding of the use of gamification techniques applied in LMHP classes in Europe as well as to examine students' skills development via these games. To the best of authors' knowledge, no study in the open literature has focused on this aspect of gamification to date.

3. Methods

To gather primary source data, an online questionnaire was prepared containing 32 questions using the online platform *Google Forms*, which the students were able to access without difficulty via their mobile phones and other portable devices. Questionnaires are suitable to collect data from a high number of respondents, as data procession of large samples is feasible this way (Babbie, 2001). The questions were divided into three main sections. The first section was focusing on the socio-demographic background of the students, followed by questions concerning students' experiences regarding in-class gamification tools. The last section scrutinised students' experience with a specific online gamification tool, Quizlet Live. The questions in the last section had been prepared by the Quizlet Team (2019) and they were adjusted for the purposes of this study.

The survey included both closed and open-ended questions as well as Likert scales to gain a better understanding of the students' perception of in-class gamification techniques. Closed questions were used in the survey, because, unlike open-ended questions, they assist respondents in providing obvious and evident answers fast and therefore can be processed and analysed by the researchers more efficiently. As Oppenheim (2005) argues, this is due to the fact that closed questions direct the respondents' views, and hence, allow the researcher to compare and scrutinise their answers more accurately. However, these question also result in the loss of natural and spontaneous answers by the participants, therefore open-ended questions were also included in the survey, which are easy to ask, but more challenging to answer and even more challenging to analyse. The four open-ended questions enabled the respondents to express their thoughts and ideas in their own words.

The language of the questionnaire was English to enable comparative studies and to target not only local, but international students as well. Anonymity was ensured. It was pretested in February 2019 by ten Hungarian and nine international students, and then modified based on their feedback.

As Heerwegh suggests (2005), response rates increase when personalization is applied to a survey. With this in mind, the authors decided on reaching over 1000+ Hungarian and international medical and healthcare students studying in the north, south, east and west parts of Europe. Email requests with the link to the survey were sent out directly to professional contacts or indirectly through professional organizations of second language or LSP teachers. As a result, responses came from the following seven countries: Austria, Czech Republic, Greece, Hungary,

Norway, Serbia and Slovenia. The questionnaire was open for eight weeks from 18 March until 18 May, 2019, due to the asynchronous nature of the semester in the various countries. It took between 10 and 15 minutes on average to fill in the survey.

Students were asked via an online link to fill in the questionnaire both in and out of class. Altogether, 547 valid responses were received, which is an estimated 50% response rate. There was a significantly higher response rate of students asked in class (98%) than that of those asked outside of class (10%). This confirms the importance of personalizing surveys to yield a considerably higher response rate, as suggested by Heerwegh (ibid).

In this paper, only the answers submitted for the first two sections of the questionnaire will be discussed due to word count limit.

4. Results

4.1. Respondents

A total of 547 students responded to the survey. More than 71% of the respondents were females. Nearly half of the students (49.7%) were between the ages of 21 and 25, 40% were aged between 18 and 20, and the rest were 26+. As Figure 3 displays, the students study medicine and health sciences in the following seven countries: Austria, Czech Republic, Greece, Hungary, Norway, Serbia and Slovenia. The majority study in Hungary (56%), followed by Slovenia (22%) and Serbia (10%), which is probably due to the fact that the authors teach at a Hungarian Medical School, and therefore they were motivated to reach out to high numbers of students.

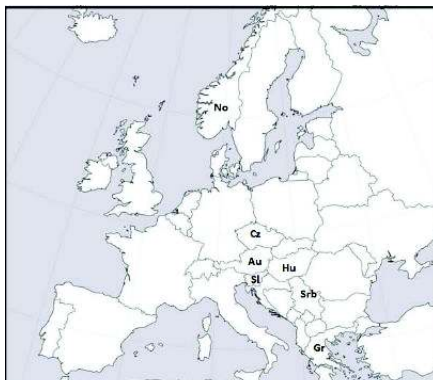


Figure 3: Countries of Study

The majority were first year students (51%), followed by second (37%) and third year students (9%). The rest were studying in their fourth and fifth year of medical/health sciences education. As Figure 4 suggests, the majority (61.8%) had a high school education and only 32.4% had some college experience, but did not earn a degree.

What is your highest level of education?

