Greenify: A Mobile Platform to Motivate Sustainability via Game Mechanics and Self-Determination

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Abstract: This paper discusses the design rationale behind Greenify, a mobile platform that leverages game mechanics and self-determination theory to foster sustainability.

Background: The Need for Intrinsically Motivated Sustainability

Communication about climate change needs to move away from threat-based responses to focus on the opportunities and possibilities for a sustainable world (Grant, 2012). This will allow us to tap into the kind of values-based, self-determined motivation (Deci & Ryan, 1985, 2000) that Osbaldiston and Sheldon (2003) describe as "high quality" with regard to fostering environmentally responsible behavior. This kind of intrinsic motivation has been correlated with greater creativity and increases in the scope of possible action (Grant, 2012; Ryan & Deci, 2000). In dealing with a problem as complex as climate change, a restricted scope of action will not allow us to meet the daunting challenges ahead. We must change the way we communicate about these problems to allow for novel behaviors and solutions. Strategies are needed to engender novel thinking through the use of intrinsic motivators.

Motivation for Sustainable Change

Traditionally, games motivate players through the use of simple operant conditioning – i.e., performing this action gives you this reward (c.f. Bang, Torstensson, & Katzeff, 2006). However, extrinsic rewards of all types have been shown to undermine intrinsic motivation (Deci, Koestner, & Ryan, 1999). On the other hand, a number of empirical studies have shown that more autonomous sorts of extrinsic motivation correlate with a number of positive outcomes, including more engagement, better performance in several areas, deeper learning, better maintenance of weight loss, and even more intimate relationships (for a review, see Ryan & Deci, 2000). That is to say that, if we perform a task solely for a reward, the task ceases to be intrinsically motivating. If we try to instill new habits simply by rewarding positive behavior, the habits will not become autonomously motivated. Mere alteration is not the right direction, but lasting change in peoples' behaviors should be the direction we take.

The question then becomes how to use games to internalize motivation, to which we offer two possible solutions: First, Self Determination Theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000) posits that fulfillment of the basic psychological needs for competence, autonomy, and relatedness facilitates intrinsic motivation. Second, McGonigal (2011) suggests that games provide intrinsically motivating experiences by (1) increasing satisfaction by showing the impact of user input; (2) allowing users to experience success; (3) expanding social connection; and (4) providing frameworks for meaning beyond the individual lives.

Greenify

Greenify is a community-based social mobile platform that seeks to promote vision-oriented sustainability (Grant, 2012) by using game mechanics to support the internalization of motivation, behavior and value changes through social elements and open-ended challenges. In Greenify, players complete user-generated real-world missions that ask a player to think of creative solutions and to act upon them. Unlike many climate change or sustainability games that are more extrinsically-driven and checklist-based, a mission in Greenify is a question that invites a player to respond to hypothetical playful missions that are a manifestation of a person's vision for a more sustainable community and world. For example, a sample mission in order to teach sustainable practices might be: "Be a locavore." Under this mission, more specific deeds will be given such as "Share a food made with local ingredients," as a scaffold for the given mission. In this way, a participant could respond by taking a photograph of locally sourced food that is good for the environment, and others can react to it. Moreover, users can create new deeds for a particular mission. Social dynamics encourage positive behaviors and scaffolding fosters sustainable learning. Thus, consistent play of Greenify means practicing pro-environmental behaviors within a community, which has been shown to be promising to direct behavior changes in real lives (Kollmuss & Ageyeman, 2002).

Perhaps more importantly, Greenify is designed to promote feelings of autonomy, competence, and relatedness, as well as a sense of meaning (Lee et al., 2013). It fosters autonomy by allowing users to freely choose what missions they would like to take on, and even to create their own; it fosters competence by providing feedback on mission completion and by offering selected scaffolded missions of increasing difficulty that enhance a player's understanding of sustainability; and it fosters relatedness through growing community, as well as the ability to join

groups and participate in group missions.

Further research is needed to evaluate whether a design based upon self-determination theory and gamification is an effective strategy to facilitate value change, identity formation and sustainable behavior change.

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