

# Motivating Participation in Crowdsourced Policymaking: The Interplay of Epistemic and Interactive Aspects

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In this paper, we examine the changes in motivation factors in crowdsourced policymaking. By drawing on longitudinal data from a crowdsourced law reform, we show that people participated because they wanted to improve the law, learn, and solve problems. When crowdsourcing reached a saturation point, the motivation factors weakened and the crowd disengaged. Learning was the only factor that did not weaken. The participants learned while interacting with others, and the more actively the participants commented, the more likely they stayed engaged. Crowdsourced policymaking should thus be designed to support both epistemic and interactive aspects. While the crowd’s motives were rooted in self-interest, their knowledge perspective showed common-good orientation, implying that rather than being dichotomous, motivation factors move on a continuum. The design of crowdsourced policymaking should support the dynamic nature of the process and the motivation factors driving it.

CCS Concepts: • **Human-centered computing** → **Empirical studies in collaborative and social computing**; *Collaborative and social computing*; *Collaborative and social computing theory, concepts and paradigms*; *Computer supported cooperative work*;

Additional Key Words and Phrases: Crowdsourcing; democratic innovations; participatory democracy; policymaking; motivation factors

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## 1 INTRODUCTION

Crowdsourcing in policymaking has become a more common method for governments to search knowledge for policies and to engage citizens [20, 65]. However, there is a lack of knowledge about the participants’ perspectives [47] and their motivation factors [5, 22, 36, 66, 70]. Particularly, the evolution of motivation factors during crowdsourcing has remained understudied. Previous work about motivation factors in crowdsourcing relies largely on research designs that involve one-time measuring of the motivation factors [1, 5, 9, 17, 18, 71, 73], resulting in cross-sectional data and leaving the changes unstudied. There is hence a lack of knowledge about the factors sustaining participation. Knowing the motives’ evolution will help us designing crowdsourced policymaking processes and technologies that fit with the crowd’s expectations and motivates them, thus sustaining participation.

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In this paper, we focus on the question: What are the factors sustaining participation in crowdsourced policymaking? By building on literature about motivation factors in large-scale online collaboration and political participation, we developed a framework for analyzing motivation factors in crowdsourced policymaking. We then examined participants' motivation factors in a crowdsourced policymaking process, the change of the motives, and factors affecting the change. We also analyzed the participants' profile and the evolution of their participation activity during crowdsourcing. We drew on longitudinal survey data and interviews from a crowdsourced Limited Liability Housing Company law reform in Finland, initiated by the Ministry of Justice in the Finland Government.

The contribution of the paper is two-fold: By developing knowledge about the evolution of motivation factors, it gives practical information for designing both the crowdsourced policymaking processes and technologies, while also informing the theoretical and empirical study of motivation factors in crowdsourcing.

## 2 LITERATURE REVIEW

### 2.1 Crowdsourcing for Participatory Democracy

Crowdsourcing is an open call for anyone to participate in an online task by sharing information, knowledge, or talent [19, 44]. Governments use crowdsourcing for two primary reasons: for knowledge search to develop stronger policies and for civic engagement [4]. Crowdsourcing is argued to make policymaking more inclusive, transparent, and collaborative while enabling the governments to access the citizens' needs efficiently [21, 81]. When crowdsourcing is deployed in policymaking, the crowd is asked to contribute to a policymaking process, whether the policy is a local rule or national law. The national governments of Iceland and Finland, for instance, have experimented with crowdsourced lawmaking, and the Parliamentary bodies in Brazil have deployed crowdsourcing for program reforms [29, 55].

Crowdsourced policymaking processes follow typically a cycle, in which the crowdsourcer—often the national or local government—invites the crowd to participate in one or more sequences of the policy cycle [28, 45]. In Iceland, for instance, the government asked the crowd to submit ideas to the constitution reform process and annotate the policy draft in 2011. The constitution drafters perused the crowd's input, discussed it and considered it to be channeled to the policy. The crowd was also invited to comment on the policy drafts [56]. In a crowdsourced Comprehensive City Plan update process in the City of Palo Alto, California, in 2015, the city asked its residents to submit ideas for solving issues in matters such as transportation and housing. The public was also invited to comment on the policy drafts [2].

Crowdsourcing is not typically used in the decision-making stage in policymaking. The elected representatives still make the final decisions about the policy, even if the crowd participated earlier in the process [3]. Crowdsourcing thus does not replace existing mechanisms in democracy, but complements and enhances them [21, 43]. Crowdsourcing functions as a method for participatory democracy, where one of the goals is to engage citizens in political processes between elections [69]. Crowdsourcing also serves as an avenue to strengthen deliberative democracy, in that it produces spaces for deliberation as a part of larger deliberative systems in society [6, 61]. Participatory methods have been argued to empower marginalized groups [27, 33] and increase learning among citizens [69]. However, the more skeptical scholars argue that participatory and deliberative practices will benefit mostly “the civic elite,” who is already civically active [76, 80, 85].

Crowdsourced policymaking is based on self-selection, which differentiates it from several other democratic innovations, such as deliberative polls [31] and citizens' assemblies [78], which aim for detecting public opinion by using the so-called mini-publics approach, using statistically

representative (random) samples of citizens. The mini-publics approach aims to replicate the preferences of the larger public, whereas crowdsourcing is based on a self-selected participant group, and thus is unlikely to be a representative sample of the opinion of a larger population.

## 2.2 Motives in Online Collaboration and Political Participation

In this section, we review prior work on motivation factors in large-scale online collaboration, namely in voluntary and paid crowdsourcing and in commons-based peer production and in political participation to understand the range of factors motivating participation. We also review knowledge perspectives, which contextualize motivation factors and help us understand them better.

**2.2.1 Voluntary Crowdsourcing.** In voluntary, unpaid crowdsourcing, a mix of intrinsic and extrinsic drivers motivates the crowd. According to the self-determination theory in social psychology, intrinsically motivated activity is performed for its own sake, whereas extrinsically motivated activity is done to receive rewards such as direct or indirect monetary rewards or other goods, to address one's personal needs, or to enhance one's skills or reputation [53, 74]. Intrinsic motivations are divided into enjoyment-based and obligation/community-based factors [60]. In enjoyment-based intrinsic motivations, people are motivated by having fun or enjoying themselves [25]. In obligation/community-based motivated behavior, the desire to follow the norms of a group or community motivates people [60].

Aitamurto et al. found that a crowdsourced off-road traffic law reform was driven by a mix of intrinsic and extrinsic factors [5]. The law was to ensure the safety of off-road traffic and protect nature. Intrinsic motivations included fulfilling civic duty, affecting the law for sociotropic reasons, deliberating with, and learning from peers. Extrinsic motivations included changing the law for financial gain or other benefits.

People contribute to crowdsourced crisis response for altruistic, humanitarian reasons to help others [68, 82]. In crowdsourced journalism, the crowd is motivated by solidarity, peer-learning, mitigating knowledge asymmetries, and contributing to social change [1]. In crowdsourced citizen science, participants are motivated intrinsically by their curiosity, enjoyment, and interest in the issue [73]. The crowd participates in crowdsourced filmmaking because they want to pass the time, for the reciprocity of the project, for the chance to share their knowledge and skills with others, and for respect and recognition [59]. People participate in crowdsourced design challenges (without monetary rewards) to express themselves, to have fun, to advance their careers, and to earn peer recognition [18].

