

Why so serious? The Role of Gamification on Motivation and Engagement in e-Participation

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Abstract. Since the emergence of e-participation platforms, an increase of public participation has not yet been documented. Recently practitioners and researchers have begun to explore the applicability of gamification in the hope to promote the usage of e-participation services. Gamification has been proven partially successful in several domains, but is only emerging in public participation. This work provides insights on whether game components can promote public participation. We report on the evaluation of a gamified mobile participation application in a field trial that took place in Turku, Finland over a period of five months. We focus on whether specific factors (internal & external) can be used to predict active participation. Our results indicate that citizens are primarily motivated by genuine interest in urban planning. Although gamification had little influence, it did add to some users' motivation. The approach did, however, not succeed in engaging new groups.

Keywords: e-participation, mobile participation, gamification, behavior models, motivation.

1 Introduction

Public participation is seen as a cornerstone of our democracy. Broadening it has been deemed desirable for various reasons: it increases the representativeness of administrative and political institutions, but also builds citizens' sense of political efficacy and acts as an important check on the abuse of institutional discretion [1]. Despite these seemingly obvious reasons underlining the significance of public participation, the promised democratic revolution based on e-participation services has failed to manifest itself [2].

In response to decreasing voter turnouts and low levels of public participation, municipalities around the world are exploring new ways to engage citizens in political decision-making. As of now, the most common approach seems to be the creation of

web-based platforms which aim to facilitate communication between citizens and authorities. Flexibility has become one of the most valuable aspects of modern life, which is at odds with time-intensive town hall meetings set at fixed times. With the proliferation of the mobile Internet, it is now possible to do most things on the go, wherever whenever. Responding to this trend, also mobile participation tools have been developed. Considering the sheer mass of apps available, the provided content of public participation applications has to be of high relevance to users/citizens. Their design has to be particularly engaging, so that people a) want to download them and b) continue to use them.

Among the many challenges of designing and providing public participation tools, activation continues to be relevant, if not even the most important aspect. Activation represents the point of entrance and hence decides upon the success or failure of the newly introduced communication channel. In contrast to traditional marketing approaches that aim to *inform* about the opportunity to engage, we posit that stronger incentives (= triggers) need to be present to *boost* people's *motivation* to engage.

Reflecting on the emergence of e-participation, it has been noted that the use of promising interactive technology does not automatically lead to a participatory practice [3]. Technology alone cannot ensure a sustainable public participation, adequate conditions as well as incentives are needed to engage citizens. This raises the question of what conditions will lead to broad and sustainable participation.

Earlier work has shown that engagement is mediated by multiple factors simultaneously and that the composition of factors (individual characteristics, cultural values and motivational factors) is quite complex [4, 5]. While previous research has mostly focused on the composition of individual characteristics such as demographics and political values of different participating groups, very little is known about the motivations and conditions that drive citizens to use and engage in digital participation platforms.

Despite the emergence of a multitude of web-based public participation platforms, e-participation services rarely scale and fail to reach a broad user base [6], thus also causing limited impact on policy and democracy [7, 8]. Addressing the challenge of designing a tool that motivates people to contribute to decision-making processes at large, this research set out to investigate whether novel approaches, namely mobile participation and gamification, have the potential to be more effective by concentrating on the presumed engaging qualities of gamification in the domain of public participation.

The presented study extends previous works on factors and conditions affecting engagement in e-participation as well as research on the impact of gamification in various contexts (e.g. [9–11]). The overall goal of our research is to explore whether gamification has the potential to promote participation mediated through urban planning apps. As a step towards this goal, this paper investigates whether the existence of game components can be an additional motivator for those already interested in the topic to participate and those interested in (mobile) gaming. A detailed evaluation of the effectiveness of the individual game components however is out of scope of this paper. This work further provides insights to the overall uptake of game-related components in relation to actual usage of those. The study therefore addresses the following research questions:

RQ1: Can game components in public participation applications be a motive to start engaging?

RQ2: To what extent do achievement systems play a role during actual participation?

We explore these aspects through the lens of a trial we conducted, in which we tested a participatory planning application called *Täsä*. In the following sections, we review previous work on individual characteristics of users of e-participation tools and the implementation of gamification in the former. Section 3 describes the gamified mobile application used, while Section 4 outlines the study design. We then present our findings, which are discussed in section 6. A final section concludes this paper and points to future research.

2 Related Work

Both gamification – using game elements in non-game contexts [12] - and digital public participation – using information and communication technologies (ICTs) to instrument participation – are trends that have received a lot of attention in recent years [13, 14]. In the following, we give an overview of relevant work in fields touched upon by our work: public participation in general, motivations to participate, gamified participation and dissembling behavior.

2.1 Public Participation

Research on public participation has a long history. The phenomena boosted with Arnstein's [15] seminal article, in which she defined participation as a redistribution of power from public servants to citizens. Much of subsequent work aimed at inclusive participation: help those citizens with weak expertise express their views, include disadvantaged groups, and balance the voice of vocal groups [16]. Fast forward into present time, citizen involvement in political decision-making is decreasing across the globe: voter turn-out is decreasing, as is party membership or voluntary organizations [17].

Decreasing participation is a direct challenge to the legitimacy of democracies, which are largely based on a majority rule. National and local governments therefore seek to increase participation in order to gain support for their actions. Faced with a track record of challenges and present citizens' apathy, engagement proves to be difficult to put into practice not at least because of citizens' demands for communication and feedback. Reflecting on this, Rowe & Frewer [18] identified three types of participation: 1) *public communication*, in which the governmental agency communicates information to the public; 2) *public consultation*, in which the public informs the governmental agency of their views and opinions on a given topic; and 3) *public participation* based on information exchange between the two parties.

