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Gamification in a Democratic Pro-Environmental Behaviour Model Towards Achieving Effective ESG Corporate Strategies

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ABSTRACT

This paper aims to analyze the extent to which gamification is an effective alternative to promote the adoption of democratic pro-environmental behaviors and contribute towards the creation of the relative organization culture. The accepted definition of gamification for this paper is the process of enhancing a service with affordances for gameful experiences to support users' overall value creation. This marketing perspective approach focuses more on the effects obtained as a consequence of activating intrinsic and extrinsic motivation through gamified systems rather than the analysis of the characteristics of the game design elements and the incentives for its practical and actual adaptation and utilization within organizations. Furthermore, the proposed model is linked with the ESG criteria to further incentivize its organization's adaptation from theory to practice. Finally, the paper indicates limitations and areas of further research towards green ocean strategies that can maximize its applications and impact.

Keywords: Gamification, Sustainability, Environment, ESG, Society, Governance, Organizations, Management, Motivation, Leadership, Psychology, Green ocean strategy

INTRODUCTION

The climate crisis has received great attention from the public and scholars over the last few decades. While the search for solutions involves strict regulations and innovation in clean energy sources, changing individual behaviors towards sustainability could prevent us from reaching a point of no return.

Inarguably, there is a need for strong involvement of the public and private sector organizations. Changing individual, organizational behaviors towards sustainability might foster a significant impact in lowering the effects of the climate crisis. In this context, a Democratic Pro-Environmental Behaviour (DPEBs) is introduced to enable green behaviors with individual and voluntary actions within organizations that benefit the preservation and recovery of the environment. Recycling, efficient energy consumption,

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reduction of meat consumption, and sustainable transportation are examples of actionable Pro-Environmental Behaviours (PEBs) that need to be fostered to reduce the human impact on climate change.

In this context, this research aims to analyze how a gamification is an effective tool for ESG corporate strategies to promote and achieve democratic pro-environmental behaviors. This research contributes to an evolving body of literature about the measurable effects of gamification, specifically in information technology systems (ITS) that promote sustainability. The process of selecting and analyzing empirical relevant studies demonstrated how different sources of motivation could be identified and effectively appealed to encourage the adoption of PEBs.

RESEARCH METHODOLGY

After a thorough selection process, a systematic literature review was conducted to exclusively retrieve case studies that evaluated the psychological and behavioral effects of gamified information technology systems. Fifteen studies were analyzed in detail, which overall provided positive results regarding gamification's capability to engage users by appealing to intrinsic motivation and effectively promoting the adoption of extrinsically motivated PEBs.

For this research, the accepted definition of gamification is "…a process of enhancing a service with affordances for gameful experiences to support user's overall value creation" (Huotari and Hamari, 2012). Arguably, this marketing perspective has more focus on the effects obtained. It activates intrinsic and extrinsic motivation through the use of gamified systems rather than analyzing the characteristics of the game design elements. Consequently, it is necessary to establish the difference between gamified systems and fully-fledged games.

The selection process for this systematic review considered systems exclusively as gamified systems if their description involved a service that used gamification affordances. Still, its core activity was different from pure entertainment or entertainment with a moral or lesson.

LITERATURE REVIEW AND RESEARCH GAP

In the case of behaviors affecting the environment, it is relevant to consider the necessity to implement new behaviors and the challenge of replacing old ones. In this regard, Verplanken and Wood (Verplanken and Wood, 2006) propose three considerations to successfully intervein to break and create consumer habits: "(1) change the context cues that trigger existing habits, (2) establish incentives and intentions that encourage new actions, and (3) promote repetition of new actions in stable circumstances" (Geelen et al., 2012).

To pursue PEBs, perhaps the most used method to diminish the power of the triggers for the existing habits is to raise environmental awareness to promote attitude changes towards sustainability and consequently the adoption of green behaviors. However, little evidence supports its efficacy to translate into behavioral change. Likewise, it has been shown that attitude changes

such as a deep understanding of individual environmental impacts are not sufficient or even necessary for behavior change (Ro et al., 2017). Instead, there is evidence pointing towards the opposite logic; the successful adoption of new behaviors can promote attitude changes towards the reason triggering that behavior (Kuntz et al., 2012). Furthermore, it is easier for people to feel identified with an environmental cause due to the constant repetition of one or more PEBs. Therefore, it is necessary to deliver other conditions for its adoption and repetition.