**2.2.2 Paid Crowdsourcing.** Money is typically the main driver in financially rewarded crowdsourcing [10, 15, 49, 58]. Participation in crowdsourced scientific problem solving on innovation intermediaries, such as InnoCentive, is motivated by extrinsic and intrinsic drivers: for the possibility of a financial reward (extrinsic) and the enjoyment of problem-solving (intrinsic) [54]. The primary motivations for people to contribute to Threadless, an online T-shirt design company, were the opportunities to make money, develop creative skills, pick up freelance work, and contribute to the Threadless community [17]. Similarly, in a study of contributors to iStockPhoto, a crowdsourced image market, [16] found that the desires to make money, develop individual skills, and have fun were the strongest motivators.

**2.2.3 Commons-Based Peer Production.** Although commons-based peer production (CBPP) — contributing to Wikipedia and free or open-source software development (F/OSS)— differs from crowdsourcing as a collaboration method in several aspects [12], the motivation factors behind these modes of large-scale online participation are similar. The primary drivers for Wikipedians are

intrinsic: fun and ideology, problem-solving and contributing to society [9, 63, 88]. The motivation factors for producing open source software are a mix of extrinsic and intrinsic drivers. Extrinsic drivers include the development of one's skills, peer recognition, and a personal need to develop software solutions, whereas intrinsic ones include enjoyment, feelings of competence, and helping others [39, 53].

**2.2.4 Political Participation.** Gustafson and Hertting found that people are motivated to participate in participatory democracy practices for altruistic common-good orientation, to represent one's professional competence, and for self-interest [36]. The literature about traditional political participation suggests motives including the moral duty to vote [13], care for democracy [37], and self-interest. Goodin and Dryzek argue in the rational theory model of voting that rational expected utility value drives political participation: The more probable it is for the citizen to win, that is, make the desired influence, and the more utility value of the desired impact has, the more likely they are to participate [34].

**2.2.5 Knowledge Perspectives.** Motivation factors reflect participants' knowledge perspectives [84, 86]. Knowledge perspectives have been defined as knowledge as an object, knowledge embedded in people, and knowledge embedded in the community [86]. When knowledge is defined as an object, the knowledge is perceived to exist independently of human action. Knowledge is a private good that can be exchanged just like any other commodity [24]. This approach holds that knowledge is only meaningful and actionable to those already knowledgeable [38], knowledge is owned by individuals, is a private good, and can be developed and exchanged in one-to-one interactions [86]. When knowledge is seen as embedded in individuals, people are more likely to exchange their knowledge for intangible returns, such as reputation and self-esteem [23, 48, 86].

Wasko and Faraj suggested the perspective of knowledge embedded in people predicts that knowledge exchange is motivated by self-interest, but that the returns (e.g., reputation, self-efficacy, and obligation of reciprocity) are intangible [86]. Knowledge perceived as embedded in a community posits knowledge as a public good that is created socially and is spread in the community without losing its value or being used up [86]. Knowledge is considered a public good, and members of the community collectively contribute to its provision and all members may access it. The motivation for knowledge exchange is care for the community, not self-interest [84].

### 2.3 Self-Interest and Common-Good Orientation as Motives

To develop a framework including previous literature on motives in large-scale online collaboration and political participation, we categorized the motivation factors to two main categories based on the logic of the factor motivating the participation, whether participation is driven by self-interest or common-good orientation. This dichotomy reflects the division of motivators both in self-determination theory and in the literature about political participation, and the framework thus merges these two, thus far rather separate pieces of literatures.

Activity driven by self-interest means participation for personal gain, whether it is for direct or indirect monetary rewards, professional advancement or recognition or for personal enjoyment, such as fun or curiosity [75]. In contrary, participation for common-good orientation is done for altruistic reasons, as in F/OSS to help others, in crowdsourced journalism to mitigate societal power asymmetries, and in crowdsourced policymaking to preserve the nature for future generations [1, 3, 54, 75]. Motivation factors can be either based on self-interest or common-good orientation or both, depending on the goal of the activity. We further categorized the motivation factors into subcategories, which describe the characteristics of the motive. The subcategories are moral obligation, social, epistemic aspects, leisure, tangible financial benefit and intangible benefit, as Table 1 shows.

Motivation factor	Characteristics	Intrinsic/Extrinsic	Self-Interest (SI) / Common good (CG)	Example
Ideology	Moral obligation	Intrinsic	CG	CBPP, Crowdsourced journalism and policymaking
Helping society and/or others	Social, moral obligation	Intrinsic	CG	CBPP, Crowdsourced journalism and policymaking
Civic duty	Moral obligation	Intrinsic	CG	Crowdsourced journalism and policymaking, political participation
Problem-solving	Epistemic	Intrinsic/Extrinsic	SI/CG	CBPP, Citizen science, Crowdsourced journalism and innovation challenges
Sharing one's knowledge	Epistemic	Intrinsic/Extrinsic	SI/CG	CBPP, Citizen science, Crowdsourced film-making and policymaking
Learning	Epistemic	Intrinsic/Extrinsic	SI/CG	CBPP, Crowdsourced policymaking
Interacting with others, e.g. deliberation	Social	Intrinsic/Extrinsic	SI/CG	Crowdsourced film-making and policymaking
Fun	Leisure	Intrinsic/Extrinsic	SI	CBPP, Crowdsourced design, film-making and photography
Curiosity	Leisure	Intrinsic/Extrinsic	SI	Citizen science
Passing time	Leisure	Intrinsic/Extrinsic	SI	Crowdsourced film-making
Direct or indirect monetary gains for oneself	Tangible financial benefit	Extrinsic	SI	F/OSS, crowdsourced design, innovation challenges, photography, microtasking, political participation, voting
Professional competence and recognition	Tangible or intangible financial benefit	Extrinsic	SI	F/OSS, crowdsourced design, film-making, photography

Table 1. The nature of motivation factors in large-scale online participation and political participation.

Participation for civic duty, ideological principles, and helping others can be rooted in moral obligation [13, 69, 83]. Socially motivated factors include participation for interaction and deliberation. Several factors, namely problem solving, learning, and sharing one's knowledge are motivated by epistemic aspects, either for self-interest or altruistic reasons [12]. Fun, passing time, and curiosity are done for leisure for one's enjoyment [61]. Tangible or intangible benefits include monetary gains, reputation enhancement and professional advancement. Motivation factors in these categories can be either intrinsic or extrinsic, and some factors can be both, depending on the goal of the activity, as Table 1 shows. Learning, for example, can be either intrinsic or extrinsic factor depending on the goal of the activity. It is intrinsic if learning is done for the sake of learning, for the activity itself. If learning is an instrumental activity for reaching a benefit, for example a monetary reward or professional advancement, it is an extrinsic factor.