The adoption of ICTs in the public sector has played out in very different ways: Local governments have used their websites to broadcast news and information to the public (public communication; [19]), while the citizens are turning to social media

tools to engage with planners (see public consultation and participation above; [20]). Studies have shown that existing public participation platforms do not allow for a two-way communication [21, 22]. It is thus clear that there are disconnects in the relationship between public authorities and citizens. At the most fundamental level, electronic public participation involves citizens' motivation to use a certain technology [23].

2.2 Motivations to participate

Previous research on political behavior has mostly focused on the potential impact of environmental variables such as a person's exposure to news media, accumulated political socialization and susceptibility to contextual influences [24]. Lately, research has also considered personal characteristics. In an attempt to explain public participation, factors such as political attitudes (e.g. interest) and the socio-economic status (i.e. demographics, education, income) have been considered. In this context, different theories have been constructed and evaluated in various research disciplines [25]. While sociologists have concentrated on the mediating role of resources such as human and social capital, political scientists have demonstrated the effects of political values and attitudes (i.e. trust, efficacy, satisfaction). Rather unexplored is the relationship between individuals' personality traits and their engagement in participatory processes [24].

Loyens et al. [26] argue that people's motivation and possibilities to engage in the public domain can either be stimulated or hindered. Considering that the level of motivation depends both on the goals pursued (e.g. reputation, money; [27]) and the meaningfulness of the activity [28], the communication of the envisioned outcomes and opportunities inflicted through engagement is an important asset for increasing the likelihood of participation.

When technologies such as Web 2.0 and later mobile connectivity emerged, great hopes have been put into these information and communication technologies [29–31]. Yet, both scholars and practitioners (i.e. public administrations) soon had to realize that introducing technology is not enough and does not represent the long-sought trigger for public participation [32–34]. Seeing that people that engage in one form of participation are very likely to also be active in other forms ("usual suspects"; [35]), e-participation seems to rather *intensify* than broaden participation [36].

Augmenting these findings, evaluations of participatory systems have shown that citizens' motivations to use those are very complex [37–39]. As the motives and barriers people experience decide upon an individuals' participation or non-participation, understanding these aspects is key to promoting effective and continuous public participation [3]. This research takes an approach to understand the mediating factors of public participation by applying Fogg's [40] behavioral model. A growing body of literature argues that apart from their own (intrinsic) motivation and ability to participate, citizens' ought to be offered an incentive to encourage them to actively participate [27]. This research explores the potential of gamification to act as such a trigger.

2.3 Gamifying participation

Components of games are known for their motivational affordances [9, 41, 42]. Empirical studies show that gamification can lead to increased usage of a system, make tasks more enjoyable (e.g. [43]) and improve political awareness (e.g. [44]). The idea behind gamifying participation is motivated by "play's ability to empower, build community, and foster collaboration and cultural change" [45].

The practice of introducing game aspects into platforms with the objective to foster public participation is what we refer to as "gamified participation". Whereas e-participation research is already well established, work exploring gamified participation is still limited. Encouraging evidence from studies shows that integrating game inspired mechanics into participatory processes can have positive impacts on participants' attitudes about process effectiveness [46], build lateral trust [47] and through collective reflecting support civic learning [48]. Moreover, gamification has been proven to be able to raise users' motivation to make use of e-participation tools (e.g. [42, 49]).

While generally more prevalent in the related domain of citizen science, where scholars slowly start to investigate the effect of specific game elements (e.g. [43]), up until now gamified participation projects have investigated only the general acceptance of game elements in relation to public participation processes. Similar to gamification studies in general, the specific impact of these components including an understanding of how they work remains, particularly in the domain of public participation, largely unexplored [13, 50].

To the best of our knowledge, all existing gamified participation systems target urban planning. Regarding the broader participation domain, gamification has found the most application in citizen science projects as well as in citizen sensing (e.g. [51]). Here studies showed that gamification can increase participation probability [52].

Bowser et al. further showed that gamification can encourage previously less active groups such as young people [53]. In a second study, their gamified application was trialed with two user groups: game aficionados and those with intrinsic interest in the addressed topic [9]. While some game aspects were enjoyed by both groups (e.g. discovery, education and socialization), others appealed more to one group with the other being indifferent regarding this aspect.

Poplin re-engineers public participation through serious games [42]; she takes a starting point in the premise that games offer satisfaction to players and motivate them to participate in urban planning processes. Projects included a simulation game around the task of finding a suitable location for a university campus as well as a design platform for proposals regarding the redesign of a market square. While gamifying public participation had positive effects such as boosting motivation and learning – in a playful manner – about the specifics of the area under planning, users found the game too complex. This suggests that designing effective gamification elements is difficult in practice and is perceived at an individual level. Moreover, in question are also the outcomes of this exercise in that it is hard to discriminate between "serious opinions" and "results of the game". Thus, it is important to keep the focus on the process at hand (i.e. democratic topics) and its impact.

Without claiming to be exhaustive, these examples offer a wide range of ways in which gamification has been applied in practice. Based on previous observations that

not everyone is prone to games [43] coupled with the belief that democratic action should not be incentivised in order to avoid bias, we decided for a shallow gamification approach that might be ignored. Next, we turn to approaches aiming to explain human behavior as a composition of various factors.

2.4 Dissembling behavior

In light of motivations for engagement being a complex phenomena comprising not only personal but also environmental factors [4, 5], we argue that drawing on theories explaining motivation will not be sufficient to understand what drives and what hinders participation. Human behavior has been said to be product of elements of the environment, individuals' basic traits (i.e. attitudes, skills), and the interaction between these traits with the environment [24]. Motivation is what drives action (i.e. behavior) and influences the intention to take action. According to the theory of planned behavior, individuals' behavioral intentions are shaped by attitudes, subjective norms and perceived control over the action [54]. A model that considers all these factors is Fogg's [40] behavior model. It illustrates under what conditions users perform an action. The model defines behavior as an interplay of motivational factors, skills and what so-called triggers. In case a factor is missing or not adequately met, the desired behavior will not show.

