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**The role of narrative in educational gamification.
Findings from a case study
Il ruolo della narrazione in ambienti formativi gamificati.
Risultati di un caso di studio**

di

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Abstract

Educational gamification, which consists in using game elements to influence learning-related behaviours and attitudes, with the ultimate aim of fostering the formation of positive learning habits, has become increasingly applied in recent years. There are many game elements and mechanics to be used in gamification; however, many applications rely primarily on points, badges and leaderboards. One of the underused game elements is narrative, which seems in contrast to the fact that storytelling is a technique commonly used to increase learner motivation in learning contexts. This qualitative study aims at exploring Higher Education (HE) students' perception of narrative elements in a gamified learning

environment, named "The Chronicles of Knowledge" (TCoK), which was tested in the course "Applied Games" involving 24 full-time, first-year university students.

Keywords: Higher Education, Students' perception, Storytelling, Game fiction, Game elements, World Café, Content analysis

Abstract

La gamification dei processi formativi, che consiste nell'uso di elementi di gioco per influenzare comportamenti e attitudini legate all'apprendimento, con l'obiettivo finale di favorire la formazione di abitudini di apprendimento positive, ha trovato sempre maggiore applicazione negli ultimi anni. Ci sono molti elementi del gioco e meccaniche che possono essere utilizzati nella gamification, spesso però le applicazioni gamificate si basano principalmente su punti, badge e classifiche. Tra gli elementi del gioco meno utilizzati c'è la narrazione, nonostante in ambito formativo la narrazione sia una tecnica comunemente usata per aumentare la motivazione degli studenti. Questo studio qualitativo ha lo scopo di esplorare la percezione degli studenti universitari degli elementi narrativi inclusi in un ambiente di apprendimento gamificato, "The Chronicles of Knowledge" (TCoK), che è stato testato nel corso "Applied Games", frequentato da 24 studenti universitari del primo anno.

Parole Chiave: Istruzione Superiore, Percezione degli studenti, Storytelling, Game fiction, Elementi del gioco, World Café, Analisi del contenuto

1. Introduction

Educational gamification or gamified learning, which is the implementation of gamification techniques in educational contexts (Armstrong and Landers, 2017; Landers, 2015), has been widely employed in recent years (Manzano-León et al., 2021; Sailer and Homner, 2020). To better capture the essence of gamified learning, the general definition of gamification as "the idea of using game design elements in non-game contexts" (Deterding et al., 2011, p. 9) has been expanded by Landers (2015). According to Landers, when applied to educational contexts, gamification can be defined as the use of game elements to affect learning-related behaviours and attitudes, with the final aim of affecting learning-related attitudes and behaviours and fostering the formation of positive learning habits such as note-taking, reflection on material learned, active participation during classes, attendance, effort and punctuality in doing homework, etc. (Landers, 2015).

Both these definitions have highlighted the specificity of educational gamification, compared to other possible approaches and solutions based on the use of games in educational contexts. First of all, the use of the word "game" instead of "play" has to be noted in Deterding's definition. Deterding, in fact, agrees with classic definitions in game studies that games "are characterized by explicit rule systems and the competition or strife of actors in those systems towards discrete goals or outcomes" (Deterding et al., 2011, p.11), while play represents a

broader category than games and is generally associated with free-form activities (Juul, 2005; Huizinga, 1949).

Educational gamification can also be set apart from the broad spectrum of solutions known as Game-based learning (GBL). The definition of GBL is usually linked to Prensky's suggestion that games, especially digital ones, can help education professionals design more engaging learning experiences for new generations of students (Prensky, 2003; Plass et al., 2015; Perotta et al., 2013). Therefore, GBL is based on the idea of using games or game-like activities to help students to reach specific learning goals, while educational gamification is based on the use of game elements, game mechanics and game design principles to foster specific positive behaviour that in turn are conducive to learning.

Moreover, a gamified learning application can be differentiated from a serious game since the latter is a complete game, which is designed and used to reach specific learning goals and not just for entertainment purposes (Abt, 1970; Barca et al., 2012; Schmidt et al., 2015), while the former just use elements of games without giving rise to an entire game.

There are many game elements to be used in a gamified learning application, as will be explained in more detail in the theoretical framework. However, some elements, such as points, badges and leaderboards, seem to be very frequently used, while others, such as narrative elements, seem to be underused (Subhash and Cudney, 2018).