Gamification has been used to engage people with diverse purposes like learning platforms (Hukulinen et al., 2013), healthcare (Sardi et al., 2017), corporate social networks (Farzan et al., 2008), energy conservation systems (Gustafson et al., 2010) and low-engaging tasks (Rodriguez et al., 2020), among others. The trend has rapidly gained popularity at the point in which the business model of some technology start-ups is to gamify their clients' services (Hamari et al., 2014).

In the business sector, gamification has shown to be a valuable tool to improve the workers' attitude and engagement to tasks developing a "sense of meaning and accomplishment" (Kotsopoulos et al., 2017).

These applications can represent an opportunity for managers to provide solutions that positively affect employees' performance and identification with the company. In addition, the commercial opportunity is promising, considering that the gaming market revenues have duplicated over the past five years (Statista, 2019).

The relatively new concept of gamification started to appear in internet blogs during the past decade to describe the trend of companies, especially technology-based start-ups, to incorporate elements and logic from video games into their software to enhance user engagement (Huotari and Hamari, 2012), (Deterding et al., 2011). This responded to evidence that pointed out the capacity of games to promote practical skills (Morganti et al., 2017), such as "selective attention, multi-tasking, and visual short-term memory tasks" (Ryan and Deci, 2000). Hence, it became relevant to understand and apply the logic behind video games to other platforms to foster behaviors beyond the gaming activity itself. Today, gamified technologies and solutions have been effectively used even in conservative sectors such as shipping (Markopoulos and Luimula, 2020), (Markopoulos et al., 2019a), Formula 1 racing (Markopoulos et at., 2019b), (Markopoulos et al., 2919c), cultural heritage (Markopoulos et al.2021a) in farming (Markopoulos et al., 2019d), and engineering (mechanical, industrial, etc.), (Markopoulos et al. 2017) where human interaction and expertise are critical for their operations.

GAMIFIED EXTRINSIC AND INTRINSIC MOTIVATION IN PRO-ENVIRONMENTAL BEHAVIOURS

Psychological outcomes are related to intrinsic motivation; in the case of gamification, positive results are described by gameful experience. This work categorizes these according to the motivational need they correspond to and their adaptation likeness in a corporate context. On the other hand, behavioral outcomes are related to extrinsic motivation; these are

the desired pro-environmental behaviors promoted extrinsically using the gamified application.

To pursue a deep understanding of how effective behavioral change is fostered, gamification literature has focused on theoretical approaches exploring the type of motivations that determine the sustainable adoption of behaviors. The intrinsic and extrinsic motivation theory (Ryan and Deci, 2000) classifies motivations and induced behaviors into intrinsic and extrinsic. Intrinsically motivated behaviors describe the interactions with the source of motivation itself, resulting in hedonic experiences. Extrinsically motivated behaviors, on the other hand, have an instrumental purpose. The consequence differs from the induce activity itself (Deci and Ryan, 2012). These two types of motivations are evident in gamified platforms such as Duolingo. Its educational mobile app is characterized by creating engagement through a gameful experience (intrinsic motivation) to learn new languages (extrinsic motivation). Following the intrinsic and extrinsic motivation logic, sustainable adoption will be determined by how engaged users are, not only with the use of the platform but also with the predisposition to learn a new language.

THE YU-KAI CHOU FRAMEWORK AND MODIVATORS IN SERIOUS GAMIFICATION

The term "serious game" has been used since 1960, long before introducing computer and electronic devices into entertainment (Clark, 1970). It was used to define gamified processes without using technology as a scenario-based model operating metaphorically as a game of strategy with probabilities, possibilities, and skills on handling information, conditions, decisions, and results.

The "serious" adjective is generally prepended to refer to products used by industries like defense, education, scientific exploration, health care, emergency management, city planning, engineering, and politics (Damien 2011). What is a serious game, and what is not serious cannot and shall not be determined by the type of its user's target group, functionality, or operations, but solely on its quality, effectiveness, and benefits to those using it for a specific purpose, any purpose (Markopoulos et al., 2017).