Similar to most theories on motivation, Fogg's model distinguishes between intrinsic and extrinsic motivational sources. Extrinsic motivation depends on environmental, social and cultural factors such as norms [55]. Intrinsic motivations on the other hand are determined by mental processes that relate to an individuals' goals and expectations as well as personal traits [56]. These traits comprise a person's attitudes, beliefs and values. These aspects differ in their stability against external and internal influences. Forming the core of our personality by representing behavioral ideals and preferences, values are the most stable. Beliefs are personal statements about what is wrong or right. Being based on experience, they can be influenced by new or additional information or observations [57]. Attitudes reflect a person's likes and dislikes, which are subject to change due to factors such as time and hence change relatively fast.

The second component of Fogg's behavioral model is based on a person's ability to perform an activity. Ability is defined as a construct of individual skills (i.e. learned behavior) and contextual parameters. Context is used to characterize a situation and is comprised of environmental, technological and individual aspects [58]. The behavioral model considers a third factor, triggers, which can either stimulate motivation (called sparks) or ability (called facilitators).

Fogg's model was originally developed for persuasive design, but has been applied in other fields. As gamification can be considered an overarching concept for persuasive technologies [59], we argue that it can be applied to explain the behaviour in gamified systems such as the one used as a research vehicle in this research.

3 Research prototype

In order to extend existing knowledge on the effectiveness of gamified participation by shedding light on the impact of gamification on motivations to engage, we tested a gamified urban planning application called *Täsä* (Finnish dialect for "here"). At its core, the mobile application aims to enable place-based dialogues between citizens and authorities (i.e. city officials, urban planners) as well as among residents. *Täsä* is based on the participatory sourcing approach allowing citizens to post geo-referenced contributions (i.e. pieces of content and optionally a picture). Visible to all, users are invited to discuss suggestions and issues. City representatives are expected to respond to input. In essence, the intention was to motivate and enable a dialogue between a city and its citizens.

We actively involved both representatives of the public administration and residents by inviting them for ideation workshops before the launch of the app. The goal was to design an app they would find easy and helpful to use. Our methodology of studying gamification in the domain of public participation further involved several user studies. Three smaller field trials were conducted with the objectives to evaluate the prototype and to prepare for the bigger field trial (Living lab) in terms of learning about possible challenges during the trial.

With our objective being to uncover the influence of specific components, we sought to minimize the potential confounding effect (i.e. individual components affecting each other). Hence, we chose to integrate only a selection of game-related aspects. This choice further corresponds to the necessity of keeping the application simple [42]. Our selection of components has been drawn from 1) a review of the relevant gamification literature (see Related Work), 2) an online survey of players of pervasive games [60], and 3) a set of small-scale user studies aimed at validating the selected components and the usability of the app [61].

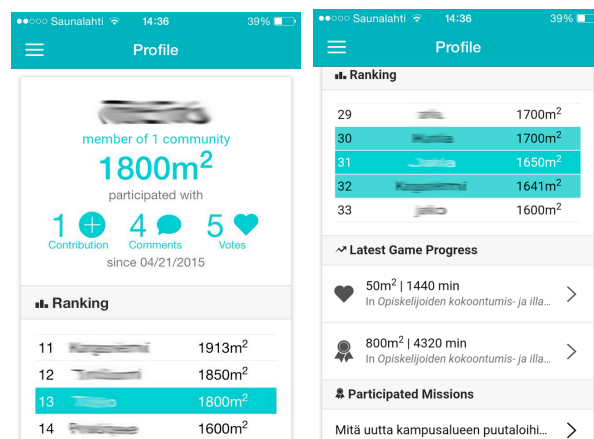


Figure 1. User profile in the *Täsä* app. Left: top of screen; right: bottom of screen.

Like most gamified (participation) applications [62], *Täsä* features an achievement system consisting of points and *leaderboards*, user *profiles*, and *missions*. The

screenshots in Figure 1 give an overview of those game elements and how they were visualized in the mobile application.

Points are awarded for in-app activity (see Table 1). An overview of points was displayed in the app. Täsä points were measured in square meters and represent a user's area of influence in the respective community. Augmenting a contribution with additional information (pictures, points of interest (POI) or emoticons displaying the authors' mood) was rewarded more points compared to passive activities (e.g. receiving votes).

Users could compare their points with other users' in both the top list and the **leaderboard**. The top list always showed the ten best ranked users, while the leaderboard displayed a user between two users ranked higher and lower (according to the "top of worlds" system; [63]). The purpose for adding two highscores was to provide users entering the trial at later stages or those having low scores with achievable goals (e.g. "even if I can't reach number one, I can still do better than others"). Both lists were displayed in the user **profile**. Additionally, the user profile also traced the in-app gaming progress, i.e. visualizing those activities for which the user was recently awarded points (see right part of Figure 1). Following the choice to design a shallow gamification, the majority of game features were only apparent in the user profile.

Rewarding active participation in Täsä (i.e. commenting, posting) with points serves a double purpose: a) it is supposed to stimulate users to contribute frequently and over long periods of time as well as b) sustaining the **lifetime** of relevant contributions. The first purpose builds on innate human desires for success, recognition, and achievement. The second purpose is part of the systems' semi-automatic mechanism of sorting relevant from irrelevant content. Starting with a pre-set value that decreases over time, the lifetime of a contribution is prolonged with each activity (e.g. a vote or a comment). We assumed that users would only interact with content they find relevant; conversely, irrelevant content would eventually "die" and disappear from the system. This mechanic is inspired by findings from threshold behavior [64]: in order to engage citizens to use the app and contribute, a certain amount of visible content needs to be present. In other words, users would find it easier to participate if they saw others already doing that (social influence; [59]).

Table 1: Summary of points awarded and in-app activities. AC: activity count; actual in-app activities.

