

Gamification of E-Participation: A Literature Review

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Abstract

Gamification is one of the most commonly employed approaches for motivating individuals to participate in several types of activities. One of its largest application areas has been e-participation (i.e. citizen engagement in policy-making). Even though the required ICT infrastructure to facilitate e-participation mostly exists today, the focus of the problem has shifted towards humans; citizens are not motivated enough to participate. Gamification is a potential approach to increase motivation towards e-participation. However, currently there is a dearth in our understanding of how gamification is being applied and researched as well as what kinds of result there exist from gamification. The aim of this paper is to synthesize research and findings on gamified e-participation, providing directions for future research in this area.

1. Introduction

Citizen participation is a practice that expresses the human endeavor to influence the governance of communities [15]. With the rapid development of technologies such as the Internet and smartphones, avenues for citizen participation have expanded to the digital realm under the umbrella of “e-participation”: citizen participation through information and communication technologies [40, 60]. Nonetheless, citizens remain relatively inactive, or at least insignificantly engaged in offline or online participation, oblivious to the societal importance of such practice [3, 11, 14, 16, 21]. E-participation is a difficult area of human engagement as it can be seen to exist outside the common hurdles of the everyday mundane life and where the effects of participation are often invisible or take time to materialized. E-participation tools however can be designed to encourage citizen engagement through hedonic design strategies such as through gamification [32, 45, 65].

Gamification refers to designing systems, services and processes to provide positive, engaging experiences similar to the ones games provide [32]. During the last years, we observed an increased interest in gamifying information systems with the intent to positively impact user engagement, often when the subject of engagement exists outside the common hurdles of the everyday, mundane life [27, 37, 44, 50, 51, 65, 84]. In the field of e-participation: gamification has the potential to increase citizen participation, possibly leading to better governmental decision-making, legitimacy and increased trust in government [1, 7, 19, 21, 29, 38]. Hence, a plethora of research and practical work is being carried out to gamify e-participation. The aim of this paper is to synthesize the research that has been carried out in the area of gamified e-participation so as to develop a comprehensive understanding of gamified e-participation and highlight avenues for future research. This study followed a literature review process focused on the summarization of knowledge [58]. Specifically, we conducted a representative, broad, descriptive review [85]. This study allows a vantage point on what research on gamified e-participation has been conducted, the findings it offers as well as avenues for future research.

2. Background

Despite participation being a relatively mature field of research, it remains problematic to conclusively define participation [6, 15] or hence e-participation. E-participation has been defined in terms of citizen engagement with each other and with their government toward the betterment of their community [33]. The betterment of a community is, however, an elusive idea, difficult to define or measure. E-participation has also been defined in terms of citizen involvement in political processes [10]. Of these processes, perhaps most specifically and seminally, e-participation has been understood in Ann Macintosh’s terms in light of citizens’ participation in the policy-making process [40]. Policy-making is naturally an integral aspect of

governance that encompasses several stages 1) agenda setting, in which objectives of policies are determined, 2) analysis, where the objectives of and needs for policies are analyzed, 3) creation, which involves the drafting and passing of policies, 4) implementation, which is about the enactment of passed policies, and 5) monitoring which is about the continuous observation of implemented policies, and society so as to detect shortcomings and trigger future cycles of policy-making. Three levels of citizen engagement with these stages of policy making could be possible [40]; 1) enabling; a basic level, focused on provision of information to citizens, 2) engaging; an intermediate level, in which limited two-way citizen-government interaction is encouraged, and 3) empowering; where citizens actively co-create with their governments.

Gamification of e-participation is often categorized as a unique and effective approach to engage citizens in e-participation and policy-making [52]. Gamification is commonly understood as the introduction of game elements to serious, mundane, non-gaming contexts (such as the context of e-participation) to induce motivation and engagement [19]. Gamification is about the design of systems, services and processes towards inducing engaging, positive psychological experiences such as enjoyment or gamefulness [32]. Such experiences then can translate into behavioral engagement with the context of gamification [27]. Gamification has hence been employed to induce engagement in the contexts of for example crowdsourcing [44], production management [84] as well as education and health management amongst other contexts [27, 37]. Some of the most commonly utilized elements of gamification in these contexts have been: points, badges and leaderboards amongst others [27, 37, 44, 50, 51, 65, 84]. Gamification of e-participation, in particular has been observed to induce increased citizen engagement with the government as is intended from its introduction to e-participation [8, 9, 11, 18, 20, 22, 31, 34, 35, 38]. Gamified e-participation is, however, often misunderstood in practice, implicating its potential for success [4, 28]. It is hence of importance to understand how this unique approach to fostering e-participation has been implemented and the actual and potential outcomes that it can bring about.