### 3 RESEARCH QUESTIONS, CASE, METHODS, AND DATA

#### 3.1 Research Questions

While there is a substantial amount of work about motivation factors in large-scale online collaboration and political participation, there is a lack of knowledge about what sustains the participation over time in crowdsourced policymaking. We do not know what happens to the motivation factors *during* crowdsourcing. How do the motivation factors evolve from the moment when the participants decide to enter the crowdsourcing process to the point when they have participated? Prior studies have measured the motives once, using cross-sectional data, and thus, they lack analysis about the motives' evolution. Our study addresses this gap by examining the change in motivation factors in crowdsourced policymaking, using short-term longitudinal design [14], in which we measure motivation factors at three different points in time. Short-term longitudinal designs have been used in studying topics within CSCW and HCI [57].

We analyzed the evolution of the crowd's motivation factors in a crowdsourced law-making process in Finland with a pre-post research design, in which the motivation factors were measured before and after participation in crowdsourcing. The longitudinal design was deployed to examine

the potential change in the participants' motives. To understand the context of the motives and the crowd's experience in crowdsourced policymaking, we also examined the knowledge perspectives reflected in the motivation factors, the profile of the crowd, and the nature of the crowdsourcing process in terms of the participation activity and the evolution of the activity. The study, however, is limited to those who decided to participate—people who have strong enough motivation to cross the threshold for participation, and who have the capacity to participate: They are aware of the possibility to participate and have access to digital tools. In the following, we present the case profile, the data, and the methods.

### 3.2 Case Profile

In the Finnish legislative system, the Parliament with its 200 members (MPs) has the legislative power. The Cabinet has executive power with its ministers, who typically are elected members of Parliament. Civil servants in the ministries are assigned by the ministry to write a bill. Civil servants are ministry employees and career bureaucrats, not elected representatives. Civil servants conduct research and assign consultants to research the subject matter. The civil servants then write the bill; after the Cabinet has approved it, the bill goes to the Parliament, which has the decision-making power about the law. When crowdsourcing is used in policymaking, the crowdsourced knowledge is used as an additional data point when civil servants prepare the law.

In 2014, the Finnish Ministry of Justice applied crowdsourcing in the reform of the Limited Liability Housing Companies Act, which regulates the governance and management of most condominium (apartment) buildings in Finland. Each condominium building is owned jointly by the owners of each apartment through a housing company. The housing company has a board, which consists of the condominium owners. The board has control over the housing company. There are 85,000 housing companies in Finland, and about 2.5 million people live in these condominium buildings, either as owners or as tenants. In the United States, an equivalent law would regulate condominium associations.

The current Housing Company law in Finland came into effect in 2010. The Ministry of Justice wanted to crowdsource knowledge from citizens to evaluate whether the law needed to be reformed, and what the problems were. Before crowdsourcing, the ministry had conducted an extensive online survey of the population affected by the law. About 6,000 Finns participated in the survey. Based on the survey results, the civil servants uncovered the most common issues: disagreements in the housing companies, lack of communication by the housing companies, and lack of information among residents, for instance, about upcoming renovations.

Based on the results, the civil servants determined three areas for which they wanted to crowdsource knowledge: governance, communication, and conflicts in housing companies. The first crowdsourcing sequence began in May 2014 and ended in June, lasting five weeks. Crowdsourcing took place on an online platform, running on customized IdeaScale software. The platform was open for anybody to participate. Participants were invited to share their ideas, knowledge, and questions about the law. The prompts for the participants included background information about the law. Participants could comment on others' submissions and show their support by using thumbs-up and thumbs-down modalities. They could choose to stay anonymous, use nick name, or their real names. The content was publicly accessible without registering on the site. To participate the user had to register by using an e-mail address. The user interface is illustrated in Figure A in the supplementary material.

The civil servants in the Ministry of Justice responded to the participants' questions on the crowdsourcing platform with expert representatives from stakeholder associations. The civil servants reviewed the crowdsourced input and summarized the findings in a report published in the Fall of 2014. The Ministry found that there may not be a need for a full reform but clearer instructions on

how to implement the law. They crafted a policy recommendation about effective communication in housing companies, and in May 2015, the ministry launched the second crowdsourcing stage for input for a policy recommendation about effective communication in housing companies. The input was integrated into the recommendation, and the policy was put in action.

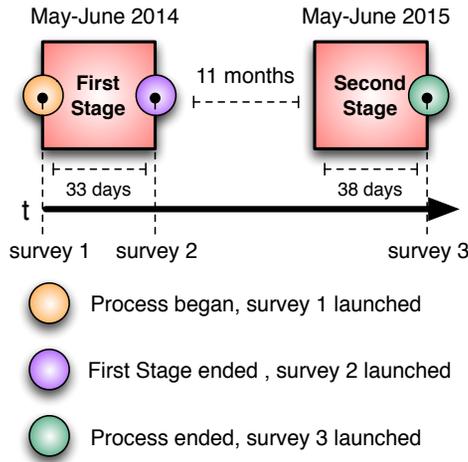


Fig. 1. Illustration of the study design.

### 3.3 Methods and Data

Data were gathered via three online surveys, interviews with participants, and the user activity log. A short-term longitudinal research design was deployed to measure the change in motivation factors. The motives were measured three times by surveys: immediately after the participants entered the crowdsourcing platform, after the first crowdsourcing stage, and after the second crowdsourcing stage. This research design enabled us to track the changes of the motives.

The first survey was launched in May 2014, simultaneously with the crowdsourcing initiative, and it was distributed to all participants. The respondents filled out the survey on the platform before participating in crowdsourcing. After the first crowdsourcing stage, the second survey was sent to the participants who responded to the first survey. The third survey was sent in June 2015 at the end of the second crowdsourcing stage to all participants. Figure 1 illustrates the design of the study. By responding to the survey, the participants were entered into a raffle for a gift card. The surveys were implemented in collaboration with the Ministry of Justice. The surveys inquired about the respondents’ motivation factors, demographic background, and experience in the crowdsourced policymaking process. To examine motivation factors, we used the following measures on a 7-point scale: problem-solving, improving the law, learning, unhappiness with the law, interest in others’ viewpoints, discussing the law with others, civic duty, passing time, and curiosity. The collaboration with the government affected the survey design, as they restricted the number of questions in the survey. Table 2 reports the number of recipients and respondents of each survey. In total, 316 unique people took the surveys, resulting in a 58% response rate. Also, to understand the nature of this particular crowdsourcing process, we analyzed the crowd’s activity on the crowdsourcing platform based on idea production, commenting, and voting activity.

To deepen the understanding of the motivation factors and their change, phone interviews were conducted with 12 participants in July and August 2015. The interviewees were recruited from the

whole participant population (566) by sending an e-mail to a random sample of 50 participants in the crowdsourcing process, of whom 12 responded. A random sampling of the interviewees from the full participant population was used to avoid bias in recruitment and also engage those who did not respond to the surveys. However, the interviewees who responded to the interview call had responded at least to one survey. Five interviewees were women, and seven were men, ranging in age from 40 to 74 years, with an average of 62 years. The semi-structured interview outline inquired about the participants' motivation factors and experience with the crowdsourcing process. The interviews lasted, on average, 25 minutes, and the interviews were recorded and transcribed. The interviews were analyzed by using Strauss and Corbin's open coding method, letting themes and patterns emerge from the data [79]. The codes were merged in the following main categories: i) expectations for the process, ii) motivations to participate iii) change in the motives and iv) evaluation of crowdsourcing as a method in policymaking. The interviewees are referred to by numbers 1–12. For clarity, we refer to the survey respondents as 'respondents,' interviewees as 'interviewees,' and the people who participated in the crowdsourcing as 'participants.'