Drawing on the available literature on how the use of narrative in gamified learning applications affects students reactions to training and learning achievements (Armstrong and Landers, 2017; Botte et al., 2015; Palomino et al., 2019), this study aims to further explore students' perceptions of narrative in educational gamification, within the specific framework of Higher Education (HE).

The remainder of this paper is structured as follows. The *Theoretical Framework* section presents a literature review about the use of gamification in education and about the impact of narrative in educational gamification. Then, the gap in the literature is identified, and the main research questions are formulated. The section *The Chronicles of Knowledge* presents the gamified learning environment, which is used as an example in this analysis, highlighting the narrative elements that are included. The *Methodological Approach* section presents the method and tools adopted in the research process and provides a description of the participants involved. The study's main findings are presented in the *Results and discussion section*, and some design suggestions on how to effectively include narrative in a gamified learning environment are formulated in the *Conclusions* section.

2. Theoretical Framework

2.1 The use of gamification in education

A recent meta-analysis carried out by Sailer and Homner (2020), in which they examined a final sample of 38 publications reporting 40 experiments, provided evidence that gamification benefits learning and the results of their study were in line with the theory of gamified learning (Landers, 2015) and self-determination theory (Ryan and Deci, 1987).

According to the results of this meta-analysis, among the most commonly reported benefits of gamified learning, there are the following: better cognitive learning outcomes, higher level of motivation to learn, higher levels of engagement in the learning process.

An empirical study carried out by Dias (2017) comparing the results of a total of 150 first-year management students, divided into two equal-sized groups, highlighted that the students taking the gamified version of the course achieved a statistically higher mean score and pass percentage. Similarly, De-Marcos et al. (2017), applying a social gamification approach to an undergraduate course and comparing the students' results with a control group, observed that the gamified group outperformed the control group on practical assignments.

Moreover, on Dias (2017), students involved in the gamified version of the course showed also higher participation and class attendance than the non-gamified group.

Another example is provided by the study of Beemer, Ajibewa, and DellaVecchia (2019), which focused on the application of gamification to physical education and highlighted that 55% of the students involved in the study performed a minimum of 20 minutes of daily exercise and only 15% did not regularly participate, with statically significant differences in comparison to the traditional group.

2.2 The use of narrative in educational gamification

To gain an understanding of educational gamification and its potential, it is crucial to dwell on what game elements are. There are, indeed, many game elements and mechanics to be used in gamification, Marczewski for instance, identified 52 of them (Marczewski, 2018; Tondello et al., 2016), including Guilds or Team; Challenges or Quests; Points; Badges or Achievements; Leaderboard; Lottery or Game of Chance; Narrative or Story; etc.

Among the various studies aiming at developing a taxonomy of game attributes, it is also worth mentioning the one carried out by Bedwell et al. (2012). In this study, the authors identified, through literature review and subsequent card sorts performed by subject matter experts (SMEs), a list of 19 learning-oriented game attributes, grouped into nine categories: Action Language, Assessment; Conflict/Challenge; Control; Environment; Game Fiction; Human Interaction; Immersion; Rules/Goals. In the same study, the authors also provided a summary of research conducted linking game attributes and learning outcomes, highlighting the fact that several studies have analysed the connection between game narrative and different learning outcomes such as declarative knowledge, motivation and cognitive strategies (Bedwell et al. 2012).

In the specific context of education, the recent taxonomy of Toda et al. (2019) identified 21 elements, divided into five dimensions: performance, ecological, social, personal and fictional. However, many of those elements are underused in gamification, which often seems to rely mostly on points, badges and leaderboards (Subhash and Cudney, 2018). One of the underused game elements is narrative (Subhash and Cudney, 2018; Palomino et al., 2019).

The marginal role that so far narrative seems to have played in educational gamification is at odds with the fact that within the learning context, narrative is not a novel concept. Storytelling, for example, is a technique commonly used to increase learner motivation using narrative (Armstrong and Lenders, 2017; McDrury and Alterio, 2002). Narratives are most often used as personal, relatable examples of course content (Armstrong and Lenders, 2017).