3. Methodology

Literature review approaches can be divided into four distinct approaches depending on the goal of the review: 1) summarization of knowledge, 2) data aggregation (of empirical studies), 3) explanation building or 4) critical assessment of extant literature [58]. Whereas the first type of reviews (including

narrative, descriptive or scoping reviews) attempts to broadly map and describe a body of literature, data aggregation approaches attempt to aggregate results in a field and specially between specific sets of variables. The explanation building approach attempts to build theory without meticulously describing the field it reports on and the critical assessment approach attempts to primarily poke holes in existent literature. Given the goal of this review, we adopt a summarization of knowledge approach. More specifically, we aimed to conduct a representative, broad and descriptive review employing a systematic literature search and coding.

We follow a combination of author and concept centric coding strategies as guided by [85] in order to organize existent literature per publication and per concepts presented in them to describe the body of literature quantitatively. Therefore, the process employed by this study proceeded as follows: 1) explorative literature search to map relevant keywords, 2) systematic literature search (of Scopus database), 3) inclusion and exclusion procedures, 4) backward search, 5) forward search, 6) concept-centric coding and analysis of literature, 7) author-centric coding of literature, 8) findings reporting (in this study).

As Ann Macintosh's framework to characterizing e-participation [40] is one of the esteemed frameworks to defining and examining e-participation, we adopted it in examining and coding the concepts emergent in the literature review. Hence, the aspects collected from the literature as guided by the research problem and theory included: Reference, e-participation study focus, type of manuscript (conference paper/ journal article / book chapter, etc.), type of study (empirical / non-empirical), research methods, gamification evaluation approach (qualitative / quantitative / mixed), e-participation level focus of manuscript (enabling / engaging / empowering), policy-making stage focus of manuscript (all/ agenda setting / analysis / creation / implementation / monitoring), gamification elements employed if a tool is reported on, results from gamification (positive / negative / neutral/ mix / not reported), psychological and behavioral outcomes of gamification and whether a governmental unit was involved in the research.

The literature search was carried out in May 2018. The database of Scopus was queried using the following search string: (TITLE-ABS-KEY (gamif*) AND TITLE-ABS-KEY (gov*) OR TITLE-ABS-KEY (poli*) OR TITLE-ABS-KEY (urban) OR TITLE-ABS-KEY (eparticip*) OR TITLE-ABS-KEY (e-particip*)) AND (LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "ch") OR LIMIT-TO (DOCTYPE , "ip"))".

The keyword gamif* includes all forms of the word gamification. Keywords gov*, poli*, urban, eparticip*, e-particip* were used to include literature related to e-participation. We limited the search to journal articles, conference papers, book chapters thus automatically excluding for example conference track introductions. Before deciding on the keywords, exploratory searches of the literature were made to ensure that the keywords used in the literature search covered the relevant literature.

Figure 1 depicts the literature search process which started with the identification of 216 manuscripts, from which 4 were excluded as they were in languages other than English. 2 duplicates were next removed. An additional 5 manuscripts [49, 56, 59, 66, 82] were excluded as they were inaccessible through the libraries of the authors of this paper or through contacting the authors of the papers in question through ResearchGate. Next, papers on topics other than gamified e-participation in policy making were excluded, leaving 50 manuscripts. Following the backwards references of these manuscripts revealed 4 relevant manuscripts [7, 17, 64, 71]. Forward references revealed 2 more [54, 70]. In total 56 manuscripts were included in this literature study. Categorization and coding of these manuscripts as seen in Tables 1-3 was done according to what is reported in the reviewed manuscripts. For example: papers indicating that they aim to enable/engage/empower citizens were categorized as such in respective categories. Otherwise, the manuscript would be categorized in a “generic” category.