Survey Number	Recipients	Respondents
1	362	168
2	169	104 <sup>1</sup>
3	566	229 <sup>2</sup>

**Note.** <sup>1</sup> The 104 also replied to the survey 1. <sup>2</sup> 81 replied to the surveys 1 and 3, 65 replied to the surveys 2 and 3, and 65 replied to the surveys 1, 2, and 3.

Table 2. Recipients and respondents in the three surveys.

## 4 FINDINGS

### 4.1 Crowdsourcing Reached a Saturation Point

Of the 1,300 visitors on the crowdsourcing platform, 566 registered. In the first and second crowdsourcing stage, 232 ideas, 2,901 comments, and 8,526 votes were submitted. Of the 566 registered users, a majority, 338 (59.7%) participated by submitting ideas, comments, and/or voting. A small number of "super-users" —59 of the 338 (10.4% of 566 registered participants) contributors— made up the majority of the active users, as typical of online participation [7, 35, 41, 46]. They posted the most ideas, comments, and votes. The survey respondents were slightly more active participants than the entire participant population. Of the 316 survey respondents, the majority (72%) contributed by submitting ideas, comments, or votes.

The participants' activity changed during crowdsourcing after a certain point, as is typical of crowdsourcing [75]. In the first stage, the activity levels (ideas, comments, votes) reached a peak twice: at the beginning (week 2) and the end (week 5) as Figures 2 and 3 depict. The second peak is a saturation point in the idea submissions after which new ideas decreased until reaching inactivity during the last week of the first stage. In the second stage, the crowd contributed less than half of the ideas of what they did in the first phase. The number of comments remained rather consistent during the process, as Figure 3 depicts. This can be explained by the lower threshold on commenting on others' ideas than proposing an idea.

As time went by, the users were more likely to post comments instead of ideas. This may be explained by that the most common ideas were already proposed and the participants avoided

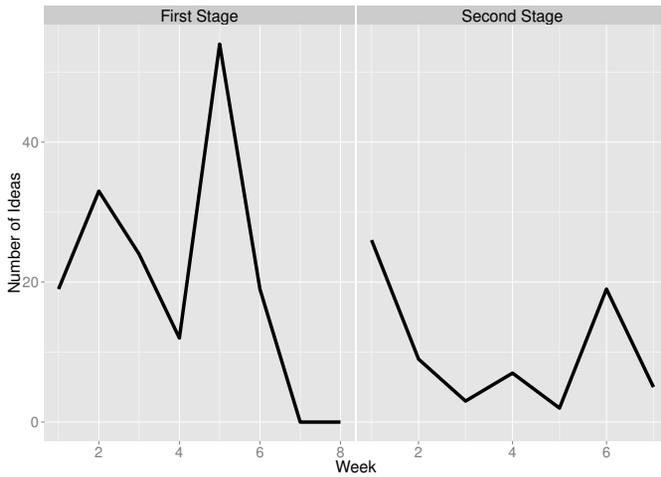


Fig. 2. The evolution of ideas in the crowdsourcing stages.

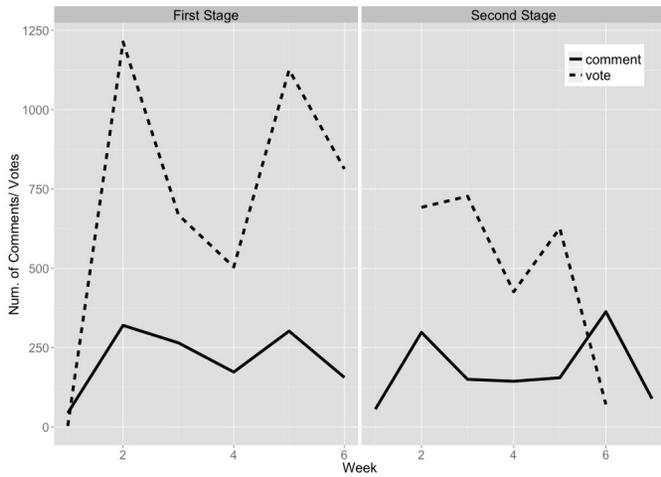


Fig. 3. The evolution of comments and votes in the crowdsourcing stages. The solid line represents comments and the dashed line votes.

replicates. There were also less new users joining, hence there were less potential new idea authors. The period of highest user registration activity occurred between weeks 2 and 3, and then the registrations decreased. The generation of votes followed a similar trend: There were two peaks in the first stage (weeks 2 and 5), and then a gradual decrease.

#### 4.2 Predicting Engagement

Only 12% of the participants (28 out of 223) who contributed in the first crowdsourcing stage with ideas, comments, and votes stayed until the end of the process. By using a logistic regression model [40] shown in Table 3, we analyzed the factors in participation activity that may have influenced the users' interest to participate throughout the second crowdsourcing stage. Both the

number of ideas and comments a participant posted in the first stage influenced significantly the participant's engagement throughout the second stage, but with a contrary effect. One unit of increment in the number of ideas, holding constant the rest of the predictors (the participant's comments and votes in the first stage), reduced more than 60% the odds of the participants to stay engaged through the second stage. But one unit of increment in the number of comments, holding constant the rest of the predictors (the participant's ideas and votes in the first stage), increased 9% the probability of the participants to continue to the second stage. In a similar vein, those who kept participating throughout the second stage ( $N = 28, M = 19.6, SD = 34.7$ ) produced significantly more comments in the first stage than those who dropped out ( $N = 195, M = 3.38, SD = 11.5$ ),  $t(27.8) = -2.45, p\text{-value} = 0.02, d = 0.42$ . Submitting an idea on the platform was a less interactive action than reacting to somebody else's idea with a comment, which can explain the different effects of these actions. Interaction means here a participant interacting with others' submissions on the platform by submitting comments.

Predictor	Coefficient	Percentage change in odds	p
(Intercept)	-2.13 (0.28)	—	< 0.001 ***
Ideas, first stage	-0.47 (0.20)	-62%	< 0.02 *
Comments, first stage	0.08 (0.03)	8%	0.006 **
Votes, first stage	-0.002 (0.01)	-2%	0.84
Deviance	126.34 (173 df)	—	
Number of observations	223	—	

**Note.** \*\*\* Indicates significance  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$

Table 3. Logistic regression model predicting the continuation of the participants' activity from the first crowdsourcing to the second one.

### 4.3 Participant Profile: Well-Educated Elderly Males

The majority of the survey respondents were well-educated men (61%), who owned condominiums (67%). Two-thirds (67%) had graduated from high school, and one-fourth (24%) had a master's degree from a university. Half were (50%) retired, and more than one-third (38%) were working full-time. The largest age group consisted of individuals over 65 years old (43%), and the second largest was 55–64 years old (33%).

