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Eliciting Citizens' Preferences to Support Decision-Making about Wastewater Management: Evaluation of a Gamified Online Survey

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Abstract: Most environmental decisions directly and/or indirectly affect citizens. In some cases, the decision-makers wish to know what these citizens prefer before making the decision. However, eliciting individual preferences from a large number of citizens is a challenge for decision support methods, such as Multi-Criteria Decision Analysis (MCDA). Usually, only around five to fifteen stakeholders are invited to face-to-face interviews or group workshops. Online technologies could allow including and engaging a larger number of citizens. Still, online elicitation of preferences requires research and development, especially with regard to (1) following state-of-the-art standards for MCDA, and in particular Multi-Attribute Value/Utility theory, and (2) involving citizens who are generally unfamiliar with the complexity of the decision topic and the elicitation methods. To tackle these challenges, we developed a prototype of a novel survey procedure using gamification for eliciting weight parameters online, which was applied to a simplified decision about wastewater management. We will introduce the concept of the gamification based on consistency checks, and a narrative including non-player characters. To evaluate the interactive tool, we carried out an experiment. We measured the performance and experience of a 100 participants on three dimensions: (1) learning facts about wastewater management, (2) constructing preferences regarding objectives and alternatives, and (3) having a positive user experience. Though the effect of gamification was smaller than anticipated, the results were encouraging: participants learnt some facts about wastewater management and constructed their preferences regarding the objectives. In addition, we collected in-depth qualitative feedback from participants, which provided us with clues on how to improve the user experience. We will share those valuable insights and introduce our follow-up research agenda.

Keywords: Stakeholder participation; Multi-Criteria Decision Analysis; gamification