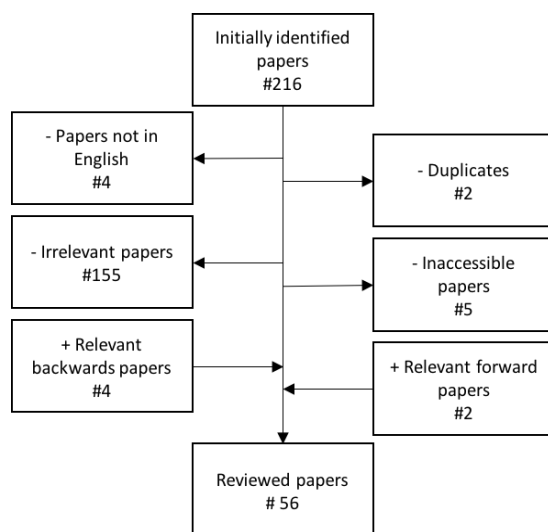


Figure 1. Literature search process and outcomes

4. Findings and Discussion

Thirty-three of the identified manuscripts reported on empirical research while twenty-three reported on non-empirical research. Most manuscripts reported on research that employed more than one research method (see Table 1). Design, prototyping, and evaluation of gamified e-participation tools and related methods are the most popular. The field of gamified e-participation appears highly geared towards obtaining primary insights which is of significant importance in any research field specially an emerging one. Additionally, the observed utilization of mixed methods highlights an attempt towards obtaining findings from various vantage points that can possibly complement each other, however, it may also indicate a lack of maturity in the field as it can show a lack of confirmatory studies based on established theoretical considerations

In terms of e-participation focus, it appears (see Table 2) that civic engagement is the most researched focus area. Civic engagement is not only a hard to concretely define concept [64] but it is also often employed as a focus because of how generic it is. [28]. While a generic study of e-participation is presumably of relevance to most sub-domain areas of gamified e-participation [28], generic research is likely to make contextualized implementations of gamification more challenging as researchers would need to exert additional work in contextualizing generic knowledge to their purposes.

With regards to stages of policy-making, 24 of the reviewed manuscripts generically examined gamified e-participation in all stages of policy-making (see Table 2). Focused research on certain stages of policy-making is hence encouraged as it could help ensure the smooth implementation of gamification attuned to specific areas of policy-making. The reviewed research often examined more than one stage at a time, however, no research appeared to be carried out with a specific focus on the “creation” stage of policy-making. This is possibly because policy creation remains a duty exclusive of governmental agencies [40] hence, there is a lack of motivation to research it. Research is hence encouraged to investigate the needs for the introduction of motivational and engagement tools to the creation stage of policy-making.

The implementation stage of policy-making appears the most researched, with 20 manuscripts focused on it. In this stream of research, we observe a significant focus on the creation of “good citizens” [2, 18, 34, 88]. While this direction of research could be of significant societal benefit, as no one can hardly argue

Table 1. Summary of the research methods employed by the reviewed manuscripts

Research methods	Studies	#	Research methods	Studies	#
Design & Prototyping	[8, 9, 11, 13, 20, 22, 31, 34,, 35, 38, 39, 48, 53, 54, 61, 62, 63, 64, 70, 71, 72, 75, 76, 87]	24	Design (no implementation)	[5, 17, 18, 42, 47, 57, 83, 86]	8
Field studies & experiments	[8, 9, 13, 20, 22, 34, 35, 39, 53, 61, 62, 64, 74, 75, 76, 77, 78, 87]	18	Case studies	[4, 48, 68, 69, 74]	5
Surveys (qualitative & quantitative)	[4, 8, 9, 13, 20, 34, 54, 61, 62, 63, 64, 74, 75, 76, 77, 78]	16	Literature reviews	[48, 54, 55, 79]	4
Theoretical analysis	[2, 7, 12, 16, 17, 23, 24, 28, 36, 41, 52, 67, 73, 81, 86, 88]	16	Qualitative observation studies	[13, 69, 75, 76]	4
Log data analysis	[8, 9, 11, 13, 22, 34, 35, 38, 53, 61, 62, 64, 69, 70, 72, 76, 78, 87]	18	Ethnography	[23, 26, 80]	3
User focus groups & interviews, debriefing	[13, 20, 31, 39, 48, 62, 63, 64, 68, 76, 78]	11	Expert interviews	[4, 64]	2

that encouraging the use of sustainable transport is undesirable in most societies, it raises concerns in the literature on the ethics of employing gamification in e-participation and in governmental dealings in general [28, 41]. While gamification could and is often utilized to induce “good” habits, it is of danger in e-participation to utilize it to foster habits that are determined by authorities. Research in this direction should hence be cautioned.