Finns are in general well educated, which in part explains the survey respondents' high education level. Educated people are also more likely to participate in civic activities, such as voting [42, 74]. The older age differentiated the survey respondents in this case from profiles in other self-selected, digital participatory democracy initiatives, which typically include a younger crowd [7, 11, 77]. The bias toward older individuals can be explained by two reasons: It is more typical for older people to buy apartments, and most participants were home owners. Older individuals also tend to fill board member positions in housing companies, and the largest participant group was board members and chairs (49.7%).

The survey respondents were active voters. Almost all (89%) had voted in local and/or national elections within the past five years, which is more active than on average in Finland: 70% of the eligible population votes in national elections, according to the Finnish Bureau of Statistics [83]. About half of the participants (46%) had written an op-ed letter to a newspaper and had expressed (47%) opinions on blogs, in newspapers' comment sections, or online forums. About one-third had contacted their representative in Parliament (29%) or in local government (28%). This process thus

attracted a mixed population: Those who are already civically active but also those who are not used to influencing policy-making by writing to politicians or expressing their views in op-eds—the majority had not been doing that.

The participant profile conforms to the skeptical view about participatory democracy initiatives engaging mostly those that are already civically active [76, 80, 85]. However, the majority of participants did not have experience in policy influencing. Crowdsourcing as a method for participatory and deliberative democracy thus shows promise for widening the participant crowd to those who are not used to policy-influencing with traditional methods such as calling the elected representatives or writing op-eds. The demographic factors did not affect the survey respondents' activity level on the platform.

#### 4.4 Motivation Factors for Participation

We analyzed motivation factors in two steps: i) The strength of the factors within each stage, and ii) the change between the stages. In the first step, to examine the strength of each factor in each stage, we analyzed the survey respondents' motivation factors within the crowdsourcing stages by using the Kruskal-Wallis Test [52]. All survey respondents' answers collected in each survey were analyzed (see Table 2). The ordinal scale scores were not equally distributed, and non-parametric methods were used.

The strength of the motives varied significantly in each stage: Before crowdsourcing ( $X^2(6) = 512, p - value < 0.001$ ), at the end of the first crowdsourcing ( $X^2(7) = 299, p - value < 0.001$ ), and after the second crowdsourcing ( $X^2(7) = 606, p - value < 0.001$ ). Wilcoxon-Mann-Whitney [30] with Bonferroni correction as a post-hoc test showed statistically significant differences at the beginning of the first crowdsourcing stage between the strongest (F1: Solving problems, F2: Improving the law, and F4: Learning) and the weakest factors (F3: Unhappiness with law, F5: Passing time, F6: Curiosity, and F7: Discussing with others). We found similar results after the first stage between F1, F2, F4, F7, F8 (Interest in others' viewpoints), which were the strongest ones, and F3, F5, and F6 (the weakest), and between F1, F2, F4, and F8 and F3, F5, F7, and F9 (Civic duty) at the end of the second stage of the crowdsourcing process.

In the second step, we examined *the change* in motivation factors during the two crowdsourcing stages. For the six factors (F1, F2, F3, F4, F5, F7) that were included in the three surveys, the responses of the 65 respondents who took these surveys were analyzed. Two factors were added to the surveys 2 and 3: interest in others' viewpoints (F8) to surveys 2 and 3 and civic duty (F9) to survey 3. To keep the number of response options low, one factor, curiosity, F6, was removed from survey 3, because it did not score high in the two first surveys and there were not observations about curiosity having a key role in driving participation, and there was not statistically significant change in the factor. For factor F6 (curiosity) in surveys 1 and 2, and the factor F8 (interest in others' viewpoints) in surveys 2 and 3, the responses of 104 and 65 respondents, were analyzed, respectively.

To analyze changes in motivation factors during crowdsourcing, Friedman's Rank Sum Test [32] was employed. Wilcoxon Signed-Rank Test [87] was applied in analyzing the factors that were included only in two surveys (F6 and F8). Half of the factors – 4 out of 8 – decreased significantly during crowdsourcing: Solving problems, improving the law, discussing the topic, and interest in others point of view weakened during crowdsourcing. As Table 4 shows, a statistically significant change was detected in solving problems in housing companies (F1) ( $X^2(2) = 21.2, p - value < 0.001$ ), improving the law (F2) ( $X^2(2) = 10.4, p - value = 0.005$ ), discussing the topic (F7) ( $X^2(2) = 12.1, p - value = 0.002$ ), and interest in others' point of view (F8) ( $Z = 10.02, p - value < 0.001, r = 0.88$ ). Learning, dissatisfaction with the law, curiosity, and passing time did not vary significantly. A post-hoc test using Wilcoxon Signed-Rank Test with Bonferroni correction showed that the significant

change in F1 ( $Z = 9.91, p - value < 0.001, r = 0.87$ ) and F2 ( $Z = 9.92, p - value < 0.001, r = 0.87$ ) occurred during the first crowdsourcing (between surveys 1 and 2) and the change in F7 ( $Z = 9.97, p - value < 0.001, r = 0.87$ ) happened during the second crowdsourcing (between surveys 2 and 3).

In sum, the primary drivers for participation were solving problems in the housing companies (F1), improving the law (F2), and learning about the law (F4). They received the highest mean scores in the three surveys (see Table 4): before crowdsourcing, after the first, and the second crowdsourcing stages. However, solving problems in housing companies and improving the law decreased significantly during crowdsourcing, whereas learning as a motive for participation did not decrease significantly. Learning, thus, was the factor that stayed strong throughout crowdsourcing without weakening.

Factor	Survey 1			Survey 2		Survey 3		Df	X <sup>2</sup> /Z	p
	N	Mdn Score	M Score (SD)	Mdn Score	M Score (SD)	Mdn Score	M Score (SD)			
F1. Solve problems in housing companies	65	6	6.23 (1.03)	6	5.52 (1.58)	6	5.65 (1.46)	2	21.2	<0.001 ***
F2. Improve the law	65	7	6.18 (1.13)	6	5.71 (1.48)	6	5.91 (1.10)	2	10.4	0.005 **
F3. Unhappy with housing company	65	5	4.32 (1.85)	7	4.4 (1.96)	5	4.35 (2.01)	2	0.01	0.99
F4. Learn more about the law	65	6	5.98 (1.05)	6	5.89 (1.12)	6	5.65 (1.38)	2	3.97	0.14
F5. Pass time	65	1	1.66 (1.11)	1	1.57 (0.83)	1	1.66 (1.15)	2	0	1
F6. Curiosity <sup>1</sup>	104	5	4.27 (1.76)	5	4.61 (1.77)	—	—	1	8.28	0.13
F7. Discuss the topic with others	65	5	5.53 (0.97)	6	5.6 (1.06)	5	5.06 (1.40)	2	12.1	0.002 **
F8. Interested in others' point of views <sup>2</sup>	65	—	—	6	6.03 (0.88)	6	5.72 (1.02)	1	10.02	<0.001 ***
F9. Civic Duty <sup>3</sup>	299	—	—	—	—	5	4.58 (1.58)	—	—	—

Note. Friedman and Wilcoxon signed-rank test results for analyzing changes in the motivation factors between crowdsourcing stages. \* Indicates significance  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . <sup>1</sup> Survey 3 did not include this factor. <sup>2</sup> Survey 1 did not include this factor. <sup>3</sup> This factor was included only in survey 3.

