Fostering Self-Regulation, Motivation, and Creativity Through Gamification Software iWrite

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Abstract: Students and academics face a range of challenges when writing, including a lack of motivation, self-regulatory skills, and creativity. To address these difficulties, the Cluster of Excellence Image Knowledge Gestaltung at Humboldt University has developed a gamification writing software called iWrite. In this article, we introduce the development process of the software and its features – including gamification features such as progress bars, points, a planner, streaks, visualization, and levels – as well as additional practical writing-supportive features such as proofreading and time and activity tracking. iWrite provides valuable game features that promote the development of efficient and enjoyable writing habits. Research indicates that gamification features like these can be a powerful tool in enhancing writers' motivation and self-regulation when engaging in creative tasks like writing. While the software development is finished, a systematic evaluation of it is planned within the EU-FairPlay project beginning 2024. The study aims to evaluate consistency of usage and impact on writing progress on students testing the software over several weeks. The result is expected to show, which game mechanics are working well in context of academic writing.

Keywords: Gamification, iWrite, Motivation, Self-regulation, Creativity

1. Introduction

Writing is a critical skill that plays a vital role in academic, personal, and professional life. However, many students and academics struggle with writing tasks due to various reasons, such as a lack of motivation and self-regulatory skills (Schunk and Zimmerman, 2007). As a result, the creative outcome of the writing task may suffer due to procrastination and frustration (Ivcevic and Nusbaum, 2017). To address these challenges, educators have developed various tools and applications to improve students' motivation with game-based approaches (Bal, 2019; El Tantawi et al., 2018; Wiethof et al., 2021) In this paper, we will introduce a gamification writing software iWrite and explain how it can facilitate the development of self-regulation and motivation, which leads to better creative outcomes in writing. The game based approach has been chosen by researchers of gamelab.berlin / Humboldt University, because feedback mechanics and interactive functions from games have shown to improve motivation for longer processes with breaking them down to more motivating and rewarding units. The interdisciplinary team aimed to proof, that carefully designed game mechanics can help students and academic researchers to fulfil their writing tasks, quicker, more sustainable and with more joy.

2. The iWrite Software

2.1 Development of iWrite

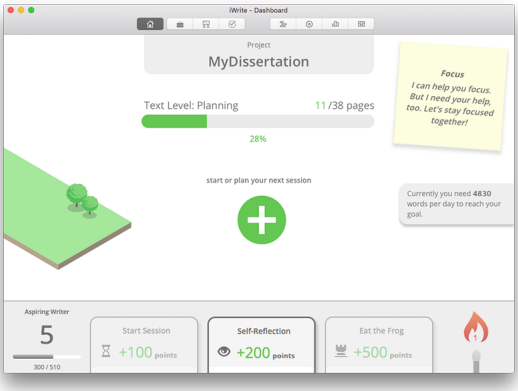

Figure 1: Startpage of iWrite

iWrite was developed at the Cluster of Excellence Image Knowledge Gestaltung at Humboldt University Berlin in gamelab.berlin. This was preceded by several years of development of the "Diary" software, which was designed to record how interdisciplinary teams work and to gain insights into how, when, and in which modes work is done. The software was able to record, categorize and visually analyze activity times and program usage. The app was developed natively in Objective-C and is available for macOS. After completing the work on it, great potential for further development was identified in the existing code base and the idea was developed to now make one of Diary's results the new objective: To support the writing of complex academic papers.

2.1.1 Problem identification

It had become apparent in the use of Diary that periods of continuous, uninterrupted, concentrated work were difficult to sustain for many academics. This was identified as one of the major obstacles in academic careers and was also described as such by the participants. The aim should therefore be to provide dedicated support for scientists working on larger textual projects such as theses, doctoral dissertations, monographs or post-doctoral theses. Such support appeared to be possible primarily through mechanisms known from game design.

2.1.2 Developmental process

The Diary project thus merged into the iWrite project at gamelab.berlin, which focuses on combining knowledge and cultural work with game design and gamification. The interdisciplinary team of gamelab.berlin interviewed numerous colleagues at the Cluster of Excellence and recorded requirements, wishes, descriptions of everyday life, problems and ideas. A game concept was developed that was based on the idea of generating motivating and descriptive feedback where there is normally none. According to the findings from the interview, iWrite should make progress visible, point out achievable milestones, give practical tips on the writing process, and create a lightweight, playful atmosphere. The team evaluated numerous game mechanics to achieve this and decided on a mix of different systems that would interlock and complement each other.

Based on the investigation and software design, the current iWrite software includes a range of mechanics and gamification features to motivate writers, including progress bar, points, planer, steak, visualization, and levels. These gamification features are align with game design elements, which are fundamental building blocks of gamification applications, featured prominently in gamification research (Zainuddin et al., 2020). Research studies have demonstrated that numerous gamification features are conducive to users' self-regulation (Li et al., 2022), motivation (Bal, 2019) and creativity (Barata et al., 2013; Xu and Hamari, 2022).

