



STUDENT SESSION

WEB APPLICATION FOR READING ENCOURAGEMENT THROUGH GAMIFICATION

Anja Busić¹,
[0009-0003-6183-4295]

Jovana Lončar²,
[0009-0000-0270-4376]

Aleksandar Petrović^{2*}
[0000-0003-3324-3909]

¹Student,
Singidunum University,
Belgrade, Serbia

²Singidunum University,
Belgrade, Serbia

Abstract:

The purpose of the paper was to examine the benefits of using gamification to encourage reading for leisure. Recreational reading has been proven scarce in adolescents and it is crucial to turn technology that is often the cause into a motivational tool. This is accomplished by developing an app that uses gamification methods relying on the psychology of motivation, mainly Self-Determination Theory, and the Octalysis framework that proposes eight core drives that motivate people in every aspect of life: meaning, accomplishment, empowerment, ownership, social influence, scarcity, unpredictability, and avoidance. The application uses those core drives to further encourage users to build their reading habits, providing them with features like tracking what and when they are reading, levelling up whenever they read, generating statistical graphs, or viewing and decorating a digital bookshelf with realistic animations. The paper goes deeper into each feature and gives an example of how it motivates users to read.

Keywords:

Leisure Reading, Reading Motivation, Web Development, Gamification, Octalysis Framework.

Correspondence:
Aleksandar Petrović

e-mail:
aleksandar.petrovic@singidunum.ac.rs

INTRODUCTION

Reading books has always been beneficial and necessary, it stimulates the brain, develops empathy and critical thinking, expands the vocabulary, and improves creativity and comprehension. It has a great cultural and social impact, and it can even improve health and wellbeing. Despite all that, there are studies that show reading for pleasure has greatly decreased in adolescents and that picking up a book of their own volition is unlikely [1]. There are different studies depending on the country, but most of them report the same findings, that motivation to read is at an all-time low, with a drastic decline in percentages of young people reading regularly, or even wanting to read, between the years.





With the rise of short form content and the easy access to social media and other technologies through smartphones and computers, which are often to blame for into the aforementioned decline [2], it is imperative to try and use these technologies for good, mainly to encourage critical thinking and build healthy habits. Since there are already useful things technological advancements have done for education, such as easier access to books in digital formats or lower costs, it is not hard to imagine that more can be done to raise awareness of all the benefits of using technology with the purpose of helping individuals build a habit out of reading. Since digital content, mainly social networks, can also pose a distraction to individuals with a lower attention span, it is beneficial to find a solution which can turn it into an advantage. One of the aspects that has been shown to accomplish those goals is gamification.

Gamification brings game elements into non-game spaces, making something that otherwise might seem tedious or repetitive more fun, with the purpose of encouraging continuous engagement and self-development [3]. It uses different tactics to accomplish this, like level progression and earning points or collectables, although that's not the only thing that defines it. It is important to distinguish it from a regular game, which has a specific structure and set of rules. It only uses game-like mechanics to give individuals tools to develop problem-solving skills and sustainable habits, and it has real-life applications and influences. Gamification has been proven useful in numerous studies on its integration into education, making an impact on academic performance, motivation, children's development, teamwork, and satisfaction. When used correctly, it enhances performance while providing enjoyable learning material and redesigning difficult tasks into fun and more meaningful behavioural model-based approaches.

Gamification can't be mentioned without also touching upon self-determination theory (SDT), which is repeatedly used in research papers on motivation [3]. The most important aspect of this theory is what motivates individuals. It differentiates two forms of motivation: intrinsic, an internal impulse to act for personal satisfaction and curiosity, and extrinsic, an impulse to act solely to obtain external rewards or social praise [4]. While most of gamification methods provide extrinsic motivators, it can be used to combine it with intrinsic ones, relying on the former to provide and build the latter. To successfully accomplish this task, three basic needs need to be satisfied: autonomy, competence, and relatedness [4]. Relying on this aspect of SDT, game elements in

non-game settings need to provide choices and encourage individuals to make their own decisions, provide meaningful feedback and challenges, and encourage interactions with peers. There are different implementation methods and frameworks of gamification, but the most relevant one that seeks to cover the main aspects of SDT is the Octalysis Framework.