547 responses

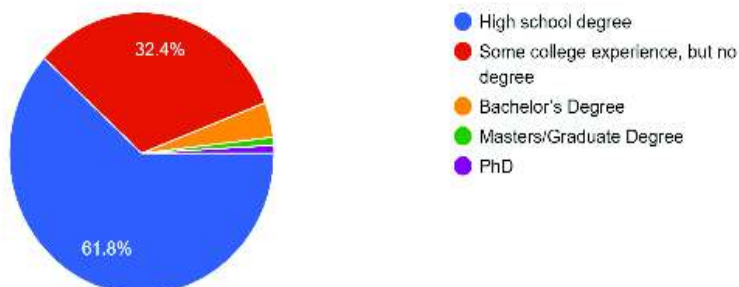


Figure 4: Highest Level of Education

The majority (68.2%) study medicine/health sciences in their mother tongue and out of those who do not, 78% study in English, followed by Slovenian (10.2%) and Hungarian (4.3%). Regarding their field of study, the majority study medicine (60%), followed by nursing (25%) and dentistry (10%). The rest study pharmacy, physiotherapy, radiology and paramedics. Concerning students' nationality, 22% were Hungarians, followed by Slovenians (20%), Norwegians (11%), Serbians (10%) and the rest were from miscellaneous countries across the world.

4.2. Gamification in class

In the second section, students were asked about their experiences regarding in-class gamification tools. Slightly more than half of the students (51%) stated that they played games in classes to enhance their medical and healthcare knowledge. The vast majority (95%) engaged in games mostly in medical language classes, such as *Medical English*, *German or Hungarian*, followed by *Biochemistry*, *Anatomy*, *Biology* and *Biophysics*. The most commonly used games were *Quizlet* and *Kahoot* (83%) followed by *Socrative* and various *interactive video-based* applications. The majority (80.8%) considered themselves *highly engaged or engaged*, when playing these games, as Figure 5 suggests, and 81% felt *more motivated* to learn words, terms, definitions, formulas with the help of these games than without them and it was considered *easier* by 78.4% of the respondents to *memorize* them following this method.

When participating in these games, how engaged/involved would you rate yourself?

276 responses

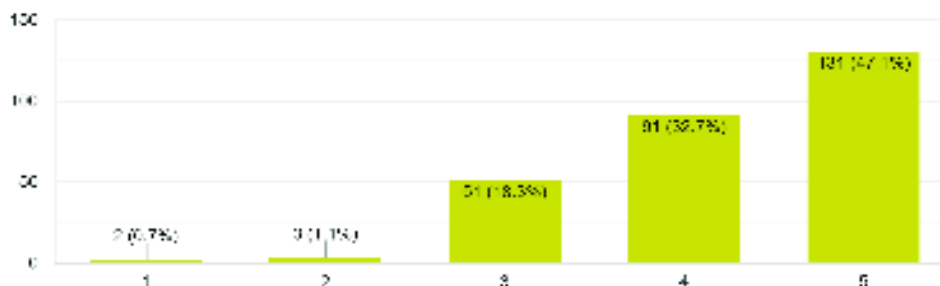


Figure 5: Level of Engagement while Playing Educational Games Online in Class

Regarding their skills improvement, respondents stated that they could develop mostly their *collaboration* (57.9%), *communication* (64%), and *language skills* (75.5%) while playing these games, as displayed by Figure 6 below, as during these games (e.g.: Quizlet Live and Kahoot) they have to work in teams and discuss the best answers and solutions possible in English.

Which skills do think you can develop while playing these games?

278 responses

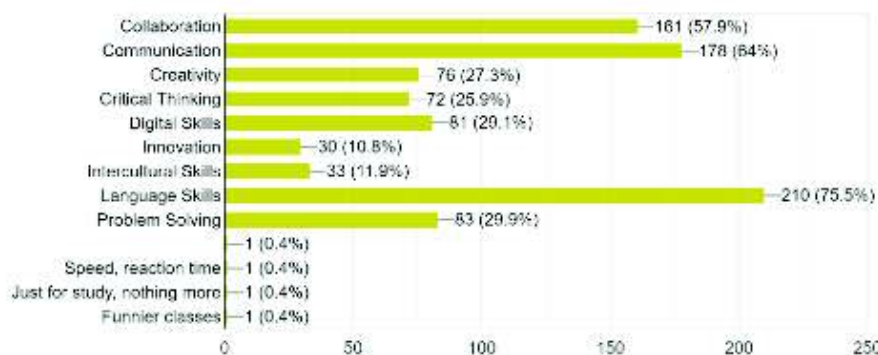


Figure 6: Skills Development while Playing Educational Games Online in Class

The survey included both closed and open-ended questions to gain a better understanding of students' perception of in-class gamification techniques. The four open-ended questions enabled the respondents to express their thoughts and ideas in their own words and they were the following:

