

The present and future aspects of Digital Nudging and Digital Persuasion

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Abstract

This paper describes the current and future aspects of Digital Nudging and Digital Persuasion (DNPD). To find this, a case study approach has been followed, such as, we organized a workshop event aimed at supporting citizens and stakeholders in applying digital nudging and persuasion strategies to increase individuals' competency and self-efficacy beliefs for goal attainment. The workshop was structured with a total of three research papers presentation, a keynote talk, and an open discussion. Over 30 participants in a hybrid mode attended the event and engaged in solving different nudge and persuasion-based tasks via technology-mediated solutions. The results have shown that there needs work to enhance the capacity of using digital nudging and persuasion techniques to achieve a more sustainable behavioral change in individuals for a healthy digitalized community with a view to transparency from policy to practice.

Keywords

Nudging, persuasion, persuasive design, gamification

1. Introduction

Nudge Theory is a groundbreaking concept that proposes that subtle changes in how choices are presented can intuitively support individuals toward desired behaviors [1]. In recent times, there has been substantial research into its application in theory and practice. For example, Maiden and his colleagues [2] significantly encouraged employees to take the stairs over the elevator by incorporating footprints and posters that reveal the "desired path". Lee and his colleagues [3] redesigned a snack-ordering website to encourage healthy choices by locating healthy snacks on the first two pages of the website and unhealthy ones on the last two. Another example was provided by Haque and his colleagues [3], who designed a simple zero-cost nudged intervention with a personal normative message installed in users' smartphones as a screensaver to dissuade physical inactivity. This simple environment modification, where individuals make decisions, was able to nudge 53% of the participants to opt for a healthy snack [4]. One area for improvement of present technology-oriented nudges is the limited understanding of their long-term effects and whether nudging effects sustain once the nudges are removed [5].

Persuasive and gamification techniques also hold great potential for motivating desired behaviors, encouraging healthy lifestyle, for instance, physical activity promotion [6] and increasing healthy eating behavior [7]. Design principles such as self-tracking, tailoring, and personalization are well-known and deeply studied in the HCI (Human-Computer Interaction) field. For instance, self-tracking is one of the most prominent theoretically informed techniques used in personal informatics tools to support an individual's regulation of their own behaviors (e.g., achieving walking goals) [6]. Nudging and persuasion have the same end goals but rely on

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different principles to encourage change. Nudges focus on guiding behaviors and decisions (i.e., decision-based task), while persuasive design focuses on changing an individual's attitudes and behaviors (i.e., attitude-based task).

In the 21st century, technology has become a primary tool to change citizens' behaviors and attitudes. Also, technology is the new key to guiding behaviors and decisions in systems such as the metaverse, which consists of persistent, shared, 3D virtual spaces linked into a shared interactive virtual universe. Technology can affect sustainability through persuasive systems design [8], and information systems in organizations can influence behavior to reach sustainability goals [9]. It further allows interventions to get users who might otherwise not seek assistance (e.g., due to fear of being stigmatized). As a result, using persuasive digital technology in research and industry domains has drawn significant attention. In our present study, we focus on applying digital nudging strategies and persuasive techniques in engaging people to increase their competency and self-efficacy, i.e., achieving their goals. Thus, digital nudging and persuasion is expected to reach a more sustainable behavioral change for individuals.

2. Case study

An exploratory single case study [10] has been applied to conduct the study. Though single case study provides a narrow scope of generalizability, yet it offered an in-depth focus that is replicable. A participatory workshop that was performed via hybrid platforms on the 19th of April 2023 at the Eindhoven University of Technology, Eindhoven, the Netherlands to get the current and future issues of DNDP. The workshop was intended support individuals participating in the workgroup session on using digital nudging and persuasion techniques to increase goal-achievement (e.g., pre-defined or self-chosen goals). This may include but is not limited to, interventions that support students in growing their academic performance, aid software engineers and researchers in improving their day-to-day tasks' performance (e.g., setting goals for daily writing output, reducing social media usage), boost patients' intrinsic motivation to adhere to doctors recommendations (e.g., medication adherence), help individuals increase their physical activity levels to achieve daily walking goals, boosting healthy eating and dietary activities, motivate green transportation habits to reduce environmental impact and lessen climate change or improve people's consumption choices (thus aiding in climate change mitigation efforts such as carbon emission awareness and so on). The application area for nudging is, therefore, potentially unlimited. We received contributions on using nudging, persuasive, and gamification technologies for addressing an individual's competency and self-efficacy-based tasks. At least two anonymous reviewers reviewed all papers. Accepted papers were published in CEUR Workshop Proceedings as Adjunct Proceedings of Persuasive Technology 2023.