Octalysis, a term coined by Yu-Kai Chou, is a gamification design framework used to improve learning and wellbeing in different aspects of life [5]. It doesn't focus on game elements, but on how those elements motivate individuals, using eight core drives that Chou termed: meaning, accomplishment, empowerment, ownership, social influence, scarcity, unpredictability, and avoidance. Each of them introduces something meaningful into a learning or a habit-building process, relying on something more than the bare technical aspects of gamification.

This paper will focus on the benefits of using these tools in web development and how gamification can encourage reading habits, specifically by designing and implementing these elements in the application for tracking users' reading, discussing, and browsing books.

2. BACKGROUND

The best way to motivate individuals to read is to understand what the driving factor is and what psychology lies behind gamification. Driving factors can depend on the individual and the environment, while gamification can have a positive or negative influence based on the context in which it is used. Since gamification's main objective is building and maintaining motivation, and Octalysis concerns itself with the best use of each motivational factor in the most beneficial way, this paper will give a brief overview of findings on each of these concepts and how they tie together.

2.1. GAMIFICATION

Gamification is the integration of game-like mechanics in non-game environments to encourage a specific habit or behaviour [6]. It involves points, badges, and leaderboards, commonly referred to as PBL, but just like in any game, those are not the only things that comprise it and make things more engaging [6]. There has to be a sense of one's importance, personal improvement, and motivation, as well as the right kind of feedback. These aspects can be used to encourage a will to learn or for developing habitual behaviour, but they are not the



solution when used as isolated tools. There needs to be an understanding of each game-like mechanic and how to combine them, as well as their influence on each individual and the behaviour it produces, for gamification to be used to the best of its ability, according to a review [7]. This review, concerned with exploring the limitations of gamification research and its implementation in higher education, found that it is an unexplored and misunderstood topic, with most projects using gamification elements in educational settings without an apparent thought-out process or psychological understanding behind it, picking game elements at random and without a proper framework. Additionally, most of them focused more on gamifying user profiles but not the content itself. Lastly, projects usually rely on generalization or providing a product to broad groups of people, without taking into account personal needs.

2.2. MOTIVATION AND SELF-DETERMINATION THEORY

Motivation is generally characterized by internal and external forces that can influence an individual on cognitive or behavioural levels [8]. The most recognized theory concerning motivation is Self-Determination Theory, which divides motivation into two categories, intrinsic and extrinsic [4]. In an article that uses SDT to strengthen gamification values in education, intrinsic motivation is defined by an individual's own wish to act or learn for the enjoyment or challenge it could provide [3]. Extrinsic motivation is based on acquiring external rewards, like badges, points or even money. Intrinsic motivation has long-lasting effects on building habits or skills, while extrinsic motivation is more temporary. Despite that, one can be used to build upon the other, and gamification provides us with the tools to do so.

A study conducted in Scotland, UK, which drew upon SDT to reflect on the findings, aimed to determine what motivates young people to read. There were six themes that they encountered: access, choice, autonomy, relatable messaging, social factors, and environments conducive to reading [1]. A similar survey was done in Serbia, which explored recreational reading habits of adults. They interpreted six factors: individual development, escapism, boredom relief, education, stress relief, and aesthetic enjoyment [9]. Those are only some of the studies conducted, but most report the same: that reading motivation is multifaceted and that it varies from individual to individual, and it is important to take that into account when using motivational tools in hopes of encouraging a habit or behaviour.

2.3. OCTALYSIS FRAMEWORK

Yu-kai Chou, an entrepreneur, speaker and gamification pioneer, developed a design framework for using gamification in variety of life environments, utilizing its full potential while avoiding negative influence that arises when gamification is misconstrued or used solely based on points and leaderboards [5]. He noted how, when asked what makes a game fun, individuals respond that it is not numbers, but the fact that it poses challenges, encourages creative problem-solving, and provides social interaction or personal improvement. Thus, Octalysis framework was coined, which is built on eight core drives, based on how they motivate individuals. These core drives are: epic meaning and calling, development and accomplishment, empowerment of creativity and feedback, ownership and possession, social influence and relatedness, scarcity and impatience, unpredictability and curiosity, and loss and avoidance. Understanding each one and correlating them to motivational theories and studies related to reading motivation, gives an invaluable foundation for developing an application that aims to deepen reading comprehension and form habits in individuals.