Activity	Points awarded	AC
Add photo to contribution	600	47
Add POI to contribution	500	10
Add mood (emoticon) to contribution	500	44
Add contributions to mission	800	71
Receive contribution vote	50	303
Receive contribution comment	100	256

Another game element included into Täsä are **missions**. Missions were based on the quest concept in video games and can be regarded as in-app tasks that users can participate in. In contrast to video-game quests, missions in Täsä did not have a final resolution. Täsä missions were connected to urban planning developments to which

city officials sought input from citizens. Given this democratic purpose, missions lacked mechanisms to rate or track their progress. In short, missions were open for participation until the end of the trial. Examples of missions included suggesting new activities for underused buildings; alternative uses for children's playgrounds; or voting for different options of a development plan. Missions provide users with concrete tasks to participate in, thereby keeping them engaged with the specific mission topics. In addition, missions were designed for city officials to gain input regarding topical issues on the planning agenda of the city ("official missions", top-down). Täsä also featured bottom-up missions, created by citizens for other citizens and city officials to participate in. Contributions could either be linked to missions upon creation or introduce a new topic/issue (= "stand-alone" contribution).

Similarly, to users' points, lifetime increasing activities were weighted differently. For instance, attaching a contribution to a mission was awarded the highest amount of points; receiving a vote extended the lifetime of a contribution by a third of the time awarded for the former.

4 The Täsä Living lab

Living labs serve as a methodological tool to connect research to practice. In our context, the goal of the Living lab was to test the potential of a mobile public participation application in urban planning in Turku, Finland. The Living lab trial took place from June to October 2015.

4.1 Study design

The launch of the Living lab trial i.e. the introduction of this official participation channel was announced in two local newspapers, by handing out flyers and through the project website. Täsä was available for free download in Google Play, the Apple App Store and Windows Phone Store. We did not offer any incentives or compensation for participating in the trial. In this manner, we avoided the overjustification effect [65].

A disclaimer in the app highlighted both the official character of the application as well as its association to a research project. We did not explicitly advertise the gamification of the application, mainly because we aimed to exclusively focus on the public participation concept but also because we were concerned that announcing the gamified nature of the application might put the seriousness of the process into question and hence deter some from engaging. The fact that the application did include game components and hence could be "played", was, however, mentioned in the app store descriptions along with screenshots that pictured, for instance, the user profile. The description text hence indirectly promoted the game aspect of the application.

The app included a short pre-survey (shown in a pop-up window upon registering), which re-appeared automatically every 24 hours until answered. Even if users did not fill in the survey, they could still use the app. The survey inquired users'

demographics, experience with and usage of mobile applications as well as their attitudes towards political institutions. At the end of the trial, a questionnaire (referred to as post-survey) was distributed by email to all registered users of Täsä.

4.2 Study participants

Over the five months of the trial 780 users registered with Täsä. Due to our design choice to keep the registration process light-weight asking only for a username and e-mail address, we do not possess personal information about all users. Only those who answered the pre-survey (24% of users; 185) provided us with their demographical data. Of all users registered, 68% never once became active in any way within Täsä (= Non-actives). The distribution of pre-survey respondents according to both their demographics and usage behaviour was very similar to those of all users (e.g. 43% non-active users). Hence, we believe that the pre-survey respondents are fairly representative for all our participants.

According to data from the pre-survey, users of Täsä are mainly between 20 and 40 years old (70% of all users; of which the age groups 20-30 and 31-40 represent 36% and 34%, respectively). The gender distribution equaled to 41% women and 59% male. With 57% of our participants holding at least a Bachelor's degree, higher educated individuals are overrepresented compared to the overall population of Turku (23%).

4.3 Method

Arguing that stronger activation approaches than merely informing about their existence are necessary to encourage citizens to engage in public participation, we sought a framework that not only describes pre-conditions for behavior (i.e. what factors lead to actions) but also considers an additional factor that is assumed to increase the likelihood that an individual will take action. Fogg's [40] behavioral model fulfills both these criteria. In this paper, we apply Fogg's [40] model to explore the potential of gamification to act as a *spark* and hence influence citizens' motivation to engage in the digital participation platform [59]. As a consequence of not widely marketing the game aspects of Täsä, the gamification could only serve as a spark *after* having downloaded the app.

Motivational sources. Aiming to understand the goals and expectations citizens had towards this trial, we inquired their motivation to download Täsä. The corresponding survey question featured five items: a) *curiosity* in testing a novel application, wanting to b) be *informed*, c) be part of ongoing *discussions*, d) *propose* an idea, and e) *play* the game. Each item was measured individually on a 5-point Likert scale from 1= "not relevant at all" to 5= "very relevant". Whereas earlier work explored participants' initial motivations [66], this research focuses on motivations of different groups of participants.

Note that the motivations we explored referred to citizens' initial reasons for downloading Täsä. These do not necessarily correspond to citizens' motivation to i) participate in public affairs or ii) keep using this specific tool. This is relevant as

motivations that trigger participation are not necessarily the same that maintain participation [67]. To this end, citizens' motivations are also context specific, meaning that the same application might have had different results in another city or country.

Motivation is understood as a composition of attitudes, beliefs and values [68]. Regarding attitudes, an important asset for political engagement has been shown to be interest in public issues [9]. With Täsä having an explicit focus on urban planning, we measured participants' *interest in urban planning*. This item was assessed on a 5-point Likert scale (1="not at all interested", 4="very interested", 5="Don't know"). Gamification is often said to appeal especially to those that are prone to games but less so to others. To factor this dependency into our model to analyze usage behavior in a gamified participation application, we asked participants' about the *frequency of using mobile apps for games and other entertainment* using a 5-point Likert scale (1="rarely" to 5 = "constantly").