Since DNDP workshop event in line with PT 2023 happened in a hybrid mode, more participants attended in person, such as over 30 participants in total (18 participants onsite and over 13 offsites). Participants were from the Netherlands, Finland, Portugal, India, and Bangladesh. In addition, participants joined from the Netherlands (Eindhoven University of Technology) as PT 23 participated here. Registered participants and authors/co-authors presented their research work as a part of the workshop proceedings. They discussed their ideas and how the pictures are implemented into their research. The workshops included activities running case scenarios, applying theoretical concepts, engaging, and empathizing with participants' ideas and drawing conclusions to culminate sustainable solutions, showcasing project work outputs, and joining with participants' feedback.

3. Results and discussion

A total of three papers have been accepted and presented in the workshop event. The summary of them are as follows.

Caliboli [11] explored the use of digital nudges, introduced within digital environments, and meant to influence a choice made within that environment. It discussed how employing digital nudges unfolds the possibility to personalize nudging processes and the kind of safeguards citizens should be guaranteed to consider nudges legitimate policy tools in modern liberal democracies. The paper emphasized the importance of transparency and public scrutiny in using nudges as policy tools.

Kashimoto et al. [12] explored a new technique for fostering behavior change using social justification, focusing on prosocial behaviors for example volunteering. The effectiveness of this technique was tested, which showed that the number of participants in the experimental group who were willing to engage in Patrol-run was statistically higher than that in the control group. The study discussed limitations and future work, including developing an adaptive intervention using gratitude feedback.

In their work, Sousa and Haque [13] presented an experiment in which undergraduate students played modified modern board games to transform a tourist map into a playful approach in Leiria city, Portugal. The results showed that the chosen games successfully generated awareness of urban heritage. The study suggested that game modifications can support the learning processes and explore touristic maps for heritage learning purposes.

In addition to the paper presentation session, there was a dedicated simulation-based open session in which the participants were asked for some real-life scenarios to recreate their ideas and gather feedback from prospective participants towards building a more persuasive atmosphere to nudge the participant toward the desired behavior. We used theoretical concepts, such as nudge deck and normative message, alongside other behavioral models, such as the PSD model [14], so tutorial participants could find the session logically designed and enjoyable. This workshop was an excellent link-up to Persuasive Technology (PT) 2023 as this promotes technology such as nudging, gamification, and persuasion to influence citizens' behavior toward reaching their goals and milestones. This workshop allowed researchers registered in the PT 2023 conference to do real simulation tasks and think from their own minds, which assisted them in group forming, teamwork and improving their self-nudging skills in a team environment.

Finally, a CEUR proceedings open-access workshop publication is available, which could be utilized as a toolkit for academic and industry stakeholders in future education and research innovation on digital nudging and digital persuasion.

4. Conclusion

This paper is an attempt to explore the current trends in digital nudging and persuasion. To find out more about this, a workshop event has been chosen in which scientific papers has been presented and described. This workshop is the previous year's extension and was built on top of that [15]. This leads to furthering the future research direction and more work in some arenas such as designing more nudged interventions and looking for more long-term effects of them. Transparency in terms of policy and practice is also a key concern to consider with. As citizens are tends to be more self-judged and therefore, a citizen-centric self-nudged mechanism could be introduced in tech-based applications and services which give citizens more freedom and awareness to personalize their task towards sustainable wellbeing.

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