Table 4. The motivation factors and their change during crowdsourcing.

#### 4.5 Decrease in Motives Predicting Disengagement

Because active commenting was a factor predicting continuing engagement in crowdsourcing (see Table 3), we analyzed the association between the motivation factors and the number of comments in the first crowdsourcing stage. We divided the group of survey respondents who participated in the first crowdsourcing stage in two groups. The first group was composed of the participants who responded to the first survey and left the process after the first crowdsourcing stage ( $N = 91$ ). The second group included the participants who responded to the first survey and stayed throughout the process until the end of the second crowdsourcing stage ( $N = 19$ ). There were not significant differences in the motivation factors (Survey 1) between these two groups when analyzed with Wilcoxon-Mann-Whitney test ( $alpha = 0.05$ ). This indicates that both groups had similar motivation factors in the beginning (F1, F2, F4, and F7).

We then divided the participants in the first stage again in two groups. The first group ( $N = 66$ ) were those who participated in the first stage, responded to the surveys 1 and 2, but did not return to the second crowdsourcing stage. The second group ( $N = 17$ ) were those who participated in the first stage, responded to the surveys 1 and 2, and continued participating in the second crowdsourcing stage. We analyzed the evolution of the motivation factors between the surveys 1 and 2 within the two groups. Wilcoxon Signed-Rank tests showed that in the first group the two motivation factors, solving problems (F1) ( $Z = 2.62, p - value = 0.009, r = 0.23$ ) and improving the law (F2) ( $Z = 2.29, p - value = 0.02, r = 0.20$ ), decreased significantly during the first stage. There were not significant changes among the respondents who took surveys 1 and 2 and kept

on participating throughout the second stage. This indicates that the weakened desire to solve problems and improve the law may have contributed to the participants' disengagement.

Similar results were found when dividing the survey respondents in the first stage by their level of commenting activity to two groups: Those whose commenting activity was above the average ( $N = 34$ ), i.e., their number of comments were above the mean 3.67, and those whose commenting activity was equal or below the average ( $N = 76$ ). Improving the law and solving problems decreased significantly in the groups that left the process, but there was not a significant difference in the motivation factors in the group that continued participating.

#### 4.6 Desire to Solve Problems in Housing Companies

We examined the reasons for the changes by using the interview data and answers to open-ended questions in the surveys. The 12 interviewees represented the survey respondent population in demographic factors: They were mostly educated, retired, civically active elderly men. The interviewees' participation activity in ideas, comments, and votes was similar to the participant population: The activity decreased over time. Their activity ranged from nothing to some ideas, dozens of comments, and over hundred of votes. Their strongest motivation factors were the same as the survey respondents', and the factors weakened over time. The numbers after the interviewees' ID code (I1-I12) refer to the number of ideas, comments, and votes they contributed, respectively. S1, S2, and S3 refer to the surveys the interviewees completed.

The analysis of the interviews and the open-ended questions in the surveys show that the primary motivation factors for participating were the interest to impact the law, to learn about it, to solve problems in the housing companies, and to discuss the topic with others. The interviewees had a clear idea about how the law should be changed, and participating in crowdsourcing provided an avenue to address issues that would make a practical difference in their lives, as described by an interviewee (I5:2,27,48;S1-S3): *"The law should make communication about renovations and cost-sharing mandatory. That would increase equality in housing companies."* This 68-year-old interviewee had been a board member of her housing company for many years, and she had experienced problems caused by the lack of communication.

#### 4.7 Learning about the Law

The interviewees and the survey respondents came to the platform to look for information for resolving issues in their housing company. They cherished the opportunity to ask the ministry experts questions, thus valuing the vertical transparency in crowdsourcing. They also appreciated the horizontal transparency, as it enabled them to interact with and learn from peers. When asked in the survey what they valued the most in the crowdsourcing, 72% of the survey respondents mentioned learning and the exposure of the variety of opinions.

They felt that they learned from other participants, thus partially fulfilling the expectations put on participatory and deliberative democracy initiatives [11, 69]. *"I learned about practices in housing companies in other parts of the country, and about issues and solutions elsewhere. Everybody can then compare their own housing company's situation to others and learn from that,"* said a 69-year-old interviewee (I3:2,1,44; S1-S3), who is the chair of the board of his housing company. The interviewees and the survey respondents perceived that they learned during the conversations. *"The conversation in itself was the best. It really informed about the problems in housing companies, although the proposed ideas were not that feasible or efficient,"* wrote a survey respondent.

They learned to understand others' viewpoints, which revealed the complexity of the issues: *"There were multiple occasions that were eye-opening to me. Nobody can innately understand all perspectives. But now I saw that an issue could be approached from so many angles that I [had] never*

*thought about. It showed how complex the issues really are and why finding solutions can be difficult*” said this 46-year-old interviewee (I4: 0,3,19;S1-S3).

The interviewees and the survey respondents hoped that the crowdsourced input would stay online as a knowledge repository for future use. *“If it stays online, it will be a great information resource for a large group of people,”* a 68-year-old housing company manager (I7:1,13,81; S1-S3) said. They wanted a broader group of people than just themselves to benefit from the crowdsourced knowledge. The notion of the shared knowledge repository reflects the perspective of knowledge as embedded in people. For those who contributed to crowdsourcing, knowledge was something to be shared and used collectively rather than to be owned and controlled by individuals.

#### 4.8 Reaching a Saturation Point

The interviewees and survey respondents perceived that the interactions during crowdsourcing were mainly civil and respectful. However, over time the negative aspects in crowdsourcing amplified. 70% of the survey respondents mentioned yanking, sharing of individual negative experiences, and too much divergence as the most negative aspects. The interviewees and the survey respondents became annoyed by those who shared stories only about negative incidents. *“Not all participants understood what the process is about, but they used the platform as an avenue for channeling their own frustrations to the world,”* wrote a survey respondent. Moreover, while the interviewees and the survey respondents enjoyed seeing the variety of views depicting the reality in housing companies across the country, too much divergence was distracting. They hoped that the crowdsourcing platform would have a more clear division of topics and better commenting features so that towards the end, the number of comments would not feel overwhelming. They also hoped for summaries of the crowdsourced input during the process for a quick overview: *“When the conversation proceeds, it is hard to follow it because there is so much material,”* wrote a survey respondent.