Drawing on tendencies that those interested engage more and those alienated by game elements less [69], we further investigated the differences in initial motivation regarding citizens' attitudes. To do so, we divided our participants into two groups according to their a) interest in urban planning and b) usage of mobile apps for games and entertainment. Each group was recoded into new variables, resulting in four interest groups: Interested & Non-Interested; Non-Gamers & Gamers. These groups are not mutually exclusive, meaning that a user classifying as Interested could also be a Gamer.

Those people who do not consider engagement in public decision-making as their responsibility as citizens will arguably also be less likely to take part in participatory processes. As a potential factor influencing behavior, an item in the pre-survey inquired whether participants believed it as important that the government changes its planned policies in response to what most people think. This was measured on a 10-point Likert scale, where 1="not important at all" and 10="Extremely important". Another item in the pre-survey assessed participants' *trust in the local government* (1="no trust at all; 10="complete trust), as mistrust in official institutions is repeatedly listed as one of the main barriers to public participation [70]. Both questions are based on items in the European Social Survey (ESS6).

Ability. Engagement with Täsä presumes that one has the capability to use the mobile application (individual skills) and that context allows participation in public decision-making (environmental context). For the duration of the living lab (5 months), the City of Turku granted Täsä official status as a communication channel with the city administration. This implies that ideas and issues voiced in Täsä would be read by city officials and potentially be considered for decisions and future plans. In that respect, the environmental conditions are given. As outlined in the section describing the Täsä application, the platform includes features that allow participants to actively take part in ideation and discussions regarding urban concerns; which grants the *technological* access. Regarding individual skills, we considered both the technological and domain specific component of participants' capability to engage. With Täsä being exclusively accessible via mobile devices, we inquired participant's perceived *skills with smartphones* (1="Beginner", 5="Excellent"). For the second, we assessed participants' internal political efficacy, which is the *belief to be well qualified to participate in politics* (1="strongly disagree", 5="strongly agree").

Behavior. In order to be able to compare the product of the factors allegedly determining behavior to actual participation in the application, we made use of backend logs. In particular, we were interested whether certain pre-conditions (here attitudes such as interest in urban planning and mobile games; see Table 1) influence level of participation (see Table 3). For this analysis, we introduce the term activity count which refers to the sum of interactions performed during the trial by a single user (e.g. number of votes cast, number of contributions posted). Thus, activity measures a user's level of participation within the Täsä application and hence represents behavior as defined in Fogg's [40] behavior model.

5 Results

In the following sections, we present quantitative insights from the pre- and post-survey pertaining to motivational sources (attitudes, beliefs and values) and abilities, which are – according to Fogg's behavioral model – relevant for explaining and predicting participation in a gamified platform. In order to link user characteristics and initial motivations to actual participation, we also give an account on quantitative usage data.

Table 2: Participants grouped by interest.

Usage of mobile entertainment apps		Interest in Urban Planning	
M = 2.81	SD = 1.31	M = 3.56	SD = .70
Non-Gamer	46%	Non-Interested	6%
Gamer	31%	Interested	94%

Attitudes. Those using apps for games and entertainment never or rarely are considered *Non-Gamers* (46%). In our categorization, *Gamers* (31%) use mobile apps for games and entertainment often to constantly. To avoid bias in our data and avoid valence, we excluded Occasional Gamers from the analysis.

94% of participants stated to be interested or very interested in how their city is planned (referred to as *Interested*; see Table 1) and merely 6% were not or not at all interested (*Non-Interested*). The high proportion of interested users, suggests that gamification might contribute little to their motivation to participate [9] – nor would it need to.

We did not find a correlation between interest in urban planning and playing mobile games. Both Gamers and Non-Gamers are interested in how their city is planned (91% and 94% respectively).

Beliefs & Values. Listening and changing plans and policies according to citizens' input was perceived as important by most participants (M = 6.62, SD = 3.08). Only 3% did not rate this as relevant. The majority of participants was not entirely convinced they can trust their local government (M = 5.29, SD = 2.38). More than half of them (53%) did however tend to trust local authorities.

Ability. Respondents of the pre-survey consider their mobile application skills to be excellent (47%) or good (42%). Hence, on average, participants had the ability to use the participation application (M = 3.33, SD = 0.73). The same holds true for their

domain-specific knowledge; participants indicated to be well qualified to participate in a participatory process concerning urban planning ($M = 3.32$, $SD = 1.32$). Only 12% were less confident and tended to view their knowledge as insufficient.

5.1 Want to play the game? - Motivations to download

Across all four groups, the main motivation for downloading the application was curiosity (76% rated this as relevant to highly relevant). Over two-thirds (68%) of participants downloaded the app because they wanted to be part of current discussions in Turku. "Playing the game" had a minor role in citizens' decision to download Täsä: 18% of participants' indicated that the game elements were (highly) relevant for them.

Relevant motivational aspects (i.e. scored 4 or 5 on the Likert scale) can be seen in Table 3. Among other, this cross-tabulation illustrates that 27% of Non-Interested rated the ability to suggest own ideas as relevant for their motivation to download Täsä.

Table 3: Amount of participants rating the respective motives as relevant for downloading, sorted by interest. Stars (*) indicate a significant difference between opposing interests.

Motivation	Non-Interested	Interested	Non-Gamer	Gamer
a) Curiosity	64%	77%	76%	75%
b) Be informed	46%	70%	61%	72%
c) Discuss	18%	35%	21%	* 50%
d) Suggest ideas	27%	* 37%	34%	43%
e) Play Täsä	18%	18%	18%	19%

The ranking of motivational aspects was similar among the four groups, with slight differences in "discussing Turku with others" (c) and "suggesting an idea of something to be changed" (d). Suggesting a concrete idea (d) was most relevant for Gamers (43%) followed by Interested (37%). "Playing" Täsä seemed to be less or not relevant for citizens' motivation to download the app.

