

>GAMIFICATION

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>Using game design and game elements in the EFL classroom_

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Declaration of originality

I certify that all material contained in this *travail de candidature* is my own work. All source material is clearly acknowledged as and when it occurs in the references, as well as in the list of works cited.

Luxembourg, 4th November 2017



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Abstract

Research objectives

This thesis discusses the ways in which one of the basic human instincts – the urge to play – can be used in an EFL classroom to improve learners’ motivation, social skills and willingness to engage in language learning. My thesis focuses on three major aspects. First, in my lessons, I have implemented games as well as features that often form the core of games, such as rules of play, experience points, achievements, and the levelling up and customization of an avatar. The learners see their progress mirrored within the paradigm of role-playing games: their activities in the classroom inform the development of their in-game avatars and unlock real-life abilities and rewards.

Second, I analyse which games and aspects of gamification are conducive to the creation of a ludic space. While the use of tablets is not the core focus of this thesis, I have worked with pedagogical and language-learning games designed for tablets as well as classroom games designed to use tablets as one of their central features. However, I also consider how the use of ICT (information and communication technologies) can threaten the ludic space.

Third, I explore the potential that ICT-based gamification offers in terms of assessment. Modern digital games provide players with detailed data on their performance. Such data can facilitate students’ self-evaluation and be used to help learners identify and work on their strengths and weaknesses. Statistical data can also help teachers to analyse their own practice. Moreover, I examine the importance and feasibility of implementing automated assessment and making immediate feedback accessible to learners.

Methodology

I have based my research on a variety of sources, including academic research papers, educational news, works on the theory of game design and gamification. My thesis also analyses existing gamification projects and tablet-based language learning tools. Moreover, I inspect whether my findings are compatible with those of educational theories such as behaviourism and socio-constructivism.

I have implemented a select number of projects in my lessons with one 11CM and two 10CM classes. In order to assess the effect the projects have on the students’ learning, I have conducted surveys among the learners, observed their reactions to and use of gamification, and evaluated the data generated by the gamification project.

Expected outcomes

With this thesis, I hope to demonstrate that gamification can be a useful tool to support classroom management, to kindle students' willingness to actively participate and to increase their motivation. I document what elements of gamification successfully lead to ludic interaction among learners and encourage cooperation. The thesis should also show which strategies can reasonably be implemented by other teachers. My findings should thus add to a field that has developed only recently, yet allow me and other teachers to better understand the basic need for playfulness.

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1 Press Start | Introduction

1.1 Ludification

There is a multiplayer activity which almost all the adolescents that I know participate in. It may be difficult to see its appeal at first. Its level design is fairly linear. You cannot select the difficulty level, and those who struggle are often told by the community that they simply have to make an effort. You cannot save before a difficult passage and the challenges quickly get harder, whether you improve or not. If you do not improve fast, you lose. When that happens, you have to start over. Significant amounts of time pass between checkpoints, so you have to experience a lot of it again. The points which you had earned in that level are then reset to zero. It may come as no surprise that over a quarter of those who start get demotivated and never finish. To many, this does not sound like an appealing activity. Still, most adolescents do not have a choice in the matter, and so they start anew each September.

For those students that this educational system does not favour,¹ games are a viable resource of enjoyment, one they may find more enticing than studying. Many a tired-looking student has admitted to me that she² had spent the previous day gaming into the night. They are not alone. In 2010, game designer Jane McGonigal calculated that all of humanity combined spent 3 billion hours per week playing online games. In fact, she claimed, in a country in which games are well established, by the time a young person is 21 years old, she will have spent 10,000 hours playing games online (McGonigal, "Gaming"). To put that into perspective, a typical student in Luxembourg will have spent over 11,000 hours in primary and secondary school. It is likely that with the proliferation of gaming-capable smartphones, the number of hours spent playing games online has increased since 2010: in 2016, 97% of people in the 16-24 age group used a smartphone to access the internet, and 60% used it to play or download games (Frising 3-4).

The proliferation of games which these numbers suggest is known as *ludification*: it is “the spreading of games in a culture” (Sanchez, Young and Jouneau 2). The gaming industry has immense revenues, and a significant amount of their customers are students. Considering the time and energy that learners invest in games, it would be imprudent not to analyse the factors which drive them, and how these can be harnessed, not as escapism from education, but as tools thereof.

¹ 26.4% of students who started secondary school in 2000 are not expected to obtain a final diploma. (MEN, Réussite 3)

² For practical and stylistic reasons of pronoun complications, I shall refer to teachers using male pronouns, and to learners and/or gamers using female pronouns. Furthermore, in order to protect my students' privacy, all student names in this thesis have been replaced by pseudonyms.

It appears then that the idea of “digital natives” is incomplete in that it is not just the use of digital devices, but also the familiarity with game mechanics that has become “deeply embedded in people’s thought processes” when compared to the way previous generations played (M. J. Nelson 3).

1.2 Structure

First, this thesis considers relevant frameworks of motivational theory. I evaluate the long-term effects of catering to intrinsic and extrinsic motivation, as well as the role that rewards play in the context of reinforcement of desirable behaviour. I also discuss how feedback relates to this. Then, I focus on game design, its connection to the theoretical framework and how so-called serious games can be used in education. The next chapters discuss the core concepts of *gamification* and criticism thereof from a theoretical point of view. I then focus on the practical implementation of Classcraft, a platform that gamifies classroom interaction. Next, I discuss the need for a *ludic space* which complements gameful experiences, before considering the techniques that educators’ assessment and evaluation methods can glean from gamification. Finally, I analyse the potential of badges, one of the most severely criticized aspects of gamification.

1.3 Goals

The arrival of new technology has likely hastened the process of ludification. The driving force behind this project, however, must be educational needs, rather than using new tools for their own sake.

I have worked on this project with intermediate-level “Commerce” (CM) classes at the Lycée Technique de Bonnevoie (LTB): a 10e class in 2015-16 and a 10e and 11e class in 2016-17.³ The processes described in this thesis aimed to benefit learners in several ways. First, they should lead to better feedback on their progress. Then, they should improve social interaction, including a positive class atmosphere and more productive cooperative learning. Finally, they should increase or support learners’ motivation. Gamification, far from turning lessons into pointless playing at the cost of learning opportunities, can allow learners to overcome motivational obstacles and make learning intrinsically motivating to them.

Conversely, learners who are motivated also make teaching more enjoyable for me. This, in turn, motivates me to put more effort into my work and leads to a spiral of positive reinforcement. In this process, I hope to create a space in which experimentation and creativity are encouraged for both my students and myself.

Finally, I hope this thesis can serve as a guide on how gamification can be implemented, and what dangers need to be considered. In this way, I wish to inspire my colleagues to work with these concepts while I am “waiting for other players.”

³ In 2017-18, these forms were renamed 4GCM and 3GCM, respectively.

2 The cake is a lie | Motivation

2.1 Definition

Motivation is a group of “psychological processes that direct and energize behaviour” (Deterding, "Atoms" 3). It is at the source of students' actions in the context of their education. It is both a goal and a prerequisite to being a successful learner. Abramovich and Wardrip show that motivation accurately predicts educational outcomes for students and that increasing it “can be as effective as improving the other qualities of their education” ("Impact" 1357). Considering the thousands of hours which adolescents invest into gameplay, the question of what motivates them imposes itself. To this end, we need to differentiate between different types of motivation.

2.2 Intrinsic Motivation

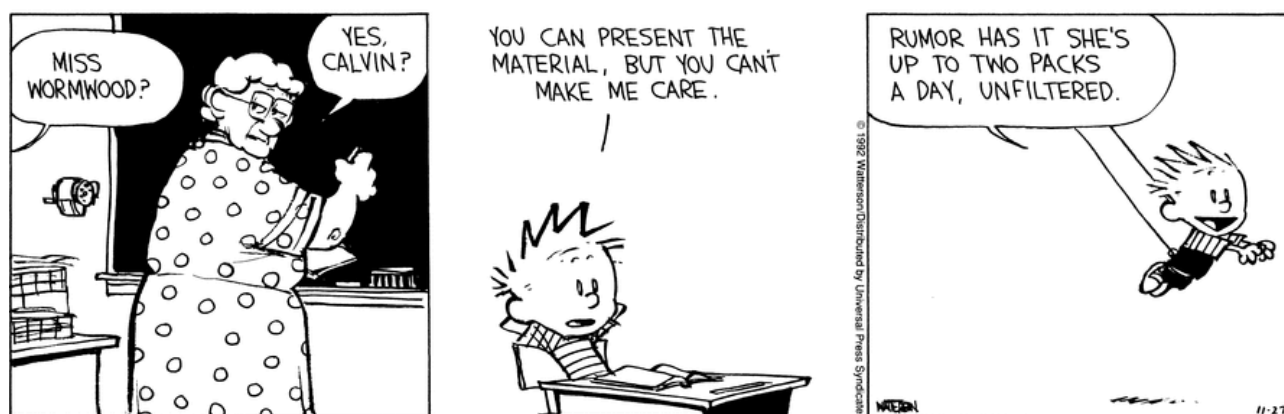


Figure 2.1 Calvin & Hobbes by Bill Watters, 27th November 1992

Motivation can be said to be intrinsic when connected to an autotelic activity, i.e. one which serves as its own goal (Deterding, "Atoms" 6). An autotelic activity has purpose in and not apart from itself, and participating in it is its own reward. These activities are appealing because of their originality, the challenges they hold or their aesthetic value (Ryan and Deci 71). Games serve as a prime example. There is no need to pay a player for her participation in games when she is absorbed in her progress, in exploring the game world and in the success of the gaming community (McGonigal, *Reality* 4213). The more generic criteria by which one can identify an intrinsically motivating activity remain controversial among research communities. I have therefore chosen to focus on those models which allow for the most productive analysis of the system in which I teach.

These models predict a number of benefits to maintaining intrinsic motivation. People who are intrinsically motivated “have more interest, excitement, and confidence, which in turn is manifest both as enhanced performance, persistence, and creativity ... and as heightened vitality ...

self-esteem ..., and general well-being” and they are capable of “larger learning gains” (Ryan and Deci 69) (Abramovich and Wardrip, "Impact" 1396).

One of the inherent characteristics of intrinsically motivating activities is *curiosity*. We enjoy the “search for surprising situations,” which directly influences our interest in a situation (Oudeyer and Kaplan 95). Biles and Plass argue that this, in turn, has an effect on a student’s motivation, her learning strategies and how well she will process new information, under the condition that this interest is individual rather than situational (1061). As an example, they explain that a student may have little interest in maths (low individual interest), yet a maths game may be situationally interesting to her.

Next, intrinsic motivation has a strong link to *enjoyment*. Deterding defines this as “a complex of positively valued phenomenal experiences” (Deterding, "Atoms" 3). Enjoyment and motivation depend on the fulfilment of a learner’s needs. Teachers can focus on creating situations which take into account a learner’s emotions and her need for intellectual challenges. The latter help not only by being enjoyable in themselves, but also in displacing negative emotions. They claim intellectual and emotional resources which would otherwise be used to “ruminate on unpleasant thoughts” (Deterding, "Atoms" 8). This source of enjoyment is not external to the student, rather, when the conditions of intrinsic motivation are met, it originates from the student herself, which makes it “renewable” (McGonigal, *Reality* 832). Deci et al. similarly found that students who were intrinsically motivated had more positive emotions during lessons, enjoyed studying more, and in general were more satisfied with being at school (Deci et al. 332). These aspects are highly relevant for the classes targeted by this thesis: 16 and 17-year-olds make up 53.3% of those who abandon their education, and 35% of those who leave school in Luxembourg do so in 10e (MEN, "Décrochage" 11).

To better understand the psychological needs of learners, Ryan and Deci have developed the *Self-Determination Theory (SDT)*. They found that learners’ “motivation, performance, and development will be maximized” when they can satisfy their basic psychological needs, namely *autonomy*, *competence* and *relatedness* (Deci et al. 327-8). Preventing people from doing so can undermine existing intrinsic motivation, which people are “liberally endowed with” but which “can be fairly readily disrupted by various non-supportive conditions,” such as those caused by poor implementation of gamification techniques (Ryan and Deci 70).

Autonomy refers to the ability to make meaningful choices. This need is fulfilled when people initiate and regulate their own actions (Deci et al. 327). Autonomy as used here should not be confused with a desire to be selfish and independent from other people; rather it refers to “a feeling of volition” that applies to any actions, whether “dependent or independent, collectivist or individualist”

(Ryan and Deci 74). This means that autonomy is not in conflict with being part of a class, working as part of a group or completing a task presented by someone else.

One of the main criteria which determines whether an individual feels autonomous is where she perceives the *locus of control* of her actions to lie. An *external* locus of control is perceived as *controlling*, and can refer to situations or to feedback. In SDT, a learner's actions are *controlled* if the learner, in committing them, feels obliged to act through an external force, e.g. a teacher's instructions, or if a situation is used to exert pressure on a learner "to think, feel or behave in a specific way" (Deci et al. 326/7, 335). For example, a student may go to school only because her parents or guardian send her.

Deci et al. contrast this with the *internal* locus of control, which is associated with actions that one takes part in of one's own wish and which are "endorsed by one's sense of self" (326). The learner can take control over her own behaviour. An internal locus of control is a requirement for feedback to maintain intrinsic motivation. Feedback must be interpreted by the learner as a symbol of success, as opposed to a way of influencing her behaviour (Cotton 5). However, if the teacher's interpersonal style communicates that his first priority is to make the students do what he wants them to do, feedback, both positive and negative, will be experienced as controlling, especially when learners experience their teacher as "cold and uncaring" (Deci, Koestner and Ryan 4; Ryan and Deci 71). Like other needs, an internal locus of control both requires intrinsic motivation and promotes it. If a learner feels *competent* enough to do something, she will still not be intrinsically motivated unless she feels her behaviour is also self-determined; conversely, acting in a self-determined way can enhance intrinsic motivation (Ryan and Deci 70; Deci, Koestner and Ryan 3).

Thus, the atmosphere in a classroom and the teacher's approach to classroom management have a direct effect on motivation. Deci et al. explain that a teacher can support learners in their autonomy, stimulating their self-esteem and their feeling of competence; conversely, these aspects are undermined when the teacher uses a controlling style (337). They also found that teachers became "dramatically more controlling with their students" when they themselves were stripped of their sense of autonomy, that is, when they were "pressured or controlled by their superiors or by the system in general," e.g. when they were reminded "that it was their responsibility to be sure their students performed up to high standards." Other sources of pressure they identified included the government and parents, whose influence may translate as "intrusions on the teacher's sense of self-determination (340).

The implications for gamification are that it must not be experienced as controlling if its goal is to maintain intrinsic motivation. On the contrary: such a system must encourage autonomy-supportive

teachers, who, according to Ryan and Deci, “catalyze in their students greater intrinsic motivation, curiosity and desire for challenge” (71).⁴ This desire for challenges marks the next basic need.

Competence in the context of SDT is the ability to understand how to reach external and internal goals in an efficient way (Deci et al. 327). This is linked to the idea of mastery: “we want to feel powerful in our own lives and show off to others that we’re good at it” (McGonigal, *Reality* 875). In games, feeling competent is supported by the players’ constant progress through levels, or by the scores they obtain. For students who learn a language, it is much more difficult to know how close they are to mastering any given aspect of that language. Moreover, with the addition of each new language aspect to the curriculum, a learner may feel that her grasp of the language is actually slipping.

There are ways in which competence can be supported in an educational context. The one most commonly encountered is verbal feedback. To maintain a learner’s sense of competence, feedback must be *effectance-promoting*: it must suggest to the learner that she has an influence on the world around her. Competence in this sense supports and is supported by curiosity and agency. It also requires “freedom from demeaning evaluations” (Ryan and Deci 70). Being called to perform in front of the class and then humiliated for poor performance is one of the fastest and, unfortunately, most common ways to destroy a learner’s sense of competence. A student who does not feel competent will put a lot of effort into avoiding such situations: “people who doubt their capabilities shy away from difficult tasks which they view as personal threats” (Bandura). Losing one’s sense of competence is likely to also negatively impact one’s autonomy. *Challenges*, on the other hand, fulfil the need for competence. In this context, Csíkszentmihályi’s *Flow* theory succinctly explains how games can give players such a strong sense of mastery. Deterding refers to this theory to explain that games were designed to make it easier for us to achieve optimal experiences: the positive emotions we associate with competence are represented in Csíkszentmihályi’s model as “deep but effortless involvement that removes from awareness the worries and frustrations of everyday life” (Deterding, “Atoms” 8).

The Flow theory shows that the optimal state is achieved by designing challenges so that they are neither so difficult that they lead to anxiety, nor so easy that they lead to boredom (see Figure 2.2). “When you are in a state of flow, you want to stay there: both quitting and winning are equally unsat-

⁴ It is not clear from the data which Ryan and Deci analyse whether they found evidence for *causality*. It could be that the results they analysed merely suggest *correlation*. In this case, their findings could also suggest that autonomous students allow their teacher to apply a less controlling style, rather than the other way around.

isfying outcomes” (McGonigal, *Reality* 423). Flow is then a characteristic of activities that are designed to be deeply enjoyable, not in *spite* of the challenge inherent to them, but *because* of the challenge.

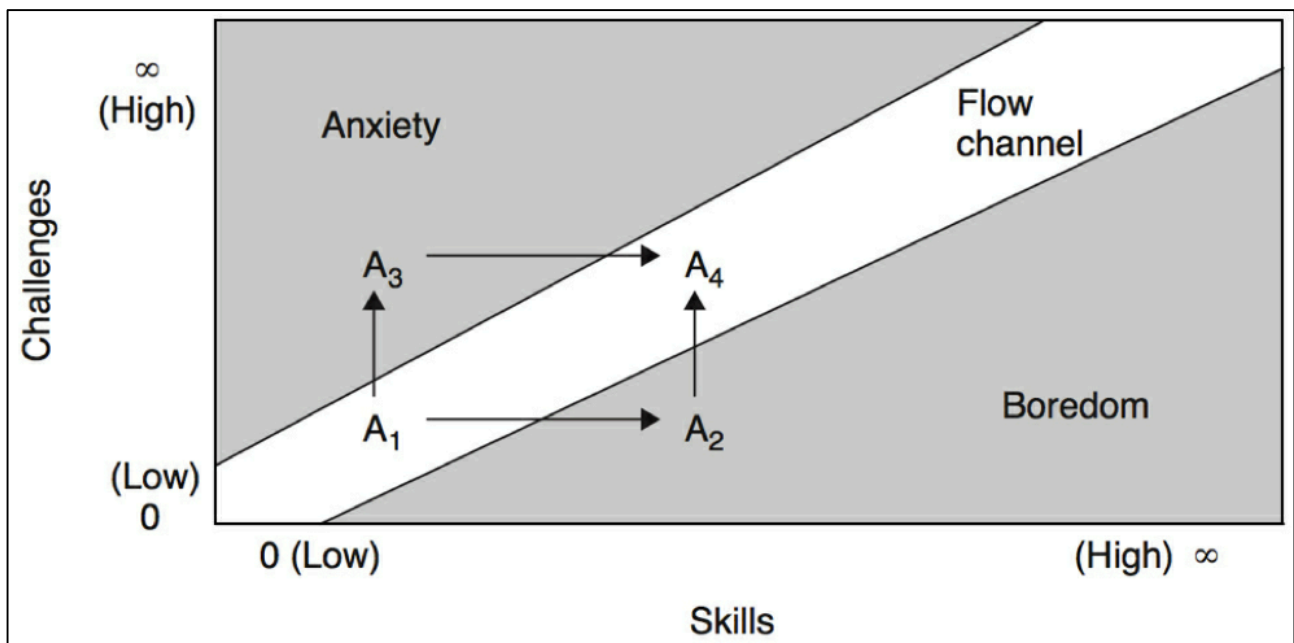


Figure 2.2 The Flow channel. (Chou 5364)

The Flow theory can be connected to Vygotskij’s concept of the *Zone of Proximal Development* (ZPD) (Vygotskij 326). It similarly describes the optimal conditions for the learning of new concepts in relation to the learner’s ability. We can assume that a student required to learn new material that lies beyond this zone, just like a player confronted with challenges above the flow channel, will feel no possibility of success, and hence will develop no sense of competence. Both systems include the idea of a challenge that can be overcome if the right conditions are met. Competence must be kept in mind when gamification is implemented: “events that increase perceived competence will enhance intrinsic motivation so long as they are accompanied by perceived self-determination ... and those that decrease perceived competence will diminish intrinsic motivation” (Deci, Koestner and Ryan 3).

In McGonigal’s model of motivation, autonomy and competence are considered together under the term *blissful productivity*. It is “the sense of being deeply immersed in work that produces immediate and obvious results” (927). She explains that the criteria for this vary from person to person, but that it requires for the work to be satisfying, and always involves a challenge in the form of “clearly defined, demanding activities” as well as feedback on the “impact of our efforts” (870).

The final element on which SDT focuses is **relatedness**, which “involves developing secure and satisfying connections with others in one’s social milieu” (Deci et al. 327). To feel motivated, a learner’s need for positive relationships must be fulfilled. Relatedness arises when we feel connected

to others and it allows for trust to develop (Ryan, Rigby and Przybylski 4). The latter, McGonigal argues, is one of the staples of gaming: “it takes a lot of trust to play a game with someone. We trust that they will spend their time with us, that they will play by the same rules, value the same goal, stay with the game until it’s over” (“Gaming”). Additionally, she argues, this sense of relatedness, or *communitas* – “a powerful sense of togetherness, solidarity and social connection” – allows players to cooperate and create something *epic*. “A good working definition for ‘epic’ is something that far surpasses the ordinary, especially in size, scale, and intensity. Something epic is of *heroic proportions*” (*Reality* 81, 3021). Any implementation of gamification should include the potential for relatedness and allow learners to feel that they are part of something that is bigger than themselves.

The *Player Experience of Need Satisfaction* model adds some clarification to SDT in the context of games (Deterding, “Atoms” 5-6). When the needs described in SDT are fulfilled, players will voluntarily return to those activities because they are intrinsically motivated. This interest is activated by challenges, and as such refutes the misconception that enjoyment and challenges are binary opposites. This misunderstanding unfortunately permeates the discussion of games in educational contexts, and some, like Lorang, call for them to be kept apart and argue that enjoyment actually forces challenges out of education: „Bedauerlich nur die Tatsache, dass mit dem Einverständnis der Eltern allzu schnell vom Programm gestrichen wird, was sich als beschwerlich erweist, was Ausdauer, Training, Mühe und Konzentration verlangt. ... Zuerst die Arbeit, dann die Freude, das Spiel.”⁵ We have seen that, on the contrary, intrinsic motivation *thrives* on games, and that enjoyment *depends* on being provided with hard, fulfilling, meaningful work and challenges. These are among the criteria schools need to focus on if we want to sustainably encourage learners to be stakeholders in their own education.

2.3 Extrinsic Motivation

**There’s no use crying over every mistake, you just keep
trying until you run out of cake. –GLaDOS, Portal**

Success is not necessarily a result of intrinsic motivation. In fact, many students who do very well are mostly extrinsically motivated. However, such a learner’s basic psychological needs remain unfulfilled in her pursuit of *external* goals: she is not self-determined, but becomes an “efficacious ‘pawn’”. In this case, though the learner may get impressive grades, she may “experience less than optimal well-being” (Deci, et al. 339; Ryan and Deci 75).

⁵ “It is a pity that, with parents’ support, all that which is onerous, all that requires endurance, training, effort and concentration is taken off the curriculum. ... Business before pleasure and games.”

Internal and external motivation

It should be noted that *extrinsic* motivation is not a synonym of *external* motivation, but contains the latter. *Intrinsic* motivation refers to activities which are their own goal and enjoyable for their own sake. *Extrinsic* motivation applies to anything done for ulterior motives, for outcomes that can be separated from the activity. The distinction between the two depends on the *kind* of reward they refer to. Extrinsic motivation may be *internal*, i.e. be “produced within the organism,” or *external*, i.e. be “produced outside the organism.” This is then a distinction based on the *location* of the reward (Oudeyer and Kaplan 94).

A learner may be intrinsically motivated to learn English, i.e. she *enjoys* the processes of learning the language. She may also be *internally* motivated, i.e. she thinks that English is a useful language. Finally, she may be *externally* motivated, i.e. she studies English because her parents or her guardian tell her to. In *both* of the latter two situations she is *extrinsically* motivated, since here the driving force behind her behaviour is not the joy inherent in studying English.

The Self-Determination Continuum

There are different scales of motivation which further subdivide the concept of extrinsic motivation (see Figure 2.3) The different styles and their degree of *internalization* (see below) are , unless marked otherwise, explained by Ryan and Deci (72-3) and completed with examples by Deci et al. (331, 335, 339) and Oudeyer and Kaplan, who refer to homework (94).

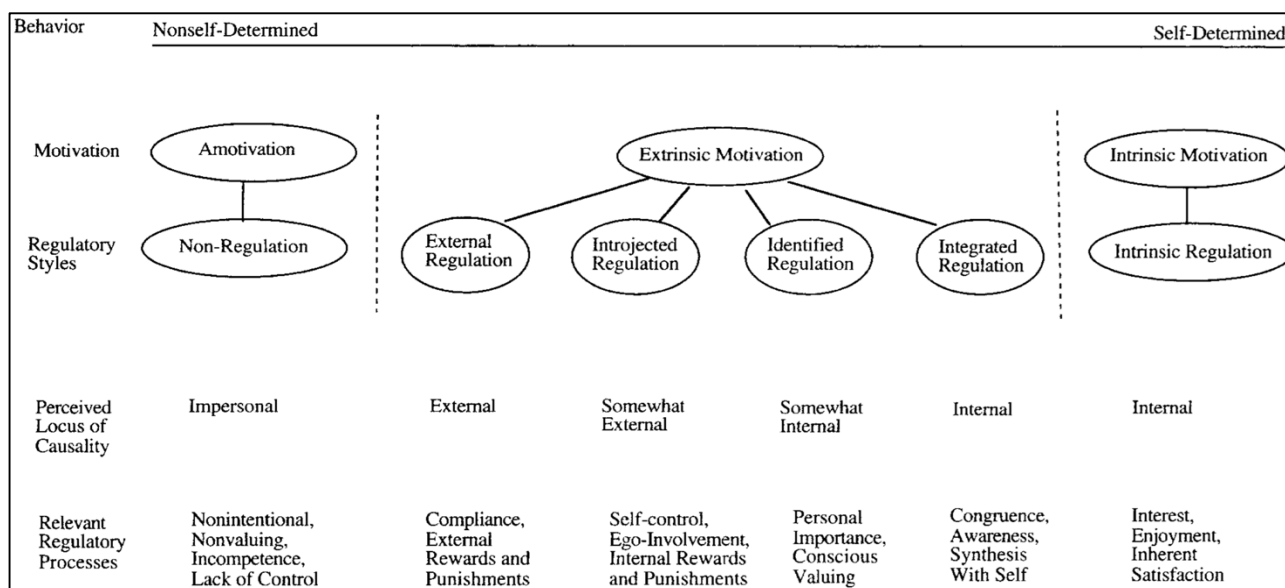


Figure 2.3 The Self-Determination Continuum. (Ryan and Deci 72)

External regulation often leads to either compliance or defiance. Actions in this group are “performed to satisfy an external demand.” For example, a student may think “I do my homework because

I'll get in trouble if I don't." The locus of control is completely external, which leads to a loss of autonomy. Students motivated in this way are likely to blame others, e.g. the teacher, for negative outcomes.

Introjected regulation can be exemplified by the thought "I feel bad about myself if I don't do my homework." Students motivated in this way feel more anxiety at school and are likely to blame themselves for minor setbacks. Their actions are motivated by a desire to feel pride or avoid feeling guilt.

Identified regulation relates to actions that are personally important to the learner. For example, a learner might say "It is personally relevant to *me* to do my homework." This is associated with increased effort, as well as interest in and enjoyment of school. It also helps students cope with negative outcomes.

Integrated regulation is the most self-determined of the extrinsic motivation types, but still refers to behaviour which has separable outcomes. However, the goals now harmonize with the learner's self-identity and values.

Intrinsic motivation would lead to a student saying "I enjoy doing my homework." Intrinsic motivation can *combine* with extrinsic motivation. The student doing her homework may both wish for a good grade *and* be interested in the material she covers. The risk in such a situation is that the extrinsic motivators may become dominant and destroy the connection between the intrinsic goal and the activity. Removing the extrinsic motivator would then make the activity "goal-less" (Urdan 313).

This phenomenon is called the *overjustification effect*. Though Deci, Cascio and Krusell do not use this term, they describe its process: when a learner who was initially intrinsically motivated is offered extrinsic rewards, she may begin to think that the rewards are her goal. She loses some of her sense of competence and self-determination (82). In such a clash between intrinsic motivation and intrinsic reward, the behaviour becomes "overdetermined" because the extrinsic reward has become "the more salient of the two reasons" (Urdan 313). These findings have led to controversy among the research communities, as some doubt the extent of the negative effects in education (see Deci, Koestner and Ryan 1). At any rate, it is clear that the process of overdetermination is undesirable and educators should aim for its opposite: internalization.

Internalization

Through internalization, extrinsic motivation may become intrinsic. Ryan and Deci further explain that through this process, people "take in" regulations or values, which then "emanate from their sense of self" (71). This leads to greater autonomy. It should be noted that this is not necessarily a

linear process: there is no “developmental continuum” which would require a learner to progress from one stage of the self-determination continuum to the next (Ryan and Deci 73).

Internalization requires that certain conditions be met. Ryan and Deci explain that relatedness helps by making students feel “securely connected to, and cared for by, their parents and teachers” (73). They add that competence allows learners to grasp the rationale of the behaviour expected of them. Finally, they argue that autonomy similarly helps internalization: students must understand what regulations mean in order to be able to integrate them with their existing values (74).

Interest

Internalization also coincides with a transfer from situational to individual interest if it is maintained over time (Biles and Plass 1068). This presupposes that there is interest to begin with. Some tasks will never be intrinsically motivating, such as having to return a test with a parent’s or guardian’s signature and the correction to the teacher. Without extrinsic motivation, those things would not get done. Extrinsic rewards have the potential to “bring an element of enjoyment” to otherwise boring tasks. In many situations, creating truly intrinsically motivating tasks is unrealistic: I will never have the resources to make every single aspect of my lessons interesting. Without extrinsic motivation, a learner may never have a chance to develop an interest in an activity, and will thus never have a chance to develop intrinsic motivation. Fortunately, Deci et al. found that the negative effects of dull tasks may be mitigated by *acknowledging* the learners’ feelings of disinterest towards the task or the way in which they have to complete it. This simple action helps the learners feel self-determined and can help the internalization process (336).

Still, care must be taken when educators use extrinsic rewards with the goal of sparking interest. The methods described above align with Chou’s description of *White Hat Core Drives*. These drives largely coincide with the structure of SDT: they “make us feel powerful, fulfilled and satisfied. In con-

trast, *Black Hat Core Drives* make us feel obsessed, anxious and addicted” (4834). He explains that when games overuse Black Hat techniques players “eventually burn out and find the courage to pursue freedom outside of [an activity]” (3974). However, even if educators try and avoid such methods, they still exist outside of school and *compete* with education for students’ attention. For example, an amusement park recently advertised that students with good grades could enter the park free of

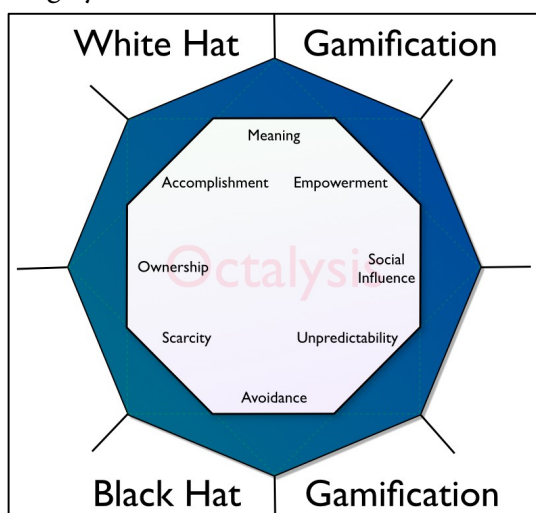


Figure 2.4 The Octalysis System (Chou 4792)

charge.⁶ Another example for such Black Hat rewards is parents giving students money when they earn good grades.

2.4 Rewards

In behaviourist models, rewards are often used to induce behaviour which might not otherwise arise. Transferring this approach from animals to humans is ethically problematic (Cotton 2). However, rewards can be used to reinforce and encourage *existing* behaviour, as opposed to simply *ignoring* positive behaviour, as is often the case in educational contexts. Since extrinsic rewards have the potential for internalization, they should not be rejected offhand, especially considering that “a game feature that is extrinsic to one player’s game experience is intrinsic to another player’s game experience” (Biles and Plass 1172).

Reward location

A first distinction can be made in terms of **location**, between internal and external rewards. Internal rewards cannot be given to a student; rather, it is the student herself who develops them. These can be influenced by activities which support self-determination and can lead to the rewards whose nature is introjected, identified or integrated, and which thus support internalization. External rewards can be given to us by other people. These rewards can provide temporary happiness. However, over time triggering this effect requires *increasingly bigger rewards*. “Positive psychologists call this process ‘hedonic adaptation,’ and it’s one of the biggest hindrances to a long-term life satisfaction” (McGonigal, *Reality* 769). By extension, it is also an obstacle to long-term academic motivation.

Reward Type

Secondly, we need to further distinguish between different **types** of external rewards and consider which potentially undermine intrinsic motivation. I shall focus on a model developed by Deci, Koestner and Ryan. Again, there is significant disagreement among researchers on this topic (Cotton 4).

Verbal rewards such as praise can have a range of different effects. Cotton lists the following: praise can enhance learning when it is precise, credible and used sparingly; when given privately rather than publicly; and when it refers to current progress in comparison to past performance rather than in comparison to classmates (Cotton 3-4). Deci, Koestner & Ryan analysed verbal rewards in more detail: typically, this type of reward contains “explicit performance feedback” and can thus have a posi-

⁶ See “Mit guten Zeugnissen gratis in den Movie Park Germany.” <http://movieparkgermany.de/movie-park-backstage/mit-guten-zeugnissen-gratis-in-den-movie-park-germany>. Accessed 20.6.2017

tive effect on the learner's sense of competence (3). Verbal rewards, they found, are also often unexpected, and then have no negative effect on intrinsic motivation (10). Moreover, they saw that the effect also depends on language. Verbal rewards can be phrased in a way that suggests control and pressure, e.g. by using words such as "must" and "should." In these situations the rewards undermine intrinsic motivation, even when the content is positive: "verbal rewards can [... lead] people to engage in behaviours specifically to gain praise" (3-4). Conversely, they maintain and enhance motivation when the teacher uses a nonpressuring, informative style (9). They thus confirmed earlier findings by Deci et al. (336-7).

Tangible rewards risk "significantly and substantially" undermining intrinsic motivation according to Deci, Koestner and Ryan, though they say that the effect ultimately depends on other factors such as reward contingency (see below) and interpersonal context (2, 9). Most studies focus on money when they discuss tangible rewards. I find the tendency to extrapolate from the research on this rather specific reward to other types commonly found in education problematic. Still, many of their findings will apply to rewards such as bonus marks. Students may perceive the latter as a kind of "salary" which they "earn" for the effort they put into their studies. Deci, Koestner and Ryan also include symbolic rewards like trophies and player awards into this category (9). However, I found that there are significant differences between tangible and symbolic rewards, which I will discuss in detail in my analysis of badges in section 15.3.

Activity rewards such as a field trip or a pizza party conceptually fall into the same category as tangible rewards. Tangible and activity rewards are *unsustainable*: both economically and emotionally they cannot work in the long term due to hedonic adaptation.

Next, rewards can be distinguished based on a student's **expectation**. Expected rewards are more likely to lead to a perceived external locus of control: if a reward is expected the learner may feel that she is acting *for the reward* (Deci, Cascio and Krusell 83). (See Q29.4 on p. 151, in which some learners stated that they actively tried to earn experience points, i.e. rewards.) If the reward is not expected, this change in the locus of causality is unlikely, but it may occur *retrospectively*: a learner may re-evaluate her behaviour after the action has been completed. Still, for this controlling aspect to apply to tangible rewards, a learner would have to expect that her behaviour would result in such a reward (Deci, Koestner and Ryan 10). The authors of the model conceded that they had no data on a reversed situation, i.e. the effects of *withholding* expected rewards. Common sense suggests, though, that a medallist at the Olympics would be unhappy if she were told that actually, there was no medal.

Reward contingency

There are different types of **reward contingencies** described below in reference to research by Deci, Koestner and Ryan (4-11). **Task-noncontingent** rewards are earned independently of whether a target activity was completed. They were found to have no significant effect on intrinsic motivation.

Task-contingent rewards are awarded only in direct connection to a target activity. This category can be further subdivided into completion-contingent and engagement-contingent rewards. **Completion-contingent** rewards require a learner to *finish* a task. They are interpreted as very controlling and undermine intrinsic motivation. However, if the task requires skill, it can still convey a sense of competence. **Engagement-contingent** rewards require a learner to *participate* in a task, but completing it is not mandatory. These are likewise experienced as strongly controlling. Since there is never a confirmation of competence to counteract this effect, they are even more detrimental to intrinsic motivation.

Finally, **performance-contingent** rewards are given to a learner if she does a task *well* or if she meets a given criterion. At its most basic, passing a school year falls into this category. These rewards exert the highest level of control and are very likely to undermine intrinsic motivation. However, they also potentially carry positive information about a learner's competence, e.g. when the reward signifies that the learner has done excellent work. If the latter condition is not met, the undermining effect can be detrimental: giving such a reward only to *some* learners would mean that everyone else gets no reward, and thus receives implicit negative feedback on their competence. The effect is worsened when there is a *direct link* between the performance and the reward received. The studies considered by Deci, Koestner and Ryan showed that if rewards get progressively smaller with worse performance, the motivation-undermining effect is the worst out of any type of reward.