3. GAMIFICATION METHODS USED TO ENCOURAGE READING

By bringing in basic principles of gamification, using the needed Octalysis framework core drives, and tailoring the content to fit each individual's motivation, a simple habit tracking app can evolve into a learning and enriching tool. The paper will first show the main features of the app, and then elaborate further on each one, correlating them to a gamification method used to make the user experience more enjoyable and productive.

3.1. CONCEPT OF THE READING JOURNAL APPLICATION

The Reading Journal is a web application where each user can make a profile to track their reading habits, view their progress and statistics, and browse their digital bookshelves. The main features of the app can be seen in Figure 1, which shows a navigation bar starting with a user profile, followed by different Library pages that they can explore: my bookshelf, reading log, books, achievements, and graphs.



The user profile contains basic personal information about the user, their role (librarian if they have admin privileges, user if not) and the most important in the context of this paper, their level and a progress bar with information about earned or needed points, as shown in Figure 2. The level is calculated by the number of books or pages read, but bonus points are awarded if achievement goals are met.

Users can add books to their reading log, based on what they are reading and when. Figure 3 shows an example of this log, where each book is displayed in a table with the cover image, title and author, status - which can be reading, completed, and to be read (TBR), start and end date, and finally buttons for editing or deleting each log. At the top right corner, there is a button to create a new log, which prompts the user to fill a form for the book they want to add, asking for the information mentioned above.

Based on the data users track in their reading log, different types of graphs are generated, such as number of books read each month, most read authors or genres, and similar. In Figure 4, there are some examples of statistics being tracked: in the top left corner there is a bar chart that shows the number of books read each month, with an adjustable range using a date picker; in the top right corner there is a line chart showing the number of pages read each month with the same adjustable range; in the bottom left corner there is a pie chart showing books read based on their status, and in the bottom right corner the same type of chart is shown tracking read books based on their page number.

Furthermore, there is a visual representation of the user's bookshelf with realistic animations; every book from their reading log that is completed is automatically added to the shelves that they can rotate, while the books

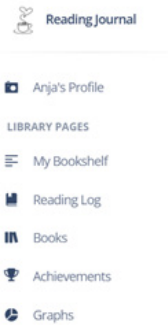


Figure 1. Navigation bar listing main features

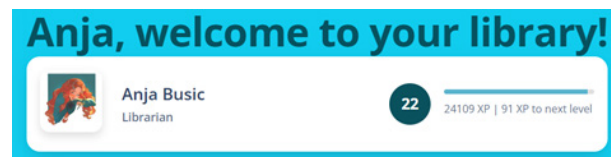


Figure 2. User profile banner with level progression

BOOK	STATUS	START DATE	END DATE	
The End Samuel Beckett	tbr			Edit Delete
Devils Fyodor Dostoevski	reading	2026-04-15		Edit Delete
Perfection Vincenzo Latronico	completed	2024-04-02	2024-08-12	Edit Delete

Figure 3. An example of a user's reading log



on them can be pulled out, put back in, or leafed through for notes and reviews, or they can just be used for easier browsing of their collection. This feature gives the user access to their personal library in case they are away from it, or, to the ones who mainly read digital and audio books, a visual representation of what their library might look like. It also makes it easier to pick, choose, and organize books, which can become tedious or difficult in real life.

The shelves as a whole are placed in a scene, which means users can fully rotate them to see their library from different angles, an example of which is shown in Figure 5, with books stacked on the shelves with spines upright and facing the front.

Books themselves are objects that can be moved independently of the shelves, so when the user clicks on the spine of the book, it slides out and rotates so the cover is facing the front, as shown in Figure 6.