When investigating who was and who was not motivated to download Täsä because of the game aspects, we found no correlation to participants' usage of mobile games. Non-Gamers ($M = 1.79$, $SD = 1.49$) and Gamers ($M = 2.0$, $SD = 1.50$) were similarly motivated to play/use Täsä. A weak, negative correlation between the motivation to play Täsä and interest in urban planning ($r = -0.15$, $p = 0.42$), supports our earlier assumption that those with a genuine interest in the topic at hand do not care much for additional incentives such as gaming.

Next, we look for differences in motivations for downloading Täsä between opposite interests (e.g. Non-Gamer vs. Gamers, see Table 3). We found that participants with opposing interest in urban planning and mobile games did not differ much in this respect. Merely for being suggesting ideas (d) and discussing (c) we found differences: Proposing an idea (d) played a significantly greater role for those Interested ($M = 3.91$, $SD = 1.86$) than for those Non-Interested ($M = 3.09$, $SD = 1.14$, $t(180) = 2.23$, $p = .001$). Gamers ($M = 3.46$, $SD = 1.30$) were significantly more interested to download an app in order to discuss urban topics than Non-Gamers ($M = 2.69$, $SD = 1.15$, $t(108) = -3.64$, $p = .000$).

Correlations between individual download-motivations showed that, with exception of *curiosity* and *discussing* (Table 4, a&c), and *informing* and *proposing* (Table 4, b&d) all motivational factors were significantly correlated. With regards to the motivation to *play* (e), there was a moderate, negative correlation to *curiosity* (a), being *informed* (b) as well as a weak, negative correlation to *discuss* (c) and a weak, positive correlation to *suggesting ideas* (d).

When comparing motivation to participate in urban planning (b-d) and curiosity (a), it can be stated that those curious about the app were more interested in a passive participation (i.e. gathering information but not contributing). On the contrary, those motivated by the prospect of playing Täsä (e), were more interested in active participation (d) and less driven by curiosity (a). Over half (53%) of those motivated to "play" Täsä, also had a concrete idea in mind to propose with the app. Note, no one downloaded Täsä just because of the game aspects. This indicates that being interested in the game aspects within public participation does not preclude people caring for the issue at hand, namely engaging in serious matters.

Table 4: Correlations between individual motivations to download Täsä (cf. Table 3).

	b)	c)	d)	e)
a) Curiosity	.394**	-.107	-.203**	-.439**
b) Be informed	/	.422**	.045	-.393**
c) Discuss	.422**	/	.432**	-.194**
d) Suggest ideas	.045	.432**	/	.180**
e) Play Täsä	-.393**	-.194**	-.180*	/

** Significant at 0.01 level; * Significant at 0.05 level

5.2 Predictors for participation

As a next step we explored whether Fogg's [40] model is a good fit for predicting engagement in a gamified participation application. The preliminary analysis to do so included examining associations between the activity count (= participation rate of individual users) and variables indicated by Fogg's model (i.e. motivational factors, attitudes, beliefs, values and ability). For this purpose, Spearman's rank-order correlations were conducted.

The correlation analysis showed that only the prospect of suggesting an idea with Täsä and interest in urban planning were significantly correlated with participation. Looking at specific activities, those motivated by the prospect to be able to put forward their ideas also posted more contributions and casted more votes. An earlier analysis showed that interest in urban planning does not always lead to increased engagement in participation platforms [69]. This mirrors findings indicating that interest in politics is not a strong predictor for engagement [71].

The impact of interest in gaming on engagement seemed to depend on the specific context. While it led to more activity in a networking platform, game affinity was associated with less engagement in the context of this trial. In short, context-relevant motivations seem to be a better deterrent for involvement in public participation than interests.

Table 5: Nonparametric Correlations between participation rate and factors defined in Fogg's behavior model. AC: Activity count

Factor	Item	AC
Motivations	Curiosity	-.068
	Be informed	.074
	Discuss	.104
	Suggest Ideas	-.205**
	Play Täsä	.010
Attitudes	Playing games	.009
	Interest in Urban Planning	-.245**
Beliefs	Trust in city administration	-.019
Values	Necessity to listen to citizens	.118
Ability	Mobile Skills	.051
	Internal political efficacy	.102

* : $p < 0.005$; $p < 0.001$

Apart from the correlations between individuals motivational sources as reported in Table 4, we further found that interest in urban planning positively correlated with all motivation sources except curiosity (a). This interest further positively correlated with internal political efficacy ($r(175) = .243, p = .001$). The practice of playing games on mobile devices, which we interpret as an interest in games, was positively correlated with the prospect of discussing local issues (c; $r(175) = .287, p = .000$) and perceived mobile skills ($r(175) = .232, p = .002$). Trust in the local government was found to be negatively correlated with mobile gaming ($r(175) = -.150, p = .048$), but positively with internal political efficacy ($r(175) = .174, p = .022$). Internal political efficacy in turn was positively associated with the motives to discuss ($r(175) = .214, p = .005$) and proposing ideas ($r(175) = .221, p = .003$).

A multiple regression was run with parameters indicated by Fogg's behaviour model (see Table 6) to examine whether they can be drawn on when predicting an individual's activity rate within in (gamified) participation application. Even after reducing the factors to those where the preliminary analysis indicated at least a moderate correlation with activity count, we did not find a model – based on factors specified by Fogg - that reliably predicted participation (adj. $R^2 < .037$). Models that significantly predicted participation were found for the combination of the variables interest in urban planning, internal efficacy, the belief that policies should adapt based on citizens' wishes and the motivation to be enabled to proposed ideas or gain information about current issues. Yet, the only variable that significantly added to this prediction was interest in urban planning.

5.3 Role of gaming within Täsä

In contrast to the pre-survey data measuring initial (download) motivation and user characteristics, quantitative (actual) usage data is based on backend logs. Usage of the application varied widely. While some users can be considered super-users due to the relatively large amount of content posted (>70 contributions), others did not actively use Täsä after registration. As we did not use in-app analytics, we do not know

whether the latter participants were passive users (reading content without actively contributing) or never opened the application after registering. Altogether, 184 contributions and 256 comments were posted during the Täsä Living lab.