The interviewees perceived that there is a saturation point in the crowdsourcing process. By that point, most perspectives were expressed, the ideas started to repeat, and the negative features in the fellow participants intensified. *“After four weeks, I felt like it’s done. The most important points were made and heard,”* said an interviewee (I2). The saturation point can explain the decrease in motivation factors and in the participation activity: The crowd felt that they proposed their solutions, learned, and heard others’ viewpoints. The desire to impact the law and solve issues decreased during crowdsourcing because the participants understood that the problems were more complex and there was a wider variety of opinions. Finding solutions was harder than they had assumed, as a survey respondent wrote: *“I realized that the changes I had envisioned in the law wouldn’t solve the problems in our housing company.”*

## 5 DISCUSSION

### 5.1 Self-Interest Driving the Participation

The motivation factors to participate in this case of crowdsourced policymaking were desire to improve the law, solve problems in housing companies, learn about the law and others’ viewpoints, and discuss the topic. These factors remained the strongest drivers in both crowdsourcing stages and are evident in the quantitative and qualitative data. The interview data revealed that participation was also driven by the participants’ concern about the missing citizen representation—namely, the participants’ own perspective—in traditional law-making.

While other strong factors weakened during crowdsourcing, learning stayed the strongest factor during the two crowdsourcing stages, without significant decrease. The two crowdsourcing stages had almost a year between them, yet learning still did not decrease, showing the strength of learning

as a factor sustaining the participation. The findings thus suggest that learning is a motive that can sustain participation over time.

The primary drivers were rooted in self-interest rather than in contributing to common good, as Table 5 shows. The participants wanted to improve the law and solve problems in it so that the law would be changed the way they perceived as the best. The factors driven by epistemic and social aspects—learning about the law, interest in others’ viewpoints, and discussing with others—were instrumental in reaching their goal: a better law. They did not participate because of a general desire to be social or to learn; these aspects were directly tied to reaching the goal of affecting the law. They wanted to learn so that they could change the law. The participation was instrumental for addressing the participants’ needs: If the law was changed as the participants wish, it will have an immediate impact on their lives, for instance, by improving communication in housing companies. The changes can generate direct financial benefit, as the law affects the participants’ property values, developing extrinsic rewards for participation.

Even though the participants were driven by self-interest, they perceived the crowdsourced knowledge as something to be shared and distributed freely for the common good rather than to be owned and used just only their own benefit. They hoped that the crowdsourced knowledge repository would remain online for anybody to use after crowdsourcing, to benefit also people who did not participate in crowdsourcing. They thus perceived knowledge as embedded in community, which typically excludes self-interest [86]. But the participants were motivated by self-interest, yet it perceived knowledge as embedded in community and wanted to share the crowdsourced knowledge for the common good.

This suggests that we should examine the motivation factors in crowdsourced policymaking on a continuum ranging from the primary factors to participate, which in this case were rooted in self-interest, and the secondary motives which emerged during and after crowdsourcing, when the crowd realized the value of the crowdsourced knowledge and wanted to contribute that to common good. This changes the nature of the motivation factors from self-interested to common-good oriented, reflecting the shift in the role of participation in crowdsourcing for the participants: starting from an instrumental act to pursue one’s own interest, moving on to a valuable process, which outcomes should be shared with the wider public.

## 5.2 The Irrationally Rational Crowd

The self-interested, instrumental, and extrinsic nature of the participation differs from prior work in voluntary crowdsourcing and commons-based peer production. The participation is often driven by larger societal or ideological goals, as is evident in a previous study about motivation factors in crowdsourced policymaking [5], citizen science [64, 71], crowdsourced journalism [1], crisis response [68] and commons-based peer-production [9, 53, 63, 88]. Neither was the participation driven by civic duty as in voting in elections [13] or for contributing to the common good as in political participation [36]. Instead, participation was driven by instrumental, pragmatic reasons. The participants wanted to address their own needs by solving issues in their housing companies, similarly to open source software production, in which programmers are driven by developing software that addresses their needs.

The participants were seeking to change the law to improve their lives in the apartment buildings and increase the value of their property. The participants’ self-interested behavior is rational, and self-interest as a motive is a common driver in political participation [8, 26, 67]. But the participants had only moderate (if any), expectations for being able to influence the law. Therefore, according to the rational utility value, which is argued to drive political participation [13, 34], the behavior is also irrational: They participated even though they knew that there is only a little, if any, real

possibility to have an influence on the law. The paradoxical behavior suggests that the motivation factors were strong enough to overcome the rationality of not participating.

### 5.3 Weakened Interest to Improve the Law

During crowdsourcing, the participants' desire to solve problems in the housing companies and to improve the law weakened. Moreover, the weakening of these two factors was associated with the decrease in the probability to stay engaged after the first crowdsourcing stage. The participants, who were primarily motivated by solving problems in housing companies and improving the law, were more likely to drop out after the first crowdsourcing. Similarly, the low participation activity in the first crowdsourcing stage had an association with the decrease in the two motives: solving problems and improving the law.

Motivation factor	Epistemic	Intrinsic / Extrinsic	Self-Interest(SI) / Common good (CG)
Problem-solving	Epistemic	Extrinsic	SI
Improving the law	Epistemic	Extrinsic	SI
Learning	Epistemic	Extrinsic	SI
Sharing knowledge	Epistemic	Intrinsic	CG
Interest in others' viewpoints	Epistemic, social	Extrinsic	SI
Interacting with others	Social	Extrinsic	SI

Table 5. The nature of strongest motivation factors in the crowdsourcing process within the Housing Company Law reform.

By triangulating the survey and interview data, we found a reason for this behavior. When the participants entered crowdsourcing, they had expectations about their chances of resolving issues through crowdsourcing. But during crowdsourcing they learned about the complexity of the problems and the law regulating them, becoming less assured about their chances to solve the problems. After seeing others' perspectives and interacting with them, the participants realized that engagement in crowdsourcing would not improve the law itself but could actually make the solutions harder to reach.

The interest to discuss the topic with others and interest in others' viewpoints also decreased significantly during crowdsourcing, particularly during the second crowdsourcing stage. The decrease in the crowd's interest in the social aspects can be explained by the saturation point in crowdsourcing, which was manifest in decreasing participation activity and motivation factors. Once the saturation point was reached, the participants felt that they had learned enough, discussed with others, and expressed their point of view or seen their views been expressed by others. The process was "said and done" for them. After seeing hundreds of other participants' perspectives, their interest in each other's opinions was satisfied. Moreover, after the saturation point, the negative aspects of others' behavior on the crowdsourcing platform were exposed, and thus, interest in interacting with others decreased.

## 6 IMPLICATIONS

### 6.1 Design implications

The findings have important implications for the design of crowdsourced policymaking processes and the technologies facilitating crowdsourcing.

**Supporting learning.** Learning was the strongest factor sustaining participation, and the participants learned from the materials on the website, each other, and the experts. The participants should be provided with various types of materials including visualizations, videos, and links. Features providing a possibility for interaction among participants such as commenting, liking, and following another participant would support learning from the peers. Interaction means a participant interacting with others' submissions on the platform by submitting comments or likes. Learning from the experts should be supported by ensuring the active presence of civil servants and other experts. Two-way communication between the experts and the participants should be encouraged by highlighting questions and answers and arranging chat moments for rapid Q&A sessions, which could feature "guest experts." Learning should also be enhanced *after crowdsourcing* by maintaining the crowdsourced knowledge repository online and summarizing and highlighting the most important aspects from the crowdsourced material, similarly to platforms such as Consider.it [50] and Reflect [51].