Moreover, since human lives are essentially narratives, it is easier for people to relate to and enjoy narrative texts than it is expository texts (Armstrong and Lenders, 2017). In a summary of the literature, Norris and colleagues (2005) identified 20 of 23 experimental studies conducted comparing narrative and expository texts that identified a positive effect of narrative on learning outcomes, suggesting the broad value of narrative.

2.5 The gap in the research and the research questions

As anticipated, this study aims at exploring the impact of narrative elements in a gamified application from a qualitative perspective. In particular, it aims at answering the following research questions:

RQ1: What is the students' perception of narrative in educational gamification?

RQ2: Does narrative improve students' overall emotional response to training (e.g., enjoyment)?

3. The Chronicles of Knowledge

The Chronicles of Knowledge (TCoK) is a gamified learning platform designed to enhance active learning in HE courses and foster students' engagement and motivation. At a technological level, the learning management system adopted was Moodle, which was gamified thanks to the *Level Up!*¹ plug-in, properly customised according to the project's needs (Figure 1).

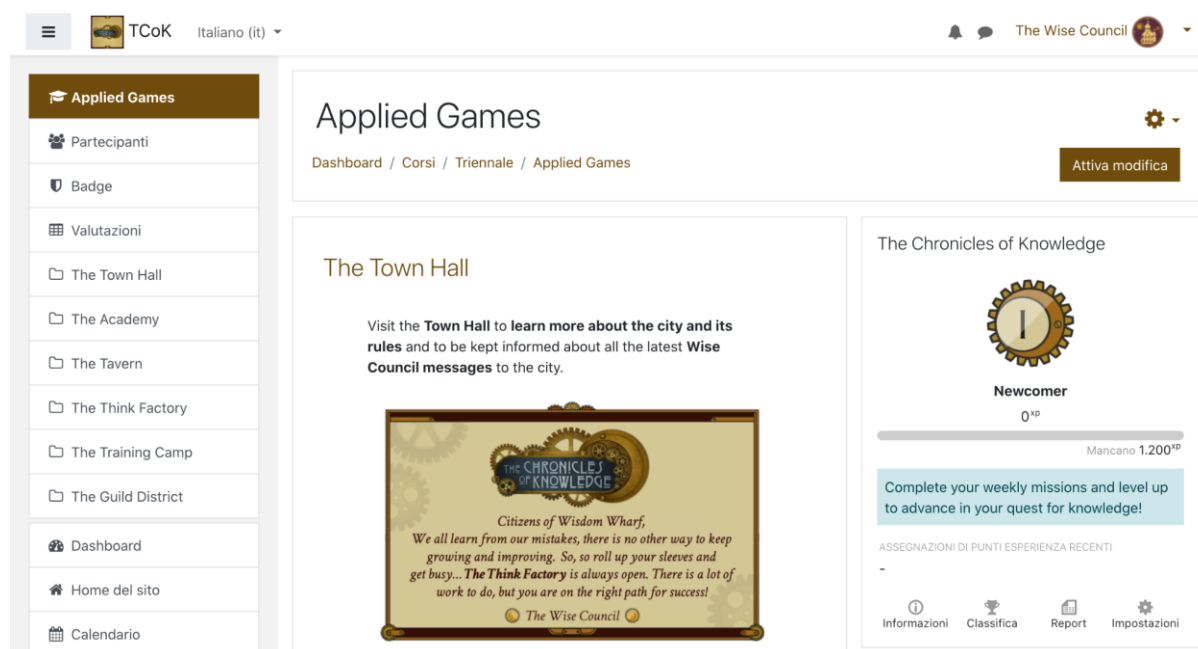


Figure 1. The Chronicles of Knowledge main page

¹ Available at <https://levelup.plus/>

TCoK was used to support students in carrying out learning activities during an academic course based on the flipped learning methodology².

The students' first approach to the fictional world of TCoK is mastered by the teacher, who introduces them to their role at the beginning of the course: students play as the citizens of a fictional small town called Wisdom Wharf. The Wise Council rules the city. Through a message from the Wise Council, the students learnt that dark forces are menacing Wisdom Wharf and that it's up to them to defend the city.

To fulfil their overall mission, students have to access the Moodle platform to complete the Wise Council's weekly assignments, such as studying the theoretical contents, completing the learning quiz, and participating in the discussion forum. Students received a predetermined amount of points as rewards for completing the weekly assignments; collecting points was functional for levelling up.