It is often observed that actual involvement from the government in gamified e-participation research is lacking [13, 23, 34, 35, 39, 42, 54, 60, 62, 67, 70, 72, 77]. That could be due to the lack of easy channels of contact between researchers and governments. Research involving the government could additionally impose increased legal considerations that researchers would rather avoid. Government involvement is nonetheless essential by nature in this research stream and hence some researchers often simulated a governmental presence on the gamified tools they were evaluating [20, 74, 75, 76]. Nonetheless, governmental presence in research is still observed [4, 8, 9, 11, 38, 53, 68, 71]. In fact, although such reports are rare, some of the research has led to actual policy implementations [69]. Such outcomes should be highlighted to increase citizens trust in governments and research.

The majority of the research (35 manuscripts) focused on engaging citizens in limited two-way citizen participation. As seen in Table 2, more than one level of e-participation were often researched at the same time. The enabling level of e-participation is the least researched, with only 7 manuscripts. This is possibly due to the enabling level of e-participation being one that is usually seen to require little engagement from the citizens, hence, it may not have been of interest to look into its gamification. Future

research is especially encouraged to research the e-participation levels of enabling and empowering.

As can be seen in Table 2: certain sub-domains of e-participation in policy-making lack research. Researcher are encouraged to investigate gamification in for example law enforcement, civic education and engagement with open governmental data so as to further conclude whether and how gamification could be of value to these domains.

With regards to the employed elements of gamification in the reviewed manuscripts as seen in Table 3, during the coding of this review, we adhered to what the authors of reviewed manuscripts report as game elements with no addition or subtractions from their reports. The most commonly employed element of gamification design is points. Naturally, points are a basic design element without which several other gamification elements would not be implementable such as leaderboards, user rankings or idea rankings.

Elements that rank users in a competition such as levels and leaderboards are the second most popular game elements employed in gamified e-participation (Table 3). Competitive gamification designs and the elements closely tied to them such as rankings, missions, and achievements are overall the most popularly employed. Competition fuels engagement and the repetitive use of a service [46] hence these findings are not unwarranted. Yet, competition also often leads to negative behavior between users such as hyper competitiveness, bullying and behavior to break the system for one’s benefit [23, 76]. It is hence interesting to observe that a number of competitive implementations attempted to shift the focus of the competition from a competition between users to one between ideas [8, 9, 20, 64, 69], often employing leaderboards of ideas instead of or next to leaderboards of users.

Table 2. Summary of e-participation specific aspects of the reviewed manuscripts

Focus of studies	Studies	#	Policy-making stage	Studies	#
Civic engagement	[2, 7, 8, 9, 16, 28, 31, 41, 55, 64, 73, 76, 78, 79, 80, 81, 83, 86]	18	All	[4, 7, 12, 16, 20, 22, 24, 28, 31, 36, 41, 48, 52, 54, 64, 68, 73, 74, 76, 77, 78, 79, 81, 83]	24
Urban planning	[4, 18, 20, 24, 36, 48, 53, 54, 74, 75, 77]	11	Agenda setting	[8, 9, 53, 55, 69, 75]	6
Crowd sensing	[5, 13, 17, 42, 47, 63, 69, 71, 72, 87]	10	Analysis	[8, 9, 53, 55, 69]	5
Urban mobility & mapping	[34, 35, 57, 61, 62, 67, 68, 70]	8	Creation	-	0
Elections	[23, 26]	2	Implementation	[2, 5, 11, 18, 23, 26, 34, 35, 38, 39, 42, 53, 57, 61, 67, 70, 72, 80, 86, 88]	20
Civic learning	[22, 52]	2	Monitoring	[8, 9, 13, 17, 42, 47, 55, 62, 63, 69, 71, 72, 75, 80, 87]	15
Welfare management	[11, 38]	2	E-participation level	Studies	#
Law enforcement	[39]	1	All	[4, 7, 16, 28, 36, 41, 53, 65, 79, 81]	10
Education	[88]	1	Enabling	[12, 22, 34, 35, 61, 70, 88]	7
Open government data	[12]	1	Engaging	[2, 5, 11, 13, 17, 18, 20, 23, 24, 26, 31, 38, 39, 42, 47, 48, 53, 55, 57, 62, 63, 67, 69, 71, 72, 73, 74, 75, 76, 77, 78, 80, 83, 86, 87]	35
			Empowering	[8, 9, 48, 54, 68, 74, 75, 77, 78, 83]	10

Depending on their personality, users might react to idea-based competitive designs by cooperating more with each other on getting the best ideas to win the competition, fueling positive engagement, or they might still engage in negative competitive behavior amongst each other [64]. There is hence, at least a possibility for cooperative, group advancing behavior to emerge within the competition, making such idea-based competitive designs worthy of further refinement and investigation. Cooperation and team setups also appear to be researched in the identified manuscripts.