Octalysis is a complete framework used in both serious and entertainment games for Gamification and Behavioural Design. Yu-Kai-Choo has designed the framework after more than 17 years of gamification research and behavioral design studies (Choo, 2015)

Yu-kai Chou acknowledged that almost every successful game appeals to specific core drives within people that motivate various decisions and activities (Wasic, 2017). The term Octalys refers to the octagonal shape of the model where each vertex is a core drive executed with specific gamification techniques (See Table 1).

The eight core drives are positioned in such an order to reflect the left and right brain hemisphere motivation activities (See Figure 1).

The Left Brain Core Drives act as Extrinsic Motivators. They motivate the need to obtain something, such as a goal, a good, or anything that cannot be easily obtained. The Right Brain Core Drives act as Intrinsic Motivators.

Table 1. Yu-Kai-Choo octalysis framework core drives.

Core Drive	Description	Selected Game Technique
Epic Meaning and Calling	A user believes that he is doing something greater than himself and/or was "chosen" to take action.	Narrative; Free Lunch
Development and Accomplishment	A user wants to progress, develop skills, achieve mastery, and eventually overcome challenges.	Progress Bars; Achievement Symbols
Empowerment of Creativity and Feedback	A user is engaged in a creative process where he analyzes new things repeatedly and tries various combinations, seeing results, receiving feedback, and making changes.	Booster; Meaningful Choices
Ownership and Possession	A user is motivated because he feels like he owns or controls something. Consequently, he wants to increase and improve what he owns.	The Alfred Effect
Social Influences and Relatedness	A user is engaged by all the social elements (mentorship, social acceptance, social feedback, companionship, competition, envy)	Mentorship; Water Coolers
Scarcity and Impatience	A user wants to make something simply because it is extremely rare, exclusive, or immediately unattainable.	Magnetic Caps
Unpredictability and Curiosity	A user is engaged because he doesn't know what will happen next.	Mystery Boxes
Loss and Avoidance	A user avoids something negative happening.	Countdown Timers

People don't need a goal or reward to use their creativity, enjoy their time or feel the unpredictability suspense, which is a rewarding activity.

Furthermore, the core drives are also divided top-down, without changing their left and right order. The upper drives act as Positive Motivators. They achieve engagement because they let people express their creativity, feel successful through skill mastery, and give them a higher sense of meaning, making users feel very good and powerful.

The lower drives act as Negative Motivators. They are related to people that always do something because they don't know what will happen next, because they are constantly in fear of losing something, or because there are things they can't have. So even though they would still be highly motivated to take the actions, they still won't feel happy with the result (Choo, 2015).

The layout of the Yu-kai Chou into Extrinsic and Intrinsic and White and Black hat Gamification covers most of the dimensions a gamified application can be evaluated with. The framework also provides a scoring system based on the score of each application on each core drive. The octagonal spider map chart shown in figure 1 presents abstract scores from different applications that can be used for comparisons or benchmarking.