After the first week, having acquired the basic game mechanics included in TCoK, students were ready to be assigned to the Guilds: Explorers, Mercenaries, Alchemists, and Inventors (Figure 2).



Figure 2. The four Guild's Founder and Symbol

² The flipped learning methodology envisages students to gain first exposure to theoretical contents as home activity (specific learning materials, such as video lectures or reading materials, were provided each week by the teacher on the TCoK platform). Classroom time was then devoted to applying the theoretical contents in practical projects, encouraging the critical discussion of each topic among the group of peers, with the teacher's supervision.

The four students that firstly reached level 2 in the competition were appointed as Guild leaders. They had the chance to choose their favourite Guild, and other students had to join one of them, according to their preferences. Guilds represented, in the end, the groups that will have to work together on the final project work and whose students' individual contribution in terms of points would have led, eventually, to victory.

To keep track of groups' progress, a Guilds' leaderboard was visible on the Moodle platform (Figure 3).

Posizione	Team name	Points
1	Inventors	252.350 ^{XP}
2	Alchemists	237.591 ^{XP}
3	Mercenaries	222.949 ^{XP}
4	Explorers	170.850 ^{XP}

Figure 3. The Guilds' Leaderboard

To balance the competitive dynamics related to the Guilds' leaderboard with a more cooperative spirit, students were informed that a mysterious enemy was approaching the coast of Wisdom Wharf, threatening to put the town under siege. To protect the city, the Guilds should have to work together, joining their forces, using their knowledge of the course's contents as their weapon. The aim of anticipating an imminent battle was to foster the students' motivation to complete each weekly mission by providing an ulterior level of meaning to their actions in TCoK's narrative framework and consequently promoting a good organisation of their studyload. In this sense, also the organization of the platform was narratively contextualised: the city of Wisdom Wharf was indeed represented through six significant places:

- *the City Hall*: where students can find the rules and have access to the Wise Council's dispatches;
- *the Academy*: here are uploaded the course's learning materials like teacher's presentations, class recordings, further reading materials and the glossary. To the creation of the latter also contributed the students themselves;
- *the Tavern*: is the location where students can talk with each other, can give feedback to their peers, can answer surveys or highlight technical issues;
- *the Think Factory*: is the place where ideas come to life; therefore, students find here templates and materials to develop their project work and upload their outputs;
- *the Training Camp*: here it is possible to practice the theoretical knowledge acquired through weekly quizzes;

- *the Guild District*: here, it is possible to have access to each Guild's related contents, including the history of the founders and the secondary missions.

All messages directed at the students and all feedback they receive are also narrated in a way that maintains continuity with the context of the story. The students themselves are encouraged to immerse themselves in the narrative when they are asked to talk about themselves or their Guild and their tasks, always respecting the individual's willingness to act as in a role-playing game.

4. Methodological Approach

To better capture the subjective experiences of participants interacting with a gamified learning environment, a qualitative approach was adopted, based on the World Café method. After a brief introduction to the World Café method, the specific procedure adopted in the context of this study will be described.

4.1 The World Café Method

The World Café is a qualitative research method that mimics a café made up of small tables, each of which represents a sub-topic for discussion (Brown and Isaacs, 2001; Brown et al., 2005) and, through a conversational process, allows groups to engage in constructive dialogue around critical issues (Fouché and Light, 2011).

This method is increasingly being used given that, as a participatory method, it offers a twofold advantage: it is an effective tool for collecting qualitative data, and it also has the added value of benefiting participants by facilitating mutual learning and the building of interpersonal relationships (Löhr et al., 2020).

According to the guidelines provided by the creators of the World Café format (Brown et al., 2005), a World Café session should be designed following seven main principles: (1) set the context; (2) create hospitable space; (3) explore questions that matter; (4) encourage everyone's contribution; (5) cross-pollinate and connect diverse perspectives; (6) listen together for patterns, insights, and deeper questions; and (7) harvest and share collective discoveries. As long as these principles are followed, the design of a World Café session can be tailored to be effective in a wide range of circumstances, from sessions as short as ninety minutes to conferences lasting several days (Brown et al., 2005). More information about the design of the World Café hosted as part of this study can be found in section 4.3.

4.2 The participants

This study involved 23 full-time students of the course "Applied Games". All the participants attended the first year of the Degree "Innovative Technologies for Digital Communication", "Video games" curriculum, offered by Link Campus University. Participants' age ranged from 19 to 26 years; 22 of them were male and 1 was female.