Table 6: Users' activity and usage of the mission feature. (*N total users= 780).

	Amount	%
# missions	18	/
# of contributions	187	/
# users who posted a contribution *	108	14%
# contributions linked to missions	71	38%
# stand-alone contributions	116	62%

The maximum number of points achieved by a citizen in the app was 11050; the respective user posted six contributions and two comments. Table 6 shows that activities awarded the least points (i.e. voting and commenting) were far more numerous than activities rewarded maximum points (i.e. augmenting posts with additional information; see also Table 1). The application registered 622 votes, 256 comments on contributions on the low points scale and 71 attachments of contributions to missions on the high points scale. Only 10 points of interest (POIs) were added. Together with data from interviews and the post-survey, we can summarize that the vast majority of participants was not interested in gaining points.

The great majority of users posted less than three contributions, only five posted more than six. The most popular activity was voting. We counted 622 votes altogether, with 18% of all participants having voted on at least one contribution and 8% on at least one comment.

All in all, there were 18 missions. When it comes to the gamified actions in the app (see Table 1, most users posted stand-alone contributions: 62% compared to 38% of those that were attached to missions (116/187 and 71/187 respectively). This low participation in missions is also reflected in the low number of users that contributed at least once to a mission (3%). Attaching a mission to a contribution is the activity awarded the highest amount of points.

6 Discussion

This study set out to explore whether *game components in public participation applications can be a motive to start engaging* (RQ1) as well as to test the extent to which *game elements play a role during actual participation* (RQ2). The findings recorded during the actual use of Täsä suggest that this subset of game elements (i.e. rewarding contributions) had little influence on participation in the app. These findings stand in stark contrast to mainstream studies of gamification (e.g. [72]). We are ambivalent about generalizing results outside our own sample.

First of all, based on usage patterns, highscores and correspondence with users we have not found any support for users actively 'fishing for points'. Their usage behavior suggests that users commented posts they found of interest rather than participating with the aim of gathering points. Citizens' relative lack of previous experience with games (only a third of users could be described as Gamers) coupled with the fact that

curiosity to test the app was the main motivation to download Täsä, suggests that our gamification per se did not motivate participants to engage with the participation application. In fact, the motivation to 'play' Täsä was always linked to other strong motivations. Our app usage statistics indicate a gap between initial curiosity and actual use: interest in points was low, the lifetime was underused due to little interest or a misunderstanding of the concept and missions gathered only few contributions. To this end, our findings mirror Morschheuser et al.'s [73] finding that gamification does not necessarily lead to an increase in participation.

Second, our users had initial interest in urban planning and only some experience with using apps for entertainment (i.e. gaming). Combined, these two dimensions allude to outcome-oriented motivation to participate rather than hunting for external rewards – even when they are only points. Citizens' genuine concerns for the undergoing developments in Turku were their main motivation to participate.

Third, the fact that most citizens chose to participate through stand-alone contributions rather than missions can be interpreted in at least two ways: for one, citizens did not know of the existence or did not find the right missions to contribute to. In these cases, the gamification element was not noticed and therefore could not have had any effect. For another, citizens might have chosen to raise matters of personal interest and not collaborate on other citizens' missions. In this case, the gaming element was intentionally by-passed. All in all, it seems that gamification had little influence on (mission) participation, just as the results above show.

RQ1: Can game components in public participation applications be a motive to start engaging?

According to our study results, the main motivator for commencing public engagement remains genuine interest in urban planning and being informed about issues in the city. The results for the *Interested* group are straightforward, since being interested in urban planning can manifest itself both passively (interested in being informed) as well as actively (suggesting own ideas). Surprisingly, the most relevant motivation for all four groups of participants (classified by interest in urban planning and games) was their curiosity. Almost equally important was gaining access to information about current (urban) topics and ongoing debates. Our findings show that for most citizens who are willing to engage (i.e. download Täsä), gaining information about ongoing discussions is sufficient to satisfy their interest or curiosity. The opportunity of being able to propose a specific idea did only for *Interested* play a role in their motivation to download the application. This result is in line with citizens' preference to remain at the sidelines of politics and not wanting to become actively involved [74].

On the other hand, our findings revealed that citizens that play games on their mobile phones (*Gamers*) are more motivated by the prospect of bringing about change than those who do not. We identified a trend that the combination of interest in urban planning and (mobile) games seems to contribute to citizens' willingness to take an active role in mobile public participation; indicating that motivations to engage are indeed more complex [4, 5]. Considering that the vast majority of those motivated by game aspects were also interested in urban planning suggests that gamification added to citizens' motivation (*Gamers'* in particular) but did not spark initial interest to download the participatory app. Due to the study setup (no active

promotion of game aspects) we argue that gamification alone could not have sparked interest if not having paid attention to the app store description.

We derive two conclusions based on the finding that *Gamers* and *Non-Gamers* were similarly motivated to download Täsä due to its game aspects. First, gamifying participation has the potential to encourage also those less or not affine to games. On this note, it might be postulated that gamers were not satisfied (i.e. maybe even bored) by the slight gamification. Second, the fact alone that an application is 'game-like' does not necessarily attract *Gamers* to use it. Based on these results, we argue that gamification does not seem to alienate those not interested in games as frequently expressed as a concern regarding the integration of game components in previous research in various domains [43, 75].

RQ2: To what extent do achievement systems play a role during actual participation?