Figure 4. Some examples of statistical graphs



Figure 5. View of the user’s Bookshelf when rotated



Figure 6. An example of the book that’s been pulled out from the bookshelf



3.2. GAMIFICATION FEATURES

Level progression motivates users by showing them a visible progress bar, a visual representation of their improvement and achievements, which is what the development and accomplishment core drive represents [5]. Additional features such as customizable reading streak and achievement badges awarding bonus points use short term gratification by breaking down progress into smaller, more manageable parts, making users read more to achieve these goals and collect rewards. Ownership and possession, a core drive that motivates users to accumulate things of value, something that they possess and therefore need to care about, can also be tied to collecting points or badges through achievements [5], or the books themselves that they are accumulating on the shelves. Loss and avoidance can also be tied to reading streaks, milestones that users can set that aren't broken as long as reading is done continuously in the amount and time specified. Users are less likely to break a habit when it is being tracked in this way because they are afraid of something bad happening, in this case losing all their hard work accomplished so far.

Social interaction and influence are integral to reading motivation, according to the study about recreational reading in Serbia [9]. Knowledge gained from reading provides individuals with broader topics and different viewpoints, so they can communicate easier and build empathy. This is further validated by the social influence and relatedness core drive. The usefulness of those claims can be observed in the visualization of a user's library. Seeing other's progress against one's own would incentivise individuals to read more often to surpass other users or keep up with them to stay relevant in book discussions, but it would also encourage bonding of the like-minded individuals in the form of book clubs.

Unpredictability and curiosity are the elements that make makes individuals want to finish something that they don't know the outcome of [5]. It is the very drive that makes individuals finish a book, so it follows that the application dedicated to readers can be a catalyst for it. Additionally, there could be hosted book lotteries, so users get invested in particular books that they might win, either based on the luck of the draw or some milestone that they need to reach before everyone else.

Statistical data that can be generated turns all the inputted progress and habits into numbers and percentages, making it tangible and more cohesive, a sort of at-a-glance review, which can make reading fun and interactive. It can also make users reflect on their habits, especially regarding dedication to genres, to broaden their reading, or let them see what works best for them.

3.3. FURTHER IMPROVEMENT

There are two underutilized Octalysis core drives that are not shown in the section above, but will be added to the application in the future. It's important to go over them to show how they can improve and strengthen the motivation for reading.

the user is motivated because he is an integral part of the story, his decisions have meaning and palpable outcomes [5]. This can be implemented by creating a narrative around the bookshelf, where each user is saving books by completing them and putting them on the shelves, away from imaginary danger such as book burning or banning.

Empowerment of creativity and feedback core drive relies on giving users the building blocks to play with and develop creative uses for, then adjust based on given feedback, according to Yu-kai Chou [5]. Each book on the shelf could be that building block, letting users organize and personalize their shelves by moving them around as they like. Adding collectable decorations for the shelves further exemplifies this idea, allowing users to channel their creativity into building a perfect bookshelf, and by enabling users to visit and comment on each other's shelves they would get the needed feedback to improve that creativity.

4. CONCLUSION

The purpose of the paper was to demonstrate the positive outcome of using the psychology of motivation to develop long-lasting reading habits. Multiple studies have revealed similar results on what motivates people to read, and all of them rely in some way on Self-Determination Theory, which essentially divides all motivation into extrinsic and intrinsic. Extrinsic motivation may be temporary, but through careful implementation and correlation to intrinsic motivators, it can be used as a tool to build upon more permanent motivation. Through gamification, this can be accomplished if the focus is on the content of the application as much as on the user profile. There are countless applications that rely only on some gamification elements, while forgetting others. The Octalysis framework proves to be a strong guide in avoiding this, facilitating web development of a meaningful application that uses the full potential of gamification by combining two types of motivation that SDT proposes. The paper showed how some core drives can be connected to reading encouragement through the app, like levels and achievements breaking



big tasks into more manageable and smaller parts to create a sense of progress, or a social community that can be built around exploring and discussing users' shelves and books. For some core drives, a hypothetical situational use is proposed, which calls for further development and integration in the application. Ultimately, each individual has different motivators, and the perfect gamification method is the one tailored to a person's experience and personality. As one survey found, the most common motivators for readers are a wish to learn, escapism, self-enlightenment and stress relief [9]. There is no uniform solution to fulfil those needs, but using core drives that correspond well with them is the key to the perfect app for readers.

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