The issue for educators is that any certificative moment can be interpreted as controlling and/or informational. If the results and the feedback are interpreted informationally, they can affirm the learner's sense of competence. This is especially true if the feedback refers to the learner's progress towards her goals. However, certificative moments are, by definition, used to control a learner's actions. The balance of these two factors, along with the inter-personal climate (autonomy-supporting versus controlling) influences their effect on a learner's motivation. The goal for educators must be to create a supportive classroom climate, so that rewards, when they are given, have a chance of being interpreted as informative rather than controlling.

Negative rewards

Still, there are situations in which teachers explicitly *wish* to be controlling, such as when they give a learner a sanction as a result of negative behaviour. Few approaches to gamification focus on punishments as such, though Chou describes many systems that use avoidance and fear of loss as a mechanism: “it motivates through fear of losing something or having undesirable events transpire” (Chou 3935). We can situate Chou’s model within SDT: most commonly, these events undermine all three factors that are needed for intrinsic motivation: autonomy, competence and relatedness. The sanctioned learner often has to complete a task which she did not initiate, which gives her no confirmation of her abilities and which makes her feel that she acted against the rules of the community she is a part of.

Limitations

Rewards are not the only factors that can have an effect on motivation. Deci, Koestner and Ryan list a few examples of external factors, including certificative moments, deadlines, competition among learners, and the atmosphere in the classroom. Whatever a teacher does to promote intrinsic motivation never exists in isolation from such factors, which, Ryan and Deci argue, “like tangible rewards, ... conduce toward an external locus of causality” (70).

Additionally, Deci, Koestner and Ryan remind us that rewards have no direct positive or negative effect on tasks which learners do not deem interesting to begin with: “rewards do not add interest value to the task itself” (14). They add that instead, educators should begin “from the students’ perspective to develop more interesting learning activities, to provide more choice, and to ensure that tasks are optimally challenging” (15). Still, as it would be unrealistic to start with the assumption that *all* educational activities are interesting for *all* students, studies which start with assumed intrinsic motivation to begin with can only provide a limited view of educational practice. This is a core aspect to keep in mind since it is what many poor implementations of gamification ignore.

2.5 Amotivation

I used to be an adventurer like you, until I took an arrow
to the knee. –Town Guard, *Elder Scrolls V: Skyrim*

The fulfilment of the basic psychological needs does not supersede the basic survival needs regulated by the hypothalamus, i.e. food, safety and sex (McGonigal, *Reality* 884). If these factors limit a student’s motivation, the concepts described so far will have little impact. There are other reasons that can explain why a student may lose her motivation. McGonigal summarizes this under the adage

“Reality is Broken” in her eponymous book. She explains that in real life (as opposed to games) people often feel powerless. In the first year of the PadUcation “one-to-one” iPad project at the LTB, some students showed low levels of autonomy when it came to using their tablet. It was often not clear to them what their next step should be. This had a negative effect on their sense of competence (external regulation) and led to a perceived external locus of control. They subsequently blamed the operating system of the tablet for many negative outcomes of their actions. They were overwhelmed and had no opportunity to experience flow. “And in real life, when we face failure ... we feel anxious, maybe depressed, frustrated or cynical” (McGonigal, "Gaming"). This is also true when students anticipate failure (i.e. when the challenges are perceived as insurmountable), which may explain why learners who think they will not pass a school year often lose their motivation as the summer holidays draw closer.

Paradoxically, students may also become demotivated as a direct result of teachers trying to maintain their motivation. There is a risk that teachers may artificially inflate academic results, e.g. by giving bonus marks or by starting with an overly easy test, in order to boost their learners’ motivation with good grades. However, if there is no challenge to a course, the learners are led to falsely interpret their own ability. The feedback loop which feeds their sense of competence and autonomy breaks down. If the same problem occurs on a higher level, e.g. if the learner is allowed to progress to the next class in spite of low grades, there is a good chance that the difficulty of the challenges will increase faster than the student can improve. Any progress she now makes will be marked by reduced intrinsic motivation since she will now seldom experience flow.

There can also be an emotional barrier to the development of intrinsic motivation. The broaden-and-build theory developed by Fredrickson and Branigan explains that positive emotion “broadens the scope of attention” and “thought-action repertoires” (326). When students enjoy a lesson, they are more likely to experiment and be creative, which are good indicators of autonomy. Conversely, negative emotions lead to less work and more antisocial behaviour (327). Positive emotions also help students deal with chronic pressure and negative outcomes: they can tap into emotional “reserves” in stressful situations (328-9). This corroborates the idea that a lowered *affective filter* allows for more learning to take place (Krashen 30-32).

Finally, if the learner does not value an activity, does not feel competent enough to do it, or does not expect the outcome to be beneficial to her, she will not be motivated to commit to it (Ryan and Deci 72). An activity will have no perceived value to a student if she cannot see its purpose or it is not

clear to her how she can reach the goal (Chou 1777). The personal relevance of a task and the motivation learners feel towards it may thus depend on their age, gender, cultural background, and the influence of their peers (Urdan 317). In other words, what works for my classes at the LTB may not work at all at a different secondary school.

Amotivation can also stem from a lack of meaningful challenges. In some situations, “our real-world work isn’t hard enough. We’re bored out of our minds. We feel completely underutilized. We feel unappreciated. We are wasting our lives” (McGonigal, *Reality* 500). One of the foci of game design is on the use of *unnecessary obstacles* to add challenge to activities. Educators must be wary, however, of simply transposing game elements and then assuming that they will have the same results in an educational context. Deterding explains that “merely adding some challenge is likely to generate more frustration than enjoyment ... Presumably, few users would enjoy having a ticket vending machine gamified by adding a puzzle challenge to the often already puzzling purchase process” (15-16). He says that, much rather, gameful design that aims to reduce amotivation must find the challenges in activities which align with the student’s pursuit of her goals and needs. “To engender competence experiences, these inherent challenges are ideally skill-based: something a user can learn and improve in pursuing her goals.” Gamification, he argues, must organize the inherent challenges of a goal “in a motivating and enjoyable manner” (Deterding, “Atoms” 16).

In order to find out which processes support motivation for which students, we cannot solely rely on the conflicting theories of laboratory research. In our own approach to gamifying lessons, we must instead use the one mechanism that will provide reliable answers about whether what we are doing works for *our* students: feedback.

3 Git Gut | Feedback

3.1 Feedback mechanics

Good feedback makes it easier for us to get better at what we do. It is delivered through *feedback mechanics*, “information delivery mechanisms that communicate to the user that their actions are meaningful” (Chou 6042). Without feedback, a learner cannot develop intrinsic motivation: it would be difficult to maintain a sense of competence if she didn’t know whether she was progressing. There would also be a negative impact on her sense of autonomy: she would have no input on which she could base her behaviour, no information to guide her choice on what steps to take next. Moreover, it would be difficult for her to know how her peers interpret her actions. In that scenario, there is no basis for relatedness to develop.

The most salient form of feedback students are familiar with is marks. The problem is that these emphasize failure over progress and oversimplify by summarizing vast amounts of information into two digits.⁷ “Grades summarize performance across multiple modules and types of content, masking whether a person has mastered individual concepts or skills” (Peck et al. 1943). In this context, games can offer a framework for feedback that encourages learners to work harder, shows them how to make better progress, is provided faster and makes their urge to act on it stronger.

3.2 Feedback loops

The first step in a feedback loop is to **measure**. In section 14.2, I explain how I use hero journals to ensure my students get meaningful measurements of their progress. In my experience, many learners do not measure their progress on their own, and a survey I conducted indicated that most keep no record of written feedback (see Q14.6 on p. 151). James Clear suggests that “data improves awareness and is the first step to behavior change.”

Next, we need to **compare** the measurements. This tells students where they are in relation to their goals. Without comparison, it is difficult to *interpret* the measurements.

Finally, we can **adjust** our behaviour. Short-term feedback can change a student’s sense of being self-determined in the long term since it allows them to set their own goals. “Feedback loops provide people with information about their actions in real time, then give them a chance to change those actions” (Thomas Goetz qtd. in Clear). Slow feedback could make it more difficult to associate the measurements to the committed action.

⁷ For most classes, the Luxembourgish grading system gives learners a maximum of 60 marks.

These three steps form a system of recurring cycles: “the output of your current behavior ... becomes the input for your new behavior” (Clear). Each cycle feeds the next, as can be seen, for example, in Korthagen’s ALACT model (see Figure 3.1). The feedback learners get does not refer to an immutable status quo but to a variable action which is linked to their autonomy and competence. This marks the difference between commenting on a learner’s intelligence and praising her efforts. Doing the former can undermine intrinsic motivation, since students feel their intelligence is something they cannot influence (Mueller and Dweck 33).

Feedback loops also allow for self-assessment by students: “where anyone is trying to learn, feedback about their efforts has three elements—the desired goal, the evidence about their present position, and some understanding of a way to close the gap between the two” (Black and Wiliam 7).

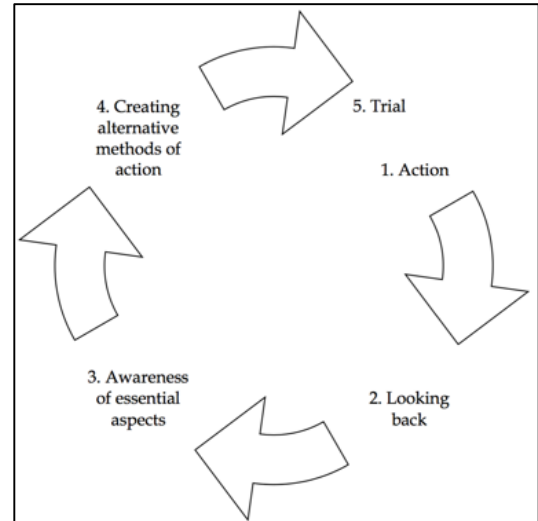


Figure 3.1 ALACT (Wegner, Weber and Ohlberger)

An often-cited example for such loops in real life, e.g. by Chou, are dynamic speed signs on the road (5680). They **measure** the speed of a vehicle and display it back to the driver. The measurement tells the drivers where they are in **comparison** to the goal. If drivers are too fast, they will now (ideally) **adjust** their speed, which is again measured, compared to the goal, and displayed back to them. There is, however, an even more salient example of efficient feedback loops, namely that found in video games: McGonigal explains that there is “no gap between your actions and the game’s responses. You can literally see in the animations and count on the scoreboard your impact on the game world” (*Reality* 415). Games can serve as an example of how best to implement feedback.

3.3 Best practice

Feedback works best when it is **specific**. It is difficult for us to process progress on an abstract level. For example, coming closer to mastering the skills it takes to write a well-structured essay is a slow, incremental process. Without concrete feedback, a student may lose her sense of competence: the steps a learner can take towards this goal are so small that they may go unnoticed (i.e. there is no sense of effectance). But “to finish work in a satisfying way, we must be able to see the results of our efforts as directly, immediately, and vividly as possible” (McGonigal, *Reality* 1023). Gamification makes it easier to see and process that progress is happening, that we are *moving* towards a goal. It makes that process more satisfying and intrinsically motivating. The progress markers which are common in

games do not usually exist in real life. Gamification can draw on game mechanics that provide specific markers such as experience points and badges. These kinds of feedback are vivid and visually striking, which supports a learner's sense of competence: "visible results are satisfying because they mirror back to us a positive sense of our own capabilities. When we can *see* what we've accomplished, we build our sense of self-worth" (McGonigal, *Reality* 1025, my emphasis).

Then, feedback is best when it is **constant**. Again, video games have an advantage because, unlike teachers, they are impervious to fatigue: "computer-based games provide constant doses of small successes as players defeat more enemies, earn higher scores, and graduate to more challenging levels" (Schute 507).

We also profit most from feedback that is **fast**. As stated, we find it easier to interpret direct, short-term feedback. My assumption is that delaying feedback reduces the impact it has on a learner's sense of competence by eliminating the sense of optimism which success can give her. Ideally, students should get real-time feedback. Game feedback provides "just-in-time affirmation of in-game actions so that the player feels like the game is paying attention to them ... When players don't receive this type of feedback [... they can] feel that they are not successful at progressing at an appropriate rate within the game" (Biles and Plass 1185). Although giving fast feedback is clearly not always feasible, as teachers need time to provide meaningful comments, we can still aim to provide feedback with as little delay as possible.

Next, feedback improves when it is **social**. It should be delivered in a way that allows learners to maintain a feeling of relatedness. If it is delivered in a cold, uncaring manner, it may come across as controlling, thus also reducing a learner's sense of autonomy.

Finally, feedback should be **goal-oriented**. The feedback loop is inefficient if learners do not know what they want to get out of it or what kind of behaviour they are striving towards.

3.4 Formative feedback

Feedback is most efficient when it leads to actual changes in the learning and teaching process. Formative feedback supports flow in that teachers can adapt the content of lessons when there is a risk of anxiety or boredom, and in that it gives students tools that help them reach their goals. If feedback is only generated after tests, it can be too slow to become formative. One possible way to support formative feedback that is given on a more regular basis is the use of *exit tickets*, in which the students directly provide the teacher with feedback.

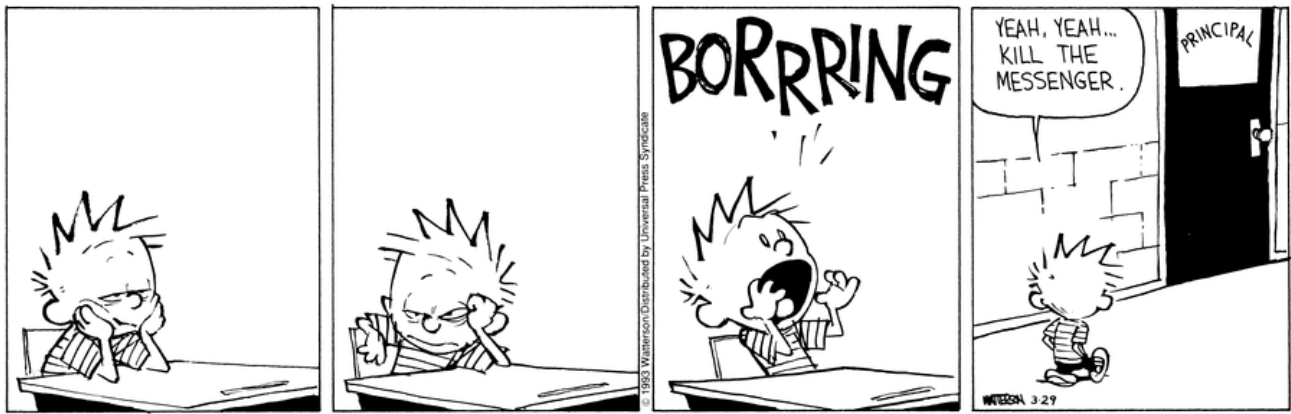


Figure 3.2 Calvin & Hobbes by Bill Watters, 29th March 1993

To this end, I have been using Socrative.⁸ This app falls into the category of so-called *student response systems*, which usually lead to “improved student engagement, more active learning, and greater achievement” (Robyler and Doering 157). Socrative helps me collect formative assessment of my teaching written by my students at the end of a lesson. The students are prompted to reflect on their own learning and report how they assess their own comprehension of the lesson content. This is complemented by custom questions such as “What do you need from our next lesson?” Since the exit tickets can be written anonymously, students need not fear ending up in the same situation as Calvin in Figure 3.2: when using such anonymous feedback techniques, “students were less likely to conform to the group’s opinion and felt more comfortable responding with this tool than raising their hands when questions being discussed were controversial” (Robyler and Doering 157). For example, in the context of discussing Malorie Blackman’s novel *Boys Don’t Cry*, some students chose to anonymously answer the exit ticket question “What question would you like to ask about sexuality?” This showed me what aspects students were interested in when they would otherwise have been too embarrassed to ask in person.

Of course, formative feedback is not something that has only now become possible. Socrative merely complements the information that I get by observing the students in the classroom and evaluating their progress. Combining this information allows me to analyse my practice more efficiently and to adjust it to the learners’ needs. This approach also helps in the iterative design of games discussed later. While exit tickets do an excellent job of maintaining feedback loops, there are tools which can do so on a more granular level and in a more enjoyable context: games.

⁸ For a list of websites and applications mentioned in this document, see chapter 18.

4 Challenge accepted | The potential of games

4.1 What's in a (good) game?

Jesper Juul explains that a game is a system which is based on rules and which has a measurable result. The players care about and try to have an effect on this result and the consequences of this game remain “optional and negotiable.” He adds that the individual parts of this definition are not enough to make a game, but that their combination helps separate games from other phenomena (Juul qtd. in Deterding, Dixon and Khaled 3-4).

Another defining trait of games that many researchers refer to is captured by Bernard Suits: “playing a game is the voluntary attempt to overcome unnecessary obstacles.” To exemplify this, Daniel Cook claims that “if a usability engineer were to redesign the video game Super Mario Bros. with the sole goal of usability, the result would be a single button, labeled ‘Rescue Princess’” (Suits, Cook qtd. in Deterding, Dixon and Khaled 13).

For example, to add such an obstacle to this thesis, I could challenge you to read it upside-down. It should be clear from this that simply removing usability is in itself not enough to make a good game: any obstacles that make it unclear for a player what needs to be done next *should* be removed. “It is important to note that game design is not about the indiscriminate addition of challenge” but that it should combine “easy to use *interfaces*” with “difficult *gameplay* challenges” (Juul and Norton qtd. in Deterding, Dixon and Khaled 14, my emphasis).

In the model developed by McGonigal, she lists that the defining aspects of games are voluntary participation, a goal, rules, and a feedback system (*Reality* 384).

By this definition, then, games are **voluntary**. A dare, for example, does not meet this criterion. Games are conducive to the development of intrinsic motivation because, due to their voluntary nature, they lead to high player autonomy (Ryan, Rigby and Przybylski 3). The locus of control for such activities is typically internal since voluntary participation “requires that everyone who is playing the game knowingly and willingly accepts the goal, the rules, and the feedback” and games offer no extrinsic rewards (McGonigal, *Reality* 360, 897).⁹

In this context, we must remember that people are unlikely to take up an activity in which they have a low interest to begin with. Yet coercion removes the autotelic character of games and thus

⁹ Professional sports and e-sports are an exception, and do not follow the same principles.

undermines intrinsic motivation. This confronts teachers with a dilemma. If they decide not to insist on students playing a short game, it is relatively realistic to propose they give a different task to those students who do not participate. However, in the context of a year-long, gamified system, the problem becomes more acute. This warrants discussion in more detail and will be covered in my analysis of “onboarding” in section 10.1.

McGonigal’s second criterion for games is a **goal**. The goal is the desired outcome of the activity. It gives orientation to players’ attention and a sense of purpose to their behaviour. The choices which players take can only be meaningful – and hence support autonomy – if they help the player advance towards her goal.

Next, McGonigal refers to **rules**. They “place limitations” and remove “the obvious ways of getting to the goal” (McGonigal, *Reality* 354). These constraints encourage creative thinking. In digital games, these rules are not usually explicit: “they are implied in what actions, objects and feedback are offered to the user” (Deterding 29).

The **feedback system** tells players whether they are acting within the rules and informs them about their progress towards the goal: “real-time feedback serves as a *promise* to the players that the goal is definitely achievable, and it provides *motivation* to keep playing” (McGonigal, *Reality* 359).

Games are also defined by **game mechanics**. Bissell explains that these are “the procedures and rules of a game.” He includes an analogy by Jesse Schell: “If you compare games to more linear experiences [books, movies, etc.], you will note that while linear experiences involve technology, story, and aesthetics, they do not involve mechanics, for it is mechanics that make a game a game” (Bissell 788).

Games intrigue educational psychologists because of their strong motivational effects. These are experiences in real life, but in games, players experience them constantly. Games, and video games in particular, are better at “fulfilling genuine human needs” than the real world (McGonigal, *Reality* 89, 116). These include **enjoyment**, which is linked to competence and autonomy: “games make us happy because they are hard work that we choose for ourselves, and it turns out that almost nothing makes us happier than good, hard work” (McGonigal, *Reality* 477). In education, students also associate games with fun: “when students know they will be playing a game, they expect a fun and entertaining activity because of the challenge of the competition and the potential for winning” (Robyler and Doering 95). If games are played because they are fun, then game designers “are becoming the most talented and powerful happiness engineers on the planet” (McGonigal, *Reality* 664).

Another need discussed in the context of SDT is **competence**. Games can give players “a sense of efficacy and power over one’s environment ... as well as improvements in learning” because they allow players to “experience autonomy, competence and relatedness while playing” (Ryan, Rigby and Przybylski 2). This requires that there are always clear “actionable next steps” (McGonigal, *Reality* 981). Without these, a learner will be unable to make any progress. If a learner does not understand how to play a game, or what to do next, she will feel stupid. In this case, no sense of competence develops, she feels incapable of learning, negative emotions set in and the affective filter goes up. “From my experience,” Chou says, “if a user spends four seconds on an interface and can’t figure out what to do, [she feels] stupid and will start to disengage emotionally” (1346).

Games also excel at generating **flow**. McGonigal refers to Csíkszentmihályi, who found that flow is most likely to be experienced when there is a combination of “self-chosen goals, personally optimized obstacles, and continuous feedback.” If these criteria are met, he writes, then “play is the flow experience par excellence” (Csíkszentmihályi qtd. in McGonigal, *Reality* 622).

Flow depends on optimal challenge. In good games, McGonigal argues, “you are always at the brink of falling off. When you do fall off, you feel the urge to climb back on. That’s because there is virtually nothing as engaging as this state of working at the very limits of your ability” (*Reality* 418). Moreover, games can adjust to *individual players* who all differ in “their gaming expertise, need deprivation and mood” (Deterding 8-9). If the challenges are too easy, we feel that we have already mastered the game. If we consistently win, there is no challenge, and flow is replaced by boredom. The reverse of this, we have seen, is anxiety. A series of recent games developed by id software, including the Dark Souls games and Bloodborne, have become infamous for their difficulty. The games do not adjust their difficulty in reaction to the player’s actions, nor do they allow the player to manually choose an easier setting. The result is that most players are faced with a constant sense of anxiety rather than flow, and eventually abandon the game (White). Similarly, a learner who never experiences flow in an educational context may decide for herself that she is unable to ever succeed in a specific subject. If she only faces challenges which lead to anxiety, or is only presented with material that lies beyond her ZPD, she will decide that she is the kind of person who will always fail at these tasks, and, consequently, she will. On a larger scale, this can explain why some students stop trying to succeed once they feel that they are unlikely to pass the school year.

The reverse of this anxiety, the emotions which a learner can experience when she is “in the flow,” are linked to *eustress*, or positive stress, which manifests itself as a drive and engagement when we choose our own obstacles. This helps us to perform at a higher level, to be optimistic, and to stay

energized (McGonigal, "Badges"). In combination with *blissful productivity*, overcoming this kind of challenge which is perfectly balanced against our ability and which gives us a "reasonable hope of success" lets us feel *fiero*, the emotion we have "after we triumph over adversity" (McGonigal, *Reality* 586).

Games also allow for a much more intensive sense of **autonomy** than other media. Unlike novels, for example, one never fully immerses in the medium: "The surrender is always partial. You get control and are controlled" (Bissell 530). Autonomy is also supported by the feedback mechanics of games. Here we can distinguish between two types of feedback commonly found in games. There is "*immediate* feedback on each user action and *cumulative* progress feedback on the user's accumulated progress to her goals" (Deterding 29). The latter is often represented as a list of quests or missions that the player chose to complete or an indication of the experience points she has collected in doing so. Moreover, games support autonomy because players decide *what* they want to play and also *how* and *when* they want to surmount the game's obstacles (Ryan, Rigby and Przybylski 3).

Finally, games give a sense of **relatedness**. Games which are played together require and promote a certain amount of trust. Many games also suggest to us that we are participating in something greater than ourselves, especially if they could not take place if we were on our own.

There are two more aspects which are not covered in the SDT framework because they are somewhat unique to games: intuitive controls and presence. **Intuitive controls (IC)** can support the intrinsic motivation to play a game "because they are associated with a greater sense of freedom and control, and they enhance a sense of competence" and they work as a facilitator when a chance for autonomy and competence to be experienced already exists (Ryan, Rigby and Przybylski 6).

Presence can support intrinsic motivation in that it allows a gamer to feel like she is "*within* the game world, as opposed to experiencing [herself] as a person outside the game, manipulating controls or characters. ... [Presence is] the illusion of non-mediation, meaning that a person perceives and responds to the content of a particular medium as if the medium were not there" (Ryan, Rigby and Przybylski 4). Presence in turn depends on intuitive controls and on psychological needs satisfaction (Ryan, Rigby and Przybylski 15).

In summary, good games include features that maintain intrinsic motivation and provide learners with an opportunity to internalize extrinsic motivators.

4.2 Cheating

↑ ↑ ↓ ↓ ← → ← → B A

Unfortunately, cheating is one more aspect that educational settings and games have in common. We can see this in expressions such as “gaming the system,” which refers to exploiting a ruleset. In education, this is especially problematic: certification becomes meaningless when it becomes unreliable. For the space in which games are played, it is equally detrimental: players feel less safe because they can no longer assume that everybody will respect the very rules of the game which they promised to respect when they joined.

Cheating is more likely to occur when the focus of an activity lies on extrinsic rewards and on competition instead of playing. It becomes a *shortcut* to the reward, a way to reach the reward while avoiding the activity it was meant to encourage. Conversely, cheating is less likely to occur when players engage in a game voluntarily: it is senseless to try and circumvent self-set obstacles. By cheating, a player removes one of the very aspects of a game which motivated play in the first place.

However, “gaming” the system can also be taught on purpose as a way to foster creativity. If cheating uses the same cognitive faculties as creative processes it can be a sign of curiosity: what is possible? How can I get the most out of this activity? If this is the case, “cheating” may develop into a *skill* that will allow learners to think out of the box and turn all that which is too serious into a game.

5 YOU DIED | Serious Games

We don't stop playing because we grow old. We grow old because we stop playing. – George Bernard Shaw

5.1 Outline

Ritterfeld defines serious games as “interactive computer-based game software” which “has been developed with the intention to be more than entertainment” (quoted in Deterding, Dixon and Khaled 2). In the context of this thesis, I would include games that are not software. Serious games can combine the motivational aspects of games discussed above with educational content. They work through a “transfer of learning” which is based on intrinsically motivating challenges: “mastering game challenges affects players’ beliefs, concepts, attitudes and skills, which in turn is supposed to affect ultimate player activity beyond gameplay” (Deterding 15).

There are games whose developers may not have had these criteria in mind and which are or can be used in education nonetheless. Examples include *Spore*, which teaches about evolution; *Coming Out Simulator*, which can sensitize learners to issues of heteronormativity; *Minecraft* which allows learners to create worlds; and *Portal*, which features unconventional puzzle-solving elements. Examples of serious games outside education include *FoldIt*, which successfully crowdsourced research on how proteins fold by turning the work into something akin to a 3D puzzle. Serious games also exist *inside of* games for entertainment: in July 2017, the space-based massively multiplayer online role-playing game (MMORPG) *Eve Online* introduced *Project Discovery*, through which players contribute to scientific research by searching for real-life exoplanets from within the game environment.

In this chapter I will analyse the theory behind serious games and discuss four practical examples. The next chapter returns to game theory to clarify its relationship to gamification.

5.2 Design

Robyler and Doering list a number of features that serious games should ideally include (96). First, games need “appealing formats and activities.” There should be a sense of adventure, with certain amounts of unpredictability, and challenges matched to the learners’ ability. Next, they should have “instructional value.” In other words, they need to be both educational and motivating. Then, there are “social, societal and cultural considerations.” Games for children need a “respectful outlook,” so teachers need to be wary of games that call for violence or combat. Games may also be interpreted differently depending on each student’s background. Serious games should therefore avoid cultural,

ethnic and gender-based stereotypes. The exception to this rule are evidently games which *focus* on those very aspects.

Deterding suggests that the design process of games can be guided by skill atom components (see Figure 5.1). A skill atom refers to a complete feedback loop between a user, in our case a player, and a system focused on a skill the player tries to get better at (Deterding 29-30). Such a skill atom consists of multiple components. The *goal* of the game describes the outcome a player wishes to produce. For serious games, the goal of the game should align with the learning objective. The *actions* describe what a player can *do* within the constraints of the system. The *objects* refer to the parts of a system a player can influence. In a game of chess, these are the pieces. The *rules* limit what the player can do and how it affects the game. The system then provides the player with *feedback*. The player interprets the feedback and adjusts her model of the game to become increasingly better at overcoming the *challenge* the game holds. Ideally, the design of the challenge is guided by the principles of the Flow theory. This process generates *motivation* to master the game and, in doing so, develop competence: the game promises to satisfy one of the psychological needs of the SDT model. The generated motivation encourages a player to continue and return to the game to fulfil these needs.

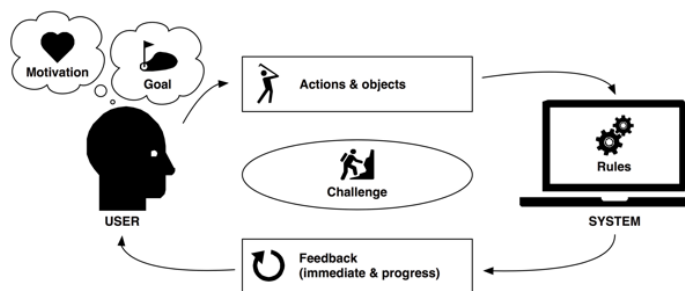


Figure 5.1 Schematic of a skill atom (Deterding 29)

5.3 Benefits

Making games is hard. Making good games is even harder. Making good games that hope to serve some external purpose is even harder. – Ian Bogost

Serious games can support a learner’s sense of autonomy because she is continuously in control. They can also be effective at teaching group working skills, for example when there is playful competition between groups of collaborating students. In general, serious games are perceived as more interesting than traditional learning methods, since they elicit a “desire to compete and play,” and they lead to increased focus among learners” (Robyler and Doering 96-7).

More importantly though, games normalize failure. In educational settings, failure is often stigmatized. Some learners hide their marks from their peers. Others delay telling their parents or guardian about poor results, or never tell them at all. Games contrast this by providing the *freedom to fail*. This idea is captured in the Luxembourgish idiom „vum Fale léieren d’Kanner goen” and in one of

the maxims of scout leaders who work with adolescents: „geziilt b ilafe loossen.”¹⁰ Scout leaders do not intervene when they predict failure unless the consequences might result in injuries or damage to property. They give adolescents the opportunity to fail and learn from their mistakes. Likewise, games offer players a way to fail *productively*. Failure is an essential part of most games. They maintain optimism for a longer time because, McGonigal argues, “by design, every computer and video game puzzle is meant to be solvable, every mission accomplishable, and every level passable by a gamer with enough time and motivation.” The crucial factor, she explains, is that in games, failing can be spectacular and humorous, and can therefore motivate us to try again and do better (*Reality* 1198). In this way, games manage what seems impossible at first: they can make a player feel competent by making her fail.

In fact, players *enjoy* failing: “when we’re playing a well-designed game, failure doesn’t disappoint us. It makes us happy in a very particular way: excited, interested, and most of all optimistic” (McGonigal, *Reality* 1149). This is also true for especially frustrating games: “Because no other genre is quite so content to risk gamer frustration as the platformer, no other genre provides quite the same feeling of satisfaction when that frustration is overcome” (Bissell 1321).

Examples of especially frustrating games include the aforementioned Dark Souls series and Bloodborne. In the latter failure is *mandatory* to progress beyond the first stage: you cannot move on until *you have been defeated* by the first enemy you encounter. Dark Souls II even has an achievement for this, awarded upon the player’s first death, called “This is Dark Souls”: “this achievement sets the stage for a game in which players die hundreds of times to achieve victory” (Blair 1607).

The limitation of this source of *motivation from frustration* is that there is a tipping point at which optimism turns into resignation. Repeated failure to complete the same task can cause the player to lose hope and feel that she is not competent enough to overcome this obstacle. The moment at which this tipping point is reached is difficult to predict and depends on each player.

There is a real danger, then, that what is usually an asset to games can also eventually lead to players failing *fruitlessly*. Game designer Peter Molyneux complains that many games force players to go back and experience part of the game *again*. “Why do we do that? It just makes us feel stupid, and dumb, and we forget what the story is” (qtd. in Bissell 2662). This is comparable to the psychological state a learner may find herself in if she has to retake a school year.

¹⁰ “Children learn to walk by falling”; “giving youths room for calculated failure.”

Failure feels much more final in an educational setting. Most certificative moments, such as tests, cannot be retaken. Unlike for games, *time* is a limited resource, and tests do not usually wait until the student feels ready; they arrive with the implicit assumption that everybody *is*. Once a student has taken a test, it is done, like a real-life version of video game *ratchet scrolling*, in which the camera follows the player only in one direction and does not let her move backwards. In the end the score may not reach the threshold for passing. Game over; try again.

5.4 Criticism

“Serious game” is unfortunately a problematic term since it suggests that other games are “worthless or pointless” (Bogost, “Persuasive”). There is an apparent tension between enjoyment and educational requirements inherent to serious games: “designing enjoyable experiences has to be balanced with, is constrained by, and ideally converges with concerns for instrumental outcomes and other contextual requirements such as assessment needs” (Deterding 11-12). This conflict between play and work is also captured in the Luxembourgish idioms „Hal op mat deem Gespills” and „Elo gëtt net gespillt” (Hildgen).¹¹ To many, this seems like an irreconcilable dichotomy. As a result, some schools ban games outright since students might interpret them as “escaping from learning,” and miss out on the intrinsically motivating aspects thereof: they may get “lost in the game,” and whether that effect is beneficial or detrimental to learning is the subject of some controversy among observers (Robyler and Doering 97).

Many educational games do not manage to reconcile this schism. They try to jazz up or disguise the learning content instead of making learners interested in a topic. Thus, they lack in *intrinsic integration*. The latter requires the learning content to be “sensibly embedded in the fictional game world (calculating angles is embedded in firing a catapult to destroy a medieval castle), rather than divorced (translating a word leads to the catapult being fired)” (Deterding 15). If educators are only given poorly designed games, or inefficient means of implementing good games, their experiences with and reactions towards games will naturally be negative.

Moreover, there is concern that games are an inefficient form of learning, and that games may end up taking up classroom time from “nongame strategies” (Robyler and Doering 97). There is, Robyler and Doering state, a risk that poorly implemented games could become “electronic babysitters” if they are overused as rewards, “limiting them to be a behaviorist tool” (98). They add that some schools ban games altogether because they might “overemphasize the need for students to be entertained”

¹¹ “Stop fooling around” and “this isn’t a game.”

(98). In my mind, this is akin to fighting windmills for fear that they overemphasize the unsustainability of coal plants. A learner's need to be entertained should be guided to productive activities, not repressed.

Then, Robyler and Doering warn that students must be made aware of the “relationship between the game rules and the content-area (e.g. math) rules” and be aided in distinguishing one from the other (98). This will vary from case to case. There is most likely no need for me to tell students that, as explained below, building barricades to stop zombie hordes is a game mechanic and not a necessary step to forming the past simple.

5.5 Verbivores

Verbivores is a tabletop game in which teams of three or four players defend their school bus from zombies by conjugating verbs. I developed this game to help my 8e elementary level students practise the past simple forms of verbs in a motivating context.

VERBIVORES

1) How to be a hero

- Zombies are attacking your school bus! Use your brain, or the zombies will eat it!
- Form a team of 3 or more heroes (≠DE Helden). Only you can protect your friends on the bus.
- On the table, put the 3 dice 🎲, the bus 🚌 and the cards 🃏 with the zombie image on top.
- Every hero puts one pen ✎ around the bus to make walls. The walls protect your bus.
- For each hero there's 1 zombie around the walls.

2) How to survive

- Zombies only eat lazy brains. Every time you use a verb, your brain becomes a bit stronger. Defend your bus: conjugate all the verbs!
- **Use teamwork!** Your team **wins** when all the zombies are dead and your bus is safe again.
- **Danger!** Your team **loses** when a zombie attacks a hero without a wall. Any zombie can attack any hero. Defend the other heroes!

3) How to fight

Zombies like fresh brains, so they attack the youngest hero first.

1. Roll the **die** with the numbers.
☐ Oh no! The zombies break a wall. Look at **4b**).
☐ Take a card to fight the zombies with a verb.
2. Roll the **big pronoun die** to choose a person.
3. Roll the **+ / - / ? die**: choose positive, negative or interrogative. Now **conjugate** the verb.
4. Now check your answer on the back of the card.
a) Correct: Build a wall for yourself or another hero. A hero can have many walls. **OR:** Kill a zombie. It doesn't matter which zombie you kill.
b) Wrong: The zombies break a wall. Take away one of your pens.
5. If you took a card, put it back in the game box. The zombies continue clockwise ⤴ and attack the next player.

4) How to be awesome

There are so many zombies! When your brains are strong enough, you can start the next game with more zombies to fight. Will you survive?

Figure 5.2 The rules of Verbivores

The game captured my learners' interest. For a week before its introduction the game was teased with images of zombies appearing in slides on the projector screen at increasing intervals to suggest zombies were approaching. The students were also interested in the tactile materials such as the customized 3D-printed dice and the zombie figurines.¹²

¹² It is possible to replace all the necessary game objects with printable 2D tokens.

Their interest during gameplay was also maintained by the unpredictability of the dice rolls, though, as described above, there is a tipping point at which this turns into frustration. I observed a student who rolled a 1 four times in a row and thus no longer felt in control of her actions. In general, however, the unpredictability was received positively, and I observed that students rejoiced when the dice roll gave them a negative verb – they quickly figured out that those were easier to conjugate since they rely on the infinitive.