Regarding the worst aspects of using these games in class the majority (84%) said there was “nothing”, “none” or “I don't think there is a negative aspect of these games”. However, some also considered the games as “boring”, “can be waste of time”, “it gets repetitive after a while”, “takes much time and it's not enough for learning them”. Certainly, technical issues were also mentioned as: “slow wifi”, “takes time to set up, like technically”, “players take too long to sign in”, “I can lose connection to internet” and some even considered the games as “stressful, only trying to find the correct answer and not really think about why it is the correct answer.” Some competitive students regarded “losing”, “hate the feeling of losing” as the worst aspect.

Students shared several *positive experiences* they had *while playing these games*, such as:

People who generally do not pay attention in class start interacting more with the class, and some of them improve the class by asking the teacher more questions about things related to the topic, which benefits everyone else.

I communicate and interact more with my classmates.

Working and interacting with other classmates I wouldn't do as much if so.

New friendships grown while playing these fun but at the same time useful games.

I learned that quizlet exists and I could also use it for other subjects to memorize better. It also is digital so you don't have to bring so many cards with you, just your ipad.

Although many respondents (79%) claimed they had “nothing”, “none”, “don't have any” or “I haven't got bad experience”, as expected, a few respondents (less than 5%) also had some *less-than-positive experience while playing these games*, such as:

After a while it gets really boring, and it isn't very great if you do not know any other students in the class.

If someone is not good at using gadgets it can make the group work harder. It's better to have an option for choosing the teams by ourselves.

Me and my friend lost the game just by one point less but it was challenging.

Actually I think the time that is spent for the games is not enough to be more effective but I understand it refers to the shortness of class's time and teaching, so in my opinion, the benefits of these games are more than their disadvantages.

To the greatest surprise of the authors, one respondent even claimed, “we played too much”, which was a less-than-positive experience for the person.

5. Discussion

The present study aimed at providing an insight into an international research that was carried out in the spring of 2019 involving healthcare and medical students from seven European Higher Education institutions. The goal of the study was to gain a better understanding of the use of gamification techniques applied in LMHP

classes as well as to shed light on students' attitude towards them. This is an under-researched area in LSP teaching, especially in LMHP teaching and there are no studies, to the best of authors' knowledge to date attempting at grasping the dynamics underlying the application of this novel methodology in education.

In recent years, the use of digital technology, and especially gamification has become very popular in education because of its motivational effects on students. It is even more significant in language learning, as there is a direct correlation between motivation and learning (Dörnyei, 1990; 2003; Brown, 2007). There has also been a significant change over the last few decades from *whether we should* use digital technology in class at all, to *how we should* use them. In his blog, Beatty (2019 August) argues that many classrooms today still look and operate much in the same way they did 200 years ago, as they are "teacher-centred and learning materials are often still limited to books and workbooks" (ibid: para. 6). Betty, in another blog (2019 July) also points out that many teachers today fear allowing students to use their phones in the classroom, without realising that those are, in fact hand-held miniature computers that let students connect to the online world, which includes, among other things, learning resources and platforms. Phones and gadgets also give students the freedom to study outside of class *what* they want, *when* they want, and *where* they want. Consequently, in his understanding (2019 July) educators should encourage students to use their phones to improve their knowledge, and at the same time, teach them to be reflective about the sources of the information they choose to use. This way, digital tools can be used to educators' advantage when teaching, although, this is not an easy task. New digital resources and various games and apps emerge almost on a daily basis. Which one to select and implement in class that suits the students' needs, which, at the same time, will not quickly seem outdated or disappear, is a challenge teachers have to face constantly.

Another essential element that has shaped 21st century education is that teaching has become a mutual, shared process between teachers and students, or in other words between digital natives and digital immigrants (Gerber, 2003; Hartnell-Young, 2006; Németh and Csongor, 2016, 2017). As Scott (2019) argues, nowadays students are the drivers of productive change by initiating and creating rich and engaging learning resources, suggesting new approaches to teaching, or novel ways to assess progress, as a result of which, a more stimulating curriculum maybe implemented. Therefore, as she claims (ibid), the student voice is an essential and valuable asset to a university. This is even more so in healthcare and medical education, where, as Németh points out (2018), the sink or swim, or in other words, the fail or succeed attitude is still present. Consequently, students often have the desire to strive to the fullest to be the best, or they fear failing otherwise. Hence, competition is a driving force for the majority, to triumph and excel. Thus, gamification facilitates these purposes as games provide countless opportunities for students to be the best and outdo their peers. Therefore, gamification may provide another method through which instructors can motivate their students to learn the target language, which could be extremely beneficial. If online educational gamification tools are applied properly and adequately, they will contribute to improving students' motivation, knowledge and personalised active learning according to Németh (ibid). Beatty (2019 August) also emphasises that students sometimes learn despite the existing approaches we use to teach, not because of them, as they have their own resources and tools to supplement their

learning process. Therefore, giving students shared responsibility for decisions that affect how or what they are learning can be a great way to generate innovative ideas that benefit both students and staff.