Interestingly, elements such as social features were often explicitly considered by some researchers as game elements [8, 9, 17, 20, 42, 47, 57, 69, 75, 76, 80], while not considered or classified as such by others [8, 31, 63, 74, 77, 78] as is also reflected on by the reviewed literature [81]. Some research considered the observed popularity in satire and memes during election times as gamification of elections [26] while no other research reflected on satire and memes as elements of gamification. These observations serve to showcase a lack of agreement in the e-participation and gamification fields alike, on what is or is not gamification. It alternatively appears that defining gamification in terms of experiences of gamefulness and related positive psychological

experiences outcome of gamification is an alternative route to categorize and measure gamification [32]. The majority of reviewed research does report on psychological outcomes from gamification in terms of experiences (or lack thereof) of gamefulness, motivation or enjoyment to name a few [4, 8, 9, 20, 22, 23, 35, 39, 62, 63, 64, 74, 75, 76, 77, 78, 87]. Nonetheless, research is observed to pay little attention to reporting the psychological outcomes of gamification [31, 35, 48, 53, 61, 69, 70, 80] which is problematic as positive psychological experiences from gamification are a precursor for its success in terms of inducing a behavioral change [27] such as engagement with policy-making. Most of the conducted evaluations of research involving gamification implementations are quantitative (Table 3). Qualitative studies could reveal nuanced differences in the reception of and outcomes from gamified e-participation and hence are encouraged.

The overwhelming majority of reviewed manuscripts point towards positive outcomes or at least mixed outcomes from introducing gamification to e-participation. These outcomes, reported in the reviewed manuscripts, included increased engagement levels with the gamified tools, positive psychological experiences from the tools in questions

as well as some behavioral change such as increased utilization of sustainable transport.

Negative results were hardly observed and mainly pertained to low engagement levels with the gamified tools, without a negative impact on behavior outside

engagement. Nonetheless, it is possible that the lack of negative results reported from gamification in e-participation could be due to that failed or negative gamification research, in general, is rarely reported on or published [30]