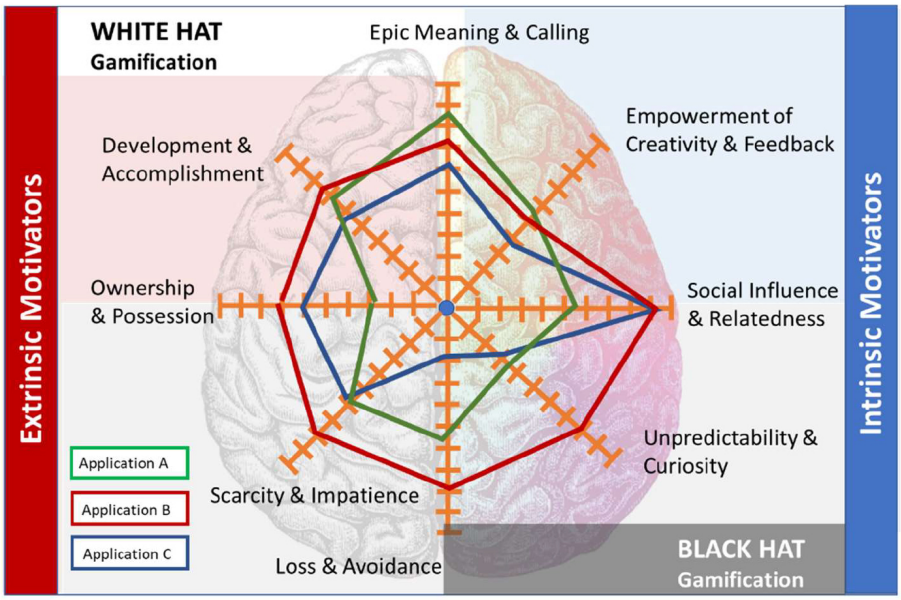

Figure 1: The Yu-Kai-Choo octalysis framework in behavioral and motivational quadrants.

THE DEMOCRATIC GAMIFICATION PRO-ENVIRONMENTAL BEHAVIOUR MODEL (DeGPEBM)

The development of corporate pro-environmental behavior can be gamified by integrating the Yu-Kai Choo framework and the Company Democracy Model (CDM) for knowledge-based shared innovation (Markopoulos and Vanharanta, 2015). The model is based on six levels of organizational maturity driven by the utilization of human intellectual capital (Markopoulos and Vanharanta, 2014). It provides intrinsic and extrinsic motivation drives for employees to share and benefit from their knowledge. Derivatives of the CDM have been developed to support specific organization's goals and markets. For example, the Green Ocean Strategy, which leads organizations to environmental and sustainable innovation, is solely based on the Company Democracy Model (Markopoulos et al., 2020a).

In the attempt to achieve organizational Pro-Environmental Behavior in a gamified context, the Company Democracy Model uses Intrinsic and Extrinsic motivation in a reverse way than the Yu Kai Choo Octalyis.

Intrinsic motivation factors drive the first three levels of the Company Democracy Model, characterized as White Innovation driven by pure innovation principles with the hope for an opportunity to change the world positively. The motivation in these levels is based on optimistic creativity.

Extrinsic motivation factors drive the following three levels: Dark Innovation-driven with a commitment to profitable success regardless of the effort and the cost. The motivation in these levels changes from creativity, curiosity, and optimism, to profitability, accomplishment, and ownership. (See Figure 2).

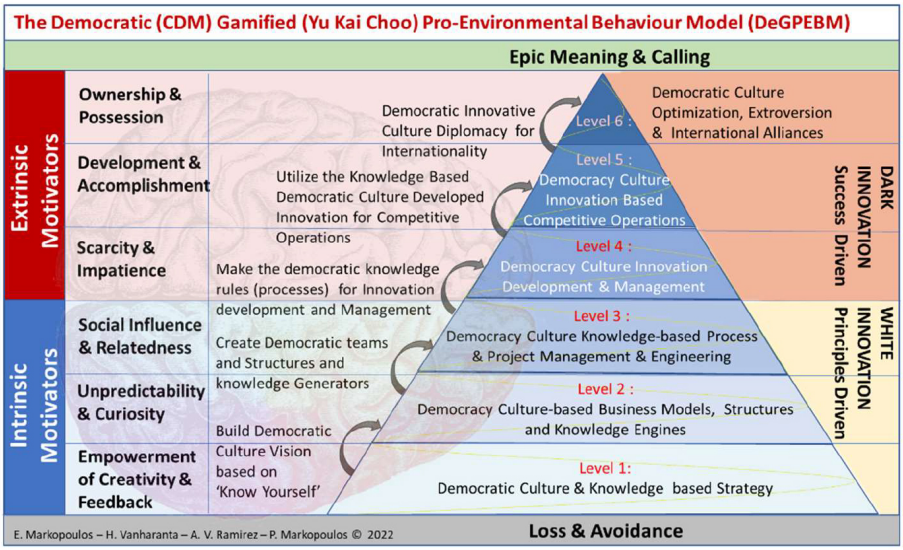

Figure 2: The democratic gamification pro-environmental behaviour model (DeGPEBM).

The first level of CDM gathers creative ideas that can potentially be turned into innovative solutions, products, and services. The second level creates teams to verify the creative knowledge. It is a level of curiosity for what this knowledge can offer. The third level develops the understanding of a product/service provided in the market. At this level, and a pro-environmental application of the knowledge, social acceptance is achieved for the green product/service contribution.