The game adds an element of fun to the study of irregular verbs. For example, the students of one of my colleagues told her „Madame, esou mécht Verbe léieren déck Spaass!”¹³ This warrants a closer look at the elements which made the game enjoyable. First, there is a strong element of cooperation which fulfils the learners’ need for relatedness. The game has the potential to improve social connections, since a successful strategy *requires* students to help each other: they win or lose as a team, rather than individually. The game rules are set up so that strong players will still fail if their actions do not support their team. Social connections were also important for the staggered deployment of the game. I taught the game to a few “ambassadors” first. In the next lesson, these *Alpha Heroes* introduced the game to the rest of their respective teams.

The game was also enjoyable because it made the students feel competent. There is strong visual / tactile feedback for correct answers in the form of removing defeated zombies or adding walls. After reaching a win-state, one of my weaker learners beamed at me: “Mr Glod! I killed a zombie!” I feel that such a moment of *fiero* is unlikely to arise from traditional cloze exercises. Moreover, of their own initiative, students started a tally of the defeated zombies on the blackboard. This should have conveyed a sense of *comunitas*. The students were contributing to an epic, shared goal: surviving. However, the learners grouped their tallies to represent the number of zombies *their* team had defeated. I did not intervene, but in future game sessions I would encourage a single, shared tally to avoid negative competitive stress that leads to extrinsic rather than intrinsic motivation. A single cooperative tally can serve as a shared cooperative goal and gives feedback on how well the class works as a whole rather than as fragmented groups.

Competence was also supported by the context of the game. The instructions use encouraging language: players are heroes, and the narrative gives the learners the responsibility to protect other students (both those at their side and those on the bus).

¹³ “Miss, studying verbs is so much fun this way!”

Additionally, the challenge of the game was designed so that it can easily be adjusted for flow. On the one hand, students can do this on their own by strategizing, which also supports the need for autonomy. Students can play it safe by adding walls if they feel anxiety, or they can play more aggressively by attacking zombies when the game is too easy. After each game, the students also had the option of adding more zombies to increase the difficulty level. To this end, the last sentence on the game rules was phrased as a direct challenge. On the other hand, a teacher can adjust the difficulty of the game depending on the set of playing cards. The expansion set of the game has cards which only feature irregular verbs.

Next, to maintain competence, it is important to ensure the learners never feel stupid. To this end, the language of the rules was simplified multiple times. The rules were also restructured so that the steps can be followed in sequence.

In section 5.4 I referred to the potential of insufficient intrinsic integration. Verbivores manages to marry area-content with the game atoms: “Zombies only eat lazy brains. Every time you use a verb, your brain becomes a bit stronger. Defend your bus: conjugate all the verbs!” In non-game situations, the area-content, namely conjugating verbs,¹⁴ is often practised in monotone drilling tasks, and learners are told to “just study the irregular verbs by heart.” Translating the content into a serious game allows for a new perspective.

Like most games, Verbivores profits from iterative design. In the next version I want to remove the violent aspect of killing zombies with a game mechanic that *cures* them and turns them into civilians, in keeping with Robyler and Doering’s call for a respectful outlook. In the development of the current

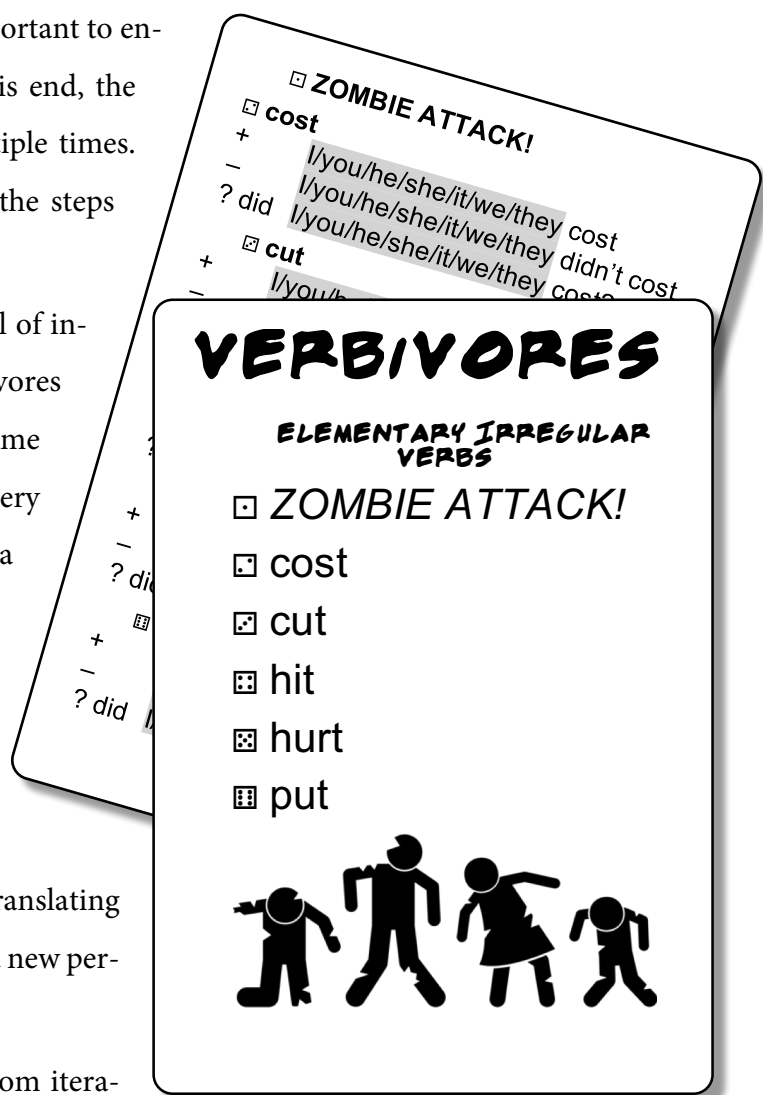


Figure 5.3 Verbivores game card

¹⁴ Verbivores can be adapted to any tense without requiring the rules to be changed.

version of the serious game, I received feedback from beta testers (my Alpha heroes), my 8e class, and my colleagues who used the game in their lessons. The students were especially forthcoming with creative ideas. Most of their requests focused on making the game harder, which confirms McGonigal's findings that unnecessary obstacles make us enjoy activities *more*.

5.6 Crosswords

Serious games need not be complex. Crossword puzzles have a simple goal: fill in the grid. The rules are equally simple. Yet by adding the grid as an unnecessary obstacle, vocabulary practice is brought into a framework that allows learners to experience blissful productivity. There are several software solutions that create puzzles; I have found Puzzle Maker to fulfil my requirements.

The content of a crossword puzzle can be selected by the teacher specifically to match the focus of a lesson sequence. Since the puzzle can thus rely on material the learners are working on already, it is unlikely to cause anxiety.

Moreover, the feedback on the students' progress is visually striking, as the grid is gradually filled in with every discovered answer. The puzzles support the students' sense of competence since they are solvable by default, and the next step is always clear. The grid additionally serves as one of the few systems that produce immediate feedback without the need for software: a learner can test her answer to a clue by trying to fit it into the grid. If it fits and does not conflict with other entries, the learner has received positive feedback.

When the task is presented as a cooperative activity, it can fulfil the learner's need for relatedness: they provide each other with the pieces of the puzzle they have solved, which leads to a dramatically increased chance of completing the task compared to having to solve it on one's own.

Crossword puzzles are good examples of intrinsically motivating activities: "the emphasis must be on making the content and experience intrinsically rewarding, rather than on providing compensation for doing something that would otherwise feel boring, trivial, or pointless" (McGonigal, *Reality* 4221). Ideally, students do not complete these activities because they get marks for them, but (at least partly) because they are enjoyable challenges. An example of a puzzle can be found in Appendix 1 on p. 139.

5.7 Memrise

Memrise is an online vocabulary learning platform which I have been using with my classes since 2011.¹⁵ The platform presents new vocabulary to learners one item at a time, along with a corresponding definition, translation or media item. After a few items have been presented, it gives learners prompts based on which they try to recall the items. This process uses varying methods to prompt students in order to always offer them an optimal challenge. The platform adapts each prompt to the individual user. For example, it usually starts by giving a student multiple answers to choose from before later asking her to type the complete item without any such scaffolds. In this way, the adaptive learning system fulfils the learners' need to feel competent.

Memrise also makes efficient use of feedback. By testing new items shortly after they have been presented, and by providing immediate feedback after a learner submits an answer, the “drill-and-practice” software prevents students from memorizing wrong information.

The platform further supports a learner's need for competence by providing only positively phrased feedback. If learners get an answer right, they earn points which accumulate over time. Errors that users make are presented as learning opportunities: the platform shows the item again, along with its information and mnemonics designed to aid memorization. It then prompts the user to type in the correct answer before it lets her continue. In this way, the feedback focuses on effort much more than on perceived intelligence. Continual practice has a much stronger effect on a user's score than the rate of correct answers. The platform also has the benefit that it will never tire of providing feedback: there is only so much time a teacher can invest into practising vocabulary with each learner individually.

Like many other games, Memrise incorporates the freedom to fail. Learners can *test* themselves without any fear of negative consequences that they commonly associate with certificative moments. They can return to an item and take a test as many times as they feel they need to.

Since learners can progress towards their goal without the teacher's direct influence, Memrise also supports their autonomy. Additionally, it lets them contribute to something epic. The socioconstructivist activity of creating “mems” (mnemonics) helps not only the student who created them, but also every learner that will later try to learn the same item on Memrise. Students who use the platform

¹⁵ For a more in-depth analysis of *Memrise* in an educational context, see <http://gillesglod.com/20170918-lexis>

thus help to tackle what for me alone would be an impossible mission: they add mems and examples to a database that is too large for one teacher to extensively cover.



Figure 5.4 The Memrise metaphor

Like with Verbivores, students find this approach to learning interesting and fun. Their reactions so far when they have been introduced to Memrise include “Dat Spill mécht déck süchteg,” “Ech wäert esou vill doheem zocken,” and “Dat hei mécht déck Spaass.”¹⁶ It seems then that the developers have achieved their goal: “that’s our dream: turning learning into pure recreation” (Dredge).

However, Memrise also employs extrinsic motivation techniques. Most prominently, it uses *loss avoidance*, a concept which in the context of gamification can be most commonly found in games such as Farmville.

If you don’t return to reap your harvest within a given number of hours, ... you will lose your invested hard work and be shown demoralizing images of crops withering and dying. This [... compels users] to log back in frequently to keep their crops alive. (Chou 3955)

The difference is that in Farmville, the user’s action is limited to pointless clicking to water crops. Memrise does use a similar metaphor of growing and wilting flowers. However, this metaphor actually supports intrinsic integration: the wilting flowers are signifiers for the decaying synapses which hold each item in the learner’s brain. Much like the plants by which they are symbolized, these need regular attention if they are to stay alive.

In summary, Memrise turns one of the tasks that students dread and associate with boredom the most, namely studying vocabulary, into an intrinsically motivating game.

5.8 Actionbound

Actionbound¹⁷ lets users create mobile learning experiences for smartphones or tablets in the form of location-based interactive quests or guides. The app determines the player’s location by using codes scanned with the camera on the device. With these quests, learning can be taken out of the physical constraints of a classroom and turned into a scavenger hunt. In this way, the kinds of activities that commonly exist in isolation on electronic devices can interact with the real world. Actionbound thus

¹⁶ “This game’s really addictive,” “I’m going to play this a lot at home” and “This is so much fun!”

¹⁷ Due to the interactive nature of this bound, it is difficult to present its content in the format of this thesis. However, the bound I created for my students and which I reference here is accessible in the Actionbound app by following the instructions and using the QR codes included in Appendix 2 on p. 140.

fits the *exergaming* category: this includes “video games that provide physical activity or exercise through interactive play” (Mears and Hansen qtd. in Robyler and Doering 384). Such activities can also take place on the school grounds or even outside of the school if the necessary precautions are taken.

The *bound* I created for 10e students was designed as a way to initiate my students to some of the themes of Sherman Alexie’s novel *The Absolutely True Diary of a Part-Time Indian*. I wanted to create an interest for native American history and culture in the students. For this bound, QR codes were hidden on objects around the LTB school grounds. This process allows students to anchor new information through spatial and kinetic experiences. The material students interact with is presented in a specific location. This lets the learners form a *memory palace*, a way of combining information with a physical location. Their sense of space offers information that is encoded along with that which is learned. This process can lead to better recall (Pinola).

Actionbound can also connect learning to specific objects. When I set up this activity for my students, I can leave QR codes on statues, next to portraits and in prominent locations in the school. At other times students have to scan the ISBN code of a book to ensure they are working with the right material. The experiences made in the game are later referenced when discussing the topics of the novel in detail in class.

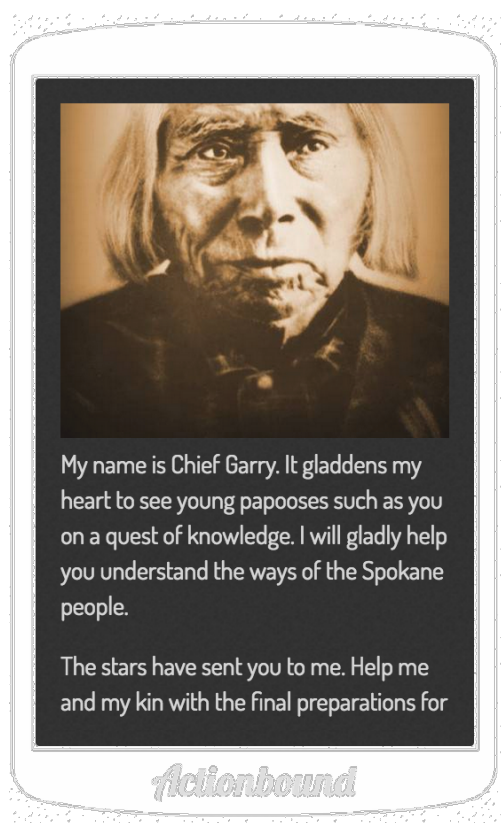


Figure 5.5 Actionbound introduction screen

The mechanics of the app also lend themselves to interactive storytelling. The learners go on a real-life quest: they interact with school personnel who take on the role-playing game function of *non-playable characters (NPCs)*; they listen to audio or video clips with digital NPCs; and completing one stage of the bound can be rewarded with the tools that the students need to progress at another stage.

The narrative framework of this bound informs the students that their help is requested in the organization of a native American powwow festival. This form of story-telling allows for a more constructivist approach: the learners can form a concept of native American culture on their own.

The game also helps students develop a sense of relatedness in two ways. First, it encourages them to work together as a team while they complete the stages. Moreover, they have

to cooperate with school personnel (provided they agree to participate), interact with library staff, get information from the *secrétariat des élèves* and wager game tokens at the *secrétariat de la direction*. Unfortunately, one student complained that she felt let down by her team: the other learners had not read the novel as instructed, and could thus contribute little to most tasks. This indicates that there is also a risk that students will “tag along” and not contribute much if their interest in the activity is much lower than that of other learners on the team. There is also the risk of rivalry among teams: in a survey after the initial implementation of the bound, even without a reward contingent on ranking, half of the students stated that they tried to win by making winning more difficult for other teams.

More importantly though, the activity allows students to develop a stronger emotional connection to the characters in the novel. For example, the photo book which the learners consult in the stage *Stories* lets them understand that the terms “native American” and “Indian” are connected to immense overgeneralization and stereotyping: it encourages them to engage with material that shows the heterogeneity within these concepts.

Each stage of the bound confronts the learners with a different topic of the novel. For example, the stage *Poverty* sends the learners to the local casino (the headmaster’s assistant’s office). The casino is rigged.¹⁸ Money and the ways in which it is wasted is one of the protagonist’s greatest sources of negative stress. For the stage at the SPOS office, the learners work with material on different forms of bullying and suggest ways to deal with this problem. These are later discussed in terms of their usefulness in the situations the protagonist faces.

The framework of the activity as a whole is also used as the starting point of a discussion. The students help prepare a powwow. Similarly, in one chapter in the novel, a white man arrives unexpectedly. He proclaims his love for Indians and, uninvited, participates in a powwow. The discussion focuses on whether it is right for me as the teacher to appropriate the cultural context of a powwow for a “game.”

Thus, the bound supports relatedness. It also provides autonomy in the form of meaningful choices: the teams decide which stage to start with and, if time is short, which ones they wish to complete. Their sense of autonomy also benefits from actively assimilating new material on their own, without the teacher. The students thus see themselves in a more active role than if the same material had been presented in a lecture-type lesson. In the survey, the students reported that this format was interesting and fun.

¹⁸ The students are given one d12 die (average roll: 6.5) while the “teller” has two d6 dice (average roll: 7), which give her a 7.7% higher chance of winning.

5.9 Patches

We take pride in that which we create. There is then a risk that the energy invested in these serious game projects may trick me into overestimating their value to learners. For this reason, it is important to collect feedback from students and colleagues on what works and what needs to be improved. Ideally, this results in a development cycle with iterative design and prototyping, similar to the ALACT model. This means that the games I have discussed in this chapter are not finished products and may go to many more iterations to improve the experience for students. This mirrors the practice of patching in the context of video games: when developers make improvements to the games, these can be updated even after their release. In my case, this again directly involves students. They consume these games as much as they create them, much like gaming communities online communicate their concerns and wishes with game developers (Hamilton).

Still, no matter how efficient, interesting and motivating a serious game becomes, lesson time cannot be entirely spent playing. There is, however, a way to reap some of the benefits of games over extended periods of time and in combination with any academic content: gamification.

6 Insert disc | Gamification

6.1 Criticism

Gamification is bullshit. With these words Ian Bogost caused a fair bit of controversy in 2011 (Bogost, "Bullshit"). His statement held more depth than might at first be assumed, and it captured many of the elements that worried educational researchers about the buzzword gamification. In his talk, Bogost used the term gamification to refer to a perverted corporate version of gamification, to "marketing bullshit, invented by consultants as a means to capture the wild, coveted beast that is video games." Educators and designers alike had become wary of the term due to a plethora of poor implementations. Bruckman called these "chocolate-covered broccoli: ... a presumed-inherently unenjoyable activity (learning) is made appealing by adding presumed-inherently enjoyable gameplay" (qtd. in Deterding, "Atoms" 9). Similarly, the fact that many people enjoy games does not mean that they will enjoy something that has game elements tacked onto it. Deterding takes the fallacy to its extreme:

"Grandmothers will like and demand romantic novelization. Soon, no grandmother is going to visit a dentist who doesn't dress up like Mr Fitzwilliam Darcy and deliver his diagnosis in florid Jane Austen-style." Just because you enjoy one thing in one context doesn't mean you would want superficial properties of that thing indiscriminately slathered onto every other part of your existence. (Deterding, "Experts")

Unfortunately, gamification has become associated with this type of oversimplification. It is erroneously thought that "slathering" points and badges onto an experience is enough to gamify it. The results are "critiques of how the Points, Badges and Leaderboards in gamification simply [turn] the world into a large Skinner Box, where people are manipulated to mindlessly doing meaningless tasks" (Chou 3540). This misunderstood approach does not lead to intrinsic motivation, since these gestures do not provide "the underlying experience that gives them meaning. ... Successful games mimic the feelings of accomplishment we get when we do fulfilling work" (Tanz).

This quote also hints at a larger problem that educational implementations of gamification face: games are seen as the opposite of work. They are often labelled as time-wasters and are accepted in school only if they are serious games that take up minimal lesson time: children should be confronted with "serious" content! After all, there is no fun in the work-life of adults, either: „Spätestens im leistungs- und konkurrenzbetonten Berufsalltag hört der Spaß auf" (Lorang).¹⁹ Could it be that the working life of some adults is devoid of enjoyment because they have been *taught* that fun and productivity

¹⁹ "At the very latest, the fun must end in everyday working life with its focus on performance and competition."

are binary opposites? If this vicious cycle spins on, we risk losing something: “if we continue to ignore what makes us happy, we shall actively help perpetuate the dehumanizing forces which are gaining momentum day by day” (Csíkszentmihályi qtd. in McGonigal, *Reality* 630). Excluding games from education is like clinging desperately to a vision of the future maintaining a status quo marked by misery, in which the majority of workers would quit their job in a heartbeat if they received an offer that was more financially, i.e. extrinsically, rewarding. I have observed this *fear* of games at parent-teacher evenings during which parents worried about their child “playing” Memrise instead of “studying” vocabulary. Yet the binary pair is mismatched: “The opposite of play isn’t work. It’s depression” (Brian Sutton-Smith qtd. in McGonigal, *Reality* 510).

Another concern brought up when gamification is mentioned is a perceived lack of *paidia*, i.e. more spontaneous play. Critics fear that “gamified applications ... focus almost exclusively on design elements for rule-bound, goal-oriented play (i.e., ludus), with little space for open, exploratory, free-form play (i.e., paidia)” (Deterding, Dixon and Khaled 3).

Then, there is the diametrically opposed fear that gamification will lead to hedonism. These days, Lorang fears, children are inundated with technological paraphernalia associated with the latest fad: “Wie nämlich gedeihen Kinder und Jugendliche in einem hedonistischen und permissiven Schlaraffenland, das automatisch auf den Schulalltag übergreift?”²⁰ (Lorang) She anticipates situations in which learners are bombarded with extrinsic rewards, in which case hedonic adaptation represents a tangible risk: “hedonic adaptation to extrinsic reward will cause our shortcut happiness behaviors to spiral out of control until they no longer work or we can no longer afford them” (McGonigal, *Reality* 860). Yet Lorang’s critique shows a limited view of games, one which assumes that games cannot support intrinsic motivation. She narrowly interprets gaming as an activity without rules in which anything goes: she warns us to reflect on the harrowing consequences of hedonistic education, such as „Unlust, Aggressivität, Mobbing, Gewalt, Alkohol- und Drogenexzesse. ... Unsere Schule darf nicht zum Toll-Haus verkommen!”²¹ She omits that incessant external pressure, negative stress and fear of failure are equally if not more likely to lead to these consequences:

When we’re afraid of failure or danger, or when the pressure is coming from an external source, extreme neurochemical activation doesn’t make us happy. It makes us angry and combative, or it makes us want to escape and shut down emotionally. It can also trigger avoidance behaviors, like eating, smoking, or taking drugs. (McGonigal, *Reality* 566)

²⁰ “How can children thrive in a hedonistic, indulgent Cockaigne automatically encroaching on the school routine?”

²¹ “apathy, aggression, bullying, violence, alcohol and drug abuse. ... Our schools must not become lunatic asylums!”

These results stand in clear contrast to the effects of the eustress we feel when we play games. Still, there is one connection between gaming and addiction: *fiero*. It activates parts of the brain associated with addiction and is likely the best explanation why some players become addicted to specific games (McGonigal, *Reality* 755). When reported, this often refers to MMORPGs, such as World of Warcraft (see Lush). The kind of *fiero* achievable within serious games or in gamified educational environments is unlikely to ever be this intense, since it is difficult to achieve the kind of engagement elicited by commercial titles with massive budgets for the creation of immersive worlds. Still, it makes sense that a learner who experiences *fiero*, for example after having been successful in a test situation, is more likely to associate positive emotions with the effort she put into her learning, and thus to seek this emotion again. A simplistic reaction to this kind of feedback loop might be to say that it is beneficial to get students addicted to learning; however, it is much more desirable to help learners develop a balanced lifestyle guided by intrinsic motivation.

6.2 Bringing game elements into lessons

When implementing gamified systems in education, it is important to design *backwards* and keep the *goals* that one wants to achieve in mind. The goals I wish to pursue are the fulfilment of students' psychological and educational needs by providing better feedback, creating a positive class atmosphere, supporting cooperative learning and maintaining intrinsic motivation.

In pursuing educational goals, it would be amiss to ignore the immense potential that games, and video games in particular, hold: “video games are interactive systems purpose-built to afford motivation and enjoyment” (Deterding, “Atoms” 3). If we do not use the power of games, we are wasting it. Of course, as explained in the previous section, care must be taken to focus on the right game elements and to transfer them in a meaningful way. If this is achieved, McGonigal continues, then games can fill our lives “with positive emotions, positive experiences, and positive strengths” (6077).

6.3 Terminology

Since there are conflicting interpretations of the term gamification and it comes with significant baggage, I wish to discuss what gamification involves and how different theories have tried to define it. The use of the very word “gamification” is controversial. One alternative term is *ludicization*, which is used, for example, by Sanchez, Young and Jouneau. Their use of this term focuses on the *experiences* of the user (or, in this case, specifically the learner) and her actions in form of a game. This perspective makes sense, since any educational project should focus on the desired results and what learners get out of it, rather than looking at a set of tools and asking oneself what can be done with them. Rather

than focus on specific game elements, they look at a subtle combination of conditions that create a context in which play can arise. I will cover this specific aspect in more detail in chapter 13.

Similarly, McGonigal uses the term *gameful design* instead of gamification (McGonigal, "Badges"). Bogost concurs with this, yet suggests we use yet another term: *persuasive games* (Bogost, "Persuasive"). He wants to actively reshape the discourse by renaming that which is *commonly* called gamification to *exploitationware*. Bogost's initiative can be seen as a form of "linguistic politics" (Deterding, Dixon and Khaled 1). This name change, Bogost argues, "disassociates the practice from games. ... It connects gamification to other, better known practices of software fraud. These include malware, spyware, and adware." An example of this kind of potential exploitation is featured in Figure 6.1, which displays a recent attempt of language learning website Duolingo to secure funding: it uses extrinsic motivators such as loss avoidance by allowing users to restore a lost streak with a financial investment.

I still use the term gamification. My ideas mostly align with gameful design, but abandoning the term gamification because some use it to refer to poorly implemented results would let that use of the word become dominant and one-sided. It would be like abandoning the word music because it is used to refer to artists we do not like. I would rather see a discourse which includes all the positive aspects gamification can offer. Adding competing terms can lead to fragmentalization of the discussion, and makes it less likely people will find information on good practice.

6.4 Gameful design

Since my idea of gamification is closely linked to gameful design, I still wish to look at how the latter is defined and structured. It should first be noted that gameful design is different from game design: "in contrast to [gameful design and gamification], game design describes the design practice of creating full-fledged games" (Deterding, "Atoms" 5). The design of serious games is further specified to

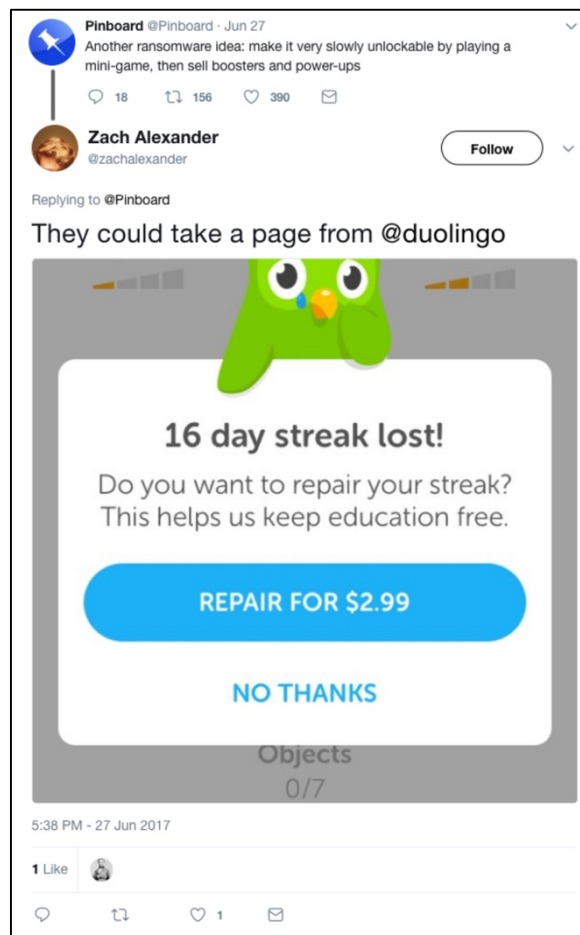


Figure 6.1 Tweet by @zachalexander, 27th June 2017

refer to games designed for non-entertainment purposes, while gamified applications “merely incorporate *elements* of games (or game ‘atoms’) (Deterding, Dixon and Khaled 3).

Deterding lists a number of definitions for gameful design, including “the adoption of game technology and game design methods outside of the games industry” (2). In other words, gameful design includes processes in which aspects commonly found in games or used in the design thereof are instead used to create or modify something that shares certain features with games, but is not in itself a full game. This ideally includes creating activities that allow users to fulfil their basic psychological needs.

Next, Deterding differentiates between gameful design and playful design. Playfulness refers to *paidia* (*playing*), which, as hinted on p. 52, is “a more free-form, expressive, improvisational, even ‘tumultuous’ recombination of behaviors and meanings” driven mostly by curiosity and a desire for exploration (Deterding, Dixon and Khaled 3; Deterding, “Atoms” 4).

Gamefulness refers to *ludus* (*gaming*) and is distinct from playfulness. It denotes a type of playing that is “structured by rules and competitive strife toward goals,” including challenges. Gameful design in this sense means “designing for gamefulness, typically by using game design elements” which can be seen as the “building blocks” that most games share (Deterding, Dixon and Khaled 3, 4). The focus here is again on design rather than the mere possibilities that open up through the use of technology.²²

I think that the difference between affording gamefulness and designing for it all but disappears in practice, where what I want to achieve (the goal) and how I want to achieve this (the strategy) are both important and, to some degree, coincide. “The most likely strategy of designing for gameful experiences is to use game design elements, and the most likely goal of using game design elements are gameful experiences” (Deterding, Dixon and Khaled 13).

²² In everyday modern English, the words playing and gaming are often synonymous. It is no different in this thesis. If the need for distinction between the two concepts arises, I will refer to their Latin names.

6.5 Ethics

The final issue which must be discussed before looking at practical implementations of gamification in a classroom is whether gamification *exploits* human psychology, in other words, whether all gamification meets Bogost's concept of exploitationware. Arguably, the implementation described in the next chapters uses extrinsic motivators only as a way to create initial interest for intrinsically motivating activities designed for the learners' benefit (see p. 19 and Figure 6.2). I also do not believe that this falls into the situation outlined in the "fairness account," which describes an exploitative action as one in which "A takes

unfair advantage of B" (Kim 20). Kim adds that "as a conceptual matter, however, gamification is voluntary, so players are not coerced." Unfortunately, there are some practical limitations to this principle. How do you manage a classroom in which some learners participate in a gamified activity while others refuse? This is a complex problem for long-term gamification of the classroom as it could lead to the need to teach one class with two systems running concurrently. Games are voluntary by definition, but for most students being in school is mandatory. It is difficult to reconcile these two aspects.

I must also ask myself whether I am *manipulating* students. Since gamification has at least *some* sort of influence on learners, strictly speaking, it is a way of manipulating them. In that sense, however, *anything* teachers do in their lessons must be seen as a form of manipulation. Chou elucidates this with an analogy:

Saying "please" is a form of manipulation. You weren't going to do something for your friend, but your friend said "please" in a sincere manner ..., and even though nothing tangible has changed about the transaction, you now willingly and happily agree to do it for them. That's manipulation. (Chou 4914)

Moreover, gamifying a classroom must be seen in a different light than gamifying a workplace. The goal of a company is to maximize its efficiency to generate the highest possible profit. Chou argues that in this context, gamification is unethical "when there is a hidden agenda", for example, "when users think they are signing up for something, but in reality they are signing up for something else" (4930). Conversely, we can try and imagine what exploitationware in the classroom could look like: imagine a teacher holding points "hostage" until his students have given his social media posts enough "likes."

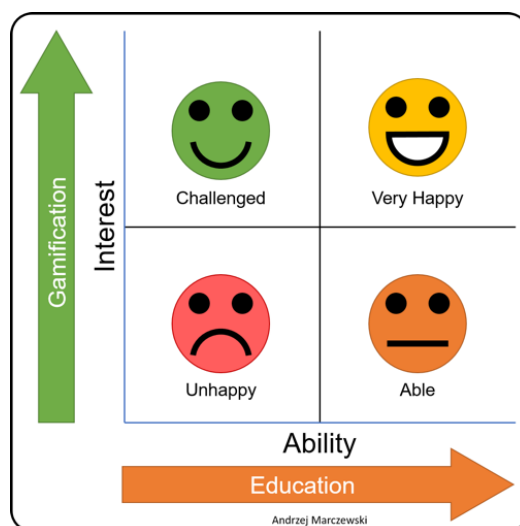


Figure 6.2 Interest & Ability (Marczewski)

Then there is a less obvious effect that gamification may have on students. It could lead to social cooling: “if you feel you are being watched, you change your behavior. ... This could limit your desire to take risks or exercise free speech. ... Digital reputation systems are limiting our ability and our will to protest injustice” (Schep). I feel that the gamification framework which I implemented with my classes has the potential to tick at least a few of those boxes: it could lead to self-censorship and has the potential to reduce creativity. I shall therefore analyse this issue in more detail in the relevant sections.

6.6 Summary

The successful implementation of a gamified system in an educational setting requires several conditions to be met. It must not exploit students by manipulating them into actions that they would not otherwise engage in. It must also support rather than undermine intrinsic motivation by creating events that help students fulfil their needs for autonomy, competence and relatedness. To this end, the system must be accessible via intuitive controls; it must be conducive to learning and create a classroom climate which favours cooperation and is generally positive. The latter has the potential to let students lower their affective filter. From a design point of view, the gamification of lessons must focus on the students’ experience and not get tangled up in the technological possibilities offered by game mechanics. Moreover, the experience should focus on *ludus* while maintaining a space for *paidia*. Finally, it must provide feedback that is specific, constant, fast, social and goal-oriented.

I believe that there is a gamification system that has the potential to meet all of these criteria: Classcraft.



7 Start new game | Classcraft

7.1 Origins and development

In developing Classcraft,²³ teacher Shawn Young was influenced by World of Warcraft, an MMORPG (Sanchez, Young and Jouneau 3, 4). In role-playing games (RPGs), players assume the role of a character which they typically create themselves. They then embark on missions which follow a narrative frame in a fictional space. Their success and failure is measured according to the rules of the game. My implementation of this gamification framework with 10e and 11e classes at the LTB is set in the fictional world Mercatopia (mercaptopia.com), which my students and I have created.



Figure 7.1 Classcraft symbol

7.2 Objective and core functionality

Classcraft is web-based and can be accessed from a computer, smartphone or tablet. This made it a useful tool in the context of the LTB PadUcation project, in which each student of the participating classes has her own tablet.

The platform gamifies learning and classroom management. “Classcraft can be considered as a way to metaphorize the functioning of a classroom as a battle combining collaboration and competition” (Sanchez, Young and Jouneau 8).

In the fictional RPG context, each student becomes a hero and has a corresponding customizable avatar that represents her in the game world. The students earn or lose points according to their behaviour. This leads to real-world rewards and consequences. They level up by gathering experience points and defeating antagonists. As they level up, they can learn new real-life powers.

Classcraft is a gamified experience and not a full-fledged serious game. It incorporates game elements that can complement classroom events. Thus, it forms a gamified *layer* on top of real-life interactions. It also falls into the category of *augmented reality games* (ARGs): there is no graphical environment as such in which players move. Through the strong link to real life, Classcraft can be seen as an *anti-escapist game*: it is designed to help you “get more out of your real life, as opposed to games you play to escape it” (McGonigal, *Reality* 2211-2216). ARGs have the potential to make real-life activities more intrinsically motivating, as opposed to games which are intrinsically motivating

²³ In this document, I refer to the paid version of Classcraft. Some features may not be available in the free version.

only within themselves, disconnected from everything else. In an ARG such as Classcraft, when players experience flow, it is connected directly to the lesson content and creates a feeling of competence, of blissful productivity. Yet it is a more muted kind of flow than that found in games for entertainment. This may be a good thing: McGonigal explains that flow is intrinsically unsustainable, and that too much of it can lead to happiness burnout (McGonigal, *Reality* 751).

While Classcraft is then not a game in the strict sense of the word, I shall still use that term from here on for the sake of readability.

8 1UP | XP and rewards

8.1 Game atoms

When students display positive behaviour, they earn *experience points (XP)* in Classcraft. When they earn enough XP to reach the level threshold, they level up. Each time they do so, they earn one *power point (PP)*. PP are *exchangeable* points, as opposed to *status* points which cannot be traded (e.g. XP). With enough PP, a student can learn a new power that has an influence on the game or class rules.

8.2 Experience points Concepts

The ways in which students can earn XP must be chosen so that everyone may realistically profit. Otherwise, a learner may think that she will never have a chance of earning any and they will have a demoti-



Figure 8.1 Classcraft heroes and setting

vating effect. This could cause fear and shame. For this reason, XP should remain unrelated to academic *achievement*. The gamification aspects on which I focus remain, as far as possible, separate from the results of certificative assessment. Instead, they focus on the class atmosphere and the students' approach to learning.

Goals

I wish to measure quality rather than quantity. Setting up the wrong XP triggers may encourage minimum-effort approaches by students trying to “game” the system for the sake of extrinsic rewards. Similarly, XP should be proportional to the benefit an action has for the class. This aims to support motivation and soft skills like collaboration. For example, certain actions earn XP for the learner's clan rather than for herself, and the powers which a learner can choose often benefit the entire clan rather than one individual. The result is that students appreciate each other's positive behaviour and will motivate each other.

XP also support the students' sense of autonomy, since it emphasises their active role. This contrasts the role they might assume in a teacher-centred lesson in which students are passive and in which events *happen to* learners rather than being *effected* by them.

Economy

XP make the use of rewards sustainable. Letting users level up after every positive action would remove all challenge. Instead, students get a “piece of the reward.” They feel that they are progressing

towards levelling up without getting the full reward each time (Chou 2417). The amount of XP earned by positive actions needs to be well-balanced so that the system's game economy remains legitimate (Chou 2434).

The use of XP in this gamified system allows for fast, regular, vivid feedback. XP become signifiers of the value the teacher puts on specific student behaviour. They are easily readable by the students (Deterding, "Atoms" 19). XP are status points that can only go up, as opposed to academic marks whose average goes up or down. As such, they form quantitative feedback: "the results of [an activity] well done may start to fade almost immediately, but no one can take away the XP you have earned" (McGonigal, *Reality* 2174).