In a pre-questionnaire, participants were asked about their gaming habits, and all of them reported a high level of time spent playing games, especially video games (13 of them played every day, 7 of them played at least four times a week, and the remaining 3 students played at least once a week). This is consistent with the fact that all of the participants are enrolled in a

curriculum focused on video games design and development, are passionate about games and identify themselves as gamers.

Table 1. Participants Demographic Information

Category	Sub-category	Number	Percentage
Age	19-22	17	74%
	23-26	6	26%
Gender	Male	22	96%
	Female	1	4%
Level of familiarity with games	High	20	87%
	Medium	3	13%
	Low	0	0%
Attitude toward gamification	Positive	22	96%
	Neutral	1	4%
	Negative	0	0%
N = 23			

4.3 The procedure

All the students who were enrolled in the course "Applied Games", joined the online gamified platform and attended at least part of the weekly synchronous online lessons throughout the semester were invited to participate in the World Café; 23 out of 24 people accepted the invitation.

Two different World Café sessions were organised; the first included 12 participants and the second 11 participants.

Each World Café session started with a brief introduction aimed at clarifying the purpose of the discussion and at engaging participants in the issue, as well as explaining how the activity would be carried out.

Then the participants were divided into the three predefined virtual tables. Each virtual table included four people max and was devoted to a specific sub-topic of discussion (see Table X); the groups rotated every 20 minutes to allow each sub-group to participate in each discussion topic. At each table, the researcher and two involved research assistants chaired and guided the discussions.

Both the World Café sessions were hosted online due to the COVID-19 restrictions. A digital tool (Discord, www.discord.com) was used to conduct the activity in an easy and friendly

way. It was selected because it was suited for the activity, and students were already familiar with it. Throughout the discussion, notes were taken by table hosts on paper sheets. The World Café sessions were audio-recorded; all the recordings were transcribed afterwards and then analysed through qualitative content analysis, as described in the next paragraph.

The aim of the whole World Café was to gain a deeper understanding of the participants' experience with The Chronicles of Knowledge and to collect feedback and suggestions on how it could be improved in order to guide the subsequent re-design process of The Chronicles of Knowledge and lead to a new version of the solution, which would better meet students' expectations and needs.

Therefore, at each table, the discussion was focused on a different aspect of the whole experience, as summarised in Table 2.

Table 2. World Café tables: sub-topics of discussions and main questions

Table	Sub-topic	Main questions
A	Didactic method	Do you think that participating in The Chronicles of Knowledge helped you to study and learn the course content? How has participating in The Chronicles of Knowledge impacted your study habits? What aspects of The Chronicles of Knowledge contributed most to increasing your level of involvement and motivation during the course?
B	Game elements and mechanics	Which elements or game mechanics of The Chronicles of Knowledge did you like the most, and which did you like the least? Was the reward system easy to understand? Do you think that the experience points awarded for the various missions were adequate to the effort required to complete them? Was the information provided on The Chronicles of Knowledge clear, or were there aspects you did not understand?
C	Dynamic and Aesthetics	Did you enjoy the narrative aspects of The Chronicles of Knowledge (such as the characters, the story, and the Wise Council's messages)? Did you enjoy the graphic style of the characters and game elements? Do you feel that collaboration and competition have been well balanced within The Chronicles of Knowledge? Did you like your overall experience as a player?

5. Results

The data were analysed through qualitative content analysis (Weber, 1990; Hsieh and Shannon, 2005; Bardin, 2013), according to the following main steps: reading and re-reading data to familiarise with them, defining the analysis units, classifying the analysis units into categories (sub-themes and themes) on the basis of the similarities between them (Bardin, 2013), reviewing themes, defining and naming themes, reporting the study findings. The first part of the analysis was performed in the original language (Italian), but the themes were defined and named in English. Data were analysed using CAQDAS software NVivo 12.

The results, collected through the six rotations that took place at the third virtual table during both World Café, were categorised under four main themes: immersion and engagement; competitive collaboration; rewards and feedback; challenges, as shown in Table 3.