The fourth level extends this green product/service into innovation based on its acceptance by the market and society. Finally, the level of innovation scarcity and impatience to evolve the existing success into global innovation.

The fifth level develops the innovation's competitiveness and acknowledges the accomplishment of the knowledge contributor.

Lastly, the sixth level, as the ultimate innovation level and international success, grants the knowledge contributor ownership and possession of the innovation.

At the top of the CDM pyramid, there is the sense of an epic achievement for leading an idea into a global scale innovation.

At the bottom of the pyramid, a sense of fear and loss blocks employees from sharing knowledge due to a lack of procedures or trust in the organization. Therefore, the first level of the Company Democracy Model is the most critical of all.

This Democratic Pro-Environmental Behaviour Model can support Green Ocean Strategies and comply with several ESG requirements, giving the organization solid competitive advantages.

ALIGNMENT WITH THE ESG INDEX

The Company democracy Model has been extensively used for Sustainable and Social innovation management. The Green Ocean Strategy and the Pink

Ocean Strategy (Markopoulos et al. 2020b) are two of the model's primary strategic management and leadership applications. The model has also been adjusted to go beyond CSR and contribute to ESG driven organizational strategies (Markopoulos et al., 2021b). Specifically, the DeSGGO (Democratic ESG Green Ocean) framework is based on the Company Democracy Model (CDM) to cover the ESG environmental and governance elements (Markopoulos et al., 2020c) primarily.

The proposed DeGPEBM builds on the DeSGGO by further utilizing the environmental dimension. The gamified Company Democracy pyramid for pro-environmental behavior is positioned between the Environmental and Governance elements of the ESG. The first three levels of the DeGPEBM contribute to the Governance ESG criteria with ethical management as they support participative management, company democracy, access to opportunity, freedom of speech, etc.

The last three levels of the model contribute to the Environmental ESG criteria, with environmental innovations being developed, applied, and shared with the world.

By turning the DeGPEBM upside down, at the CSR space, the first three levels indicate corporate commitment that leads to responsible innovations with implementing the top three levels (See Figure 3).

The gamified structure of the DeGPEBM provides the base for the delivery of a gamified ESG strategy. The degree of success for such a strategy relies on the degree of democracy the employees have to think sustainable in a gamified process while enjoying being part of it.

LIMITATIONS AND AREAS OF FURTHER RESEARCH

The process of a systematic review itself implies the exclusion of a high number of papers that could have been relevant but, by based on their metadata (titles and abstracts), they did not pass through the selection process, especially considering methodological decisions such as the inclusion of titles with

Figure 3: DeGPEBM alignment with ESG and SCR strategies.

the word gamification in them. Another limitation was the scarcity of long-term studies included in this dissertation. While the reported results evidence gamification's effectiveness to promote PEBs, they are insufficient to determine if the adopted behaviors prevail after extensive periods. Further studies are needed to evaluate the persistence of adopted behaviors in the absence of the gamified ITS and how effective are these gamified systems to maintain engagement in the long term, expressed in variations of usage rate over time.

This work can serve as the foundation for future development on gamified management metrics and indexes. The proposed model is directed to encourage pro-environmental behavior. Still, it can be extended to pro-social behavior that can lead to Pink Oceans, which also impacts the ESG performance and complements this work.

CONCLUSION

Simplicity and pleasure are the keys to unlocking the complexity and knowledge acquisition towards achieving goals and strategies that require employee participation. The art, the science, the management, the discipline, and the strategy of gamification significantly impact the economy and society. It is early to measure this impact, but it will undoubtedly be the subject of more applied research. (Markopoulos et al., 2017)

The paper presents a gamified methodological approach and a process model that integrates democratic organizational culture elements that utilize gamification to achieve employee pro-environmental behaviors that can benefit both the economy and society. The multidimensional use of the DeG-PEBM and its adaptation to the ESG and CSR elements can be easier with a gamified process. Gamification provides strong employees incentives to act and think sustainably, contributing to their organizations' ESG indexes while fulfilling their personal and social goals for a more sustainable planet.

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