2.2 Gamification Features of iWrite

2.2.1 Progress bar

The core of the mechanic was a progress bar that appears at the edge of the screen during each writing session. This bar shows the number of words written or the elapsed time, depending on the mode. The constant visibility also gives a visible progress within the writing sessions, an achievable goal and a sense of a certain concentrated working mode that also comes back to an end. The previously indescribable sense of constant work pressure without visible progress and indefinable endpoint, is thus made concretized, definable, and visible through iWrite's progress bar.

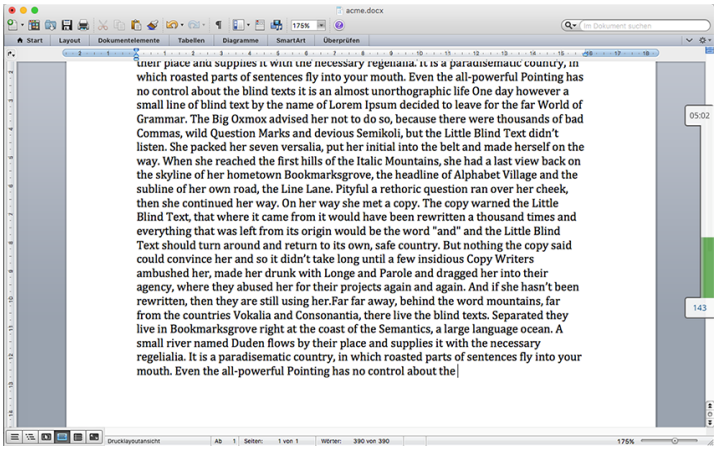

Figure 2: Progress bar of iWrite

2.2.2 Points

For each of writing sessions the user receives points according to the duration and intensity of the session. This mode is complemented by three selectable modifiers. Thus, one can choose not to take breaks within the sessions, not to activate messenger and mail programs during this time, and not to use browsers. The architecture of iWrite allows these criteria to be checked and detects violations. This increases the commitment of the users to actually comply with the criteria and builds the atmosphere of a guardian of the concentration time: iWrite is not just a tracking tool, it is also perceived as a watchdog and in some way an authority, under the condition that the writers are willing to grant such authority to the program. If one or more of the options is chosen, the achievable score per session increases.

2.2.3 Planer

This mechanic focuses on the time unit of individual write sessions. Sessions can also be set for the future, however, so that a schedule can be built up in which iWrite reminds the user of the sessions. The user thus learns to plan ahead, to find times when uninterrupted work is possible and then to use them.

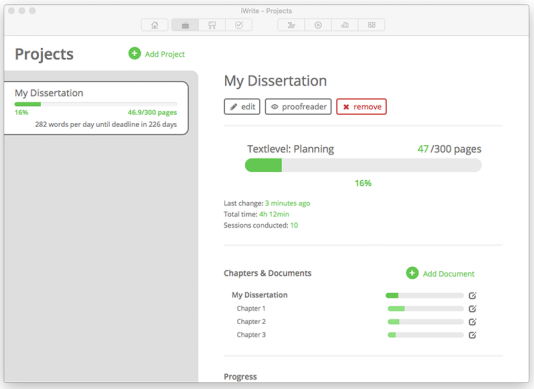

Figure 3: Project planer of iWrite

2.2.4 Streak

In order to not only plan sessions, but to perform them continuously and thus slowly habitualize them, iWrite includes a streak system. This is visualized by a flame that is always visible on the home screen. The flame gets bigger and bigger depending on the number of days on which at least one session was carried out without interruption. After three days in a row, you get a match that is also visualized. This allows one to keep the Streak if one sits out a day. In this way, the motivation of the Streak system is maintained, even if a day is not written in between. Streaks utilize the fear of losing progress as a game mechanic, as individuals are often motivated to maintain their streak and avoid losing their progress once it has been achieved. Thus, repetition over duration is incentivized and even short sessions are rewarded, which maintain the streak. Habits can be built more effectively over repetition than over long duration, which is what is being promoted here.

2.2.5 Visualization

An important factor in writing is not only the work invested, but also the text itself. For this purpose, iWrite reads Word documents, examines them for their chapter structure defined in the document and visualizes the progress in each chapter. In this way, different writing projects can be created, each with a target page number and also a target date. iWrite is then able to calculate the necessary sessions or words per day from this and thus breaks a large task into manageable parts. With the progress of the chapter, a feeling of partial completion is achieved, which supports the overall motivation.

Also on the main screen is a visualization of a house that, following the metaphor, grows from the terrain to the foundation, the shell in various construction stages to a living building. This visual progress indicator contributes significantly to making the atmosphere of iWrite perceptible as a game and to perceiving one's own text as an intellectual building. It also creates a visual reward as well as curiosity for the next visualization stage.

2.2.6 Levels

In addition to these features a level system exists for the users themselves. Linked to the progress of points across projects, users can move up levels and receive a new attribute depending on the level, such as "word gnome" or "sentence master". In this way, progress is not perceived to be lost when a project is completed, and the writing skills acquired are further incentivized. Linked to the level progress, there is also an expert tips module in which an exclusive video or a text with writing tips from alternating writing experts is unlocked per level. Level progress is thus rewarded with insights that are otherwise inaccessible. Conversely, the reception of tips is perceived as a reward and is therefore received more positively. A total of 15 detailed tips for 15 levels can be found in iWrite.