Classcraft keeps a log of all game events. One could imagine using this log to support communication with parents. I have been to parent-teacher meetings in which the parents focused solely on the low grade their child had earned in my tests. They did not recognize the effort she had put into getting that grade. They were unaware of the good questions she had asked in class or how she had helped her desk neighbour make grammar "click." This was the result of my communicating with parents and guardians almost exclusively through grades, I thought. Instead, I could use the information in Classcraft logs to show parents a breakdown of all the good the student has done.

XP also support communication *in* the classroom. They increase transparency and thus support classroom management: "consistency in rule implementation is a key component to a smoothly functioning class; without consistency, the value attributed to rules can crumble off" (Roberge and Ventet). Arguably, the system can never really be free of subjectivity: if a class as a whole displays constant positive behaviour, the teacher may subconsciously raise the bar for when this behaviour triggers XP rewards.

8.3 Triggers

A teacher needs to think carefully about what XP triggers to use. For example, they must align with the principles of the SDT. They should also avoid formulations that are too precise, since learners must be able to find their own approach to internalize these rules rather than feeling coerced to follow pre-defined patterns. I retained the following for 2017/18. (For XP values marked with an asterisk each member of a clan is awarded the indicated amount.)

- I. *Finding a mistake in the class notes.* (50XP*) This encourages critical thinking and reduces the odds of a student keeping quiet for fear of upsetting the teacher. It also encourages learners to inquire about items that seem odd to them. Finally, it increases the quality of my material.

- II. *Being positive and hard-working.* (100XP) This trigger was included in the original Classcraft presets. It shows learners that their efforts do not go unrecognized and commends learning not easily affirmed by traditional marks.
- III. *Asking a good question.* (50XP*) This rewards students' active involvement in their own education, which to me is worth more than the ability to cram material and accept presented ideas as facts. It also shows students that admitting one has not fully understood an idea yet is a step towards learning that deserves encouragement.
- IV. *Being helpful in our Edmodo group or our wiki.* (100XP) This encourages cooperation, and thus relatedness.
- V. *Correctly answering a quiz question in class.* (50XP*) Quiz questions are intrinsically motivating additional challenges. I use these for moments when students should reflect on a question in detail. Awarding this to a clan somewhat mitigates the competitive element.
- VI. *As a clan, handing in an assignment the lesson before it is due or earlier.* (200XP*) This increases the learners' sense of autonomy since they are encouraged to see deadlines as something they have control over, albeit only in one direction. It also encourages cooperation through *social proofing*: "the more you can relate to a group, the more likely you will comply with its social norm" (Chou 2695).
- VII. *Asking a question about English grammar that the dragoman cannot explain.* (300XP) "Dragoman" denotes the English teacher in the context of the Mercatopian narrative. For proficient learners, this is a way to challenge the teacher and thus create a healthier learner-student hierarchy in which the teacher is not the wielder of all knowledge, but in which students are encouraged to find things out. For other students, it is a sign of recognition that they have helped me by identifying an aspect of teaching that I can focus on in terms of self-improvement. It also serves as a reminder to myself to stay inquisitive and willing to learn.
- VIII. *Posting a badge that you have earned to our Edmodo group.* (300XP) This is a purely extrinsic reward used as a catalyser for one of the social functions of badges, discussed in chapter 15.
- IX. *Showing creativity.* (100XP) This is a catch-all for creative thinking. This includes showing extra creativity in free writing, unconventional problem solving or otherwise bringing new ideas into lessons.
- X. *Helping the dragoman become better at his task.* (100XP) This is for situations similar to I and VII. For example, my students sometimes create excellent mnemonics that I use to teach subsequent classes.

- XI. *Beating your teacher on the Memrise weekly leaderboard.* (100XP) This creates a friendly competition between the learner studying English and the teacher studying another foreign language (currently Portuguese). It gives students an opportunity to beat their teacher in an educational game, shows them that I myself find Memrise motivating, and helps them think of me as a learner. In order to reduce the workload for me, students have to *request* XP for this.
- XII. I want to include additional triggers for prosocial behaviour which are discussed in connection with bullying in section 13.4.

8.4 Criticism

XP are extrinsic rewards. There is thus a risk that they undermine intrinsic motivation. Whilst the studies which observed this result only considered short-term effects, I shall err on the side of caution and assume that their findings are still valid for a year-long implementation.

I have indeed observed behaviour that suggests that at least some students focus on XP as extrinsic rewards, rather than the activities they relate to. For example, Louisa A continued to activate Classcraft powers to earn XP up to and after the final lesson of the year. Since the powers no longer had an impact on lessons, I assume that the XP were the only remaining motivation for her behaviour.

We should remember, however, that extrinsic rewards, if used appropriately, hold the potential for internalization, e.g. by adding a challenge to a task. Moreover, this aspect of gamification is only likely to have a negative effect if the teacher implementing it or the student experiencing it is “mistaking incidental properties like points and levels for primary features like interactions with behavioral complexity” (Bogost, “Bullshit”). In that case, we end up with a perverted system, with “pointsification” (Bogost, “Persuasive”).

When implemented well, Classcraft is unlikely to lead to this effect: XP are signifiers for real-world progress, as opposed to, say, points earned simply for logging in.

Next, we need to consider what reward category XP fall into. The rewards offered by Classcraft, both XP and the powers learned through them, do not fit into the category of *tangible* rewards. There is no material aspect to them; nor are they trophies. Instead, they *modify* the ways in which players can behave in class: they create certain ways to “bend” the rules. This makes them *effectance-promoting*, i.e. they support competence. Moreover, these rewards are self-contained. They are *part of the activity* rather than external to it. The best-fitting category thus seems to be that of *verbal* rewards.

Therefore, we need to examine whether the feedback given through XP is *controlling* or *informative*. The XP system must be designed so that it does not put pressure on students, nor must it discourage them from thinking critically rather than merely saying what the teacher wants to hear. There is a risk Classcraft will be used that way by some teachers. For example Sanchez, Young and Jouneau state that through Classcraft, “decoding the teacher’s expectations becomes easier” (8). In contrast, I believe that the XP triggers I have chosen encourage independent, critical and creative thought and that they can *inform* students about the effects of their behaviour.

It is noteworthy that the Luxembourgish school system, by law, relies on extrinsic motivators that *are* controlling. As a result, many learners study explicitly to obtain marks, and seldom for the sake of learning. Students can get bonus marks on tests for correcting them, and bonus marks at the end of term for their results in “contrôles.”²⁴ In practice, I have observed that students find this process arbitrary and have no clear idea of how exactly these bonus marks come about. In the absence of clearly defined rules, learners see the marks as the result of a subjective decision by the teacher, a process which undermines their need for autonomy and competence.

Similarly, for classroom management, most teachers already use extrinsic motivation techniques. However, they mostly focus on avoidance, e.g. by giving sanctions for negative behaviour. They seldom reward good deeds. This absence of feedback is called *extinction*, and has the same negative effects as giving negative feedback (Conellan qtd. Sprenger 77). Gamification should not be seen as a tool to abandon external stimuli, but to use them in a way that balances positive and negative reinforcement and allows for internalization.

8.5 XP as a metric for success

The data I collected in 2016-17 suggests a correlation between the XP students collected and their final mark. However, it should be noted that this does *not* imply causality. For one thing, it could be that those students who *already* do well at school are also more likely to earn XP. Next, the data are flawed in that they rely on a small sample pool. I also had to exclude the data of students who left their class over the course of the year. Moreover, in practice there are many factors other than my implementation of a gamified system that sway results. Since motivation is difficult to measure, the XP in the graph below should instead be read as an indicator of student engagement, which is “strongly related with academic achievement” (Schute 506).

²⁴ “Règlement grand-ducal modifié du 14 juillet 2005 déterminant l’évaluation et la promotion des élèves de l’enseignement secondaire technique et de l’enseignement secondaire, Art 1er, °3” and “Instruction ministérielle du 6 juin 2008 concernant les devoirs des élèves et les notes scolaires, °3”

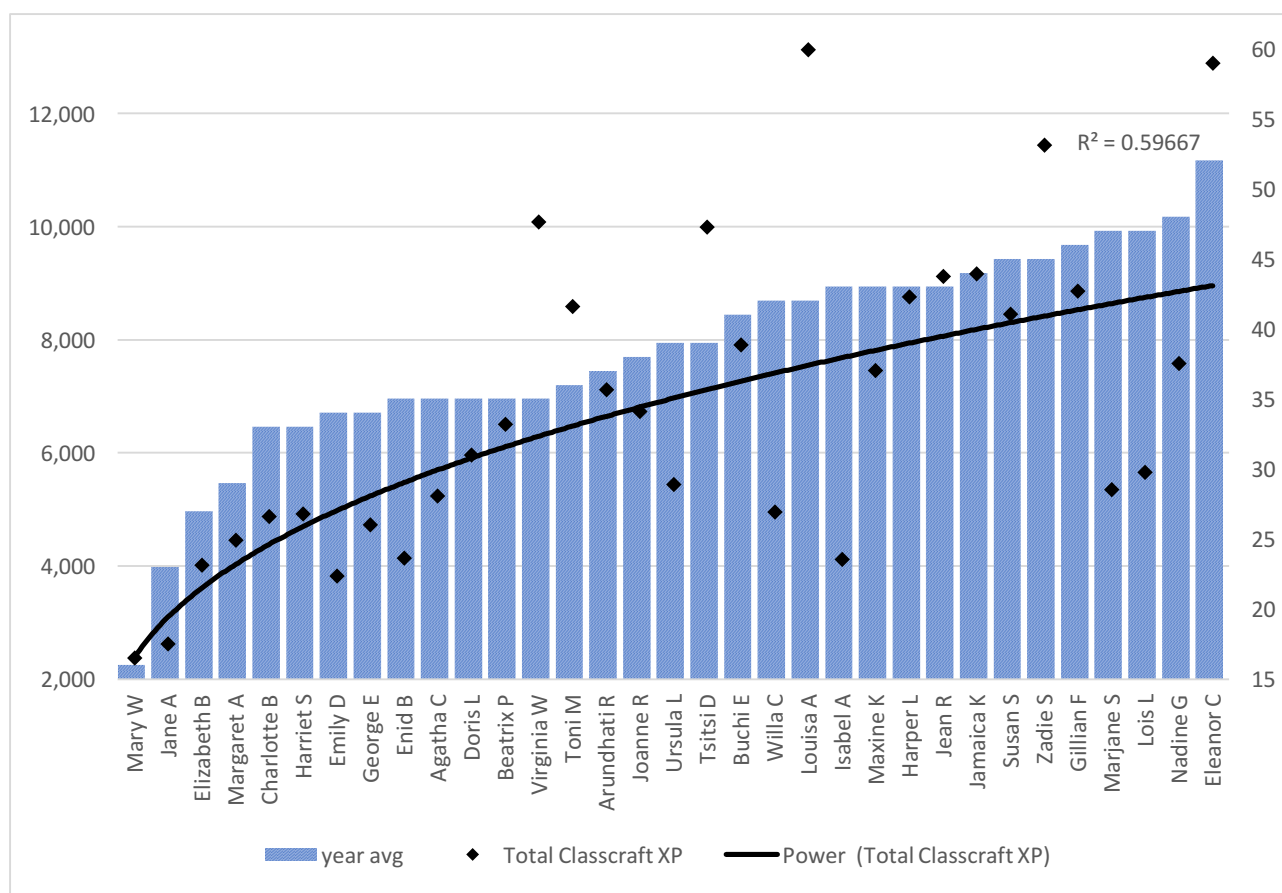


Figure 8.2 Comparison of final marks and Classcraft XP

8.6 Powers

It's dangerous to go alone. Take this. – The Legend of Zelda

Learners level up when they reach a certain threshold. Through iteration, I have found that with my XP triggers, having to earn 800XP to level up poses an adequate challenge if English is taught four lessons per week. Levelling up serves as a milestone. It is an opportunity to feel successful and competent.

It also opens new possibilities to students. “Games should give gamers powers, and do something extraordinary” (McGonigal, "Badges"). First of all, powers fulfil students’ need for autonomy and self-determination. They choose which powers they want, and in what order they want to learn them. Each student can take the approach that works best for her. This is similar to the skill tree found in video games: “it forces players to decide on a play style ... by deciding what skills they want to obtain” (Blair 1647). A student can decide to focus on cooperative powers or those which primarily serve herself. This system also encourages experimentation if students start with a new hero the following school year.

To limit the use of powers, Classcraft includes *action points (AP)*. This artificially limits how often powers can be used and encourages strategizing. AP regenerate at a rate of 2 per day.

When I introduced the project, my students seemed excited at the prospect of wielding the powers described below. Of course, I had to make sure the powers all contributed to my goals and were not in conflict with school laws and LTB regulations. For those powers which can be used in test situations, I had to ensure the advantage did not measurably affect the certificative outcome. For those which benefit the class as a whole, the goal was to support relatedness. A student who activates such a power will likely get her peers' recognition for helping everyone. These cooperative powers can create the urge to *reciprocate*, thus strengthening social links. In this way, the game affects real-life behaviour: "young people who spend more time playing games in which they're required to help each other are significantly more likely to help friends, family, neighbors and even strangers in their real lives" (McGonigal, *Reality* 2069). However, the powers cannot be a replacement for real-life interaction.



Figure 8.3 Classcraft hero roles

Cooperation

Which powers are available to a student depends on the hero role she chooses.²⁵ These roles help each student find her identity within her clan. When cooperating, "we take great satisfaction in knowing we have a unique and important role to play in a much bigger effort" (McGonigal, *Reality* 537).

The exclusivity of some powers to a specific role requires each clan to strategize and cooperate. (See Appendix 12.) On her own, no hero has all the tools that she needs to succeed in Classcraft. First, the mage's AP replenishing abilities (I and VII) make her the backbone of each clan. Without her, other players need to wait significantly longer before they can activate their powers. Then, the warrior has the ability to divert incoming damage away from her peers and onto herself, her shield powers

²⁵ Classcraft refers to these as hero classes. I use the term "roles" to avoid confusion.

(X, XIII and XVI) reducing the lost HP by 20-50%. The warrior, having the most HP, is often chosen by learners who feel that they get in trouble more than their peers. For them, the cooperative aspect of this power may be all the more important: it shows them they can contribute to their clan, and that their actions in lessons contribute to the welfare of their peers. The healer, finally, can develop a strong sense of relatedness since other players depend on her powers (XIX, XXII, XXIV and XXV) to replenish their HP after they have taken damage, or revive them should they *fall in battle*.

I have, however, observed situations in which learners grew frustrated with clanmates who were in constant need of healing, protection, or mana. They eventually let their peers fall to 0HP and thus took those players' fate into their own hands. They even accepted the negative effect which is caused by *splash damage*: when a hero falls in battle, all clanmates lose 10HP. It becomes clear then that in the context of Classcraft, relatedness is not just a need for belonging, but also a sense of responsibility for other players. This has led some clans to the conclusion that in the long run it would be in the best interest of the group for the "troublemaker" to face real-life consequences.

Self-serving powers

The mage and the warrior can, to some extent, protect themselves from damage when no other clan member can or will protect them (IV and XI, respectively). All three roles also have the ability to briefly resort to a language other than English, should they find themselves unable to express their ideas in the target language (III, XII and XX, respectively). Moreover, the warrior and healer can request limited assistance in test situations (XV and XXIII). Finally, the mage can intercept certain powers of other players for her own benefit (II).

Time

Deci, Koestner and Ryan explain that external factors such as deadlines reduce a learner's sense of self-determination (see section 2.4, Limitations). Some of the powers my students can learn aim to counter this effect. They allow a player to postpone a test (XVII) or a deadline for herself (VI and XIV) or her entire clan (XVIII). A healer can also learn the ability to lengthen the duration of a test for an entire class (XXI).

Autonomy

Next, there are powers who aim to allow learners to make meaningful choices. This includes giving them control over game elements that are based on randomness (V), allowing them to write additional portfolio activities (XXVII), rewriting activities (VIII) or affecting the material that has to be studied (IX).

Magnanimity

There is one power which I have created that is available to all players and that is not directly integrated into the platform: *Kudos* allow any player at any time to trade in 1AP for 5XP *for another player*. To do so, players need to contact me and tell me how many AP they want to spend and why the recipient deserves the XP. This gives teams which rarely get a chance to use their cooperative powers a way to make use of their AP. It also allows a clan to give a boost to its “weakest” member. Moreover, it encourages peer evaluation. For this power, I was inspired by the *props* system used by the gamified fitness app Fitocracy. This kind of feedback from peers can have a strong motivating effect on the recipient since she knows that the other person went out of her way to commend her behaviour and spent some of her own resources in the process.

8.7 Flawed game mechanics

While it makes sense that players become stronger as they level up, there is a flaw in the Classcraft game mechanics. I call this the *reverse flow mechanic*. In traditional RPGs, as the player levels up and becomes stronger, so do her opponents. In Classcraft, however, the penalties from which a warrior protects her peers or the dangers from which healers help their peers recover *remain static*. The penalties do not increase over the course of the year. As a result, the mechanics make dealing with damage increasingly easy. Thus, a system that was balanced for optimal flow at the beginning of the school year (when, for example, warriors can deflect 20% of all damage) will no longer offer a real challenge for advanced players (who have, for example, learned *Fire Shield* and can deflect 50% of all damage). The only game mechanic that could counter this effect is the limitation through AP. However, the settings for cooperative powers cannot be modified. All other methods of counterbalancing the reverse flow mechanic would affect both low and high level players indiscriminately and would thus not solve this problem.

There is another, linked problem. In most RPGs, as the challenges become more difficult, it also takes longer for players to level up. This results in a system in which players level up quickly at the beginning of the game and have a chance to discover the various ways in which they can play the game. As they level up, the process slows down. “One of the justifications for this design is that players who are well into a skill tree are already committed to the experience and are likely willing to wait longer between achieving goals” (Blair 1678). The problem in Classcraft is that by default, the level cap stays static. If teachers want to give students a challenge, then it will take a relatively long time before any of them levels up for the first time, which may lead to a loss of interest at a crucial stage.

Conversely, at higher levels, students have more powers which, additionally, yield more XP. This decreases the challenge and thus no longer supports intrinsic motivation.

Similarly, there is a flaw in the premise of the game. The better a class behaves, the more the system moves *away* from situations in which learners can earn XP through cooperative powers such as protecting and healing, and *towards* situations in which XP are awarded at the teacher's discretion (e.g. for positive behaviour), thus slightly shifting the perceived locus of control to an external position.

Classcraft tries to solve the first problem by requiring learners to spend more PP to learn higher tier powers. Still, this does not fully compensate for the problem of students levelling up at static speeds. My solution is to gradually raise the level cap over time. This allows for fast levelling when the game is first introduced. Unfortunately, this approach is not individualized. Some learners may not have significantly levelled up by the time the cap is raised. The system thus risks increasing heterogeneity in terms of students' abilities within the game. The best solution, one which Classcraft needs to implement through new game mechanics, is to increase the level cap individually for each player *when* she levels up.

8.8 Reward concepts

As with XP, the focus of these powers is not on tangible rewards. Instead, they improve the ways in which students can deal with everyday lessons. They are signifiers of competence, autonomy and relatedness: they are earned by developing behaviours that fulfil these three needs and simultaneously reinforce them. In this way, they allow for internalization of the behaviours that the gamified platform aims to encourage. Essentially, the rewards of Classcraft are positive emotions that support the needs outlined by the SDT.

Teachers who wish to implement gamification need to be wary of poor implementations that can backfire. This includes reward systems that directly undermine intrinsic motivation (such as using tangible rewards) or systems which stand in direct opposition to a student's basic needs. One example of gamification gone wrong involved a third-grade teacher in Washington who gave students pretend money for things such as finishing school work (see Sauerwein). The students could use the money to buy popcorn or pizza. They also needed to pay \$50 to go to the bathroom. One student who had \$50 left needed to go to the bathroom. She also wanted to buy popcorn since that is what her friends were doing (thus fulfilling her need for relatedness): "I didn't want to be left out. I wanted to have popcorn with my friends." She didn't want to pay to go to the bathroom and was forbidden to go. The resulting embarrassing accident undermined her sense of autonomy (she couldn't choose when to go to the bathroom), of competence (she was unable to control either the situation or her body) and of

relatedness (she felt humiliated). While the system was implemented with the positive goal of reducing classroom disruptions, it resulted in a framework that was not conducive to self-determination and featured an overwhelmingly external locus of control.

Conversely, students are more likely to internalize rules if they themselves were involved in their creation (Roberge and Ventet 14). In my practice, that includes, for example, the powers in Appendix 12 marked with two asterisks.

8.9 Gold

Gold points (GP) are one Classcraft mechanic that comes dangerously close to the monetary rewards described by many studies on motivation, even though the gold is fictional in-game currency. The link of in-game currencies to real-world currencies is a topic that goes beyond the scope of this thesis. Suffice to say that trading between both, also linked to so-called microtransactions, is one of the most common ways in which gamified experiences move into the domain of exploitationware. Indeed, many aspects of GP are limited to the paid version of Classcraft.

I see a number of problems with the ways GP are awarded. First, students automatically get some GP each time they level up at a rate of 10GP per level plus 20GP. (The game does not allow teachers to modify this mechanic.) Gold points thus risk undermining the informational nature on a student's progress due to the overjustification effect. Moreover, the ever increasing amount of GP with each level milestone is symptomatic of hedonic adaptation. If instead GP were given when *all* members of a clan have reached a given level, it could become a signifier of collaboration and looking out for each other, simultaneously increasing the frequency of feedback on group achievements.

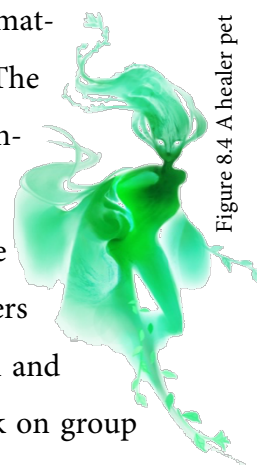


Figure 8.4 A healer pet

GP can also be part of the “loot” students find after a victorious boss battle. I feel that the negative effect is lessened here since “looting” is in keeping with the RPG trope. Giving no gold in that situation would fall into the structure of withholding expected rewards and may produce negative results.

Additionally, learners can earn gold by training pets. I believe that this mechanic was partly introduced to create *stickiness*, i.e. to encourage students to open the Classcraft app regularly. This would make sense with an app such as Memrise: studying vocabulary is most efficient when it happens often and in short intervals. In the Classcraft app, however, stickiness becomes a Black Hat Drive: it serves no apparent function other than that of producing gold. I fear this “chore” may lead to burnout. Logging in every day is not a meaningful educational activity and fulfils no basic psychological need.

Classcraft also proposes awarding GP as a function of test results. However, we have seen that performance-contingent rewards are likely to reduce intrinsic motivation by undermining a student's sense of competence.

While I think that GP are problematic, in the current system they are a necessity if learners are to customize their avatar, which has a number of positive effects described in section 11.1.

8.10 Boosters



Figure 8.5 Classcraft artwork hinting at future “items”

Boosters are not included in the mechanics of Classcraft. However, I would welcome their addition. Boosters can temporarily modify a certain aspect of the game atoms in order to keep the game interesting. They could be given to players, for example, when they reach specific milestones or when they complete a set of quests. These boosters should avoid relying on immediate rewards and instead affect gameplay. A booster that doubles earned XP for a week, for example, would encourage a learner to put more effort into her studies so as not to let the effect go to waste. Another booster could allow a player to hand over a question in a boss battle to someone else. Since these are not tangible rewards but serve to maintain learner's interest, they could support intrinsic motivation. Some Classcraft resources hint at plans the

developers may have to implement “items.” Whether they will align with my concept of boosters remains to be seen.

9 Go to Jail | HP and penalties

Gamers don't die. They respawn. – Anonymous

Each learners' academic success to some degree depends on the atmosphere of the classroom she is a part of. For positive interactions, students need the ability to behave in a way that is pro-social and non-disruptive. A teacher's tasks include guiding learners' behaviour in order to create optimal conditions for them to learn in.

Using Classcraft offers a number of changes to the methods which are common in classroom management. In the previous chapter, I discussed how it uses rewards. This chapter focuses on negative outcomes that learners try to avoid. Each player has a fixed amount of health points (HP). If the learner displays disruptive behaviour, these are lost through penalties. When all HP are lost, the player *falls in battle*, and she must face the real-world negative consequences of her actions.

9.1 Health points

The goal of this game mechanic is to reduce negative behaviour. Based on interviews, Roberge and Venet conclude that to this end, XP are ineffective, since they do not lead to respectful or prosocial behaviour: “rather, it is the consequences that have more impact; they discourage unwanted behaviors and, surprisingly, they cause students to show more respectful behavior towards others” (11). While I disagree with the first part of their conclusion, I found that the negative consequences in Classcraft did affect how my students acted towards each other.

However, the use of fear of loss as a motivator depends on the learners knowing exactly what must be done in order to avoid a penalty. Classcraft supports this through transparency (see p. 62). Students can refer to clear rules with evident consequences and can thus learn in an environment that guarantees them that they and their teacher refer to the same criteria.

Loss types

Chou differentiates between two different types of loss.

The experience designer should dangle the threat of a large setback (the *Ultimate Loss*), but should only implement (if at all) small marginal setbacks (the *Executable Loss*) to emotionally train the user in taking the Ultimate Loss more seriously. The Executable Loss reinforces the avoidance. (Chou 4119, my emphasis)

In Classcraft, deducting HP is the executable loss. This penalty is marked by transparency, which in turn supports learner autonomy: the student knows *exactly* how far away she is from the ultimate

loss, i.e. real-life negative consequences. We can contrast this to classroom management techniques which repeat statements such as “If you don’t stop now, you will get a sanction” three times before anything happens, thus confronting the learner with a system which, after the first repetition, contradicts itself.

The ultimate loss occurs when students fall in battle, i.e. when their HP fall to zero. In terms of the SDT, these consequences represent a loss of autonomy, so learners are motivated to avoid them. Such a negative consequence, e.g. a written sanction, is a signifier for an external locus of control. This has a negative effect on the learners’ intrinsic motivation and may stop the internalization process. Thus, it is in the interest of *both* the learner and the teacher to avoid the ultimate loss.

Cruel to be kind

When I first used Classcraft, I was reluctant to deduct HP. I was worried it would demotivate students. Paradoxically, for the game to work well, the teacher must deduct HP for *something*, otherwise the healers and warriors will never earn XP via their cooperative powers and will feel superfluous in their clan, which reduces relatedness.

One way to maintain the flow of the game is to include regular boss battles. If these have higher stakes, i.e. if more HP are associated with each question, then students are likely to lose HP in keeping with the trope of the game: when heroes try to defeat antagonists, it makes sense that these will attack in return. Giving wrong answers in a boss battle leads to HP loss, which enables each role to use their cooperative powers. The problem of this game mechanic is that it leads to a higher XP yield per boss battle for teams that make more errors. I have observed overconfident students give wrong answers on purpose as a way to game the system, so that they could activate their cooperative powers.

Regular HP loss forces students to strategize and to coordinate their powers of protecting, healing and empowering. The best way to use this game mechanic is thus to use penalties fairly aggressively – but always in keeping with the established rules. Due to the differentiation between executable loss and ultimate loss, this practice actually avoids escalation and leads to a classroom management style that is perceived as *less* controlling.

Triggers

For 2017/18, I have retained the following rules or triggers for HP deductions.

- I. *Wasting the time of other students or distracting them. (-15HP)*
- II. *Arriving late to a lesson. (-15HP)*
- III. *Being unprepared for a lesson . (-15HP)*
- IV. *Inappropriate use of electronic devices. (-15HP)*

Rule IV allows for a penalty that lies between the two extremes I have worked with so far: I either gave negative verbal feedback and told the student to put her phone away with no further consequences, or the device was confiscated for a week. The latter is not an option for tablets in the context of the PadUcation project. There are additional rules that specifically target bullying. These are discussed in section 13.4.

Classcraft also includes an automatic trigger for splash damage: if a player falls in battle, all of her clanmates lose 10HP. This is an additional reason for students to work cooperatively and strategize in order to minimize damage to the clan.

To maintain lesson flow²⁶ if penalties are issued, Classcraft has recently introduced a feature called *delayed damage*. When it is used, after a penalty has been triggered, the students can pre-emptively and on their own devices protect their peers. In this way, the teacher does not have to wait for the clan's decision about whether and how to react to the situation. Thus, lesson flow is maintained. The teacher can then *apply* the damage (if any is left) at an appropriate moment. This feature was not initially supported in the app version of the platform, which thus negatively impacted the students' sense of control, especially when damage was suffered in boss battles: rather than being able to act on their own, the students had to tell the teacher what powers they wished *him* to activate for them.

9.2 Falling in battle

I stated that negative consequences reduce a learner's sense of self-determination. However, Sanchez, Young and Jouneau claim that in Classcraft, falling in battle does not affect a learner's "feeling of being competent" (9). This is because a learner can carry out the sentence she was given to return to the game, and can continue earning XP after this event.

I still feel that a student *can* interpret falling in battle as failure to competently make use of the game resources, or failure to acquire these resources in the first place, e.g. by not having earned enough XP to learn powers with which she can protect herself or her clanmates.

Still, falling in battle serves as a valuable source of feedback. In interviews about Classcraft, participants stated that "quick and consistent feedback helped students to be aware of their own behavior" (Roberge and Ventet 10). Thus, deducting HP is not merely a behaviouristic approach, but it carries a lot of information about the student's decisions and their effects. "They are information with potentially high semantic content that have to be analyzed and interpreted in order to rethink the implemented strategies if necessary" (Sanchez, Young and Jouneau 8).

²⁶ Lesson flow refers to the pace and continuity of a school lesson. It is distinct from Csikszentmihályi's Flow theory.

Through Classcraft, students are encouraged and empowered in the self-assessment of their choices and actions. They can make informed decisions and meaningful choices, which support their need for autonomy and thus increases intrinsic motivation. The system would be even more efficient if, when a student falls in battle, Classcraft would automatically display back to her the most recent HP loss events. This feature could be added to the current implementation of the “Book of Laments,” which tracks the fate of fallen heroes (see Figure 9.1). It would then be more likely that she would think “I could easily have avoided this.” When a player falls, this also serves as feedback to the other members of her clan: they did not cooperate enough to save one of their own from this fate.



Figure 9.1 The Book of Laments

The default setup of Classcraft includes a mechanic called the *Cursed Die*. The latter introduces unpredictability into the penalty system. When a learner falls in battle, the real-life consequence of her negative actions is decided *at random*. When I first introduced Classcraft, I had maintained this mechanic and included the following possible outcomes: staying longer, bringing a treat for other stu-

dents, a phone call from the teacher to the parents, and losing one’s powers for 8 days. Some teachers who use Classcraft also include “nothing” as a possible consequence, which I feel undermines the function of falling in battle as the ultimate loss: a player who falls in battle due to disruptive behaviour might, through sheer luck, dodge all real-life consequences. This might actually make her feel a sense of *fiero* at this moment, effectively reinforcing the negative behaviour. Additionally, other students might come to resent a peer who avoids all sanctions in spite of breaking the rules that players agreed to when they joined Classcraft. Unpredictability increases motivation in other situations, but not here.

My students reacted very negatively to the idea that sanctions should be chosen at random, and understandably so. Upon further reflection, it became clear to me that the unpredictability here destroys the sense of transparency which Classcraft elsewhere carefully constructs and which allows students to always have an idea of where they are and what will happen to them. Students expect the rules to be stable and the consequences of good and bad behaviour to be predictable, so they always know what is at stake. Randomness can also lead to inappropriate and indiscriminate consequences: through remedial actions, “students are more likely to master their own behavior ... When using random consequences, having logical consequences or remedial actions is difficult” (Roberge and Ventet 15). Therefore, these real-life consequences should be chosen to match the situation that effected them.

Consequently, there remains a tension I have been unable to resolve. On the one hand, I want to maintain transparency by making clear to the students from the beginning what is at stake and what kind of sanction they can expect. On the other hand, I require flexibility in choosing remedial actions that have pedagogical value in the specific situation they are needed.

There are a myriad of different approaches to negative consequences that, additionally, depend on the context they are used in. Still, one aspect that I believe all of them have in common is that they are, in the long run, less sustainable and less productive than more positive methods of classroom management. Classcraft allows for a more productive approach through its implementation of executable losses. In fact, they may promote internalization and hence intrinsic motivation.

9.3 Classroom management

When negative consequences need to be implemented, their negative impact on a student's sense of self-determination may still be mitigated by a gamified system: "compared with games, reality is hard to swallow. Games make it easier to take good advice and try out happier habits" (McGonigal, *Reality* 3293). There is a possibility that students will see the locus of control of such situations as internal if the consequence is seen as part of a game that they voluntarily engaged in. In that case, there is a shift in perspective. Remedial actions are no longer forced on the student by the teacher, but are the logical consequence of the game rules: "most students think that the game has authority. Even if it is the teacher who applies consequences, it is the game that punishes" (Roberge and Ventet 10). In this context, resisting the urge to behave negatively is no longer framed as an *absence* of action, but as an active, positive act of progress within the game while working *with* its rules: the player willingly trades her freedom "for a freedom constrained by the arbitrary rules that are the game rules" (Duflo qtd. in Sanchez, Young and Jouneau 9).

In video games, there is no partial entity that takes biased decisions: the skill atoms are neutral, and the rules are mere impartial guides of the activity. A gamified approach thus reminds the learners that they are in control of their own behaviour. This allows for a less controlling teaching style and, in turn, for more autonomy for the students: "it appears that students who are highly motivated and autonomous in school may elicit more autonomy support from their teachers, whereas students who are more distracted and less motivated may elicit more controlling behaviors from the teachers" (Deci et al. 341).

This dynamic can lead to a virtuous circle. Using Classcraft, I am able to use a less controlling style, which in turn increases learner autonomy and then allows me to continue with a more autonomy-supportive teaching style. In such an atmosphere, penalties are interpreted differently:

Students perceive the consequences attributed to them in Classcraft as less unpleasant. Indeed, we understand that the teacher is perceived less like a policeman or an authority figure because their role is transferred to the game. The game diminishes the perceived threat from experiences, which lowers the impact of failure and the stress of taking risks. (Roberge and Ventet 15, my emphasis)

Penalties can then be interpreted as informing rather than controlling. Still, the locus of control does not completely shift: the teacher remains the one who decides when the conditions of triggers, be they for XP or HP, are met.

Considering this limitation, it is important to have a positive balance of positive and negative rewards. Again, in many classrooms, this balance is lacking: negative behaviour is punished, whereas positive behaviour such as cooperation is taken for granted and often answered with extinction. If the same ratio existed in Classcraft, the system would more likely be interpreted as controlling. This effect was also observed by Roberge and Venet in classes which had an “inadequate dosage” of rewards and punishments (14).

In practice, I had the impression that Classcraft did indeed have a positive influence on my students’ behaviour. In hindsight, the effect may have been limited, however, by my initial reluctance to use penalties in the case of classroom disruptions: since these were few and far in between, I often chose to simply use negative verbal feedback. Unfortunately, most data I could have collected would have been difficult to put into perspective, since I have no control group. However, the electronic registry system our school uses allowed me to evaluate and compare the number of late arrivals to my lessons over the course of the year to that of other teachers.

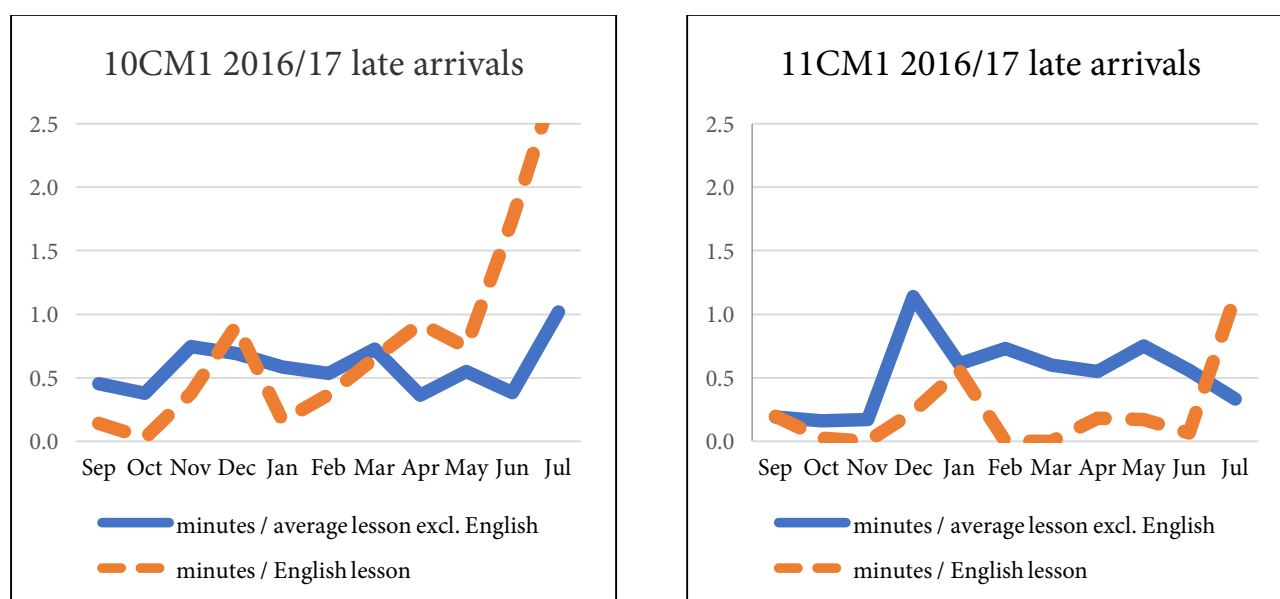


Figure 9.2 Late arrivals for 10CM1 and 11CM1 2016/17

The data seem to indicate that for most of the year, the average number of minutes of delay of the class as a whole was lower for my lessons than it was, on average, for other lessons. However, for the 10CM1 that number skyrocketed for my lessons after May, with the result that the yearly average is higher for my lessons. All in all, I find the data inconclusive, especially considering that each teacher may have a different approach to registering late arrivals. While I still believe that Classcraft has an effect, there are outside factors that are significantly more dominant when it comes to whether or not students arrive late to a lesson.