Table 3. Summary of gamification specific aspects of the reviewed manuscripts

Gamification elements	Studies	#	Gamification elements	Studies	#
Points	[8, 9, 11, 13, 17, 22, 23, 31, 34, 35, 38, 39, 42, 47, 53, 54, 57, 61, 62, 63, 71, 74, 75, 76, 77, 78, 86, 87]	28	Social media integration	[20, 23, 31, 64, 69]	5
User rankings, levels & leaderboards	[8, 9, 13, 17, 20, 22, 31, 34, 35, 39, 42, 47, 57, 63, 70, 74, 75, 76, 77, 78, 83, 86, 87]	23	Stories, characters	[20, 34, 54, 62, 80]	5
			Notifications	[17, 20, 53, 64]	4
Goals, missions, to-dos, quests, tasks, challenges	[8, 9, 17, 22, 23, 34, 53, 54, 57, 64, 69, 70, 71, 72, 74, 75, 76, 77, 78, 80, 86]	21	Feedback	[17, 71, 72]	3
			Newsfeed	[57, 64, 70]	3
Achievements, badges, medals	[8, 9, 11, 22, 31, 34, 35, 38, 47, 63, 64, 76, 83, 86]	14	Punishments	[13, 31, 87]	3
User profiles	[8, 9, 20, 22, 47, 62, 64, 70, 74, 75, 76, 77, 78]	13	Player roles	[20, 54]	2
Competition	[8, 9, 13, 20, 31, 42, 57, 63, 64, 69, 75, 77, 87]	13	Avatars	[20, 42]	2
Location tagging,	[20, 23, 24, 42, 47, 53, 57, 62, 64, 74, 75, 76, 78]	13	AR	[20, 62]	2
Time constraints	[17, 57, 63, 64, 74, 75, 76, 77, 78, 86, 87]	11	Rules	[71, 72]	2
Posting, sharing, commenting	[8, 9, 17, 20, 42, 47, 57, 69, 75, 76, 80]	11	Forums	[23]	1
Rewards, prizes, incentives	[17, 23, 34, 35, 53, 62, 68, 70, 71, 72]	10	Satire & memes	[26]	1
Cooperation, teams, player communities	[17, 23, 53, 57, 64, 70, 76]	7	Emoticons	[75]	1
Ideas rankings, likes & leaderboards	[8, 9, 17, 20, 57, 64, 69, 75, 76]	9	Downvoting	[17]	1
Progress bars	[42, 64, 70, 72, 76, 78]	6	Chat	[20]	1
Reputation systems	[17, 74, 76, 77, 78]	5	Hardware	[39]	1
Gamification Evaluation	Studies	#	Gamification Evaluation	Studies	#
Non-applicable	[2, 4, 5, 7, 12, 16, 17, 18, 24, 28, 36, 41, 42, 47, 52, 55, 57, 67, 73, 79, 81, 83, 86, 88]	24	Quantitative	[8, 9, 11, 22, 34, 35, 38, 53, 63, 70, 72, 74, 77, 87]	14
Mix	[13, 20, 61, 62, 64, 75, 76, 78]	8	Qualitative	[23, 31, 39, 68, 69, 80]	6
Not described	[42, 48, 54, 71]	4			
Findings	Studies	#	Findings	Studies	#
Positive	[8, 9, 11, 20, 22, 31, 34, 35, 38, 39, 53, 62, 63, 64, 68, 69, 70, 71, 72, 74, 77, 78, 87]	23	Mix	[4, 23, 26, 75, 76, 80]	6
Secondary & theoretical studies	[2, 7, 12, 16, 24, 28, 36, 41, 52, 55, 67, 73, 79, 81, 88]	15	Negative / Inconclusive	[13, 61]	2
Not reported / not conducted	[5, 17, 18, 42, 47, 48, 54, 57, 83, 86]	10			

Effective gamification requires attentive user and context analysis [16, 28, 31, 45, 79]. Some of the reviewed research appeared to pay close attention to context and user analyses [11, 38, 62, 64, 68], while other research seemed to fail to report on such analyses [72, 75]. The logic and process of gamification design hence remain in a relative black box, inaccessible to other researchers and practitioners in the field. We highly encourage researchers to report on their design and analysis processes, providing detailed insights into design for gamified e-participation.

Gamification can be counterproductive in certain context of e-participation if it affects equal access to vital services such as healthcare, or if it creates dimensions for discrimination between individuals in the type and quality of service they can receive [4, 7, 28, 76, 78]. The digital divide is a concept of high relevance to e-participation research and it is possible that gamification, as other e-participation means before it, could strengthen access to e-participation for certain educated segments of a population, while lowering it for other segments, leading to biases in governmental decision-making [25]. It is possible, however, that gamification could positively influence peoples' belief in their political abilities (political self-efficacy), encouraging them to participate more. We encourage researchers to maintain a holistic and critical view towards gamified e-participation. Some e-participation gains from gamification could be desired but may lead to other e-participation losses. Aspects such as equal access, political self-efficacy, and representativeness of the populace on gamified e-participation tools should be investigated.

Furthermore, we observed that most gamified e-participation designed and evaluated in the examined literature were researched by domain-specific researchers. Gamification design by nature is multidisciplinary [43] and in the context of e-participation, in specific, requires knowledge of psychology, game design and political theory amongst other disciplines [28]. This observed disconnect between gamification, game design, psychology and political theory could lead to the design and introduction of gamified e-participation tools that do not meet their objective. We hence call for multidisciplinary research on gamified e-participation.

5. Conclusions

Overall, as seen in the results of this literature study, increased engagement outcomes are reported from gamified e-participation in overwhelming numbers relative to the reported mixed or potentially

negative outcomes from gamification. We encourage research on gamified e-participation, especially qualitative, longitudinal studies. Research involving the government or at least that simulates government involvement is of importance to instill a sense of trust in the conducted research in the research participants. Researchers are invited to attempt contextualized study of e-participation sub-domains that lack gamification research such as the domains of law enforcement and civic education. Similarly, research is encouraged in stages of policy-making that have not seen a plethora of research, such as the stages of agenda setting and policy analysis and creation. We further call on researchers to investigate various and emerging elements of gamification design. and to examine the psychological experiences – such as enjoyment and gamefulness – that gamification instills in users.

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