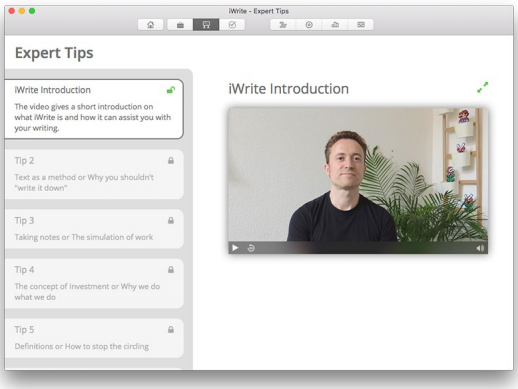

Figure 4: Expert tips of iWrite

The selection of game mechanics is rounded off by three game cards, which contain new small tasks every day. The fulfillment of the tasks also gives points. These are tasks accompanying the writing process, such as improving the writing environment, planning or correction loops, which cannot be measured directly in words or time. A card played immediately increases the score and motivates the writers in a varied way to improve the writing process as a whole.

2.3 Writing-Supportive Feature of iWrite

Beside the gamification features and game mechanics, iWrite also includes text-based feedback systems and features to support writing.

2.3.1 Proofreading

A proofreader module has been integrated that analyzes the text and gives practical tips on sentence structure, sentence length, foreign words and comprehensibility - as far as this is algorithmically possible. This generates feedback directly on the text and provides a different perspective that can help improve the text at the sentence level.

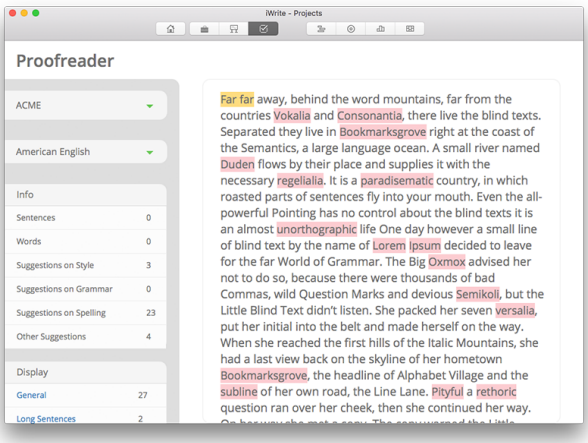

Figure 5: Proofreader of iWrite

2.3.2 Time and activity track

Diary's functionality has also been retained to iWrite to allow writers to analyze how they spend their time at the computer, when their activity times, program usage categories, and the extent to which their working practices are fragmented. This objective, non-judgmental insight creates another valuable level of feedback that helps writers better understand their own working practices, identify problems, and gradually improve practices through the provision of helpful tips and tasks.

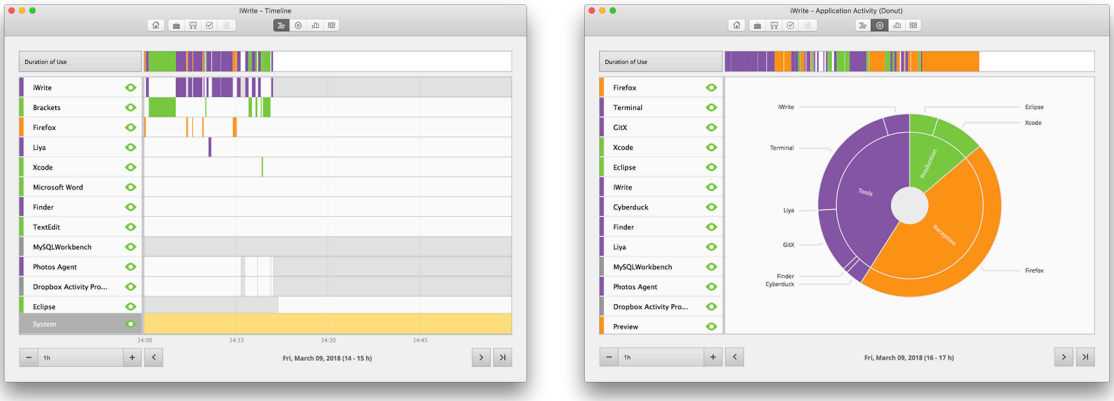

Figure 6: Time and activity track of iWrite

3. Conclusion

Taken together, iWrite includes a series of mechanics that support and motivate writers at different stages, time intervals, and perspectives to stay motivated through longer writing processes, purposefully develop writing habits, and move toward a more efficient, continuous, and enjoyable writing experience. Its development process was an iterative approach of continuous testing, interviews and development. Knowledge from game designers, computer scientists, sociologists, interaction designer, writing experts and students has been used. Tests within the cluster of excellence have shown positive adoption of the tool, and many staff members used it for their publications and provided feedback. Its use was also tested in an academic writing school at Humboldt University of Berlin. As these tests provided good first results, further and more systematic investigation is planned. For future studies, a systematic evaluation will be executed to test the effectiveness of iWrite on self-regulation, motivation and creativity within EU-FairPlay project.

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