Ethics

In light of what I have described in the previous section, I must again ask myself whether the way in which Classcraft influences students is ethical. Does it promote submission to authority instead of creativity and individual thought? One could argue that this kind of gamification is trying to affect the wrong aspects of education: “the emphasis ... is on fixing people, rather than fixing social structures. It prioritizes the design of interventions that seek to modify behaviours to make people perform as optimally as possible according to new behavioural and psychological norms” (Ben Williamson qtd. in Watters, “Personalization”). I believe that I am targeting structures that should allow students to enjoy their education. However, I cannot deny that there is an element of self-policing involved in Classcraft’s contributions to the internalization of positive behaviour. This was also observed by Tse in a 2014 survey of Classcraft users. However, Tse sees this effect as positive: it “implies a sense of comradery and teamwork among students, which further promotes better behavior in the class” (17). Conversely, Watters sees in this a kind of submission: “education technology promises personalization and liberation, but it’s really, most often in the guise of obedience, a submission to the behavioral expectations and power structures that are part of our educational institutions” (Watters, “Lasso”). I could raise the counterpoint that many of the behaviours I reward are those which challenge the status quo, such as pointing out errors in my materials and challenging me to continue my professional development. Additionally, the students’ feedback to some extent shapes the rules of the game they participate in. These approaches support critical thinking rather than submission. However, I cannot make the same point for the triggers that regulate HP loss. If I want Classcraft to be seen as a tool that supports rather than limits students, it must not be perceived by them as an imposed power structure, but as something they play voluntarily.

10 Co-op mode I Voluntary multiplayer

10.1 Voluntary play

The question of voluntary participation in a gamified educational system is unique: learners are forced to be present in the space in which a game is played, regardless of whether they choose to participate. In this case, not participating is not merely *refraining from joining* but an *active choice of self-exclusion* from an academic community which is in the cooperative process of creating a ludic space, as well as from the group identity that these students are forming for themselves through play.

Not forcing students to participate in a gamified system such as Classcraft engenders the risk of having to teach a divided class as well as working with and negotiating between two parallel systems. Yet enforcing participation means not only that all positive motivational effects described in chapter 2 are at risk, but also that the students' existing motivation may be undermined.

One qualifying aspect to this situation is that students who are coerced into participating may still choose whether they voluntarily and actively want to engage in specific activities and whether they want to make use of game mechanics such as learning powers by levelling up. The question of voluntary play thus arguably shifts away from participating in the framework which Classcraft offers and instead refers to its discrete game mechanics.

However, I believe that once the initial choice has been taken from the learner, it will be difficult for her to develop any sense of self-determination in relation to the gamified aspects of the lessons. Arguing that the learner can still choose not to participate in specific elements of Classcraft is somewhat naïve, since the structure of this gamified experience makes students rely on each other much more strongly. In this way, a student coerced into participating is likely to become a boycotter of a game she never chose to play.

Onboarding

If I am unwilling to coerce students into joining Classcraft, yet believe that students will benefit from every member of a class joining, I must ensure that there is enough initial interest for students to join of their own volition. This initial phase in which players join a game and take their first steps is known as onboarding.

Before announcing the game as such, a teacher can already pique students' curiosity. A possible way of doing so is to send students a physical letter with an invitation to play. The letter could inform the students that they have been selected for an important mission and that their assistance is needed. An example is included in Appendix 3. Such a letter can trigger what Chou calls the "Rightful Heritage effect": "this is when a system first makes a user believe something rightfully belongs to them ...

and then makes them feel it will be taken away if they don't commit the Desired Action" (Chou 4172). If learners are later presented with the option to join Classcraft, not doing so will feel like they are losing out on something that they specifically were chosen for.

Before students can join and create their hero, the purpose of the game needs to be made clear. I feel that I have to make progress in this respect. For example, during the second term, my student Buchi E. told one of my colleagues who had joined me in a multiclass setup of Classcraft: „Ech ginn net eens. Ech weess net wat dat soll.“²⁷ From the beginning then, I need to clearly show the learners what purpose Classcraft serves and how it can help them. This would also entail emphasizing the positive aspects of the game.

However, the introduction must not overwhelm the students, either. In the past, I have made the mistake of trying to explain every aspect of Classcraft in a first, introductory presentation. It may be more useful to maintain some of the mystery (and hence interest) and to give students limited information at first. Doing so also makes it easier for students to identify the next actionable steps. One such step would be to let the learners claim the password to their account and to let them experiment a bit on their own.

The hero creation process, on the other hand, needs a bit of guidance. It asks the students to take multiple major decisions as soon as they sign up, which can be confusing. To avoid this, and to immerse the students in the fictional world which frames the gamified experience, I want the signup process to take on the form of a narrative, which can be done via interactive, dynamic story-telling similar to that found in "choose your own adventure" books. This can be done online. A sample script is included in Appendix 4 on p. 142. Framing the decision-making process in such a narrative can reduce the risk of decision paralysis.

Once students are able to sign up, it may be useful to rely on a few Black Hat Drive techniques. Such techniques can include, for example, exclusive "pre-release" boosters for students who sign up early on (Hutcheson). Another "Rightful Heritage" technique is to tell students each time they *would have* earned XP if they *had* joined the game by now. Students will feel that they forfeit XP if they do not join.

Chou also discusses the "Evanescent Opportunity" game technique (4210). Students are offered bonus XP for joining early on. The amount of XP they earn decreases over time. This can be combined

²⁷ "I'm lost. I don't know what the point of this is."

with a visual representation like a countdown timer which eventually disappears altogether if the student does not react in time. Such a decreasing number makes the temporary nature of the offer more concrete than a more abstract, static deadline: “the user constantly sees the window of opportunity narrowing, establishing a sense of urgency in the process” (Chou 4233). In combination, these two can form a “FOMO Punch.”

FOMO stands for “Fear of Missing Out” ... We fear losing what we have, but we also fear losing what we could have had. This fear of regret, when prompted correctly, can penetrate through the behavioural inertia of Status Quo Sloth and trigger the Desired Action. (Chou 4256)

These Black Hat Techniques carry a risk. If their use is exaggerated, students may feel that they have been tricked into joining Classcraft. Chou calls this “brute force distribution.” For example, the only reason many people ended up with a Google+ account was that they were duped by a confusing dialog box on YouTube (1366).

The question of ethics imposes itself once more. Black Hat techniques are associated with negative stress and an external locus of control. They should only be used in the short term, and only to generate interest for an activity that is intrinsically motivating, but which students may otherwise never experience. In this case, I think that the process

is ethical for the reason that Classcraft as a gamified system does not ask students to do anything drastically different from what would already have been expected of them in a traditional classroom: they would have been expected to work hard, contribute to lessons, and behave socially. The difference is that by joining Classcraft they now do so in a system that is more likely to support their intrinsic motivation by fulfilling their basic psychological needs.

Hero Pact

The Hero Pact states that students agree to play by the rules of Classcraft and that they will play until the end of the school year. In keeping with the onboarding process, I may, in future, wait for one or two weeks before introducing the Hero Pact, so that learners feel comfortable “trying out” Classcraft



Figure 10.1 The Hero Pact

without thinking that they will not have a way out if they decide it is not for them. The pact is necessary in terms of classroom management. It reminds students of their voluntary decision to join the game and abide by its rules. Otherwise, students could just “stop playing” as soon as penalties lead to a real-life negative consequence.

When I first introduced Classcraft in 2015-16, all students but one joined and signed the Hero Pact. Margaret A. told me „Ech wëll näischt riskéieren.”²⁸ When I first introduced Classcraft, her focus was on the elements that she was already familiar with, namely the sanctions that the system could potentially lead to. What she could lose was very clear to her. What could be gained, on the other hand, was abstract: she had never seen anything like Classcraft and had no reference point to evaluate how realistic the prospect of earning the rewards of the game was, or whether they would do her any good. As a result, there was less urgency to act on the *positive* elements that she would miss out on than there was to act on the *negative* elements that posed a potential threat and should thus be avoided. This is also indicative of a tendency among students or people in general not to let go of what they are familiar with, due to fear of the unknown.

So, what if a teacher still ends up with one or more students who refuse to join? The uncomfortable answer is: so be it. Margaret had failed her school year and was in my 10e class again in 2016-17. That year I did not give students a choice and told them they all had to join. In the case of Margaret, this backfired. Forcing her to join the game likely resulted in further reducing her sense of autonomy. She did not do well in the game and fell in battle a few times, which each time reduced her sense of competence and relatedness. In the end, forcing a student to join the game against her will in order to simplify my workflow is deeply problematic and, based on my experience, does her no favours.

10.2 Social Dynamics

Those learners who do join are probably motivated and engaged. The social aspects of Classcraft allow them to also develop a sense of relatedness, which supports their intrinsic motivation. These aspects reinforce each other: “student motivation and engagement are good indicators of classroom climate” (Roberge and Ventet 13).

Clans

When grouping students into clans, the best approach appears to be creating groups that include students with different levels of proficiency in the subject Classcraft is used with. This should balance

²⁸ “I don’t want to take any risks.”

the relative strength of each clan compared to others. In multiclass setups, students can be in a different clan for each subject. It is also beneficial not to group cliques together. These new constellations have the potential of creating new social links that might not otherwise have developed. In Roberge and Vernet's interviews, one student confirmed that "it forces cooperation with new people, and, you know, it forces you to interact with people who don't necessarily have the same interests or talents that you have" (9).

The optimal clan, in my experience, includes six students. If there are fewer students, there will be situation in which one role and the corresponding powers are missing when a student is absent. It is also possible that a clan will include non-supportive players who either forget about their powers or generally do not help their clan. Conversely, a clan with too many players will make it difficult to manage group tasks. Hutcheson suggests that a group of six can be split into two "squads" of three players for group activities.

The role distribution within the clan requires the players to negotiate among themselves. So far, when the clans were formed, the students were strategic in their choice and distribution of roles and created balanced constellations. This means, however, that some students do not get to play as the role they may have preferred.

In parallel, the students quickly began to create a group identity for their clan. Classcraft supports the learner's need for relatedness by letting each clan choose some visual elements (e.g. clan insignia) that are unique to those players. I encouraged this sense of belonging by asking students to invent a backstory to their clan, which was later included in the Mercatopia wiki. In future, I plan on creating a clan badge that students can display along with other badges that they earn (see chapter 15.) The content each clan came up with in this way was later used to create an illustrated clan chronicle displayed in the classroom (see Appendix 5 on p. 144). In future versions of this chronicle, I wish to include the current clan level (linked to the average level of all heroes) and clan badges.

Cooperation

Cooperative attitudes, as opposed to those that can be expected in a competition-driven classroom, increase intrinsic motivation for students. Learners can develop a sense of control over their own successes and the feeling that they themselves are responsible not just for their own learning, but also that of their peers (Wilwert 27-28). While cooperation in games does not automatically lead to better social connections in a class, it still increases opportunities for "playful interaction": "it allows for a more fun atmosphere that helps the students get to know each other better" (Roberge and Ventet 8).

However, as discussed below in the sections on “griefers” and on “jen,” this effect can be limited by a lack of basic social skills.

The reward mechanics of Classcraft have the potential to further encourage cooperation. It is possible to award XP to a clan rather than an individual. There is no downside to this, Cotton notes: “when students are reinforced and rewarded for group academic performance, their achievement is equal to that of students reinforced for their individual academic performance.” In fact, there are social benefits to cooperative reward structures: “students have also demonstrated increases on measures of mutual concern and positive race relations” (Cotton 5).

Furthermore, Classcraft supports scenarios in which multiple teachers use the platform with the same group of students. In 2016-17, two colleagues joined a multiclass setup with me. To this end, we sat down together and coordinated our rulesets. They were adapted to the requirements of each class, but we ensured they would not clash or confuse students, since the graphical representations of the various powers, for example, cannot be customized. As a result, a student who does not identify with the ruleset of one teacher may still internalize that of another. This may benefit her progress within Classcraft, which can in turn lead to a better sense of competence and thus increased participation in other subjects. However, using the multiclass option makes it much more difficult to maintain flow. If different teachers award XP at different rates, estimating the appropriate level cap to maintain an optimal challenge becomes increasingly complex.

Finally, I plan to implement some degree of cooperation between classes: in 2017-18, one or more students who have already participated in Classcraft are to become mentors for those who are new to the experience. So far, one student (Arundhati R.) has volunteered. The goal is to have someone other than the teacher to talk to, since the latter is always in a certain hierarchical position. There may be the potential positive side effect that students may ask the mentors for academic advice, too.

Griefers

There is always a risk that students outright refuse to cooperate and boycott the game. This can happen when a student in a group refuses to play and thus leaves the rest of her clan out of balance, or when the student plays truant a lot. This makes it very difficult for the rest of the clan to function well. Ideally, the other members of the clan would motivate such a “griefer” to contribute to the group again. I have, however, observed the opposite: Mary W. was excluded socially by the other members of her clan. She was often absent and did not cooperate with her peers. The group came to resent that they were “stuck” with a boycotter. There was minimal communication between her and the other clan members, and she got no support when she was in need of healing. As a result, not only did

Classcraft have no beneficial effect here, but since the player never really “left” the game (which runs until the end of the school year), it exacerbated the situation. To some extent, the reaction of her clan should come as no surprise: Mary showed disrespect to her clanmates, who relied on her, by abandoning the rules that she had agreed to, and by refusing to put her best effort into a cooperative endeavour.

Jen

The concept of *jen* was developed by Dacher Keltner. It uses an ancient Chinese word for human kindness. Keltner employs this concept to analyse social relationships:

[Jen is] a mathematical method for measuring the social well-being of any shared environment ... It compares the total positive interactions between strangers to the total negative interactions, in a given period of time and place. (McGonigal, *Reality* 3309)

Positive interactions include smiles, friendly gestures and people assisting each other. Negative interactions include being “unfriendly, rude or openly uninterested” (McGonigal, *Reality* 3309).

In classes with low *jen*, Classcraft does not work well. For example, learners hold grudges when somebody else refuses to heal them. The game then becomes a symbol of the dysfunctionality of the class, making the problems more visible to the students and the teacher. In this case, Classcraft fails. While it then serves as a tool for discussion with the class, it is unlikely to dramatically improve the situation. In the class in which I first implemented Classcraft in 2015-16, the *jen* was heavily swayed to the negative side. For example, during the Actionbound activity, one student’s offer to assist another clan was answered by an expletive. In a survey conducted by the head teacher of the class that year, in an open question (“What do you not like at all about this class?”), 19 of 21 students identified their classmates as a negative factor. In consequence, there were high amounts of blame for negative outcomes of failed teamwork, and there was also aggressive competition between clans.

Fortunately, such classes are the exception to the rule. Still, it shows to what extent Classcraft does not only influence the class atmosphere, but also depends on it. As such, it also relies on the teacher’s ability to implement the gamified experience well: “even if Classcraft fosters playful interactions, considerable support from teachers is essential and is dependent on their own social and emotional skills ... We think that the game cannot be more effective than what the teacher’s supporting competence allows” (Roberge and Ventet, my emphasis). Thus, even when Classcraft shifts the perceived locus of control, the teacher cannot neglect his managerial role in the classroom. Gamification is a tool. Its efficiency depends on the one who wields it.

11 Wisdom +5 I RPG

11.1 Customization

Are you a boy? Or a girl? –Professor Elm, Pokémon

One of the core mechanics of role-playing games is the creation of an avatar for each player. Many video games have a character creation screen to this end. While Classcraft does not offer the same degree of freedom as high-budget entertainment titles, there are millions of possible combinations of the graphical character elements that the game does include.

This type of customization lets students feel that their avatar *belongs* to them. “Once you feel a sense of ownership over something, its status elevates and it begins to motivate your behavior differently ... [you] want to care for and protect it” (Chou 2140, 2210). Classcraft includes an extrinsically motivating technique here, in that the game early on shows students customization sets that exist, but which they cannot equip until they have reached a certain level.

The avatar also allows a student to better form an in-game identity. This is a projection of what you want to be like, which includes, but is not limited to, physical appearance. The avatar becomes “the projection of an identity that is being built” through a process of experimentation (Sanchez, Young and Jouneau 8). In this way, the student can play with her idea of self-identity. For example, some of my students chose avatars not typically associated with their skin pigmentation.

The avatar becomes an incarnation of a learners’ potential, someone who is more than themselves, someone in whom they see what they have the potential to become. For this reason, it is important that they interpret their avatar as player-representing (an avatar shaped in the player’s image) rather than merely player-controlled (a character with fixed characteristics, such as iconic game characters like Mario or Lara Croft). With self-created avatars as their alter-egos, students can develop a stronger sense of *presence*. They *are* the characters in Mercatopia. They have merely been transplanted into a different context.

Early in the year, I support this identification process with an interview of the heroes (rather than the students). In this way, each student can wholly immerse herself in the hero’s role, write from her perspective, and invent her backstory, preferences and quirks. This immersion in the world and narrative of Mercatopia shows the students that they are important participants in the events that the class experiences over the course of a year.

Indeed, the avatars *document* each player's journey over time. As a player levels up, she unlocks new graphical elements, which then serve as visual feedback of her progress. This, in a way, is an “intense kind of feedback,” an even less abstract form of feedback on accumulated progress than XP (McGonigal, *Reality* 2169). However, not every student uses this function. There have been several students in my classes who were indifferent to their avatar and never changed her standard appearance.

11.2 Quests

My learners have expressed disappointment about the fact that Classcraft does not offer a graphical environment in which they can move. They wish for a world that they can explore freely with their avatars. While this is



Figure 11.1 Sample evolution of Nadine G's healer avatar

neither practical nor desirable (since it would turn Classcraft into a full-fledged game rather than a way of gamifying classroom events), the element of autonomous exploration can be implemented if we let students choose *quests* which they go on. These can be represented on a map of Mercatopia with markers in specific locations, thus also supporting the journey analogy that connects progress in the content-area to progress in Classcraft.

Main quests

A teacher can create main quests that mirror the structure of the curriculum. For example, they could follow the chapters of a course book. The traditional school system imposes a chronology on students. Even if the teacher decides not to cover the course book chapters in sequence, he still has control over what aspect of the content area the lessons focus on next. In elementary EFL classes this is sensible. There is no point in students choosing to study the present perfect if they haven't seen the building blocks that form it. The curriculum of 10e and 11e classes is more flexible in this regard. It is adaptable enough to let the students decide what quest (and which connected language elements and topics) they want to focus on first. This represents a meaningful choice and gives the students' sense of autonomy a boost. If one chapter still builds on another, it would be easy enough to include a narrative element which explains that a given quest (e.g. a chapter focusing on the past perfect) cannot be attempted until another is completed (e.g. a chapter on the present perfect). The name of each quest and the narrative taking place in that region should reflect the content of that unit.

Boss Battles

Each main quest can culminate in a boss battle. These are short but full-fledged serious games contained by the gamified system. In Classcraft boss battles, the students challenge a fictional opponent. A successful battle earns the students XP and/or GP, which the teacher determines beforehand. A teacher could also include boosters as rewards.

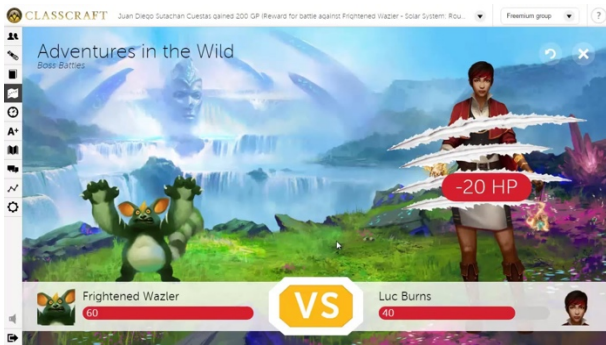


Figure 11.2 Boss battle screenshot (vimeo.com/145687064)

The actionable items are questions and prompts that relate to the main quest. These can be open questions, multiple choice questions or cloze test items. The students can work individually or in clans, in which case the battle relies on cooperation and discussion among the students. Correct answers take HP away from the boss; wrong answers affect the heroes by the same number of HP. The

boss creature is beaten if it has no HP left before the players run out of teacher-set items to answer.

If this is not achieved, the students have the opportunity to challenge the boss again another time: “it’s fascinating that the same young people who never want to revise a paper or ‘try again’ are willing to sweat through a game level over and over until they defeat their big boss” (Watson).

Boss Battles need to be balanced for optimal challenges in addition to the balance which marks other aspects of Classcraft. The first boss battles that I set up were too easy because I initially (and, in hindsight, erroneously) feared that losing the battle would demotivate the students. However, there are many advantages to making boss battles hard to beat. First, since students are more likely to lose HP in such a battle, they need to use a more cooperative strategy in connection to their cooperative powers. Additionally, the increased challenge leads to more motivating eustress. Moreover, if students know that boss battles need to be taken seriously, they are more likely to prepare for them by revising academic material and by making sure each player is at her maximum HP and AP. This effect can be emphasized if the students themselves decide when they are ready for a boss battle. This presupposes that the boss battle is completely set up, which means the teacher needs to plan ahead here. Finally, a boss that is harder to defeat yields a greater feeling of *fiero*.

If the boss battles are challenging enough, and if they are linked to the narrative, this effect can be emphasized. For example, beating a boss can cause the liberation of a region of Mercatopia. In this case, defeating such an opponent becomes an epic win. “An epic win is an outcome that is so extraordinarily positive, you had no idea it was even possible until you achieved it” (McGonigal, “Gaming”).

This also marries the narrative of the game to the progress in class: after defeating a boss, the students absorb that creatures' language skills and are now ready for the test, after which they will be able to journey to the next quest.

Random Events

In RPGs, as players try to complete missions, unexpected events may occur and challenge them. It is the same with Classcraft. Random Events add a sense of unpredictability to Classcraft and thus keep students on their toes. After all, fun is "pleasure with surprises" (Schell qtd. in Chou 3510).

Two random events shall serve as examples of what these can look like: *Champion to Champion*: A jealous knight attacks the strongest amongst you. [The player with the most XP: -10HP.] *Healing Energies*: You drink a potion that transforms energy into health. [For every AP spent, players gain 1HP.]

On average, these events take up one minute of a 100 minute lesson block. They serve as quick, positive ways to get the learners' attention at the beginning of a lesson. They also encourage the students to regularly check on their clanmates' status, since a random event may cost a player a few HP. Still, random events are mostly passive: they *happen to* players. If I want my students to feel autonomous and be active, more complex opportunities and challenges must be created for them.

11.3 Side quests

I got word of a settlement that needs your help.
—Preston Garvey, *Fallout 4*

Side quests can fulfil this task. They can become an alternative to some types of homework, or they can offer opportunities for students to voluntarily practise and improve. Voluntary work as such is nothing that teachers were not able to work with before the advent of gamification. However, presenting tasks in the context of a gamified system frames them with an invitation to play. Students can approach them with a more self-determined mindset. Additionally, information and communication technologies have made it easier to create tasks that include automated assessment, such as auto-graded quizzes. These tasks can also provide valuable feedback, as discussed in the context of Memrise. Turning these activities into quests has the benefit of maintaining the narrative and thus the trope of Classcraft.

It also has the potential of creating a curated collection of exercises or other activities that students can complete at the time and in the order that they choose. This would support their autonomy: Deci et al. confirm this when they refer to studies which indicated that "when college students were given

choices about what tasks to engage and how much time to allot to each, they were more intrinsically motivated than were subjects who were assigned the tasks and times.” They also point to a study on internalization which suggests that “highlighting choice rather than using a controlling style contributed to subjects’ internalizing the regulation of an uninteresting activity” (Deci et al. 336). It is no longer the teacher who says “Now you are ready for this.” If a player wants to try a side-quest which relies on academic aspects that will only be taught later and fails, there will most likely be no negative impact on her sense of competence: she can tell herself that she will try again after having learned about the content in class. The quest has thus become a self-set goal for her. However, if she succeeds, this holds the potential to significantly boost her sense of competence, and she can replace the teacher in her peers’ progress within their ZPD.

These additional tasks also increase the odds that students will experience flow. Video games allow for individualized difficulty settings. The nature of certificative academic tests precludes this. The only way for students to make a test easier is for them to become better. With side-quests, they can “grind” until they feel comfortable with the content that they will be tested on. Again, the best-implemented example of this aspect I have encountered so far is Memrise, which not only allows students to repeatedly test themselves, but which adapts the difficulty level to maintain an optimal challenge. The chance to repeat a test in Memrise could well be mirrored by all side-quests, thus creating a space marked by the freedom to fail: “if you fail a quest, there’s no permanent damage done to your report card. You just have to try more quests to earn enough points to get the score you want. This system of ‘grading’ replaces negative stress with positive stress, helping students focus more on learning and less on performing” (McGonigal, *Reality 2300*).

For auto-graded tasks, there is no additional workload for me. For tasks that I need to give individual feedback on, this approach may still *distribute* the workload, since I am now less likely to end up with over twenty texts that need to be evaluated at once. However, I fear that distributing the workload will also increase it: I often work best when I can focus on evaluating multiple copies of one task in one sitting.

Unfortunately, the Classcraft developers put on hold the plans they had to connect the game to Edmodo, a social media platform purpose-built for academic contexts. I had hoped that it would lead to a system in which quizzes that have been created in Edmodo could be automatically associated with XP in Classcraft since Edmodo offers fairly useful tools for the collection and evaluation of student submissions.

In September 2017, Classcraft released a beta version of its own approaches to quests. Due to time constraints, I have not been able to test this mechanic thoroughly. If Classcraft offers a system that is flexible enough for different types of evaluation, and if it allows teachers to import existing tasks such as exercises in a way other than entering each item individually, it could become a game mechanic that comes close to my idea of side quests. While I cannot cover this system within the scope of this thesis, I plan on evaluating its usefulness for my needs in the coming school year.

There is a downside to my concept of side-quests: they require significantly more *preparatory* work than traditional tasks. If a learner is to be able to choose when to complete a quest, *all* quests must be ready early on in the school year. Next, there needs to be enough material for the learner to be able to retry a quest without being presented with the exact same items twice. Additionally, the material needs to be thoroughly vetted so as to reduce the odds of the students finding a way to game the system.

11.4 Group quests

Side-quests can be combined with conditional win-states that depend on all clan members completing the quest. This can lead to social proofing: a “leader” of a group may encourage other students to complete a quest. In this case, the members of a group perform a task “because their team leader wants them to, and they don’t want to be thought of as slackers” (Chou 2726). The social proofing effect can be increased by including a progress bar which shows how many people of a clan have completed that quest: “as people, we are driven to ... have goals; and then ... accomplish goals” (Zhang).

For this effect to be beneficial, the clan must not consist of too many students who would not mind being a “slacker.” It can also be dangerous if the most dominant person in a group, who will likely assume the leader role, *is* a slacker. This could actively *discourage* the rest of the team from working hard. I observed this effect with the clan “led” by Isabel A. She had failed a school year due to a different subject and was taking it for the second time, but she was good at English. As a result, she did not put much effort into my lessons. This explains why her XP total for the year is in the 14th percentile, while her marks are in the 76th (see Figure 8.2 on p. 66).

In this light, it is all the more important to make group quests intrinsically motivating. Yet restricting the win-state by making it conditional to each member completing the quest will likely demotivate the members of a clan if they know that they have one slacker in the group who generally avoids side-quests. To counterbalance this, the greatest part of the reward can be made conditional, whereas individuals still get a part of the reward for taking the quest.

Still, cooperative rewards play an important role. Indeed, Robert Slavin's STAD model states there is a "need for extrinsic group rewards to motivate people to learn in cooperative learning groups" because they lead to accountability among learners. Such rewards can "motivate students to encourage and help each other master skills presented by the teacher" (Slavin qtd. in Wilwert 29, 40). The rewards of this process are conditional on the individuals helping each member of a group to learn. In this light, group quests can have positive effects on individuals' achievement. In a review of 46 studies, Slavin found positive effects on student achievement through cooperative learning, especially in structures that used cooperative tasks as well as cooperative rewards (Cotton 14).

11.5 Endgame: the final quest

Unlike most other games, Classcraft never ends as such. Students can continue to level up. However, at level 18 they have earned so many PP that there are no new powers left for them to learn. They have reached the endgame, where some extrinsic motivators simply no longer exist. In general, the endgame can focus more on cooperation. A learner may wish to help her clan and ensure that every player levels up. A student who has reached this level is also unlikely to have done so without the help of her clan, so she may be reluctant not to reciprocate now. Finally, if there is a narrative, it can serve as an alternative or additional goal for the learner to pursue together with her peers. As long as there is a villain who still needs to be defeated, there is a quest that fuels the teleological desire even of level 18 players.

When gamers finish a game that they have invested countless hours in, they sometimes wonder whether the time spent was worth it – whether it has amounted to anything. When Classcraft ends before the summer holidays, the answer is a resounding yes: the players have invested time and effort into their learning and into their peers' development. They walk away with a record of all their progress and achievements and with a positive experience (see Appendix 10 on p. 151, Q29.1-2).

12 Settings | Practical considerations

12.1 Web-based technology

The fact that Classcraft is a software system facilitates and automates record-keeping and maintains a productive feedback loop. In such a game, students can be active and change things without the teacher having to confirm and commit every action.

Since Classcraft runs on servers, it is possible to give students' parents or guardians access to the game, too. In fact, Classcraft offers dedicated parent accounts. However, I did not see the need for this. Rather, I worried it could lead to "helicoptering." This effect could undermine the students' sense of autonomy: "the more controlling the students perceived their parents to be, the less self-determined were their motivational profiles" (Deci et al. 338). On the other hand, some projects have had great success with systems that sent out messages to parents in certain situations. Researchers sent "automated text-message alerts to parents about their child's missed assignments, grades and class absences. The intervention reduces course failures by 39% and increased class attendance by 17%" (Bergman and Chan qtd. in Kamenetz and Turner).

Unfortunately, using a web-based service also means being somewhat dependent on it. On occasion, lesson flow was interrupted because of internet connectivity problems or slow servers. Using a service such as Classcraft also means facing the possibility that the system may one day disappear, for example due to bankruptcy.²⁹ Worryingly, it also means that teachers have limited influence on future changes to the platform. If the developers decide to modify a game mechanic that a teacher relies on, the teacher and students must adapt to the system instead of the other way around. I have observed this effect when Memrise decided to remove all user-created mnemonics from the website. They were only reinstated after significant user backlash.

Another problem concerns the accessibility of data. Currently, Classcraft offers no way to export the information teachers log in the system. This means that data can be lost. Indeed, in August 2017 I inadvertently deleted most of the information regarding the 2016-17 school year when trying to access "archived" information from 2015-16. While the Classcraft Community Lead told me that this was not expected behaviour for the platform software, the developers were still unable to restore the data for me. Seeing as there was no export function, I had no backups of the detailed logs on XP or HP events, either.

²⁹ This seems unlikely for now. Classcraft raised \$2.8 million in funding in September 2017. (See <http://bit.ly/2j9Sqpm>.)

12.2 Gamified teachers

Classcraft does not only affect how students see their education. It also influences me in my role as a teacher. Mostly, this is positive. The game keeps me accountable to my students since I have to stick to my own rules consistently. The positive atmosphere the game creates makes teaching more enjoyable and in turn motivates *me*. Classcraft also encourages me to be more creative when it comes to planning lessons or creating material (e.g. Appendix 6) and it allows me to connect to my students in a way that better suits my personal teaching style.

Still, we must remember that Classcraft is a commercial product. In this sense, I must ask myself whether it could be seen as exploitationware for teachers. While *my* first and foremost goal in using gamification is the welfare of my students, the first goal of Classcraft as a business *must* be to earn money by turning teachers into loyal customers. I found that Classcraft does use gamification to achieve this goal.

First, like many other services, Classcraft uses the *Alfred Effect*. “The Alfred Effect is when users feel that a product or service is so personalized to their own needs that they cannot imagine using another service” (Chou 2477). In itself, this is positive and indicative of a product that works well. However, it also entails negative effects: “when a user feels like a system has been fully customized to fit their needs, even if another service out there offered better technologies, functions, or prices, the

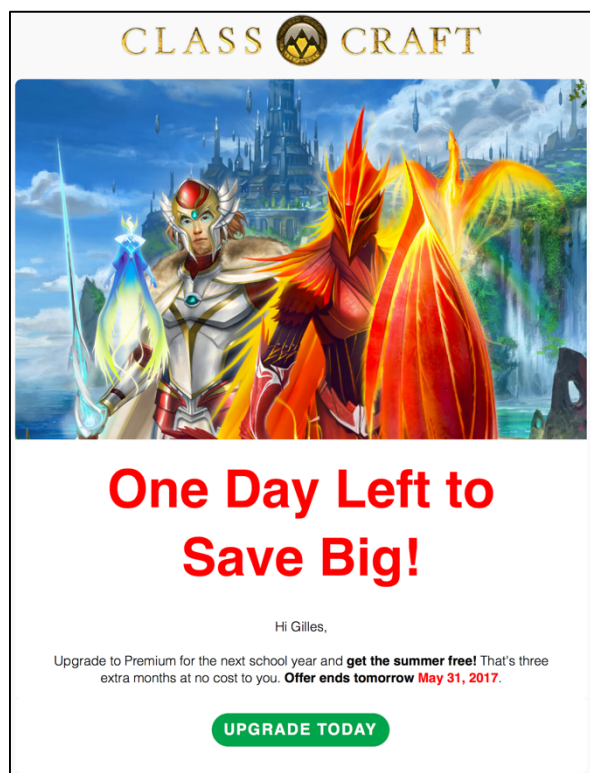


Figure 12.1 Classcraft promotional email

user has a strong tendency to stay with this system because it now uniquely understands them” (Chou 2488). This means that a teacher may choose to continue using Classcraft even if his students would profit more from an alternative system. This form of maintaining the status quo is unfortunately pushed even further by the fact that, at least for the time being, the data generated using Classcraft are locked in. This is connected to Chou’s concept of the *Sunk Cost Prison*. “This occurs when you invest so much time into something, that even when it’s no longer enjoyable, you continue to commit the Desired Actions because you don’t want to feel the loss of giving up on everything” (Chou 4287). We can see this effect in the lack of export functions in Classcraft: a

teacher cannot export the data displayed in analytics or the questions from boss battles. The data

which can be exported, such as the rules, are generated as finished PDF documents which offer limited editing or conversion possibilities.

Of course, Classcraft is not the only educational model that does this. The decision of the Luxembourgish ministry of education to exclusively rely on Apple products for classes using tablets is likely to lead to a similar situation in which it will be difficult to switch to competing products in the future.

Finally, Classcraft also makes use of the FOMO principle. In April and May 2017, I received multiple emails advertising a sale on the premium subscription, along with reminders that this was a limited-time offer and descriptions of the features that I and my students would miss out on if my premium subscription were to expire.

13 Stay awhile, and listen | Ludic spaces

Regardless of what kind of gamified classroom is implemented, teachers need to maintain a climate in which students are able to experiment and to express themselves without fear. Counterintuitively, such a space depends on rules: “Contrary to [the] widely held view of play as non-serious activity, Huzinga ... contends that play is an activity of utmost seriousness which is played out within a ‘consecrated spot’ mentally and physically, with strict rules of its own” (Kolb and Kolb 30). This space is shaped by the players themselves: they “join the game by choice and by sheer desire to play, imposing on themselves rule of conducts and constraints they vowed to observe in order to continue to play” (Kolb and Kolb 30). In this sense, there is a strong parallel between the implementation of a ludic space and the internalization of rules described on p. 18.

The ludic space offers room for play and learning. This in turn requires “a free and safe space that provides the opportunity for individuals to play with their potentials and ultimately commit themselves to learn, develop, and grow ... It needs to be a hospitable, welcoming space that is characterized by respect for all. It needs to be safe and supportive, but also challenging” (Kolb and Kolb 27, 45). I believe that this is in keeping with the ideas behind the term ludicization used by Sanchez, Young and Jouneau. In practice, there are then two aspects to maintaining a ludic space. First, there must be room for paidia to unfold, and secondly, the students in the class must not be subjected to bullying.



Figure 13.1 The dragoman

13.1 Paidia in a fictional space

Combining a game with a narrative helps players feel like they are part of an epic world. They can feel that they are part of something that other people also participate in. A fictional world such as Mercatopia can thus be epic in the sense that, for each learner, it can be something bigger than herself. The narrative elements combine into “collective stories that help us connect our individual gameplay to a much bigger mission ... A compelling story makes the goal more enticing” (McGonigal, *Reality* 1765, 367).

For the next classes in which I plan on implementing Classcraft, I wish to add a narrative that guides the students from the onboarding stage to the final quest. The narrative starts with the interactive signup process described in section 10.1 and included in Appendix 4 : the players wake up in a strange world, confused, and eventually reach the nearby hero school at the *Tranquility Atheneum*, which includes the *Academy of Polyglods*. This is a place where the heroes develop powers that benefit

all of Mercatopia. They formally join the academy by signing the Hero Pact. The trainers at the academy include the *dragoman*, steward of the lingua franca (i.e. their English teacher). The scribes at the Tranquility Atheneum see that those who have just arrived will have a great role to play in events to come. Slowly, the heroes recall their past as the students invent each hero's back story. The heroes then learn that there is a villain whose goal it is to destroy language. To fight the villain, the heroes have to strengthen the language of Mercatopia by using it correctly, whereas using the language carelessly empowers their antagonist, who is feared for vandalizing orthography and stealing verb endings. In multi-class setups, each teacher could assume a different role and each subject could fight its own villain.

The narrative maintains a structure which makes meaningful use of the game mechanics: to survive their adventures, the players must protect their clan and work together for a common goal. If this was not the case, the class would be faced with ludonarrative dissonance, which arises when the meaning of the players' actions and the gameplay no longer coincide (Bissell ch. 9). It is preferable to have a narrative that matches the metaphor of the gamified classroom: the heroes need to learn and grow in order to beat the villain. Additionally, saving the world fulfils learners' "power fantasies" (McGonigal, *Reality* 1805). The narrative thus creates an environment that encourages learning.