Our data indicated that only few participants engaged in the game play. In accordance with a previous finding that participants were not interested in competing with fellow citizens [76], this analysis showed that participants also did not care for achieving points. The vast majority of participants was indifferent to collecting points for their activities as well as responding to the decreasing lifetime of contributions. The latter is arguably due to some users misinterpreting the feature. Yet, the behavior could also be linked to a perceived low relevance of the posts and participants not interacting with them on purpose. Results from our previous studies [61, 77] suggest that missions were appreciated as an inspiration for own ideas. However, with only a very small percentage of users participating in missions, this feature did not seem to encourage participants to actively contribute. These findings lead us to conclude that game elements played a minor role during the actual participation in our trial. Moreover, our users preferred "easy participation", i.e. taking those actions that required the least effort (voting and commenting). This practice is also referred to as "slacktivism" and rated as a "watered-down form of participation" [78].

To conclude, it can be inferred that the elements points, lifetime (time constraint) and missions, in the way they were integrated in the presented design, do not seem to be effective for engaging people (i.e. posting contributions). Yet, the presence of game elements in general might serve as an additional motivation for those who are considering to engage (i.e. have some interest in the topic) and have a genuine interest in shaping their neighborhood. Prior research on a gamified citizen science application suggested that gamification has the potential to engage young people [53]. In our analysis we found no indication that gamification can encourage those that are not interested in public participation or not aware of the options to engage (e.g. hard-to-reach groups). The vast majority of our users was interested to very interested in urban planning and reasons to download were always linked to at least one participation-related motivation. Further studies are needed to verify whether the individual elements can be (more) effective in other applications or in combination with other game-related elements. At this point, it should be stressed that the design of a tool plays a central role in its acceptance, as visual aspects mediate issues that it aims to engage potential users in. The design further triggers aesthetics that influence how the tool is perceived and experienced by users. The design of Täsä might have also had a significant effect on our findings. Some users, for instance, confused the

lifetime visualization with a loading bar. As a consequence, these users might have not caught on to this game component and the dynamic that lay behind it.

We further showed that Fogg's [40] behavior model is not a good fit for predicting engagement in a public participation context. This confirms that public engagement is indeed a complex phenomenon, where multiple factors play a role. Interest in urban planning as well as having a concrete idea in mind to raise were factors that positively influence participation. Taking previous findings into account [69], a mere interest in the topics discussed in a participatory process does not automatically lead to active engagement. In this context, it is important to differentiate between those that already use a participation tool and those being provided the opportunity to use one. While interest might very well spawn increased activity, it is not guaranteed that this attitude increases the likelihood to start engaging.

7 Limitations

When interpreting these findings, it should be kept in mind that the game elements were never actively promoted when marketing the Täsä app as an additional official channel to communicate with the municipality. This was due to the focus of the associated research project being on mobile participation and the research team not wanting to divert the focus by (openly) introducing a second theme. In short, the main question was whether the *mobile* aspect could promote participation, and not gamification.

Exploring citizens' different motivations for downloading a gamified participation application without having received detailed information about the integrated game aspects and the concept certainly creates a bias in the findings. Although we informed users about the gamification in the description texts and screenshots in the app stores, the question of how much awareness it created is vastly unknown.

This marketing strategy has probably influenced the type of users downloading (or seeking to use) Täsä. We might have missed a considerable number of people who would have been intrigued by game elements and only downloaded the application because of them. Due to our trial setup, we can only speculate on whether these two effects (alienating some and encouraging others) would have cancelled each other out.

Further research should investigate whether by strongly promoting the game aspects and thus marketing a gamified participation tool can be enough to attract initially less intrinsic motivated people to start using a public participation tool. In this respect, our conclusion that gamification did not broaden participation might only be specific to the presented context.

Our findings are based on data from a trial where a selection of game components (points, leaderboards, user-profiles, lifetime and mission) was evaluated in a distinct setting. Hence, they and may not hold true for other game-inspired elements.

In addition, our categorization of Gamers and Non-Gamers is based on whether participants use entertainment applications such as mobile games on their smartphones. This insight does not necessarily reveal citizens' attitudes towards games in general. Some users may not use mobile games, but enjoy playing board games mirroring an interest in a specific type of games.

8 Conclusion

Gamification has only recently found its way into the domain of electronic public participation. The Täsä mobile application that served as a test-bed for our study, included a number of different game elements which were added with the objective to solve one of the domain's main challenges, i.e. encouraging citizens to use digital tools that aim to facilitate the communication between them and city authorities. While most public service authorities that created public participation platforms have more or less randomly added game elements, this research aimed to investigate i) effects of interests on motivation to download a gamified participation service as well as ii) the role of game elements on users' usage and participation behavior.

We have presented insights from a Living lab in which a mobile application was deployed in a city in Finland. Our findings show that citizens were primarily motivated by their genuine interest in urban developments, over which gaming elements had little influence. Yet, we also found that gamification does add to some people's motivation irrespective of whether they are interested in games or not. As this mitigates the concern that gamification could alienate some citizens who consider planning "too serious to play with it", it does support attempts to gamify public participation. Furthermore, because the game elements only motivated citizens who were already inclined to use the app (due to their interest in urban planning), this slight and not actively promoted gamification approach was not able to activate new user groups. This aspect should be researched in future work, focusing on whether other game elements have the potential to attract people's interest.

For public participation, our findings imply the need to foster interest in urban planning by for instance building trust in the impact of public participation. When such prior motivation exists, the tools used serve their intended purpose: to facilitate public participation, rather than creating it. Nevertheless, public participation remains a complex phenomenon, which is not easily explained by common theories on behavior. Contrary to substantial research, our findings suggest that game components are superfluous in the face of motivation. Perhaps citizens' apathy (e.g. for politics or urban affairs) is taken for granted too many times, when in fact on some occasions the opposite is true.

In this paper, we only focused on reward-based gamification (i.e. points, leaderboards). Future work should include a thorough investigation of the effects of other game components on participation and motivation (e.g. social gamification). In order to better estimate the net-effect of introducing game elements to participation platforms, the design of future studies should further include a baseline.

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