Table 3. Themes and sub-themes revealed in the analysis

Themes	Sub-themes	f*
Immersion and engagement	Role-playing Enjoyment and fun Graphic and animation Narrative world	38
Competitive collaboration	Community building Active participation Individual differences	42
Rewards and feedback	Link between achievements and story progression Notifications Avatar evolution	15
Challenges	Interactive storytelling Frequency Balance between challenge and skills Fostering good study habits	27

*Note: The frequency was calculated based on the number of mentions during both the World Café sessions

5.1 Immersion and engagement

The majority of participants (n=19) stated that they liked the story and that the narrative elements contributed to their overall enjoyment of the course experience. One of the participants stated, *"It reminded me a lot of a role-playing game, I liked immersing myself in this fantasy world with the various places, the tavern, the different guilds of players who had to work together to complete tasks and narrative missions but, at the same time, always allowed you to learn something"*.

Some of the participants (n=6) also noted that the narrative framework provided an additional level of meaning to their actions, increasing their level of motivation to complete the assigned missions. As pointed out by one of the students, *"it was very nice to see that the notices about the tasks to be completed for the following week were written as if you were actually part of that fantasy world, so you felt thrown into the dimension of the game world"*.

Many students (n=12) would have liked an even richer and more complex narrative design: *"I would have liked to have had an in-depth look at the story, perhaps every so often, or to have been able to influence the course of the story at a particular point through our actions"*.

5.2 Competitive collaboration

The introduction of the guilds, as well as being functional to the development of the narrative, has effectively contributed to creating an atmosphere of pleasant collaborative competition. This was highly appreciated since some of the students (n=7) asserted that they don't like competition per se, but the way it was presented in TCoK was actually effective in fostering positive studying habits: *"A healthy kind of competition was created, not a harmful kind. In the sense that, since I want to hold a certain position in the ranking, I am willing to*

take the quiz even immediately, as soon as the class ends. Which, if there hadn't been this system, maybe honestly speaking, I wouldn't have done, and I would have taken more days, or I might have forgotten to do an activity".

5.3 Rewards and feedback

Many rewards and feedback offered in TCoK were presented in a narrative form (badges, messages from the Wise Councils, new levels reached which corresponded to a change of status for the player, etc.). Students appreciated these aspects as well, however many of them (n=14) demanded a more structured connection between their achievements and the evolution of the story. The perceived value of some rewards, such as badges, seems to be rather low because they were not very integrated into the story progression. One of the students suggested: *"I would have added some more graphics in some cases, maybe when you got a badge. Or I would have given the possibility to create an avatar, and this avatar would then evolve in the various passages of level, possibly with an animation where there was the avatar receiving the new badge".*

5.4 Challenges

According to the participants, challenges were a useful and enjoyable part of the gamified experience. They generally recognise the importance of challenges, both individual (quizzes that were weekly released in the learning environment) and collaborative (the final boss fight) to help them better understand course content and organise their workload. In this regard, one of the students stated, *"Undertaking a course accompanied by such stimulating activities is a winning solution because you achieve an important result, which is to keep yourself active, and to learn the various concepts over the course of the weeks so that you don't have to learn everything a week before the examination."*

However, some of the students (n=8) would have appreciated a higher level of connection between their performance in the different challenges they faced and the narrative elements of The Chronicle of Knowledge. They suggested that an interactive storytelling approach should be adopted and that the story should unfold in different ways depending on the students' achievements during the course. In the word of one of the participants, *"It would be useful to continue to develop the storyline during the course, perhaps linking it to the missions. In this way, the missions would also become more important because depending on what you do, the story would develop differently."*

6. Conclusions

With regards to the students' perception of narrative in educational gamification, is it possible to highlight that, in the context of this case study, the narrative framework, even though focused just on a few elements (the guilds founders' characters, the bits of the story related to the siege, and the initial presentation of Wisdom Wharf), was highly appreciated.

During all rounds of the two World Cafés, it was evident that the participants perceived the story as a relevant part of their experience and appreciated the fact that narrative elements were incorporated in the gamified application. Most of the concerns they raised were indeed requests for a deeper and more complex development of the narrative, in terms of both lore

(the story of the game worlds and of its characters) and plot (especially with the aim of connecting their performance to the story progression).

Moreover, students reported that, thanks to the narrative elements of the gamified application, they have the opportunity to experience a deeper level of connection both with the course content and with the group of peers. The last aspect was particularly relevant since their course was completely held online, and they never had the chance to meet in person with their colleagues.

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