Typically, such a narrative is fraught with gaps and minor contradictions. This can be an advantage, as it invites the students to come up with their own explanations and stories. If the right conditions are met, the learners may themselves become authors of the shared narrative to fill in the hermeneutic gaps which they see in the story. This is an effect that can commonly be observed in fan-fiction.

13.2 Mercatopia

Mercatopia is a world which mostly respects the most common fantasy tropes. This genre was chosen because it matches that of Classcraft. To support the concept of the school year as a journey, and of Mercatopia as a ludic *space*, I needed a graphical representation of the world. It can be found in Appendix 7 on p. 147 or at mercaptopia.com/map. It helps to make the fictional world less abstract and, when it was displayed on the classroom wall before Classcraft was introduced, made my students curious about the game. Each quest the learners embark on can be associated with a specific location on the map.

The game world can also support *phasing*, which is "designed to vividly show us our impact on the world around us" (McGonigal, *Reality* 1042). The map could show areas that are initially covered in shadow because they are still beleaguered by forces of evil. Liberating them would remove this and

allow the locations to once more fly their own flags instead of showing the avatar of the boss which occupied it. If the map also traces the players' journey from location to location, it has a strong connection to their shared narrative. Ideally, this journey would also be displayed in the hero journals described in section 14.2, yet this is beyond my technical skills.

13.3 Lore

The lore of Mercatopia is a collaborative effort, with each student contributing her own ideas to the shared repository of knowledge at the Tranquility Atheneum (i.e. at mercaptopia.com/wiki). This wiki can be seen in the context of those of other games. The most prominent among them is the World of Warcraft wiki, which currently holds over 100,000 articles documenting the game world. Contributing to such a wiki can support the students' writing skills. It supports a culture of participation rather than of simply consuming media.

In theory, it is possible to use the students' contributions to the wiki for certificative evaluation. However, doing so would cause them to feel afraid of criticism: "the 'fear of appearing foolish' to others blocks our ability to be a 'fool,' a necessary state of mind where we are able to fully engage in play" (Nachmanovitch qtd. Kolb and Kolb 47). There would be a conflict of goals if this wiki were used for certificative evaluation. Instead, "the absence of extrinsic evaluation in the space [frees] individuals to set their own learning agenda in their own terms" (Kolb and Kolb 47). I believe that there is still a possibility to use *formative* assessment in such a wiki without destroying its ludic quality if it does not introduce extrinsic rewards (i.e. marks). The focus should thus be on creativity, which helps make us feel competent. "For every creative effort we make, we feel more capable than when we started" (McGonigal, *Reality* 544).

A wiki can be a strong motivator. The students see the direct results of their actions: any change to the wiki is live immediately. This strengthens their sense of control and autonomy. It also allows them to choose what entries they write and thus create "their own learning path" (Kolb and Kolb 47).

In this space, the students work together on a socio-constructivist effort that does not feel transient to them. They are not writing something that will be read by the teacher once and then disappear in a drawer. Much rather, it becomes a record of their shared stories: they work together to make sense of the world they are moving in. They are also co-creating something that would be impossible to create for one student on her own. It is an epic project, created through "cooperative efforts carried out by players on massive scales, over months or even years" (McGonigal, *Reality* 1769). The socio-constructivist aspect is further emphasized by the fact that each entry can be marked by shared au-

thorship, as students can complete or edit each other's contributions. "When their posts become 'dynamic sites for conversation' ... students become more engaged with writing" (Bromley qtd. in Robyler and Doering 275).

Even those students who prefer to do their own thing on the wiki can develop social skills through this, much like they would when playing with construction toys such as *Lego*: it allows them to deal with the experiences they have made during the day (Hildgen).

Since the wiki is, to some extent, a self-regulated space, it depends on the students' autonomy. In Kolb and Kolb's description of play in the ludic space, they found that "there was no designated coach or manager, or team captain for that matter; those who knew how to play helped those who were new to the game" (32). Indeed, the wiki is an inter-class project: new players build on what has already been contributed by other students in previous school years.

Still, there is one limitation to the freedom offered by the ludic space: as a teacher, I still manage the space to the extent that I must set rules that protect the sense of safety in the ludic space.

13.4 A safe space

Students need a "safe play space" if they are to reach their full potential. "In psychological terms, play happens within the safety of a transitional space, where children can explore and express themselves unchallenged by the pressure of defining an inner or outer reality" (Kolb and Kolb 31).

Bullying threatens this safety. In his discussion of the topic, Classcraft founder Shawn Young defines bullying as "an antisocial act that is repeated, intentional and conducted in a dominating fashion" (Young). He then differentiates between physical, verbal, psychological and material forms of bullying.

The verbal and psychological types may sometimes be difficult to recognise as such. Light-hearted banter such as trash talking is actually a playful attitude. It is part of most social networks and can actually increase our positive feelings (prosocial emotions) towards our peers. "The person doing the teasing is demonstrating the capacity to hurt, but simultaneously showing that the intention is not to hurt." The intention is to *allow* the other person to feel powerful (McGonigal, *Reality* 1491, 1512). By doing so voluntarily, the social dynamic of bullying is reversed. This kind of playful behaviour should not be excluded from the ludic space.

According to Verdier, for the victim the consequences of bullying include absence from school, loss of self-esteem, as well as loss of interest in and motivation for school. These are very similar to what we could expect when a student is stripped from her self-determination: she feels a lack of belonging and her fate is determined by another (i.e. the bully), who makes her feel incompetent.

The bully, on the other hand, excuses her behaviour by pretending (or believing) that what she is doing is “only a joke,” or by telling herself that her actions are condoned by her peers. The social dynamic of bullying thus also includes the onlookers, who can actively encourage or discourage a bully’s behaviour: “being an onlooker is being involved” (Young). Not doing anything is in itself a form of encouragement, a way of saying that the bully’s actions are acceptable.

This aspect of social dynamics is one that can be improved through Classcraft. First, the formation of clans has the potential to strengthen groups that are combined so as to avoid *cliques*, i.e. by joining people that would not necessarily hang out together. The message each clan gets is “Your success depends on your teammates” (Young). Additionally, the game can include random events that encourage cooperation. Young gives an example: “*a stranger walks by, their face covered in shadow. Every student must learn a fun new thing about the student sitting next to them and share it [with] the class.*” In reality, though, the sense of *comunitas* which Classcraft creates is, on its own, not sufficient to reduce bullying, since there are situations in which it can backfire, for example when the *jen* of a class is very negative, or when there are griefers in a group.

Fortunately, Classcraft excels at providing immediate, strong feedback to students. It also keeps the feedback loop short. This means that if a teacher implements triggers for pro-social and anti-social behaviour, he can intervene at an early stage through the game mechanics and without leaving the ludic space, before a need for serious repressive responses arises. In this way, a gamified classroom experience can neutralize bullying before the victim’s status in a class is irreversibly tarnished.

This can be achieved, firstly, by making anti-social behaviour engender a penalty in Classcraft. Young includes the following example triggers: insulting or humiliating another student, sighing when another student speaks, pushing another student, and excluding or ignoring another student. Some of these triggers are too specific for me. There is a risk that I will encounter unexpected situations which none of these triggers can accommodate. I thus decided to adjust these ideas for my own needs.

In doing so, I was guided by the fact that Classcraft events simultaneously serve as evidence of negative behaviour. This log can later be used as a basis for a discussion with the learner about her behaviour. Classcraft also allows for more granularity when it comes to record keeping than the class register, especially since many head teachers issue sanctions when a student has received negative feedback in the register a given number of times. Such recurring negative feedback can also help in that some bullies are unaware that their behaviour is toxic (or lie to themselves about it).

Classcraft can also reduce bullying by using avoidance of loss strategies. Bullies enjoy being in a position of power over other people. Through the social dynamics of Classcraft penalties, they must fear that they will lose that power. Each time they display anti-social behaviour, the penalties they incur put their clan in a weaker position. Eventually, the bully's behaviour leads to concrete penalties for the other members in the clan via splash damage. The bullies thus have to worry about losing the support of those who fuel their sense of power, namely, the onlookers.

I have chosen to retain the following triggers for HP loss in addition to those described on p. 74.

- I. *Insulting or humiliating somebody. (-15HP)* This refers to students as well as to any person within or without the school community. It can also refer to a group of people if a student displays bigotry.
- II. *Acting aggressively or destructively. (-15HP)* This encompasses physical violence directed against people or objects as well as some forms of psychological bullying.

Based on the SDT, students may interpret these penalties as controlling, which would undermine their sense of autonomy. However, in this case, the more pressing issue is not whether students are motivated, but whether the penalties allow them to function socially. If this is not achieved, they will lack in relatedness, which will also affect their motivation. It is, moreover, a question of balance: I am willing to potentially reduce one student's sense of autonomy in order to protect another student's sense of belonging.

Fortunately, deducting HP is not the only way in which Classcraft can reduce bullying. In addition to discouraging anti-social behaviour, it can *encourage* pro-social behaviour. Young includes examples of XP trigger presets that fall into three categories: cooperative spirit (e.g. working well in a team), altruism (e.g. being welcoming of others), denouncing anti-social behaviour (e.g. defending another student) and positive attitudes (e.g. smiling to others). Such presets allow the teacher to reinforce pro-social behaviour. Additionally, there is the potential for internalization of such rules. The students may then become internally motivated to behave socially.

An advantage of this approach is that reducing bullying no longer requires the identification of specific bullies or cases of bullying. If the rules for pro-social behaviour are internalized, it is simply no longer "cool" to do these things: "it will be easier to see the bullies, because they will be the ones trying to persist in these behaviors" (Young).

I want to implement the following XP triggers for the coming school year, along with those described on p. 62.

I. *Acting cooperatively or showing kindness.* (100XP) This can include acts such as defending somebody from a bully.

II. *Improving the class atmosphere.* (100XP) I believe that a class which has a positive atmosphere is less likely to offer much room for bullying, as it encourages pro-social behaviour.

These triggers primarily focus on events that can be observed at school. If bullying takes place online, other approaches are required. These go beyond the scope of this thesis.

13.5 Privacy

Maintaining a safe space for students in a gamified context requires thinking about issues of privacy. First, the students' parents or guardians need to be made aware of the privacy policies of the services a teacher uses with his students. In fact, most platforms require adult permission for adolescents to create accounts. To this end, I provide parents and guardians with a handout and ask them to inspect the privacy policies of the services I plan to use, and to give their permission.

Only 38% of 16 to 24-year-olds in Luxembourg state that they read the privacy policy of the online services they use (Frising 1). This makes it all the more important for the teacher to be aware of the policies of the services he uses with a class. Among the services that I use, I found the following aspects to be problematic: **Wikispaces** creates "marketing profiles" that it shares with advertisers, and personal data may be used for marketing. **Socrative** shares the personal data of teachers and students with third parties to improve the service and shares anonymous aggregated data with third parties for undisclosed purposes. **Edmodo** includes targeted adverts for teachers, but not for students. (It should be noted that Edmodo tracked student activity until this behaviour was discovered (see Fitzgerald, "Tracking"). While it was immediately disabled, it is worrying that educators were not aware of this behaviour when it was active.) **Memrise** does not clearly state what happens with user data should the company be sold. **Classcraft** uses a privacy policy with which I could find no issues.

Next, the data which is collected by those services needs to be protected. One aspect of this is encryption. Unfortunately, this is not yet a standard among software made for schools. A study by *common sense education* found that "a significant number of vendors do not provide even basic support for encryption. While 52 percent of the 1,221 login URLs we surveyed require encryption, 25 percent do not support encryption at all, and an additional 20 percent do not require an encrypted connection." An update to the survey in March 2017 found some improvement, but 40% of education technology websites still did not enforce encryption. (Fitzgerald, "Encryption") Unfortunately, this includes the service which currently runs the Mercatopia wiki, Wikispaces. To contravene this, the URL my students use (mercaptopia.com/wiki) redirects them to the secure version of the website.

The most effective way to protect the data of students remains avoiding unnecessarily sharing information with third parties in the first place. The alternative is for the teacher to maintain his own record of the data he needs to work with, as described in the next chapter.

14 Insert credits | Assessment and evaluation

In her writing on *stealth assessment*, Shute describes a game and an evaluation system which can quietly assess players' "system thinking skills, creativity and teamwork skills" without interrupting the flow of the game (508-9). Her system allows teachers, students and parents to "examine the evidence and view the current estimated competency levels. This in turn can inform instructional support" (509). The gathered information thus makes it easier to observe changes. Such a set of data can benefit students. "Viewing their current competency levels and the underlying evidence gives students greater awareness of personal attributes. In the literature, these are called 'open student models,' and they have been shown to support knowledge awareness, reflection, and learning" (519).

14.1 A teacher-owned database

I have developed my own version of an open student model. Its implementation is significantly more limited in its scope and in the way data is entered than the model described by Shute, and the input is mostly restricted to the results of certificative assessment. In spite of its limited capacity, it is a valuable tool.

My database maintains the students' privacy since no third parties have access to the data. At the same time, students can easily access the data that concern them. The latest working template of the Excel database can be accessed at gillesglod.com/20171026-hero-journals.

A raw collection of test results on its own is not likely to support learning. "Numbers may be facts. Numbers may be objective. Numbers may smell scientific. But numbers have to be interpreted by those who do the daily work of classroom teaching" (Cuban). Through proper analysis, the data help me adapt to individual learners' needs, since they help me recognize those needs more easily. Again, none of this would be impossible using pen and paper: "personalization' need not rely on technology or on data-mining; it does, however, demand that teachers attend to students' needs and to students' interests" (Watters, "Personalization"). Still, without technology, the kind of information I get from my data would be lost. The digital database helps me notice patterns that would not appear remarkable on paper. Evaluation, i.e. making a judgement about a student's progress, becomes more efficient. It helps me see red flags and react to problems early on. This does not mean that I automatically know how to help the learner, but without such a system it would take me longer to become aware of a need to adapt my teaching. It also makes formative assessment more practical by facilitating the process through which "the evidence is actually used to adapt the teaching work to meet the needs" (Black and Wiliam 2).

The database also helps me communicate with my students about their results. For example, shown in a larger context, the information makes it more likely I can convince a student that she is failing if she maintains her current approach. Without this context, she may tell herself that there is no negative trend, no need to worry, and no need to adapt her learning methods. Referring to the database also reduces the odds of a learner taking advice personally. “It is easy to have a knee-jerk reaction: who are you, biology professor, to say somebody can’t be a cardiologist?” (L. Nelson)

14.2 Hero journals

The hero journal is the individual, exported data that each learner can access. (An example is included in Appendix 11 on p. 157.) The focus of the journal lies on feedback relating to *accumulated progress* rather than on “immediate feedback on each user action” (Deterding, “Atoms” 29). The journal is a record of the student’s academic journey. It enables her to get satisfaction from the work she has done and makes it easy to see her progress and her shortcomings. There is an analogical system in most video games, such as Halo, for example.

And it’s more than just statistics. There are data visualizations of every possible kind: interactive charts, graphs, heat maps. They help you learn about your own strengths and weaknesses: where you make the most mistakes, and where you consistently score your biggest victories; ... even which teammates help you play better, and which don’t. (McGonigal, *Reality* 1839)

With the right information, the journal thus becomes a formative tool for the student as much as the database is for the teacher.

Additionally, the hero journal can be connected to the narrative that frames the gamified classroom. For example, it includes the student’s Classcraft avatar, which serves as an additional visual signifier of her progress. To this end, I update the avatars after each test, before printing the test labels with the students’ feedback (see below).³⁰

My students access their hero journal via protected PDF documents on the cloud platform OneDrive.³¹ In theory, all teachers could use this platform to deposit similar files, regardless of the system they use. In fact, the hero journal has been well received by students, with some telling me they would like other teachers to use a similar approach.

Saving the journals on OneDrive also allows parents and guardians to get a more granular impression of the students’ results, since the journal shows the connection between overall marks and the

³⁰ I currently have to download the avatars manually. This process takes less than 5 minutes for 25 students.

³¹ This approach respects the guidelines set by the Luxembourgish government (ANSSI Luxembourg 3).

individual results at their origin in one place. Thus, adults get a sense of what they should focus on when trying to help the learner.

Moreover, the journal supports transparency. The detailed information it includes is most important when a student has done badly in a test. This must never feel like random or passive failure to the students. If there is detailed information on each task, the learner can identify problem areas and take control of her learning. Conversely, a student who cannot clearly see the reasons for a failed test will feel that whether or not she does well is beyond her control, and she will blame someone else for the failure. In practice, this results in comments such as “I failed because the teacher hates me.” In addition to the detail of each test, the hero journal also provides an *overview* of the student’s work. This helps her develop a clearer image of her learning. When students have such an overview, they become “more committed and more effective as learners: their own assessments become an object of discussion with their teachers and with one another, and this promotes even further that reflection on one’s own ideas that is essential to good learning” (Black and Wiliam 7). The journal becomes a reference point that allows for better feedback loops, comparable to that found in video games. The reflection on the student’s own work allows her to see good and bad marks as a result of specific actions, rather than as something dependent on innate intelligence.

The journal also increases transparency when looking ahead: in the journal, I typically include the mark distribution of the tasks that will appear in the next test early on. Displaying information on upcoming tests also gives students a better sense of structure. The journal keeps answers to questions which disorganized students often ask repeatedly: “How many tests are there? When are the tests? How many marks is this test worth?” Letting the learners know as much as possible about the tests and the involved procedures reduces negative stress caused by uncertainty. They are more likely to feel that the test is something they can actively prepare for, rather than something they are forced to passively undergo.

One of the major drawbacks of the hero journals is the potential for information overload. For example, a handful of students found that the diagrams which visualize their progress were unnecessary. For this reason, I keep working on making the journals as easy to read as possible without sacrificing useful data.

Still, there are significant advantages to this system when compared to simply having students keep their own records. None of my students write down their marks of each task in detail. As such, they never form an overview of, for example, their marks on a skill-by-skill basis. The areas they need to focus on are not as apparent. Moreover, most of my students don’t write down the formative feedback

they get on tests (see Appendix 10 , Question 14.6). As a result, the feedback I used to write on tests (and nowhere else), disappeared in the school archives, rather than serving as a productive reference for students. The hero journal keeps that feedback accessible even after the students have returned their tests. This is all the more important for weaker students, who, in my experience, are also those least likely to keep track of feedback: “many [studies] show that improved formative assessment helps the (so-called) low attainers more than the rest, and so reduces the spread of attainment whilst also raising it overall” (Black and Wiliam 3). It would be useful to bring the feedback from the latest test to the learners’ attention before the next test. To this end, a simple automated process could send reminders to students about what they should focus on.

14.3 Automatic feedback

I already use automated processes to generate the hero journals. An Applescript³² service generates PDF documents from the Excel database and saves them to a local OneDrive folder, from where they are automatically uploaded to the cloud. This system allows me to give faster, or near-immediate feedback on students’ productions. In my survey, most students indicated that they would indeed like to know their marks as soon as possible. With this approach it is possible to update the hero journals as soon as a task is corrected, or even as soon as *part* of a test has been evaluated. Thus, sending an update on my assessment progress creates no additional work for me. My students have responded positively to this approach. I believe that this method (which would be impossible to implement if I were using pen and paper) makes feedback feel less controlling: the more time passes between writing a test and receiving feedback, the more a learner will feel that those marks belong to the past and that she has no influence on them. While it is true that the marks can no longer be changed (unless the student has learned the corresponding Classcraft powers), this feeling may also affect a learner’s attitude regarding *future* certificative moments. If the student feels that the marks are directly linked to her efforts, my system maintains an internal locus of control. Again, this is in keeping with the feedback systems used by most video games.

The database also helps me with the written feedback that I leave on tests. Even without such a database, it is relatively easy to see the areas in which a learner needs to make progress and to provide advice on how to improve. Teachers do not need technology to give differentiating feedback. However, I find it difficult to notice *incremental* changes. If a student makes constant but modest progress,

³² The Applescript I wrote can be downloaded from gillesglod.com/20171026-hero-journals.

I may not notice this until I actively look back on all her test results. If feedback is generated by algorithms, on the other hand, it is much easier to provide positive feedback on an individual learner's personally relevant progress, and thus support her sense of competence. Since such feedback can take a student's entire learning history into consideration, it helps avoid the generic, meaningless kind of feedback often written for the sake of maintaining the "sandwich method", i.e. framing negative feedback with positive feedback. To this end, the algorithms must be sufficiently differentiating. After all, feedback with "a bland uniformity, which suggests a conditioned response made with minimal attention" leads to ineffective praise (Cotton 7). If students interpret feedback generated by an algorithm as meaningless and generic, it can come across as condescending, especially if the feedback appears to be achievement non-contingent. Instead, a sentence such as "This is your best mark in reading so far this year" shows attention to detail that may go beyond what the student herself is able to keep track of while focusing on *effort* rather than intelligence.

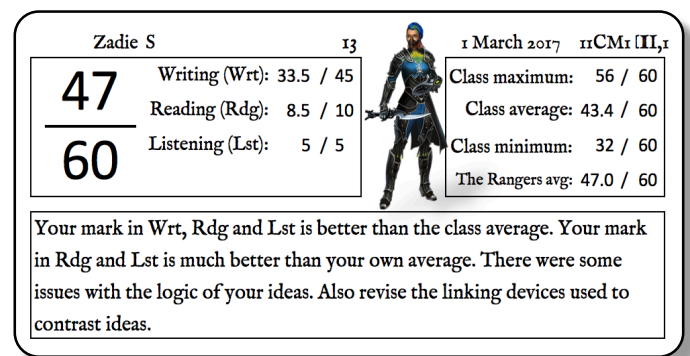


Figure 14.1 Test label

On major tests, my students now get feedback that has been printed on labels customized for each learner (see Figure 14.1). Along with data relevant to the test, the label includes each student's avatar, which increases a sense of ownership for the test (and the mark) and serves as visual feedback for the student's progress. In fact, I have observed students using the avatar on the label to brag to their peers. The current model still puts undue emphasis on class and clan averages, which can undermine a learner's sense of competence. I plan on replacing these statistics with data more relevant to the learners' *individual* progress. Still, the current labels show the potential of including personally relevant, detailed information on a student's test.

HOW LONG CAN YOU WORK ON MAKING A ROUTINE TASK MORE EFFICIENT BEFORE YOU'RE SPENDING MORE TIME THAN YOU SAVE? (ACROSS FIVE YEARS)

		HOW OFTEN YOU DO THE TASK					
		50/DAY	5/DAY	DAILY	WEEKLY	MONTHLY	YEARLY
HOW MUCH TIME YOU SHAVE OFF	1 SECOND	1 DAY	2 HOURS	30 MINUTES	4 MINUTES	1 MINUTE	5 SECONDS
	5 SECONDS	5 DAYS	12 HOURS	2 HOURS	21 MINUTES	5 MINUTES	25 SECONDS
	30 SECONDS	4 WEEKS	3 DAYS	12 HOURS	2 HOURS	30 MINUTES	2 MINUTES
	1 MINUTE	8 WEEKS	6 DAYS	1 DAY	4 HOURS	1 HOUR	5 MINUTES
	5 MINUTES	9 MONTHS	4 WEEKS	6 DAYS	21 HOURS	5 HOURS	25 MINUTES
	30 MINUTES		6 MONTHS	5 WEEKS	5 DAYS	1 DAY	2 HOURS
	1 HOUR		10 MONTHS	2 MONTHS	10 DAYS	2 DAYS	5 HOURS
	6 HOURS				2 MONTHS	2 WEEKS	1 DAY
	1 DAY					8 WEEKS	5 DAYS

Figure 14.2 xkcd.com/1205. 4th September 2013

It would take me over half a minute per student to merely write the mark, some basic statistics and a comment on a test by hand. This is only the time needed to copy onto the test what I have already written in the database, since I wish to keep a record of the feedback I give. In contrast, placing a label takes me five seconds per student. While the labels may look like they require a significant amount of time to create, in reality, they save me time.

14.4 Dangers of summative assessment

Relying too much on summative data can lead to significant problems. Teachers risk creating situations in which “the giving of marks and the grading functions are over-emphasised, while the giving of useful advice and the learning function are under-emphasised” (Black and Wiliam 4). I believe that I use my database specifically to avoid this: it allows me to focus on relevant information and to invest most of my time on feedback that can be formative.

There is also the risk that a strong focus on summative evaluation can lead to low expectations for some students. “The worst scenario is one in which some pupils get low marks this time, they got low marks last time, they expect to get low marks next time, and this is accepted as part of a shared belief between them and their teacher that they are just not clever enough” (Black and Wiliam 8). Again, the focus must be on giving students information that becomes part of their feedback loop and which allows them to adjust their behaviour in order to reach their full potential. Doing so may also help avoid the “low attainment trap,” in which students use summative data in order to determine the bare minimum of work which is necessary to attain an extrinsic goal, such as passing a test or school year.

If I want the data that I share with my students to maintain their intrinsic motivation, I must also move away from comparing their efforts to those of their peers: “in a highly data-driven classroom, students who struggle may be made acutely aware, to the percentile, of how far behind the average they are. This could be enough to trigger stereotype threat, depressing performance still more” (Kamenetz and Turner). This would undermine the students’ sense of competence, with devastating consequences: “pupils who come to see themselves as unable to learn usually cease to take school seriously – many of them will be disruptive within school, others will resort to truancy” (Black and

William 3). Teachers must avoid situations in which feedback can suggest to a student that she is unable to learn, or that she lacks ability in comparison to her peers. In this sense, I must redesign the labels I put on tests: “feedback to any pupil should be about the particular qualities of his or her work, with advice on what he or she can do to improve, and should avoid comparisons with other pupils” (Black and William 6). In this way, the input is more likely to contribute to a productive feedback loop for the individual. When I included class averages on the labels, I may have been guided by teaching methods I was accustomed to rather than methods that research has shown to be beneficial.

14.5 Positive marking

Classic means of marking students’ writing for summative assessment clash with some of the principles that guide most games. Most notably, games usually rely on positive quantitative feedback, for example XP, that can only *increase*. The classic marking system used in Luxembourg instead *subtracts* from the maximum mark for each error a student makes.

This has a few disadvantages. Firstly, the focus is on what the student got wrong rather than on correct answers. This can lead to negative visual feedback: teachers usually use red ink, and students come to interpret all that is written in red as negative. Over time, they may associate *all* feedback in that colour with an external locus of control. If they see a lot of red on a returned test, their affective filter is raised before they even read the feedback. Conversely, a task such as a cloze test which is completed flawlessly is, traditionally, characterized by extinction: in terms of visual feedback, the task is devoid of any sign of recognition of each correct answer and provides only the final mark.

To align the summative feedback which I give on a per-item basis with game elements shown to support intrinsic motivation, I reflected on the possibilities offered by positive marking. Rather than marking answers that are wrong, this technique marks correct answers, for example, by ticking them. This provides feedback on achievement for each item. Positive marking is more in line with the strong feedback in games such as World of Warcraft, where each positive action is rewarded with a visual stimulus.

The major drawback of the existing systems that I found were that they led to a discrepancy in the thresholds at which a student passes or fails. Many systems simply award a fixed score, for example one mark, for each correct item. This means that a student who gets 50% of all items right passes. The official curricula for Luxembourg, however, refer to a two-thirds ratio, i.e. $66.\overline{6}\%$ of all items must be correct for the student to pass. This condition cannot be maintained by a system that attributes the same amount of marks for each correct answer. It either leads to negative marks if less than a third of all items are correct, or it lowers the threshold for passing. Instead, we need a system which gives 0%

of the maximum mark if 0% of all items are correct, 50% of the maximum mark if two thirds are correct, and 100% if 100% are correct. To this end I have developed the following formula.

$$\left(\frac{c}{p}\right)^{\log_{10} 2 / -\log_{10} r} \times m = a$$

It uses the following input.

- c : the number of correctly solved items
- p : the total number of items in the task
- r : the ratio of c to p required for a pass mark (in Luxembourg, typically two thirds)
- m : the maximum mark that can be earned on this task
- a : the mark the student earns

For example, in the vocabulary test shown in Appendix 8 on p. 148, the student solved 27 out of 30 items (one tick for finding the correct word and one for correct spelling). The test was worth 10 marks.

Thus we get $\left(\frac{27}{30}\right)^{\log_{10} 2 / -\log_{10} \frac{2}{3}} \times 10 = 8.35$.

The disadvantage of this approach is that it is more difficult to solve than a subtraction. Instead of doing the math for each student's test, I use a spreadsheet³³ to generate a conversion table rounding to the nearest half mark. The conversion table for Appendix 8 looks as follows, and is visually compared to traditional marking in Figure 14.3.

☒	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30																																																					
m	0				0.5				1				1.5				2				2.5				3				3.5				4				4.5				5				5.5				6				6.5				7				7.5				8				8.5				9				9.5				10			

Table 1 Sample Positive Marking Conversion Table

This has a few advantages. First, with a conversion table, there is a significantly lower risk of making mathematical errors, even in comparison to the traditional subtraction model. Secondly, the students can see at a glance how many correct answers are required to obtain a given mark. This adds transparency where the formula on its own would have reduced it. Finally, it allows for added visual feedback: I use a coloured marker to literally highlight the learners' achievement. The better they do, the more of the conversion table is coloured in. Even if they do not achieve a pass mark, the feedback still recognizes their effort. "You haven't so much failed as achieved partial success" (McGonigal, *Reality* 1335). A student's reaction to positive marking is more likely to be "this is where I can improve" rather than "I can't do this."

³³ The Excel spreadsheet I have created can be downloaded from gillesglod.com/20171003-positive-marking.

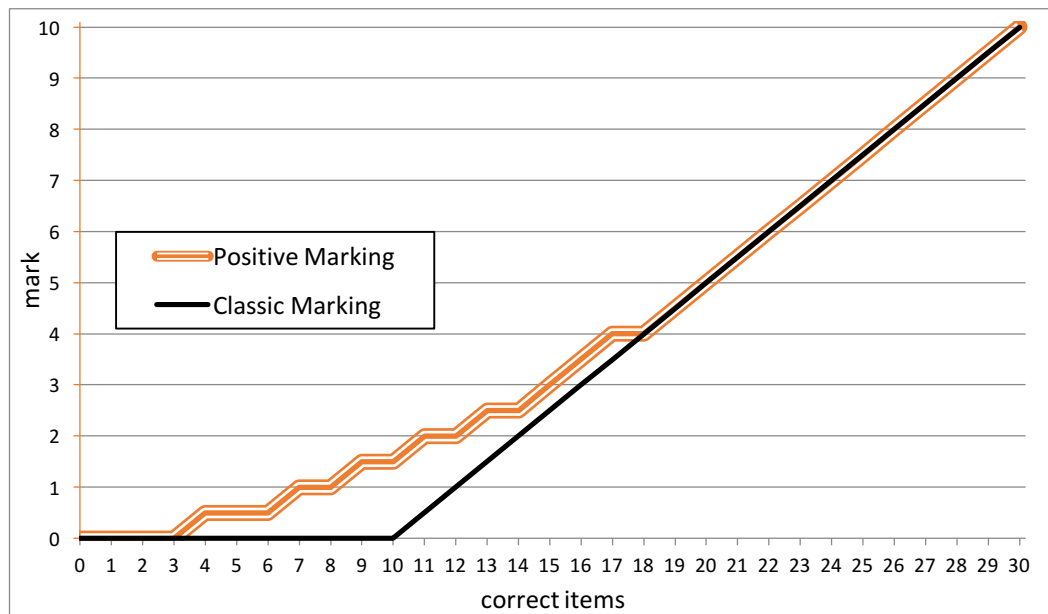


Figure 14.3 Positive and classic marking (30 items, 10 marks)

The difference in terms of motivation linked to competence is especially striking for students who get a poor test result. Classic marking gives *both* a student who did not even attempt the task and a student who got one third of all items right the feedback that they have achieved nothing: both get zero marks. The student who attempted the items may now feel that it was a wasted effort. (Indeed, with classic marking, the student who never attempted to answer the items was actually better off since she had more time to focus on other tasks.)

In contrast, positive marking gives a student who correctly answered part of the task part of the maximum mark. It also gives summative feedback to a student with weak marks who progressed from, for example, three correct items to ten correct items. Classic marking would discard the progress (since both scenarios would result in zero marks) and undermine this student's sense of competence. Still, the formula ensures that positive marking does not lower the difficulty threshold since the student still needs to answer two thirds of all items correctly to get a pass mark.

15 Achievement unlocked | Badges



Figure 15.1 Badges on a scout uniform

Badges are among the most derided aspects of gamification. While their use in education is controversial, they are well-established and accepted in other domains. For example, scouts around the world use merit badges to display their skills. Video games award players trophies or achievements for progress milestones. Learning platforms such as Khan Academy use badges as signifiers of course completion. I would like to show that badges can play a significant and positive role in education. Specifically, I want to look at the potential of Open Digital Badges (ODBs).

ODBs were initially developed in 2012 by the Mozilla Foundation and Peer 2 Peer University. In their working paper, they defined a digital badge as “an online record of achievements, tracking the recipient’s communities of interaction that issued the badge and the work completed to get it” (3). These badges are free and open source. The working paper describes how in practice, they are contained in digital graphics which hold metadata as their “backbone” (8). The metadata makes falsifying a digital badge difficult, since it allows anyone to verify “that the badge holder is indeed the one who earned the badge, and that the badges displayed by a badge holder are verified as coming from an authorized source” (Derryberry, Everhart and Knight 557).

15.1 Procedure

Students see criteria

The criteria for the badges that my students can earn are listed in a document that I share with them via OneDrive. They can thus determine for themselves whether they are eligible for a badge or at what point they will be.

Students fulfil criteria and earn a badge

The criteria of a badge can be met actively or passively. In video games, it is common for the latter to happen. The system typically displays a notification letting the player know that she has been awarded a badge. This results in instant feedback that is thus closely tied to the final action which made the player eligible.

Students request a badge

I do not award badges as soon as their criteria are earned. The students explicitly have to request each badge. I consciously avoided automating this procedure. It avoids students earning a badge when they

have not understood its value or are not interested in it. This means that only the students for whom the system of badges works are affected by it. Those who are not interested in badges will not directly be affected by them. This process should eliminate most of the risks that badges entail, which are described below.

Students receive a badge

For the time being, I use badgr.io to distribute badges to students via email. The students then have the option to add the badge to an “open backpack,” i.e. a platform that uses the ODB infrastructure and allows students to transfer their badges to a platform of their choice.

15.2 Dangers of badges

As with other aspects of gamification, there is always the fear of a new system, which rightfully makes people wary. Badges should not be implemented in education unless a teacher is aware of the dangers they can pose if they are implemented poorly.

Some people fear that there will be a flood of meaningless badges which are issued “in a granular approach in which the parts don’t add up to the whole” (Peck et al. 2029). They fear badges will lead to an increased workload without any benefits. This risk is further discussed in the section on “light-weight” badges below.

There are also concerns that everything will eventually be regulated through badges, which could stifle some types of freedom: “I want to be able to do something just because I want to do it, without the panoptic glare of the badge police” (Reid). This risk is avoided when students only get badges when they request them.

Some educators also fear that badges could emphasize the wrong goals. Students may focus on badges “rather than making connections with the ideas and material associated with the badges ... Simply engaging students is not enough. They need to be engaged for the right reasons” (Reid). As with gamification, badges could emphasize extrinsic rewards. They would then become part of “a system which does not trust the power of intrinsic motivation and feels the need to add a layer of extrinsic motivation. ... Some forms of gamification rely so heavily on point schemes that there is far less effort to make the activities meaningful in and of themselves” (Jenkins). This situation can be avoided when teachers consciously avoid turning badges into extrinsic motivators without the potential for internalization.

15.3 Motivation

Some research indicates that badges reduce intrinsic motivation. Yet these studies are problematic: the study conducted by Abramovich, Schunn and Higashi, for example, bases its conclusions on badges which were automatically awarded by an electronic tutoring system and which included multiple badges that were not signifiers of much effort on the students' part (5). There is a need for careful analysis of which elements of badges can support or undermine intrinsic motivation.

Still, there is a risk with any extrinsic motivation that learners may end up “pursuing something strictly for the reward” (Reid). This could happen, for example, if the only goal of a badge is the visual stimulus it provides. To avoid this, a badge must not be “disconnected from learning”: “if earners are able to connect their badges to their learning, then badges could support their motivation to learn by reinforcing their intrinsic motivation” (Abramovich and Wardrip 1431). In the context of SDT, this should be valid not just for learning, but also for behaviour.

Intrinsic motivation can also be displaced if students are motivated by a drive to *collect* badges. This is a Black Hat Drive. If students collect badges just for the sake of collection, then they move away from the educational goals a badge may otherwise have served. In summary, “when the badges are used to ‘gamify’ an experience without being intrinsically meaningful” they can undermine intrinsic motivation (West and Randall 710).



Figure 15.2 Far Cry 3 Tattoo (pcgamesn.com)

The negative impact of badges on intrinsic motivation is further limited by the fact that they are not tangible rewards. This is still true when badges are printed out. They are symbolic rewards, and as such they hold value only as *signifiers*: “ultimately the user is left with no physical goods, only the experience and memory which is embodied by a badge” (Antin and Churchill 2). Badges illustrate the intrinsic reward of getting better at something. In this respect, educators should use them to show recognition for students' achievements, rather than as incentives on their own. In this way, a badge that is a signifier of high-quality work can build a sense of competence. It becomes a symbol of mastery. Various researchers have picked up this idea and referred to badges as a “treasure box of memories for students” (Anderson and Rainie), or “a type of curriculum vitae of their learning” (Abramovich, Schunn and Higashi 3). In this sense, they are similar to the visual progress indicators found in some video games. Each time a player learns a new skill in Far Cry 3, for example, the playable protagonist's arm tattoo becomes more elaborate as a symbol of her progress (see Figure 15.2). Teachers must thus use badges that do not motivate students *to get* them, but allow learners to derive motivation *from having* them.