As the results of the study suggest, many educators across Europe have realised the above, as gamification tools are commonly applied in healthcare and medical education (Ahmed et al., 2015; Mesko et al., 2015; Rutledge et al., 2018,), and gamifying LMHP classes contributes to students' motivation, provides them with a genuine sense of achievement and enhances their communication and collaboration skills. Students' answers to both the closed- and open-ended questions of the survey imply that teaching and learning methods are enhanced by exploiting the benefits of gamification tools in LMHP classes. The results of this survey are in line with previous studies, as according to Meske et al. (2017), companies, such as IBM and Microsoft have long used gamification techniques to promote communication and collaboration among their employees and as Read and Shortell (2011) claim, gamification enhances communication, judgment and high-level social skills such as leadership and collaboration.

However, in foreign language and LSP classes, teaching students how to communicate in the real world with their mouths, ears, faces, eyes and bodies is just as important. In the authors' understanding, gamification can be used as a potential source of stimulation from which to launch into interactive communication keeping a healthy balance between the sensory and the digital resources. Numerous digital gamification tools emerge every day, which require special skills, knowledge and competence, therefore teaching with or without them cannot and should not be imposed on language teachers, instead, this decision should lie exclusively in their hands.

In the future, the authors' aim is to extend this survey to several more countries within and beyond Europe, and turn it into a blended-method research. This could incorporate structured as well as focus group interviews with the target group and other stakeholders, including the teaching staff, with the aim of gathering an in-depth understanding of the use of gamification techniques while teaching not only LMHP, but other disciplines and subjects to both local and international students. This mixed method survey will enable a multidimensional approach to the same subject matter from various aspects and reveal yet less investigated resources in medical and healthcare curriculum core subjects.

6. Conclusion

Gamification techniques have long been applied by the business and marketing world to encourage explicit behaviours and increase customers' incentive and commitment. However, in the past ten years in education, especially in language teaching and learning the benefits of this technique have also been realized as it provides an alternative method to engage and motivate students in the classroom. Effective language teaching should not be about imposing heaps of new vocabulary, phrases, grammar and content on students, but instead, providing opportunities to comprehend and apply them within context as well as through digital and educational games (Németh, 2018).

The results of the study have revealed that gamification enhances students' motivation and engagement in LMPH classes and increases students' collaboration, foreign language and communication skills. However, further

research is needed to evaluate the effectiveness of gamification in language classes, like the possibility of comparative studies of motivation brought by gamification versus actual language performance gauged by language teacher. Still, it can be claimed that the success of gamification lies in making the learning experience engaging and interactive, irrelevant of whether we are using this methodology face to face or online, due to the COVID-19 pandemics. Consequently, continuous professional development is an imperative for LMHP teachers to improve the quality of teaching, as digital competences are of major importance nowadays. Therefore, life-long learning is vital for the academic staff in Higher Education to meet the needs of digital natives of diverse cultural backgrounds and to prepare for online teaching, as a result of global pandemics. As Beatty argues (2019 August), using old methods to teach, educators may experience some success, however, they should also remember that students sometimes learn despite the existing approaches applied, and not because of them. In his blog post, Beatty quotes (ibid) Buckminster Fuller (2008: 21), an American engineer and architect, who once said the following about old solutions:

“If you are in a shipwreck and all the boats are gone, a piano top buoyant enough to keep you afloat that comes along makes a fortuitous life preserver. But this is not to say that the best way to design a life preserver is in the form of a piano top. I think that we are clinging to a great many piano tops in accepting yesterday’s fortuitous contrivings as constituting the only means for solving a given problem.”

To conclude, based on established literature and the outcomes of the present survey, the authors encourage fellow teachers to re-assess and re-evaluate the methods they have been using and consider Fuller’s piano top metaphor of old methods and D. H. Lawrence’ lines about the absorbing and fun nature of work in amending their classes, if deemed necessary.

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