**Rapid problem-solving.** Solving problems and improving the law were strong drivers despite their weakening. The weakening of these factors predicted disengagement, and therefore it is particularly important to strengthen these factors. In addition to providing pre-determined problems to the participants to solve, the problems emerging from the crowd's input should be highlighted. The problem-solving could be organized similarly to crowdsourced flash teams [72], in which the tasks are addressed collectively in a rapid manner. The crowdsourcing process should be designed in sequences: In the first stage the participants would be asked to share problems related to the law, and in the following sequence, the focus would be in solving these problems. This design enables focusing on one important task at a time.

**Interactivity and transparency.** It is common that commenting is disabled in crowdsourced policymaking processes [2, 62] to maximize the effectiveness of the broadcast knowledge search, at the cost of users' needs to communicate on the platform, although interactivity and transparency play a crucial role in crowdsourced policymaking. The participants valued the interactive and transparent nature of crowdsourcing: The possibility to exchange information with one another and seeing others' opinions. The findings suggest that a higher commenting activity predicts continuous engagement in crowdsourcing, and interaction also plays a crucial role in learning. Crowdsourced policymaking should enhance the interactive and deliberative features with the platform design, which supports structured commenting trees and a variety of reaction methods, such as comments, replies to comments, likes, and emojis.

**Enhancing interaction.** The interactive factors, discussing the topic with others and interest in others' viewpoints, however, weakened after the saturation point. One reason for the decrease was the amplification of the negative aspects: The repetition and divergence in the comment threads, and the cascading content, which overwhelmed the participants. To address these issues, the crowdsourcing platform should have a more precise topic categorization and an active moderation. If the process was designed for deliberation and reaching consensus, and bargaining and compromise proposals were encouraged and incentivized, the crowd would probably be more interested in continuing interaction. The weakening interest in the interaction, however, is natural, and cannot probably be fully avoided. The participants' interest in others' perspectives and discussing with them will become satisfied at a point, and it can be pointless to try to artificially maintain their interest in social aspects.

**Designing an evolving process.** Crowdsourced policymaking should adjust to the dynamic nature of the participation and the motives driving it. The process and technology designs should vary in different stages of crowdsourcing. The process should be designed for sequences each of which has a clear goal. The use of graphical timelines in prominent parts of the crowdsourcing platform can help in communicating to the participants the structure and status of the process.

If the process starts with problem-mapping, knowledge sharing should be supported. When the process continues with collaborative problem-solving, social and deliberative aspects should be enhanced. Because crowdsourcing reaches a saturation point after a couple of weeks, the sequences should be fairly short, and the crowd should be re-activated in the new sequence with new prompts.

**Knowledge commons.** Crowdsourced policymaking should enhance epistemic aspects by facilitating both short-term, fast knowledge search and by developing long-term knowledge commons. The final “sequence” in crowdsourced policymaking should be the maintenance of the crowdsourced knowledge repository, which can benefit the broader public in long-term, not only those who participated. The process should be designed for gathering the crowd’s and experts’ knowledge in a format, which can be maintained online. The goal of creating the knowledge commons should be communicated to the crowd at the beginning of the process because it can motivate participation. Moving from only the short-term, campaign-style crowdsourcing initiatives to projects, which require more long-term commitment from the crowdsourcers—the government, in this case—is a fairly large change in the current nature of crowdsourced policymaking projects, and thus requires thorough examination.

**Beyond the civic elite.** Crowdsourced policymaking should be designed to engage participants beyond the civic elite. To strive for the goals of participatory democracy, the number of civically non-active participants should be increased, otherwise, crowdsourcing is largely amplifying the civically active’s voice, as was evident in the case studied in this paper. The design of crowdsourcing initiatives should move on from the typical “one size fits all” designs to developing differentiated communication strategies for user groups: To those that are politically active, and those that are more alienated from civic life. Moreover, the equality among the participants on the crowdsourcing platform has to be secured by creating a safe environment for everybody to express their voice.

## 6.2 Methodological and Theoretical Implications

The findings show that the participants’ motivation factors evolved over time. The dynamic nature of the motives suggests that to more fully understand the evolution of the participants’ motives in crowdsourcing, the factors should be measured several times. Furthermore, the findings show that rather than having a dichotomous nature, the motivation factors move on a continuum.

The changing nature of the motives should be taken into account in the theories about motivation factors, in which the factors are currently largely approached as dichotomous. Understanding the shifting nature of motives is particularly important for analyzing the factors, which can sustain participation. Informed by these findings, future research should analyze the association between the saturation point and the evolution of motivation factors and whether the saturation point affects some motivation factors more than others. Future research should also examine the impact of design choices on the motivations and the timing of the saturation point.

## 7 LIMITATIONS

This study has several limitations, one of which is the empirical context constrained to one case study. To test the generalizability of the findings, future research should examine motivation factors in crowdsourced policymaking in several countries in several policy types. Furthermore, the process and technology design may have affected the findings. The process was designed for knowledge search rather than for deliberation. Had the design better supported deliberation and other interactive aspects, those factors maybe would not have decreased. The design, however, did not specifically support learning either, yet learning remained a strong motive.

Moreover, this study only captured the motives of those who were motivated enough to participate, were able to participate, were aware of the crowdsourcing process, knew how to participate,

and had the digital means for participating. Several groups were excluded, particularly the underprivileged population, as is often the case in civic engagement processes such as deliberation [76]. This amplified the existing bias in participation by further mobilizing those who are more active, to begin with. The profile of the participants can also affect the motivation factors. This study captured participants who were educated and had a high socioeconomic status. Future research shall examine motivation factors in various contexts with diverse participant groups.

The survey and interview -based research design within in-the-wild crowdsourcing had also its limitations. We captured the motivation factors of those who responded to the surveys and the interview requests. Those who are already civically active tend to self-select to participate as an informant, thus amplifying the participation bias. Research designs without self-reported measures could, therefore, provide more holistic knowledge. A/B-testing in controlled experiments would allow more detailed examination of motivation factors. However, within in-the-wild studies in official, government-run policymaking, the possibilities for conducting such studies are limited, because the government does not want to subject citizens to different conditions, which can affect their participation. Collaboration with a third-party imposes restrictions to the research designs [43], as was the case also in this study.

## 8 CONCLUSIONS

The findings show that the participation in a crowdsourced lawmaking process was motivated by improving the law, solving problems, and learning, which were instrumental factors rooted mostly in self-interest, but also in common-good orientation. Learning was the only strong motive which did not decrease during crowdsourcing, thus, it was the factor sustaining participation. The epistemic and interactive aspects were deeply intertwined: The participants learned when interacting with the peers and the experts on the platform, and the more they interacted, the more likely they stayed engaged in crowdsourcing. The findings bear important design implications on the design of crowdsourced policymaking processes and technologies. The designs should match the needs of the crowdsourcers and the crowd: The participants come to influence the policy but also to learn by interacting. Meaningful interactivity requires more work from the crowdsourcers, who tend to design the crowdsourcing processes rather for knowledge search than for deliberation and knowledge sharing among peers. However, matching the needs of the crowdsourcers and the participants is crucial for conducting successful crowdsourced policymaking processes, from which the participants also derive value.

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