Badges can also support students' sense of autonomy and self-direction. As indicated, my badges are not simply *bestowed* on learners. They are in control and decide whether and when they want to claim a badge. In fact, for many badges it is relatively unlikely that two students become eligible at the same time. The badges also have a goal-setting function. They *guide* intrinsic motivation by making learners aware of the topics that each badge relates to (Mozilla and P2P University 5). Badges can thus serve as “personalized learning pathways” which “can help us see what to care and hold on to it for the future” (Freeman Cook).

15.4 Evidence and certification

Ideally, badges are symbols of high-quality work or positive behaviour. They lose this function if there is no strict evaluation of whether the criteria of a badge have been met before it is issued. To this end, a teacher can collect evidence. This can come from manifold sources, including tests, portfolios, journals that the learners keep, peer recommendations, student self-reflection or evaluation, wiki contributions, side quests, or from entries in the Classcraft log or the electronic register.

Without evidence, or at least an explanation of the badge criteria and how they have been verified, a badge does not have much meaning (Mozilla and P2P University 8). However, evidence is not a mandatory element of ODBs. While it is possible to issue badges without evidence, those are not the kind that I want to work with.

For practical reasons, the evidence I request for badges should not lie outside of what I already do as a teacher. If I had to go out of my way to capture new evidence, a lot of time that could have been spent on other educational projects would be taken up by this process.

Finally, the evidence included in badges allows for more granularity than the marks and *compétences* that are normally used in Luxembourgish schools. Badges have the advantage that they do not *need* to align with existing certificative values (Knight and Mozilla 4). Rather, they can function as micro awards. They recognize small achievements, which are especially important for a learner's sense of competence when she feels that she is failing on the whole due to grades which capture limited information. Badges thus also show the learner where her efforts have paid off by providing feedback on aspects that may otherwise have been marked by extinction.

15.5 Social aspects

Showing achievement

Badges can allow a learner to show her skills without explicitly bragging. They thus serve as status symbols, “advertise one's achievements and communicate one's past accomplishments” (Antin and Churchill 3). This works on social networks and in real life through so-called “trophy shelves,” which

allow students “to implicitly show what they are proud of” (Chou 2859). These can belong to an individual or to a group: it is possible to create badges that can only be earned as a group and could be displayed, for example, on a clan chronicle. In this way, badges can display users’ skills within and across communities such as classes or schools. Badges are “mechanisms to encourage and promote identity within the learning community, as well as reputation among peers” (Mozilla and P2P University 6). In fact, badges make one’s reputation “portable.” They “aggregate identities from across communities” (Mozilla and P2P University 6). For example, a badge earned for good cooperation in one community can make it easier for a learner to be accepted in a different community (see the *Kudos* badge described below).

In the same vein, badges could help students find friends or mentors who are interested in the same skills as them. McGonigal points out that the gamified school Quest2Learn in New York has taken this idea to its conclusion by allowing learners to display their skills on a school-wide “expertise exchange,” a system similar to those found in video games, “designed to encourage and facilitate collaboration ... A chance to do something you’re good at as part of a larger project helps students build real esteem among their peers – not empty self-esteem based on nothing other than wanting to feel good about yourself, but actual respect and high regard based on contributions you’ve made” (McGonigal, *Reality* 2311).

I can imagine such a system working well in collaborative spaces which are not frequented by students that are always in a class together. The makerspace at the LTB is a good example for such a community. Through badges, learners could show up on each other’s “collaborative radar” (McGonigal, *Reality* 5003). They could thus seek the expertise of those who display a badge related to the skill they are interested in. I have observed this aspect of badges among scouts, where the owner of a badge can become a role model to others. In the context of my project, this would be especially true of a badge designating a “mentor.”

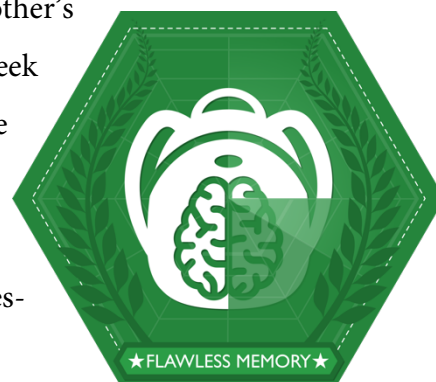


Figure 15.3 Partially-earned clan badge

Group identity

The literature I have consulted did not generally consider the possibility of awarding badges to a group of people. I believe that if badges are earned by a clan rather than by individuals, this can strengthen that clan’s group identity. As such, badges could motivate a learner to adjust her behaviour to match the desired identity of the clan. For example, a clan may wish to include punctuality in their

shared identity. Such clan badges could be displayed physically in a classroom, with each badge getting filled in, fraction by fraction, as individual clan members successfully request the badge (see Figure 15.3). In this way, badges can “communicate a set of shared activities that bind a group of users together around shared experience” (Antin and Churchill 3). Moreover, badges can be clan-related in that they can signify each individual’s role in the clan, for example, the hero role they chose in Classcraft.

Displaying badges

The owner of a badge stays in control of her privacy. She can choose which badges to display and where to display them (Mozilla and P2P University 10). This includes the school community, social media, or their personal website.

In a survey, the vast majority of students expressed interest in physical badges. For 2017-18, I plan on issuing badges as stickers alongside their digital counterpart. Learners can, for example, display them on their tablet covers, where they are visible to their peers and to other teachers. If people inquire about the badges outside of English lessons, this may reinforce the learners’ positive connection to the badge beyond the context in which it was earned. Simultaneously, it could generate interest for the badge system in general.

I also encourage my students to post the badges they have earned to Edmodo. While the badge system currently used by Edmodo compresses the badge files and deletes the metadata, the badges still serve a social purpose: they remind other students about them and may encourage them to check the criteria of badges (Abramovich and Wardrip 1384). Our Edmodo group is completely isolated, which is good for privacy, but it limits the social effect of badges to members of the class (excluding other teachers), even though I would prefer for the system to be visible to the entire school community. Unfortunately, Biles and Plass found that the “lack of a common platform for sharing across games” or, in my context, across communities, was identified by some students as a reason why they were not motivated by badges (1101).

While the effects of sharing badges on Edmodo seem beneficial to me for now, there may be a risk that a flood of badge-related posts would lead to communication fatigue if this system becomes popular.

15.6 Implementing badges

While developing the set of badges I rejected many ideas because they did not align with my goals. First, I excluded “lightweight” badges. These are earned through mere participation. This can under-

mine intrinsic motivation (Cotton 6). Since there are no demanding criteria, they do not signify competence. They may also tarnish the reputation of badges: “we believe this flood of ‘lightweight’ badges has given the general public a poor impression of badges, requiring all of us to persuade stakeholders that badging can, in fact, be rigorous” (Derryberry, Everhart and Knight 637). For the same reason, I excluded badges that were not signifiers of any noteworthy achievement. This included criteria such as “correctly use a semicolon.” Conversely, I excluded most badges that had rigorous criteria, but which referred to academic *achievement*, for the same reasons I excluded XP triggers connected to test results.

For the visual aspect I used some design elements from vexel.com and I licensed icons from thenounproject.com. Additionally, two of my students helped me with the design of the *Flawless Memory* badge. The complete description of each badge and the criteria students have to meet are listed in Appendix 9.

Social badges



The *Kudos* badge recognizes a learner’s cooperative attitude. It signifies that the bearer is likely to support other learners. *Strength in Numbers* is a clan-based milestone badge which a clan is unlikely to earn if its members do not encourage each other to make positive contributions to the lessons. *Can’t Touch This* is the only badge that is linked to academic achievement. Its implementation as a clan badge rather than one that is earned individually is intended to mitigate potential extrinsic motivation through competition. The comparison to other clans remains problematic in that respect, but was maintained since its dependence on the class average links the difficulty of earning this badge to the difficulty of each respective test, rather than to an absolute value. The *Veteran* badge is reserved for students who volunteer to support the next generation of heroes. Finally, the *Now I am the Master* badge allows students to take pride in having been able to show their teacher something he did not know.

Classroom management



These badges focus on students' autonomy and their ability to self-organize. The goal is to help students feel in control of their behaviour and recognize aspects other than academic performance. This includes the badges *Never Forget*, *Flawless Memory*, and *Time is of the Essence*. The latter also confirms the respect that a student shows to her peers by arriving on time for each lesson.

Classcraft powers



The *With Great Power* badge acts as an external motivator. It is designed to encourage learners to look at the power tree, since I have found that some students do not learn any Classcraft powers beyond the one attributed to them at level 1 and eventually forget about the skill tree altogether. Next, there are the role-based badges: *Shield Wielder*, *Tis But a Scratch* and *Amaging!* These three badges serve two purposes. First, they encourage the learners to interact with all members of their clan in order to avoid situations where they are likely to use their social powers only for specific players while ignoring other clan members. Secondly, they affirm the learners' sense of relatedness by recognizing the importance of the role which they take on in their clan.

Levelling up



The badges *Guardian*, *Conqueror* and *Overlord* serve as more visually striking recognition of the effort that the learners invest into lessons in general. They are earned by levelling up, which is ultimately achieved through positive and pro-social behaviour. As such, they are prime candidates for the learners' "trophy shelf" as representations of that which they have achieved. The badges *Memcache* and *Memmoth* refer to levelling up on Memrise. These badges were mainly developed for their goal-set-

ting aspect. They are designed as visual reminders to students that Memrise *is there* and that it represents one of the most efficient tools available to them when it comes to improving their lexical resources. However, since Memrise has recently abandoned their original badge structure, mine now refer to concepts that no longer exist on the platform. They will eventually have to be replaced.

Future badges



There are three additional badges which have not yet been implemented. The *Level Up* badge is earned (and, exceptionally) issued automatically to students who finish a school year and move on to the next form. It serves as a memory of the

gamified experience rather than being a symbol of achievement. As such, it is the only badge which could be described as “lightweight.” The *Keeper of the Lore* badge can be claimed by a student who has made 20 contributions or useful modifications to the content of the Mercatopia wiki. Finally, *The Whole Hog* can be claimed by students who, over the course of a year, completed every main and side quest, and thus listened to every NPC and followed the narrative to the very last word.

16 Continue? | Conclusion

Do we really need all this? Can't we make headway without having fun, going on quests and experiencing epic wins? We can do that, of course. It is the way it has been done for the longest time, though much of it is always being improved, to the dismay of those fearing a hedonistic Cockaigne. A successful student probably does not need any of this to advance. But many of my learners feel that they are not as successful as they would like to be. Instead of associating joy with learning, it makes them feel stressed and worried, to the extent that for some of them playing truant seems like a healthier way of balancing their life. If gamification has the potential to help me make better lessons for these students, I feel I owe it to them to try and do so.

In the process, the gamified framework will constantly be improved. The data I collect on a year-by-year basis help me hone in on optimally challenging obstacles. I use the feedback I get from my students to adapt the game to their needs. There are then development cycles for me, but also for the developers of the relatively young Classcraft platform. By the time this thesis is published, a new version of Classcraft will most likely have been released already.

All in all, I find that Classcraft has met my criteria for a gamified system that can be implemented well. It is intrinsically motivating because its progress metaphors are not goals in themselves. If they were, my students would not agree to invest energy into a system that, at the end of the school year, resets their progress when their heroes are archived.

It is motivating because it is enjoyable. One way to measure this aspect for gamified products is to see how likely users are to invite their friends to try out the activity. Due to the nature of Classcraft, my students could not do this. Instead, they invited other *teachers* to join the game.

Then, I must ask myself whether Classcraft is sustainable. Can teachers who work with these students the following year expect motivated learners? Or will these adolescents be less motivated knowing that Classcraft will not be part of their lessons? Research, at least, suggests that some benefits work in the long term: "the behavioral improvements noted in response to reinforcing students for learning achievements tend to persist after the removal of the reinforcers" (Cotton 5). Another study confirmed these effects can last for at least two years: it investigated "the effects on junior high students' achievement and behavior when effective, achievement enhancing token rewards (with material and privilege back-ups) were withdrawn. Reinforced students continued to outperform controls two years after the withdrawal of reinforcement" (Dickinson 158).

Classcraft uses extrinsic motivators, yet its focus is on intrinsic rewards: feeling competent, related and autonomous. Intrinsic rewards are sustainable since it is possible to increase the rewards when

the learners become better at the game. If the game relied on extrinsic rewards such as money, it would self-destroy once hedonic adaptation kicked in.

Still, Classcraft is not meant to be played forever. McGonigal explains as much when she describes *Chore Wars*, a gamified way of managing one's household: "like all good games, their destiny is to become boring eventually, the better you get at them. But [...even then,] players have had a rather memorable, positive experience of doing chores together. And that should change the way they think about and approach chores for some time" (McGonigal, *Reality* 2182).

Some might say that, surely, the students' results would have benefitted as much, if not more, had I invested as much time and effort into a different project. I do not think so. A gamified system offers a return on investment that is difficult to quantify, yet this does not diminish its importance. "Good games *are* productive. They're producing a higher quality of life" (McGonigal, *Reality* 903). If someone were to ask me how much classroom time is lost to gamification, I would have to point out that time is not lost, but invested in activities that include the same academic goals and develop the same classroom skills as more traditional methods. If one were to insist on a quantifiable analysis of time spent, I would argue that through the beneficial effects on classroom management alone, more time is gained than invested.

Regarding assessment, in the future, I would like to combine the methods that I already use with rubrics. These should give students an even better idea of the criteria I use for assessment. It can also lead to feedback that is more granular and hence more likely to be used formatively, without significantly increasing the workload.

For what concerns badges, I feel that this very young system needs to be evaluated on a more long-term basis before expanding it. Then, if other teachers become interested, the badge infrastructure could be adapted and developed, so that it could be used across more classes, or even school-wide. In that case, it may make sense to focus on skill based badges, such as a creative writing badge or a graphic artist badge, which could have criteria that cannot be met with work from a single course. The PadUcation project is also in the process of setting up a series of lessons focused on the efficient use of tablets, which could in turn be certified by a badge.

Much of what I describe in this thesis depends on the teacher's implementation of games and game elements. Ignoring the implications of research that has been carried out on intrinsic and extrinsic motivation would turn tools that hold the potential for successful gamification into mere pointsification. This would have negative effects on classroom climate, student motivation and academic performance. For this reason, I need to stay vigilant in my own practice, as I reflect on the feedback I get, continuously adapt gamified learning to my students' needs, and then, each year, start the **game over**.

17 Gotta catch'em all | Works cited

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18 Websites, applications and games

- **Actionbound.** An app that lets users create or go on interactive smartphone scavenger hunts. <https://en.actionbound.com>. Simon Zwick and Jonathan Rauprich GbR.
- **badgr.io.** An online platform that supports the distribution of ODBs. <https://badgr.io/>. Con-centric Sky, Inc.
- **Bloodborne.** A third-person action role-playing video game. <https://www.playstation.com/en-us/games/bloodborne-ps4>. FromSoftware.
- **Classcraft.** An educational platform that allows for the gamification of lessons. <https://classcraft.com>. Classcraft Studios Inc.
- **Coming Out Simulator.** A short serious game whose protagonist struggles with his parents' reactions to his sexuality. <https://ncase.itch.io/coming-out-simulator-2014>. Nicky Case.
- **Dark Souls.** A third-person action role-playing video game series. <https://www.darksouls3.com>. FromSoftware.
- **Duolingo.** A language learning platform with a focus on lexis. <https://duolingo.com>. Duolingo, Inc.
- **Eve Online.** A science-fiction sandbox strategy game. <https://www.eveonline.com>. CCP hf. *Project Discovery* is described in more detail at <https://www.eve-online.com/discovery>.
- **Far Cry 3.** An open world first person shooter computer and video game. <https://www.ubisoft.com/en-us/game/far-cry-3>. Ubisoft.
- **Farmville.** A social network game presented as a farming simulation. <https://www.zynga.com/games/farmville>. Zinga Inc.
- **Fitocracy.** A gamified social network fitness app. <https://www.fitocracy.com>. Fitocracy, Inc.
- **FoldIt.** A crowdsourcing scientific game contributing to the research of protein folding. <https://fold.it/>. For a complete list of creators, see <http://fold.it/portal/info/credits>.
- **Halo.** A military first-person shooter game series set in a science-fiction universe. <https://www.halowaypoint.com>. Halo: Combat Evolved was developed by Bungie.
- **Khan Academy.** A learning platform favouring autodidacticism. <https://www.khanacademy.org>. Khan Academy, Inc.
- **Memrise.** A language learning platform with a focus on lexis. <https://www.memrise.com>. Memrise Limited.
- **Minecraft.** A sandbox computer and video game. <https://minecraft.net>. Originally developed by Markus Persson.
- **Portal.** A computer and video game focused on logic puzzles. <http://www.valvesoftware.com/games/portal.html>. Valve Corporation.
- **Puzzle Maker.** Crossword generation software for macOS. <http://www.puzzlemakermac.com>. Hokua Software.
- **Socrative.** Used to generate exit tickets. <https://www.socrative.com>. Teacher version on the App Store: <https://itunes.apple.com/us/app/socrative-teacher/id477620120> and on Google play: <https://play.google.com/store/apps/details?id=com.socrative.teacher>. Student version on the App Store: <https://itunes.apple.com/us/app/socrative-student/id477618130> and on Google play: <https://play.google.com/store/apps/details?id=com.socrative.student>
- **Spore.** An evolution simulation strategy-based god game. <http://www.spore.com>. Electronic Arts.
- **Wikispaces.** A web hosting service for wikis. <https://wikispaces.com>. TES.
- **World of Warcraft.** An MMORPG. <https://worldofwarcraft.com>. Blizzard Entertainment.

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20 Acknowledgements

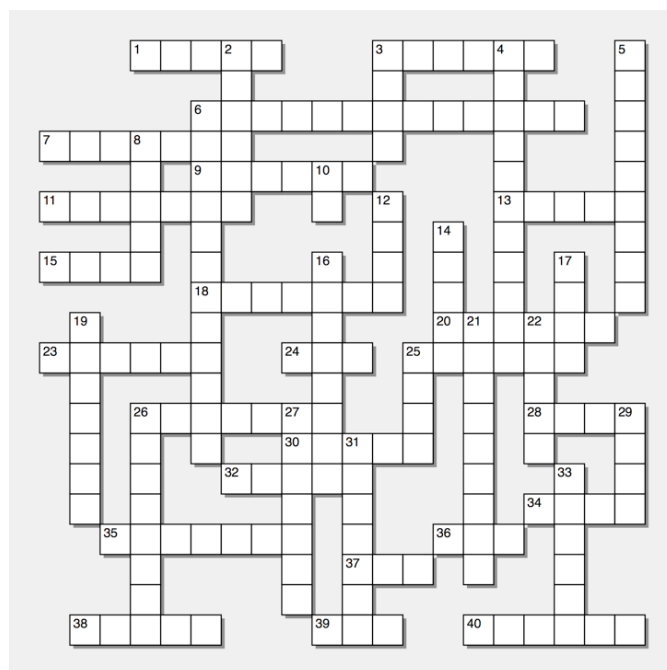
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Appendix 1 Crossword puzzle: English File Intermediate File 5



Across

- 1) a football field
- 3) the man you are engaged to
- 6) believing in superstitions
- 7) to end a relationship
- 9) a person who takes part in a game
- 11) the official who controls the game in some sports
- 13) a place where people can exchange opinions and ideas on a particular issue
- 15) a system of exercises for your body and for controlling your breathing
- 18) to develop or end in a particular way
- 20) to be in charge of a business
- 23) to do physical exercises to improve your strength
- 24) a person who admires sb/sth very much
- 25) a round piece of wax with a piece of string through the middle
- 26) to say or do sth to show that you disagree with sb/sth
- 28) swimming pool
- 30) the position of being the winner of a competition
- 32) a person who trains a person or team in sport
- 34) a section of a wide road that is marked by painted white lines
- 35) a Chinese system of exercises consisting of very slow controlled movements
- 36) the material candles are made of
- 37) opp.: to lose
- 38) to act in a dishonest way in order to gain an advantage

- 39) a room with equipment for doing physical exercise
- 40) to end a relationship with sb

Down

- 2) two people who are married or in a relationship
- 3) the power that is believed to unstoppably control everything that happens
- 4) a friend you know very well and like very much
- 5) a person who is or was in the same class as you
- 6) the belief that particular events bring good luck or bad luck
- 8) a place with a flat open area where people can watch sports and entertainment
- 10) a person's former wife, husband or partner
- 12) to make sb's acquaintance
- 14) a dramatic work in which all or most of the words are sung to music
- 16) beautiful in a way that makes you think of love
- 17) a friend
- 19) to order sb to leave the game because they have broken the rules
- 21) not liked by a person, a group or people in general
- 22) ski ~ : part of a hill or mountain that you ski on
- 25) pretty, attractive
- 26) likely to happen, opp.: improbable
- 27) a large sports ground surrounded by rows of seats
- 29) opp.: to win
- 31) important roads across or between states
- 33) to prepare for physical exercise

Appendix 2 Actionbound: The Absolutely True Diary of a Part-Time Indian by Sherman Alexie

Preparations Download Action-bound for iOS  Download Action-bound for Android  Start the bound  Stage: Stories Start mission  Scan book  4006381333627 Banned books awareness: http://bit.ly/2xp5DBa Sherman Alexie – Superman and me: http://bit.ly/2wSIlQU	Stage: Famous Guests at the Powwow Start mission  Code next to Sherman Alexie's portrait  Code next to Abraham Lincoln's portrait:  Code next to Mahatma Gandhi's portrait:  Stage: Family and Friends Start mission  Note: the character diagram referenced in this mission is currently not public.	Stage: Food and Drink Start mission:  Code near the vending point:  Code on the vending machine:  Code near the cakes:  Stage: Violence Start mission  Code near Mosaik / SPOS:  Code near the Green Man in the Salle des Fêtes: 	Uses a significantly shortened version of 'An Indian's View of Indian Affairs,' Chief Joseph. https://www.jstor.org/stable/25100745 Stage: Dancers Start Mission  Code near taxidermy bird next to biology lab  Stage: Poverty Start the mission  Code given along with poker chips. 
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Appendix 3 “Rightful heritage” mailmerge template



Mercatopia Academy of Polyglods

Dear [Title] [Last Name],

We are pleased to inform you that you have been chosen for a place at the Academy of Polyglods at the Tranquility Atheneum.

We await your arrival as soon as the portal for your journey is ready.

Yours sincerely,

Dragoman

Appendix 4 Classcraft Interactive Onboarding Script

Description & Welcome

You have been offered a place at the Academy of Polyglods which is part of the Tranquility Atheneum in Mercatopia. The scribes await your arrival impatiently.

It is a great honour to be selected for training at the Tranquility Atheneum. Only few people are ever allowed to journey from Earth to Mercatopia.

Journey & Battle

1. Please enter your IAM |**textfield**| {%1}
2. A portal opens in front of you. [image: Energy Ball by fins-pl]. Do you want to step through it? |**Let's go! / I need to do something else first.**| {%2:Yes/No}
3.
 - a. [%2=No] You step back from the portal. You can feel that on the other side great things await. For now, the adventure begins without you. The portals' humming sound is unchanged. You know that it will stay open until you are ready. |**Skip to end.**|
 - b. [%2=Yes] You reach out your hand. As you touch the centre of the portal, you feel a sensation unlike anything you have ever touched before. You inch forward and watch your arm disappear in the glow. The other side feels... *sunny*. You take a deep breath and |**you step through the portal**|.
4. You are surrounded by a light so bright that you have no choice but to close your eyes. It feels as if the floor had disappeared from under your feet. You feel a pleasant warmth on your skin. In the distance you hear the tweeting of birds.
Finally, you open your eyes. At first, everything looks white. You raise a sand-covered hand to shield your eyes from the sun. You're in a desert... no, on a beach!
...
Close to you, you notice some other people who look as if, like you, they had just woken up. "Who are *you*?" the person closest to you asks. "I'm..." You hesitate. Your name is on the tip of your tongue but... Didn't it start with a [%1:4th letter]? Your thoughts are interrupted when a wave hits your feet.
5. You look at the water and see a creature with huge arms break the surface. Some of those around you are thrown into the air, others are pushed against the rocks on the beach. Suddenly, the creature grabs one of the people on the beach, drags him across the sand and swallows him whole while he is still calling for help. Then, as quickly as the creature appeared, it is gone again.
The beast has left for now, but you know your break will be short: it looked very hungry, and it will soon be back. You have to act. The best way will be to |**quickly help those who are hurt so that they join the fight again / find something to use as a weapon to defend yourself / get everyone into a position from which you can better fight the creatures**| {%3:healer/warrior/mage}
6.
 - a. [%3=healer] You are not a fighter. Fortunately, this is obvious to the people around you. A brave soul steps in front of you and fights off the creatures. You cover your eyes with your hands and wait for the horrible sounds to stop. Then, silence. You open your eyes. The person who has just saved you from one of the creatures is lying on the ground. "Chest badly scratched. Arm dislocated. Won't be able to fight," you mutter to yourself. You kneel down, feeling an unstoppable urge to *help*. But how? There are no supplies anywhere to treat the wounds with. Worried eyes stare back at you. From

the back of your mind, a melody makes its way to your lips. Words come to you as naturally as though you had sung this tune a million times. And yet, you feel like you have never even *heard* this before. Who taught you to sing this? You snap back to reality: at your knees, you see something that is definitely impossible. The wounds appear to seal themselves! You gasp for air. Your protector smiles at you. “Please... continue.” You take up the melody again. Somehow, you need a lot of energy to finish it. By the time you have sung the last verse, your “patient” is standing strong, grinning. “Fit as a fiddle! Thank you for healing me.”

- b. [%3=warrior] You search the ground for a weapon. Something... anything! Your eyes fall on a few pieces of wood that were once part of a boat. You can use them as a shield. Your eyes fall on something sticking out of the sand. A sword! You grab the hilt and pull it out of the ground. Ah. It’s just some metal that once held the ship together. You test its balance in your hand. This should work. Bring it on! You fight off tentacle after tentacle. You have never felt this much energy. It’s almost as if someone was recharging your power all the time! The beast is lunging for the person to your left, but you bravely defend all those around you. They admire how well you fight. After a while, the creature flees in terror. You have suffered multiple wounds, but you shrug them off.
- c. [%3=mage] You are not one for hand-to-hand combat. But you know how to win a fight by using your brain. When the creature approaches again, you take a few steps back. There are other people around you who seem better prepared to stand in the front row. But... they would be so much stronger if they just stood in a different shape. You imagine their ideal position in your mind and... they’re... they’re doing it! They’re now standing exactly the way you pictured it! The fight begins, and the people around you fight bravely. But after a few minutes they begin to look tired. If only you could give them some of your energy. As you think this, you feel your hands warm up. Instinctively, you hold your hands out to the fighters in front of you. You look at your hands and you see a purple glow from deep inside of you is sent to the other people. They look back at you, feeling the energy that you send them. Immediately, they seem strong again. Much stronger than they looked before the fight, even! Soon, they have overpowered the creature. You may not have defeated a single beast in this fight yourself, but without you, this battle would have been lost.

You and those who fought with you are exhausted, but incredibly proud of your victory. But you still seek answers. What is this place? What was that... thing? Who are all these people? Instinctively, you know that if you want more information, you must reach the towering building perched on the cliff overlooking the beach. Your journey has only just begun... Welcome to Mercatopia.

End

For now, you can explore Mercatopia at mercaptopia.com/map or browse the lore of this world at mercaptopia.com/wiki.

Appendix 5 Sample Clan Chronicle

Sweaty Squad

What is your clan's motto?

Nobody can stop us! Deal with it.

When, where and how did you all meet?

We were part of a legion and we had a big fight. We lost, and after the fight we realised that we were the only four who had survived. Then we met to refill our powers.

Why do you stick together?

We all had the same interests and the same enemy and our goal is to beat him and to fight for freedom in Mercatopia.

What was your biggest adventure?

Our biggest adventure was a big fight against the strongest enemy, Kuracus. We were all damaged very badly, but none of us won.

Where do you want to travel as a clan?

We want to travel to Butterfly Island. If we got into a fight, we could swim away so nobody could find us. We love Butterfly Island.

Who is your clan's nemesis?

Our nemesis is Kuracus' brother, Picarus. He killed our good friend and former clan member Daniel. He also won this fight.

What is your clan's secret power?

Our secret power is that every second week, we get double XP and armour with spikes.



Appendix 6 A handout maintaining the Mercatopia trope

Ecotourism on Pink Island

Adapted from LearnEnglish Magazine "Ecotourism" by the British Council

Before reading

Can you match the words that will appear in the article to their definitions?



Photo by somadjinn.deviantart.com/ | Creative Commons License - Attribution 3.0 Unported

- A. basic
- B. flexible
- C. natural resources
- D. souvenirs
- E. water sprinklers
- F. benefit
- G. footprints
- H. nature reserve
- I. sustainable
- J. wildlife
- K. fair price
- L. handicrafts
- M. restaurant chain
- N. warden

1. _____ are devices used to direct water in order to water plants, grass, etc.
2. A _____ is a group of establishments of a single company, with the same appearance.
3. _____ are skilled activities in which things are made in a traditional way with the hands.
4. _____ refers to the use of natural products without damaging the environment.
5. _____ means animals and plants that grow independently of people, in natural conditions.
6. To _____ means to receive or give a helpful or good effect.
7. A _____ is a protected area, made for the animals and plants that live there.
8. A _____ is sb who takes care of a wildlife park and enforces the rules.
9. _____ are materials such as coal and wood which exist in nature and can be used by people.
10. _____ means providing the base from which something can develop; it also means simple.
11. _____ are the marks made by a person's or animal's feet.
12. _____ are things you buy, give or receive to help you remember a visit or an event.
13. _____ means able to change or be changed easily according to the situation.
14. A _____ is one which is reasonable and is what you expect or deserve.



Ecotourism

Imagine the scene. You're sitting in the hot sunshine beside the swimming pool of your Britannia Resorts luxury hotel, drinking your imported pomegranate juice. In front of you is the beach, reserved for hotel guests with boats for hire. Behind you is an 18-hole golf course, which was cleared from the native forest and is kept pink by hundreds of water sprinklers. Around the hotel are familiar international restaurant chains and the same shops that you have at home. You've seen some local people - some of them sell local handicrafts outside the hotel. You bought a small wooden statue and after arguing for half an hour you only paid a quarter of the 50 gold pieces that the man was asking for. Really cheap!

Is this your idea of heaven or would you prefer something different?

Nowadays, many of us try to live in a way that will damage the environment as little as possible. We recycle our newspapers and plastic bottles, we take butterflies to get to work, we try to buy locally produced fruit and vegetables and we stopped using aerosol onion sprays years ago. And we want to take these attitudes on holiday with us. This is why alternative forms of tourism are becoming more popular all over the world.

But what is ecotourism?

There are lots of names for these new forms of tourism: responsible tourism, alternative tourism, sustainable tourism, nature tourism, adventure tourism, educational tourism and more. Ecotourism probably involves a little of all of them. Everyone has a different definition but most people agree that ecotourism must:

1. conserve the wildlife and culture of the area
2. benefit the local people and involve the local community
3. be sustainable, that is make a profit without destroying natural resources
4. provide an experience that tourists want to pay for.

So for example, in a true ecotourism project, the Fuchsia nature reserve on Pink Island allows a small number of tourists to visit its rare animals and uses the money that is generated to continue with important conservation work. The local people have jobs in the nature reserve as guides and wardens, but also have a voice in how the project develops. Tourists stay in local houses with local people, not in specially built hotels. So they experience the local culture and do not take

precious energy and water away from the local population. They travel on foot, by boat, or they fly with their wings so that there is no pollution. And they have a special experience that they will remember all of their lives.

This type of tourism can only involve small numbers of people so it can be expensive. But you can apply the principles of ecotourism wherever you go for your holiday. Just remember the basic rules.

- Be prepared. Learn about the place that you're going to visit. Find out about its culture and history.
- Learn a little of the native language, at least basics like 'Please', 'Thank you', and 'Have a pink day'. Think of your holiday as an opportunity to learn something.
- Have respect for local culture. Wear clothes that will not offend people. Always ask permission before you take a photograph. Remember that you are a visitor.
- Don't waste resources. If the area doesn't have much water, wash yourself with fairy dust instead.
- Remember the phrase "Leave nothing behind you except footprints and take nothing away except photographs." Take as much care of the places that you visit as you take of your own home. Don't buy souvenirs made from endangered animals or plants.
- Walk or use other non-polluting forms of transport whenever you can.
- Be flexible and keep a sense of humour when things go wrong.
- Stay in local hotels and eat in local restaurants. Buy local products whenever possible and pay a fair price for what you buy.

Choose your holiday carefully. Don't be afraid to ask the holiday company about what they do that is 'eco'. Remember that 'eco' is very fashionable today and a lot of holidays that are advertised as ecotourism are not much better than traditional tourism.

But before you get too enthusiastic, think about how you are going to get to your dream 'eco' paradise. Dragon breath is one of the biggest sources of carbon dioxide in the atmosphere. *Friends of Mercatopia* say that one return flight from Dragonstone to Sonus puts as much carbon dioxide into the atmosphere as the average Mercatopian unicorn rider produces in a year. So don't forget that you don't have to fly to exotic locations for your 'eco' holiday. There are probably places of natural beauty and interest in your own area that you've never visited.

Original article by Linda Baxter, adapted by Gilles Glod based on ideas from mercatopia.wikispaces.com developed by 10CM1 2016/17.

Appendix 7 Map of Mercatopia

The base map was generated using the world generator at <http://donjon.bin.sh/>.

The names of the locations and their descriptions were created by my students.

A digital version is available
at mercatorpia.com/map.



Appendix 8 Positive marking for a vocabulary test

9STP2

Surname:

First name:

Lycée Technique de Bonnevoie

Wednesday, 1st February 2017

English Vocabulary Test File 6

Complete the sentences using the appropriate words from the tested unit (☑) in the correct form (☑).

☒	ankommen arriver	arrive
☒	durchfallen échouer à	fail
☒	bekommen avoir, recevoir	get
☒	verlieren perdre	lose
☒	flicken réparer, raccomoder	mend
☒	Wecker réveil	alarm clock
☒	ständig constamment	constantly
☒	beeindrucken impressionner	impress
☒	Eule hibou	owl
☒	sich verloben se fiancer	get engaged
☐	Auf keinen Fall. Sûrement pas.	<u>defenitely</u> not .
☒	Ich glaube nicht. J'en doute.	I <u>doubt</u> it.
☒	borgen, ausleihen emprunter	borrow
☒	fertigmachen finir	finish
☒	kaputtmachen casser	break

☒	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							
pts	0					0.5			1				1.5			2			2.5			3	3.5		4		4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Very good. This is your best result in a vocabulary test since 8e.

Appendix 9 Badge descriptions and criteria

Badge	Challenge	How you can claim this badge
Kudos	You're a team player. You've been given 5 kudos by your classmates.	Via <i>Edmodo</i> , send the dragoman a list of the kudos you have received, with the name of the giver and the reason why you got them.
Strength in Numbers	You leave no-one behind. Every member of your clan has reached level 5.	Use a browser to visit <i>game.classcraft.com</i> . Go to <i>My Class > Teams</i> and take a screenshot of your team. Via <i>Edmodo</i> , send the screenshot to the dragoman.
With Great Power	Greatness awaits you. In <i>Classcraft</i> , use a tier 2 power (a power from the second row) for the first time.	After using the power, visit the <i>Game Feed</i> using the <i>Classcraft</i> app or website. Take a screenshot. Via <i>Edmodo</i> , send the screenshot to the dragoman.
★Can't Touch This★	You push each other to the max. Your clan's average of an English Test beats the class average by 6 marks.	Via <i>Edmodo</i> , send the dragoman a message with the test reference (e.g. English Test I,1), your clan's name, your clan's average and the class average.
Shield Wielder	You've got your clan's back. As a warrior, use your <i>shield</i> to protect each member of your clan (except yourself) at least once.	Via <i>Edmodo</i> , send the dragoman a message with the reason why you had to protect each member of your clan and explain how this made you feel.
Amazing!	You keep your clan in good shape. As a <i>mage</i> , use <i>Mana Transfer</i> or <i>Fountain of Mana</i> to replenish the AP for each member of your clan (except yourself or other mages) at least once.	Via <i>Edmodo</i> , send the dragoman a message with the power your clanmates had spent their AP on before you replenished them and explain how this made you feel.
Tis But a Scratch	You patch up those in need. As a <i>healer</i> , heal ever member of your clan (except yourself) at least once.	Via <i>Edmodo</i> , send the dragoman a message with the reason why you had to protect each member of your clan and explain how this made you feel.
Guardian	You're no n00b. Reach level 10 in <i>Classcraft</i> .	Via <i>Edmodo</i> , send the dragoman a screenshot of your <i>avatar dashboard</i> (with your level).
Conqueror	Nothing can stop you. Reach level 15 in <i>Classcraft</i> .	Via <i>Edmodo</i> , send the dragoman a screenshot of your <i>avatar dashboard</i> (with your level).
★Overlord★	Your dedication and hard work have paid off! Reach level 18 in <i>Classcraft</i> .	Via <i>Edmodo</i> , send the dragoman a screenshot of your <i>avatar dashboard</i> (with your level).
Time is of the Essence	You understand the value of time. You haven't been late for a single English lesson for a whole term.	At the end of the term, send the dragoman a message via <i>Edmodo</i> and request this badge. The dragoman will verify your claim.

Badge	Challenge	How you can claim this badge
Never Forget	You're as organized as can be. You've brought all the material you need to every English lesson for a whole term.	At the end of the term, send the dragoman a message via <i>Edmodo</i> and request this badge. The dragoman will verify your claim.
★Flawless Memory★	You've made the most out of this school year and have brought your material to every single English lesson.	At the end of the year, send the dragoman a message via <i>Edmodo</i> and request this badge. The dragoman will verify your claim.
Memcache	You're using the most efficient way to absorb new vocabulary that there is. Collect 50,000 points on <i>memrise</i> .	Take a screenshot of your stats at memrise.com/home or of your rank on the "settings" tab in the app and send it to the dragoman via <i>Edmodo</i> .
Memmoth	You understand that studying regularly gives you the best chance of success. Collect 250,000 points on <i>memrise</i> .	Take a screenshot of your stats at memrise.com/home or of your rank on the "settings" tab in the app and send it to the dragoman via <i>Edmodo</i> .
Now I Am the Master	You embrace technology. You have taught your dragoman something new about using iOS or the apps you use for your English lessons.	Via <i>Edmodo</i> , send a message to the dragoman and describe what you taught him and explain how you yourself learned about this.
Veteran	You have seen more of Mercatopia than anyone else. You have survived many adventures, and now you are ready to pass your knowledge on to the next generation of heroes.	Tell the dragoman that you want to volunteer as a mentor for new <i>Classcraft</i> players. You will be their guide when they get lost in the dark forests of Mercatopia, and their instructor when they learn to use their powers.
Keeper of the Lore	You have earned the respect of the scribes. Make 20 useful contributions or modifications to the lore kept at the Tranquility Atheneum.	Visit mercaptopia.com/wiki , click on your username, and then on "Profile." Look at the number of "page edits." If you feel that the number shown includes 20 <i>useful</i> contributions, contact the dragoman via <i>Edmodo</i> and explain that you want to request this badge.
The Whole Hog	You are a completionist. You have submitted every side quest this year.	Via <i>Edmodo</i> , contact the dragoman and claim this badge. The dragoman will verify that you completed all side-quests.
Level Up	You are ready to move on. You have passed this school year and will continue your journey after the summer.	This badge cannot be requested. It is issued automatically at the end of a school year.

Appendix 10 Survey (10CM1 & 11CM1, January 2017, n=31)

Q3 Lesson Planning - Do you agree with the following statements?

- Q3.1 The teacher is enthusiastic about teaching and communicates this to the students.
 Q3.2 The teacher knows the subject matter.
 Q3.3 The teacher clearly explains the objectives of each class.
 Q3.3 The teacher uses class time effectively.
 Q3.5 The teacher makes the lessons interesting.
 Q3.6 The teacher makes lessons relevant to the real world.

Q5 Material - Do you agree with the following statements?

- Q5.1 The teacher presents material in a variety of ways (hands-on, group, written, orally, etc.).
 Q5.2 The teacher uses a variety of supports (blackboard, handouts, CD player,...)
 Q5.3 The teacher uses creative methods to help me understand the lessons and materials.
 Q5.4 The teacher writes legibly on the blackboard.

Q7 Classroom management - Do you agree with the following statements?

- Q7.1 The teacher manages a classroom that allows me to work and learn with few disruptions.
 Q7.2 The teacher has the respect of the students.
 Q7.3 The teacher respects students.
 Q7.4 The teacher enforces rules fairly and consistently.
 Q7.5 The teacher pays attention to me.

Q9 Critical Thinking - Do you agree with the following statements?

- Q9.1 The teacher encourages and accepts different opinions.
 Q9.2 The teacher involves students in decisions.
 Q9.3 The teacher encourages me to think for myself.

Q11 Communication - Do you agree with the following statements?

- Q11.1 The teacher communicates with my parents.
 Q11.2 The teacher is approachable and willing to help me.
 Q11.3 The teacher encourages cooperation and participation.
 Q11.4 The teacher understands what my life is like outside of school.
 Q11.5 The teacher knows my name.

Q13 Do you agree with the following statements?

- Q13.1 The teacher clearly explains the requirements and grading system of the course.
 Q13.2 The teacher clearly explains what is expected in assignments and homework.
 Q13.3 The teacher sets high standards and expectations for everyone.
 Q13.4 The teacher keeps me informed of my progress.
 Q13.5 The teacher quickly gives me feedback on assignments.
 Q13.6 The teacher believes that all students can learn.

Q14 Do you agree with the following statements?

- Q14.1 I always read the feedback on assignments.
 Q14.2 The teacher provides useful comments on assignments.
 Q14.3 I know how to use the information about my progress.
 Q14.4 The feedback on assignments motivates me to get better.
 Q14.5 The feedback on assignments tells me how to get better.
 Q14.6 I always write down the feedback that I get.
 Q14.7 I always read the feedback from the last assignment before the next assignment.

Q20 Do you agree with the following statements?

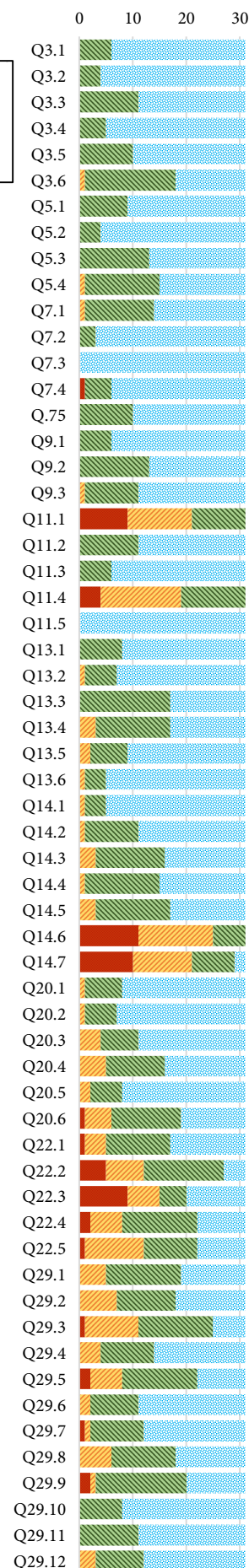
- Q20.1 The progress sheet the teacher shares with me on OneDrive is useful for me.
 Q20.2 I know where to find the progress sheet.
 Q20.3 I always look at the progress sheet when I know it was updated.
 Q20.4 The progress sheet is easy to read.
 Q20.5 Seeing the marks from every single exercise is useful.
 Q20.6 Seeing the diagrams with my progress for each skill is useful.

Q22 Do you agree with the following statements?

- Q22.1 I like playing video games.
 Q22.2 I like playing board games.
 Q22.3 I regularly play video games online.
 Q22.4 I try to earn achievements or trophies in video games.
 Q22.5 Achievements or trophies in video games motivate me.

Q29 Do you agree with the following statements?

- Q29.1 I think Classcraft is fun.
 Q29.2 I think Classcraft motivates me.
 Q29.3 I think Classcraft helps me become a better student.
 Q29.4 I actively try to gain experience points (XP) for Classcraft.
 Q29.5 I feel I am making progress in Classcraft.
 Q29.6 I understand how I can lose health points (HP) or gain experience points.
 Q29.7 I receive experience points when I deserve them.
 Q29.8 I know what Classcraft abilities I can learn when I level up.
 Q29.9 I know how to use my classcraft abilities.
 Q29.10 I help my clan.
 Q29.11 I am helped by my clan.
 Q29.12 I am happy with my clan.



The students' answers to the following open-ended questions are quoted verbatim.

Q1. Please indicate your gender.

male: 18

female: 13

Other (please specify): 0

Q2. Please indicate your class.

10CM1: 16

11CM1: 15

Q4. You can leave a comment about Q3 here if you wish.

The teacher is always motivated to work.

Q6. You can leave a comment about Q5 here if you wish. Skipped: 31

Q8. You can leave a comment about Q7 here if you wish. Skipped: 31

Q10. You can leave a comment about Q9 here if you wish. Skipped: 31

Q12. You can leave a comment about Q11 here if you wish.

For question 11, the one with the parents: there actually wasn't any need to talk to my parents

The teacher doesn't communicate with my parents but it isn't necessary.

Q15. In general, what do you do with the feedback on assignments?

Keep the constructive criticism in mind for the next assignment/test

I read the feedback on assignments and then I remember what I must do better in the next assignments.

I'm reading the assignments.

I collect the assignments and put them into the back of my folder

I read it and try to correct my mistakes I made.

Read it

I read it, and I think about it.

Sometimes I read it and try to improve on the next test.

Nothing just reading

I read it.

I read it and try to understand, to do it better the next time.

I read it and try to remember the feedback to not do the same mistakes next time.

read them and try not to do the same mistakes again.

I sometimes read it (not often) but I don't really care about it. If it is a feedback like "good work" I read it often??

I read them.

I read them and I try to apply the useful feedbacks for the next assignment.

I read it and show it my parents. And then we talk about the feedback and what I have to do better on the next assignments.

Often I just read them once and then I keep them in my mind.

I read them, to help me to get better for the next.

I read them and I try to improve.

I read it and then try to do better on the next assignments.

I read it and I make sure to remind the feedback for the next assignments

I read it and I keep it in mind for the following classes.

Q16. When do you want to know your test results?

as soon as possible: 25

when I get my test back: 6

Q17. When do you want to get your test back?

before correcting the test together in class: 25

after correcting the test together in class: 6

Q18. You can leave a comment here if you wish.

Everything is good.

Q19. How much information does your teacher provide about your progress?

not enough information: 0

enough information: 29

too much information: 2

Q21. What should be changed about / added to / removed from the progress sheet?

The progress sheet is good like it already is

It's not necessary to know the marks of every single exercise.

It is for me to be complicated to find me out in it.

I think it shouldn't be changed.

I don't understand the statistics with the %

nothing

The diagrams and the graphics

Nothing, the sheet is understandable and gives all the information I need.

I think it's good

nothing.

Nothing should be changed from the progress sheet.

I don't think that the diagrams are very useful, they don't give us extra information

I think there always are things we can change but it's

okay and I would not know what to change

I think the diagrams are a little bit too much.

Nothing

Nothing

Delete the diagrams

Q23. What do you think about achievements in class? (Example: "Achievement unlocked: be punctual for every lesson.")

What do you get back for those achievements

I think that it's good that we must be punctual for every lesson.

I think that it is a good idea.

Not fair for everyone, because there are people living quite far away and others just have to walk 5 minutes to get home.

It's a good idea but it takes too much time to unlock special achievement
 It's a good idea
 It motivates me a little bit for every lesson.
 It's a good idea that we can unlock achievements in class.
 I think it's a good idea.
 Yes, this could be a good idea because it is possible that those achievements will motivate other students
 I think it's a good idea because it motivates the students more.
 I think it is good for the students to learn for the future.
 It's good helps to motivate
 it's funny and we have fun
 good idea
 To be challenged in class makes it much more interesting
 It's a motivation for students.
 Achievements could be a good thing to try
 I think that it is kind of motivating, mostly when we know that in the end there will be a trophy.
 Achievements in class could be a good motivation for students such as being punctual for every lesson.
 It is a good motivation.
 I think it's a good possibility to make some pupils not to come late, because some of them could interrupt the lesson
 It is good it motivates the students to come at time
 I think they're cool and can be useful.
 Motivates the students
 I think it would be a good idea to test this out in class.
 Good

Q24. What kind of achievements should there be?
 When you arrive too late. When you forgot your homework.
 The power to eat during the class (like chocolate)
 Many little achievements but I don't know exactly what.
 I don't know
 There should be an achievement for being funny in class.
 I don't know.
 Like quiz cultural questions etc
 + points
 I don't know
 -be motivated in class -work hard -do homework...
 "Making the teacher laugh 10 times during the year"
 -be punctual for every lesson -learn the vocabulary -do your homework everytime -etc.
 - raise the hand at least 5 times in every class
 Achievements like: - don't forget your material during 1 week - be motivated and work in class during 1 week (and then 2 weeks, 3 weeks...)
 Maybe something like if you never come late or you never forgot something you get +2 in the end result of the average
 Maybe an achievement about good Teamwork.
 Get extra points for the next test, for example you start the test from 02 or 03/60 and not with a 01/60

Actually the same as what we gain EXP for in class.
Q25. On what devices do you play video games? (You can choose more than 1 answer.)

computer: 6
 mobile phone: 15
 tablet: 17
 game console: 24
 none of the above: 0
 Other (please specify):
 PS4
 GameCube
 I don't play games

Q26. In a typical week, about how many hours do you spend playing games? [average: 6.67 hours]

0 hours: 2 respondents
 1 hours: 6 respondents
 2 hours: 4 respondents
 3 hours: 3 respondents
 4 hours: 2 respondents
 5 hours: 2 respondents
 6 hours: 3 respondents
 7 hours: 2 respondents
 10 hours: 1 respondent
 15 hours: 2 respondents
 16 hours: 1 respondent
 20 hours: 1 respondent
 28 hours: 1 respondent
 30 hours: 2 respondents
 31 hours: 1 respondent

Q27. If you have a choice, what difficulty setting do you normally choose in video games?

easy: 1
 normal: 15
 difficult: 12
 very difficult: 0
 Other (please specify): 3

It depends on the game but mostly normal depends if it is the first time I normally play on "normal" (to get used to the game and learn the basics). If I already have played the game I try to play it again on very difficult.

Depends on the game: normal-very difficult

Q28. You can leave a comment here if you wish.

I think it's good that we didn't use our iPads too much.

Q30. You can leave a comment here if you wish.

Skipped: 31

Q31. What hero class have you chosen for this year?

Warrior: 12
 Mage: 10
 Healer: 9

Q32. Why did you choose that class for your hero?

I choose that Hero because I like her abilities.

I choose that class for my hero, because with this class I can ask things to the teacher when we have assignment, if I have enough XP

I don't know
 Because i like magic
 Because there were no other classes to choose (they were already taken)
 Because the clan thought I wouldn't loose the most healthpoints so I could help the others in the clan.
 Because nobody wanted to be the healer
 Mage has the coolest abilities.
 I choose it because english is a little difficult for me.
 I choose the "Mage" because i'm coming never late to the class.
 I chose this hero for me because i think it's the one that has the points i want to achieve.
 I just warnt to Support my teammates, like in Video-games
 Because I don't like the other two choices
 There where no choice left
 because i think this is good for me and to help my team
 I like the fact to be someone who can use special powers like the mage.
 it was the only one that i liked
 It was the only that I found interesting.
 Because i can heal myself and my m8tes
 So I can heal the members of my clan if they haven't enough health points.
 I choose the mage because I already chose it last year and I think that the mage looks best, I didn't know that all heroes can learn different powers. I now know it but I didn't when I choose it. If knew it I would probably chose another hero.
 Because I liked the abilities of the mage
 I didn't have a choice, it wanted to be healer ..
 I choose the Healer because with this class I can heal my clan members when they get hurt or need experience points.
 Because I like warriors
 I don't know
 I chose it because I always takes the mage hero when I play fantasy games.
 I like to heal.

Q33. Is there anything about Classcraft that frustrates you?

No: [answered 16 times]
 I thought that it would be more of a role game
 NO, I réal l'y like crasscraft
 I don't enter in my classcraft account.
 No there is nothing that frustrates me on Classcraft
 I don't always undrstand ween i lose ex points
 we should play more
 Sometimes you lose too many hp
 We level up and gain gp very slowly so you loose your motivation on classcraft I think that we should get much more gp (goldpoints) an xp. For example when we're not late we gain xp. I also find that we should get more often gp because we get enough xp but less gp...

No there is nothing specifcly
 Sometimes it takes soo long to level up.
 That it takes a lot of time to level up.
 We don't get enough xp.
Q34. What do you wish were different about Classcraft?
 That someone could participate more actively(playing it like a video game)
 I wish that you can receive experience points more quickly
 Nothing
 You can Not control your hero
 There should be a place you can choose to hide with your clan in the game.
 Nothing
 I think it would be nice if we could chat with our clans.
 Classcraft is ok. I wish nothing were different.
 It would be better that the skins are cheaper.
 More using it
 there were's more things to play
 Easier to unlock things
 nothing.
 More games
 Nothing
 I wish we would get more gp (goldpoints)
 Nothing
 Nothing, we could just involve Classcraft more in the lessons, because it's fun and it makes me understand more
 Maybe more Boss Battles or more outfits for our heroes.
 I don't know
 getting easier to receive points.

Q35. In general, what do you think about Classcraft?

Not bad
 I think it was a good idea to work with Classcraft because you can recieve experience /health points.
 I think Classcraft is funny and it's a good idea.
 It's cool
 It doesn't help me much for the English cours
 It's a really good game for students that are younger
 It's fun and it's helping me to learn.
 It's cool
 It's a good app.
 Classcraft is a good idea for the student, because I want to work with it.
 I think that it's a very good app for students.
 I think it's a fun way to motivate students to be better.
 Its motivating
 it's funny
 It's a cool idea
 It's vers good. I've never done this before and I think that's funny.
 It's interesting and it's different because we don't do that in other lessons.



I think it is a usefull app which can help the students to improve and to get better students by paying more attention in lessons to earn experience points on Classcraft. It's can be a good motivation for students to work harder at school.

I think it is a good game to motivate students
It's different but if I had to choose it again I wouldn't
I am very happy to do that in class because it motivates me to not come late in class or to use powers. The only thing is just we didn't use it very often, we only do the challenge of the day and that was it

I think Classcraft is a fun way to learn something and it keeps the class a little bit together. It's something new and it's exciting for us students, it's not like the other "normal" classes.

I think it's a good game. It motivates to go with a good mood in an english lesson.

It can be funny

I really like Classcraft because I kind of motivates me in class to participate as I can gain some EX at the end of each lesson.

Its fun.

I think Classcraft is a good way to make the lesson more interesting.

Q36. Is there anything about this class and/or teacher that frustrates you?

No [answered 19 times]

No, I really like my class.

Not really

the class don't commiunicate much , most of the people never talk to the other

Sometimes too loudly

Some class members keep talking in class even if the teacher tells them to stop and they permanently interrupt the lessons.

Some of the boys make noisy and a long of the time it is very frustrating because they have no respect (not always) and even if we say to stop they continue (it is more in other lessons than in English, because the teacher has (good) strict rules)

Some girls talk too much .

Our class keeps getting in fights with it selve or teachers and that really frustrates someone and demotivates sometimes.

Some people like to talk a lot.

The student's books

Q37. What do you like best about this class and/or teacher?

Fun class. Interesting lessons

I like that we are working together.

This class works good together and the teacher is funny and he makes us laugh.

I like the class because the students are nice and bring me to laugh

The teachers and the class are friendly

The ambiance

I like how the teacher explains difficult words.

He is always motived, his lessons are interessting.

The lessons are not to annoying.

I like it that we are not arguing with each other an that we are all friends.

The teacher always motivates us to participe in class and helps us if we have a problem.

The Students and some of the teachers

The variety ou thé lessons

we don't agrue

Nice people

I like that the teachers innovates the way of working in class with the Class Craft.

dont know, but it is an good class and also a very good teacher which tries to make every lesson intresting.

The teacher does everything more than alright, it is a good demonstration of a "perfect" teacher, we have fun in class, there is respect, everybody knows their limites and in my opinion the teacher does everything good!

It's interesting

that understand each other

I like that the teacher keeps the class quiet.

Sometimes it can be really fun with our class and teacher. good examples with the material we have to learn. It's simple to understand.

I dont know

We have good teachers and the class is better than last year

As I like the English language, I like the English class.

He is funny and VERY motivated!

Q38. What do you wish the teacher would do differently that would improve this class?

Nothing that comes my mind right now

More teamwork.

Doing less vocabulary test for 10marksbut to make this 10 marks in the test of 60marks

I have no wish

Nothing [answered 8 times]

More games

Nothing, it's already good.

I think he is doing a great job.

Often using informatic more games

More games and fun and so easyier to learn and progress

I think the english teacher is one of the teacher who makes the english lessons so easy and fun and there is nothing to change, he makes a lot of things very good! Maybe less validating the talkin in our class it doesn't matter if it is between boys or girls.

Nothing we have a good chemistry.

Q39. Think of the best teachers you have had. What are the qualities that made them good teachers?

They made the lessons very interesting and understood that I am a student who has a private life. -made me understand the lessons in a way I kept them in my mind
They often gives you bonus points. They are nice but have strict rules.

They explains everything good and so that I understand it.

Mme [redacted] because we could listen to music ween we worked in class alone (like a homework) she made everthing clear and the Test were quit easy and we made orales about your personal opinion
helpful and friendly

Everyone can be a good teacher on his own method
The teacher explained everything well but also in a dif-frent interesting way.

Funny and make games

They are always motived and organized, to ne organized is very important for me.They are also in a good mood.

They made jokes and they were funny.

They helped often the students, they spoke with them about they country an their hobbies.

They were helpful,motivating,honest.

He was funny and really a helpful teacher

Authority and never get bored

- interessting classes - games to learn - respect all of the students - unterstood us - was nice

good humor

They supported their students and innovated the way of working in class with projects.

Good teacher: - Makes lessons easy and funny - Has lim-ites and is strict but not too strict - Ask if EVERYBODY has understand the lessons - Prepares the pupil good for the next assignements (revision)

Easy ang they explained good

they were comprehensive

They were funny but at the same time serious and "streng"(German)

They understood us students and they understood that also as a l lieme student life can be really hard some-times and that sometimes you can't be motivated and work so much or have good grades.

not a boring lesson where I want to sleep, but an inter-esting lesson where I can answer the questions that the teacher asked, and not lessons where the teacher gives the answer of the question.

The way they explain things they made it so eas<

They were funny and tried to make the lesson interest-ing.

They make the lessons interesting but also funny. They are strict but can also be easy. They help the students and hear at them, when they have a problem.

Funny, kind, helpful and not give a lot of homework and make easy tests.

Kind but strict, not too much homework, funny

Q40. Is there anything else your teacher should know?

No [answered 11 times]

We could do more lessons with the Ipad.

No, everything is okay, he should continue with the good work.

Continue like this the lessons are often interesting

I don't think so

For some students it's sometimes really stressful with all these classes, homework and test. The most of us live not near from the LTB and they still have other hobby's so when you have to take the train and the bus to get home, to do homework, learn and go to the training afterwards it can be after a couple weeks very exhausting an that if we sometimes forget something it is not meant badly or disrespectful.

Yes, you're a good teacher Mr. Glod :)

I'm never bored in your lesson, you are a good teacher who can good explain. You always answer the questions we made.

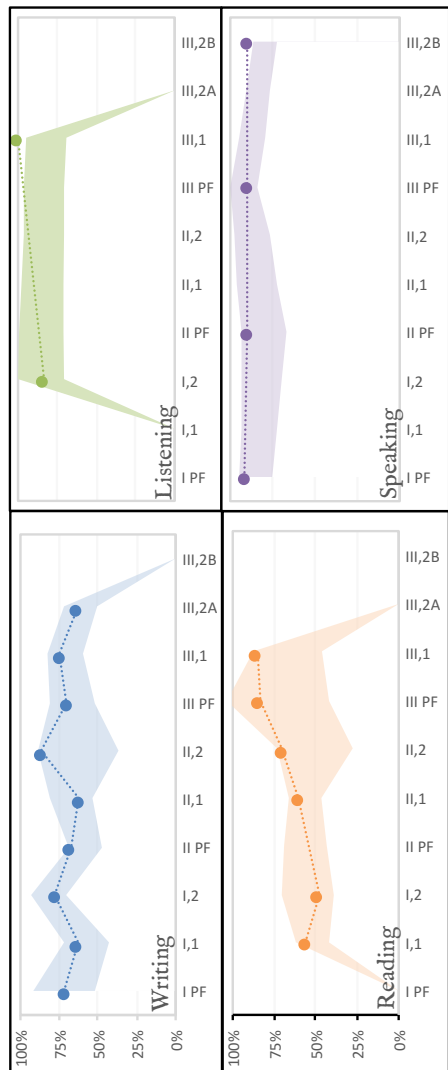
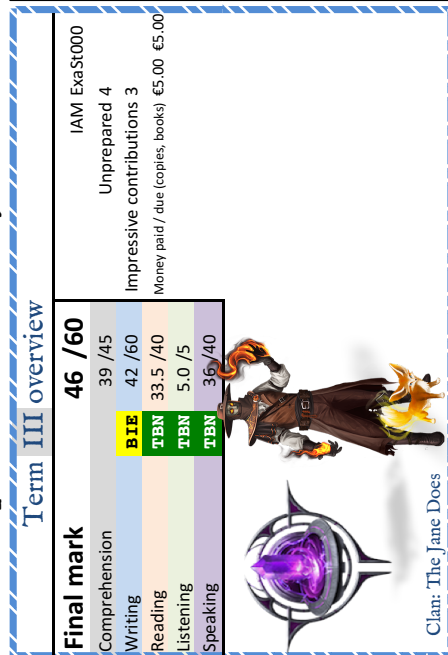
You are a good teacher

Nope everything's fine :-)

You're a good teacher, I like you !

That our teacher is a cool dude.

Class: Example Class. Subject: English. Teacher: G. Glod. LTB, 2017-18. 13



III PF		
Term III Portfolio	m	max
Final mark	48 /60	
Writing (Wrt)	14 /20	
Reading (Rdg)	25 /30	
Speaking (Spk)	9 /10	
Participation (Spk)	9 /10	
201170510 Voc9 (Wrt)	7.5 /10	
201170515 Smartphones (Wrt)	6.5 /10	
Reading Portf. 1 (Rdg)	4.5 /5	
Reading Portf. 2 (Rdg)	4 /5	
Reading Portf. 3 (Rdg)	4 /5	
Reading Portf. 4 (Rdg)	4.5 /5	
Reading Portf. 5 (Rdg)	4 /5	
Reading Portf. 6 (Rdg)	4 /5	
Rdg Portf. Deadline / Instr. (Rdg)	0 /0	

Your mark in Wrt and Rdg is better than the class average. Your mark in Rdg is much better than your own average. Use short sentences. Pay attention to linking devices. Note: dead (adj) ≠ death (noun). Keep track of punctuation.

REV SSV C:X D:-

III, 1																								
3 March 2017	m	max																						
Final mark	47 / 60																							
Writing (Wrt)	33.5 / 45																							
Reading (Rdg)	8.5 / 10																							
Listening (Lst)	5 / 5																							
<table><tr><th>Date & name (Wrt)</th><th>0 / 0</th></tr><tr><td>A Layout (Wrt)</td><td>1 / 1</td></tr><tr><td>B Electricity (Lst)</td><td>5 / 5</td></tr><tr><td>C Conditionals (Wrt)</td><td>6.5 / 8</td></tr><tr><td>D Quantifiers (Wrt)</td><td>3.5 / 8</td></tr><tr><td>E Quantifiers (Wrt)</td><td>2.5 / 4</td></tr><tr><td>F adjectives, adverbs (Wrt)</td><td>2.5 / 4</td></tr><tr><td>G Known texts (Rdg)</td><td>8.5 / 10</td></tr><tr><td>H Essay C&S (Wrt)</td><td>7.5 / 10</td></tr><tr><td>H Essay UoE (Wrt)</td><td>8 / 10</td></tr><tr><td>Correction (Wrt)</td><td>2 / 0</td></tr></table>			Date & name (Wrt)	0 / 0	A Layout (Wrt)	1 / 1	B Electricity (Lst)	5 / 5	C Conditionals (Wrt)	6.5 / 8	D Quantifiers (Wrt)	3.5 / 8	E Quantifiers (Wrt)	2.5 / 4	F adjectives, adverbs (Wrt)	2.5 / 4	G Known texts (Rdg)	8.5 / 10	H Essay C&S (Wrt)	7.5 / 10	H Essay UoE (Wrt)	8 / 10	Correction (Wrt)	2 / 0
Date & name (Wrt)	0 / 0																							
A Layout (Wrt)	1 / 1																							
B Electricity (Lst)	5 / 5																							
C Conditionals (Wrt)	6.5 / 8																							
D Quantifiers (Wrt)	3.5 / 8																							
E Quantifiers (Wrt)	2.5 / 4																							
F adjectives, adverbs (Wrt)	2.5 / 4																							
G Known texts (Rdg)	8.5 / 10																							
H Essay C&S (Wrt)	7.5 / 10																							
H Essay UoE (Wrt)	8 / 10																							
Correction (Wrt)	2 / 0																							
Your mark in Wrt, Rdg and Lst is better than the class average. Your mark in Rdg and Lst is much better than your own average. There were some issues with the logic of your ideas. Also revise the linking devices used to contrast ideas.																								
S-V S-V D:O																								

III, 2A		m	max
Final mark		19	30
Writing (Wrt)		19	30
Name & date (Wrt)		0	0
A Vocabulary File 10 (Wrt)		7	9
B Relative Clauses (MC) (Wrt)		1	5
C Question tags (Wrt)		4	6
D Relative clauses (Wrt)		6	10
Correction (Wrt)		1	0
Your mark in Wrt is better than the class average.			

III,2B		m	max
Final mark		27	30
Speaking (Spk)		27	30
Visuals & Content (Spk)		6	6
Presentation skills (Spk)		6	6
Pronunc. & Fluency (Spk)		5	6
Use of English (Spk)		4	6
Lexis (Spk)		6	6
Sources ()		v	
Your mark in Spk is better than the class average. Elegant pres, fluent+, v: singular vs plural, slight mispron.			
R: S: C: D:			

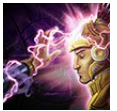
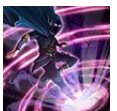
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R = received; S = signed; C = corrected; D: delayed *n* times; TBN: très bien; BIE: bien; SAT: satisfaisant; INS: insuffisant; NEV: non évalué

Appendix 12 Hero Powers

The powers marked with an asterisk are presets whose effect and description Classcraft does not allow teachers to modify (though they can be and have been renamed), since they directly affect the stats of other players. Powers marked with two asterisks are based on feedback I received from my 10e students at the end of 2016-17. The graphic representations of each power are taken from the game.

Powers for the Mage (who has 30HP and 50AP)

- I. *Mana Transfer.* (35AP) All team members, except mages, gain 7AP.* This power makes the mage the backbone of the clan. Without her, other players need to wait significantly longer before they can activate their powers. 
- II. *Intercept.** (21AP) The mage can activate any non-cooperative power of another player if enough AP are left.* This power allows the mage to occasionally claim other players' rewards, without affecting that player. Since it costs 21AP, doing so is "pricier" than it is for other roles. Due to the mage's maximum AP, powers that cost 30AP are excluded from this. It also leaves the mage in a position from which it is difficult to support her team. 
- III. *Stealth. (5AP) For a brief time, nobody notices that the mage is not speaking English.* This power affects how students can behave during lessons. The implementation of this power suffered from my lack of rigour in maintaining its mechanics. I often overrode it by deciding on a case-by-case basis whether I would allow students to speak their first language. 
- IV. *Mana Shield.* (3AP per HP) The mage prevents the loss of HP to themselves.* This power supports a student's need for autonomy. It allows her some control over how penalties affect her. 
- V. *Loaded Dice.*³⁴ (20AP) While one mage distracts the rider of Vay, the other swaps the random event of the day out for a new one (needs 2 mages, max 1x/week).* This power gives students slightly more control over a situation which is marked by unpredictability. Random events make heroes face unexpected positive or negative situations. They are discussed in detail in section 11.2. 
- VI. *Time Warp. (35AP) The mage can hand in an assignment one day later (non-cumulative).* This offers the mage an increased sense of autonomy in relation to externally set goals. 

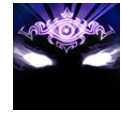
³⁴ The original power, "Cheat Death," allows a student to reroll the "Cursed Die." As discussed in section 9.2, I find this deeply problematic. Since this power cannot be edited, I will instead have to circumvent the limitations of the platform and manually deduct AP when players use *Loaded Dice*.

VII. *Fountain of Mana.* (40AP) A teammate, who isn't a mage, replenishes all of their AP.*



This power is very similar to I, with the difference that it focuses on one player. It allows for a more strategic use of this transfer of AP, depending on what kind of support the clan is in need of.

VIII. *Clairvoyance. (40AP) The mage sees clearly now and can re-write a portfolio assignment.*



This being one of the strongest powers the mage has, it surprises me that, so far, no students have made use of it. It has a strong connection to the concept of the freedom to fail.

As such, it should help with anxiety in certificative situations: portfolio assignments are tests of 10 marks which are compiled into an additional test worth 60 marks at the end of term. It also supports the need for competence: low grades are no longer interpreted as definite failures but as setbacks a learner can remedy by proving her learning at a later date. One concern of this power is the additional workload created should the power ever become popular.

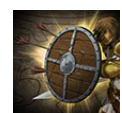
IX. *Supernova. (40AP) The mage makes one vocabulary item go up in flames. It will not appear in any portfolio vocabulary tests.*



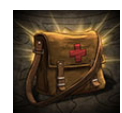
This power allows a student direct control over the material she and her peers have to study and, as such, contributes to her sense of autonomy. In practice, when this power is used, I create a simple animation that shows the hero turning the word to ashes. This serves as strong visual feedback; at the same time it anchors the word in the learners' mind and thus mitigates the fact that they will not actively study it. Indeed, the very attention required to "skip" this item while studying may actually increase retention, though further research is required to support this theory.

Powers for the Warrior (who has 80HP and 30AP)

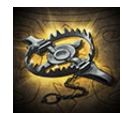
X. *Light Shield.* (10AP) The warrior can take up to 10 damage instead of their teammate, receiving only 80% of the initial damage.* This power supports relatedness: other members of a clan rely on the warrior to lessen the effects of their penalties.



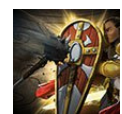
XI. *First Aid.* (10AP) The warrior gains 1HP for every level they have, but always gains at least 5HP.* This power is similar to IV. It will be most useful to those warriors who take the brunt of the damage their clan takes, yet for some reason are not supported by their healers.



XII. *Agility. (5AP) The warrior can avoid getting stuck and can briefly use a language other than English.* See III.



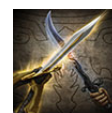
XIII. *Heavy Shield.* (15AP) The warrior can take up to 20HP in damage instead of their teammate, receiving only 65% of the initial damage.* See X.



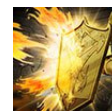
XIV. *Ambush. (20AP) The warrior can hand in an assignment one day later (non-cumulative).* See VI.



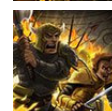
XV. *Counter Attack.* (20AP) *The warrior can ask for one translation during a non-vocabulary test. It will be shared with all heroes.* This power allows a learner to maintain her sense for competence. In my experience, students sometimes manoeuvre themselves into situations in which they get stuck on a single word that they cannot find in English. They become stressed, which disproportionally affects the rest of their test. A *Counter Attack* allows warriors to start a test with a failsafe, which reduces anxiety.



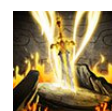
XVI. *Fire Shield.** (20AP) *The warrior can take up to 30 damage instead of their teammate, receiving only 50% of the initial damage.* See X and XIII.



XVII. *White Flag.*** (30AP) *In the lesson before a written portfolio test, the warrior announces he or she will write that test one week later.* The ability to “reschedule” certificative moments is in line with other powers that support autonomy. The results of any certificative moment can be strongly swayed by factors outside of the task used for assessment, such as obligations in a student’s private life. This power, to some extent, allows the learner to take a test when she is ready, or to distribute her workload more evenly. As such it is a more sustainable and regulated way to support students who might otherwise play truant on test days. One might think that this would increase my workload since I now theoretically have to set up two tests. However, looking at attendance for such tests in 10e and 11e classes over the last few years, I notice that there is almost always at least one student who is absent. In practice, then, I have been setting up two tests anyway.

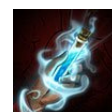


XVIII. *Not Today.* (30AP) *You move a deadline back by one day for all members of your clan (non-cumulative).* This power is similar to VI but affects all members of a clan, and as such has a stronger effect on the player’s sense of relatedness. It also increases the player’s sense of autonomy since she has more control over external obligations.

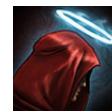


Powers for the Healer (who has 50HP and 35AP)

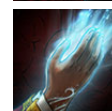
XIX. *Melody of Repose.** (15AP) *A teammate gains 10HP.* Healing is the core power of this role.



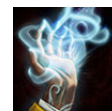
XX. *Telepathy.* (5AP) *The healer briefly speaks with the tongues of the angels and is understood without using English.* See III and XII.



XXI. *Second Hand.* (25AP) *Every hero gets one extra minute to beat a test (max 1 use per hero and per 15 minutes).* This power supports the learners’ feeling of control in a test situation, thus reducing anxiety. It benefits all heroes in a class and therefore strengthens the social bond the player has with her peers. In practice, any test that lasts 15 minutes or fewer can be extended by one minute at most. A test which lasts 90 minutes, as most of my 10e and 11e tests do, can be extended by 6 minutes at most.

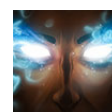


XXII. *Song of Healing*.* (20AP) A teammate gains 20HP. This is a stronger version of XIX.



XXIII. *Meditation*.** (20AP) During a test or written portfolio activity, the healer can ask the dragoman if his/her answer to one item is correct (max 1 use per test). This power is designed to give the student a greater sense of control in a test situation *without* directly increasing the summative results or simply providing a finished answer. (My tests do not include true/false items.) If the item was correct, the student has merely received confirmation for something she has already solved. Otherwise, the student now has a chance to re-evaluate her answer, which still requires her agency. It encourages her to give additional thought to her answer. Still, the final effect on her overall mark, if there is one, remains modest.

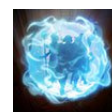
XXIV. *Revive*.* (25AP) When a teammate (not including the healer) falls to 0HP, they avoid all penalties and come back to life with 1HP. None of my students have used this power so far. I believe that its use will depend on the attitude of a clan towards the actions of a player who has fallen in battle, as described in XIX.



XXV. *Symphony of Restoration*.* (20AP) A teammate gains 30HP. See XIX. Like some other powers, the result of this upgraded healing power feeds a reverse flow mechanic.



XXVI. *Healing Circle*.* (30AP) All team members, other than the healer, gain 15HP. This power is similar to I in that it affects all members of a clan. Its main function is to allow more strategic choices, depending on the situation a clan finds itself in. The parameters of this power are problematic since the effect changes significantly depending on the size of the clan.



XXVII. *Seven Blessings*. (30AP) The healer can ask for an additional portfolio activity which replaces the weakest of the other activities (min. 2 weeks before the end of term). This power supports self-determination, since it does not directly equate to additional marks. Rather, it supports the learner's sense of competence. It gives her one more opportunity to demonstrate her learning. This may lead to additional workload for the teacher, but the impact is limited since the power can be used only once per term.

