HereSay: Gamifying Urban Crowdsourcing Through Affordance-Based Data Collection

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Abstract

We present *HereSay*, a gamified mobile crowdsourcing application that transforms urban observation into engaging gameplay whilst collecting valuable data for participatory planning. The app addresses the challenge of sustaining citizen engagement in urban planning through five integrated gamification mechanics: progressive unlocking, daily streaks, experience points, levels and leaderboards. Unlike traditional planning tools that solely rely on functional categorisation, *HereSay* adds affordance-based prompts to capture how citizens actually perceive and use urban spaces, with particular emphasis on urban landscape perception. Built using Flutter and Firebase for cross-platform accessibility, the application requires only standard smartphone capabilities. Initial evaluation with seven users demonstrates strong engagement with gamification features and successful motivation to explore urban spaces. The application showcases a scalable solution for inclusive citizen participation that bridges the gap between informal experiential knowledge and structured planning data.

CCS Concepts

• **Human-centered computing** → *User studies*; • **Applied computing** → Cartography; • **Information systems** → **Geographic information systems**; **Location based services**.

Keywords

Crowdsourcing, gamification, urban planning, participatory tools, participatory design

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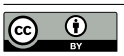
1 Introduction

Urban planning increasingly requires citizen input to create liveable and sustainable cities that serve diverse populations with varying needs, cultural backgrounds, and behavioural patterns [9, 15, 22]. The challenge intensifies as cities must accommodate 68% of the global population by 2050 whilst addressing climate change and maintaining quality of life [33]. However, traditional consultation methods (e.g. public hearings, community workshops, paper surveys) suffer from well-documented limitations that create systematic exclusion [1, 22, 35]. These methods typically attract only those with sufficient time, resources, and confidence to participate in formal settings, resulting in demographic biases that favour educated, comparably wealthier, and politically engaged citizens. Moreover, episodic consultation events fail to capture temporal dynamics of urban space usage, reducing complex spatial experiences to static comments that disappear into bureaucratic processes.

Digital tools promised to democratise planning participation, yet many merely replicate analogue limitations in virtual form. Web-based surveys and online mapping platforms struggle with rapid decline in participation after initial launch, with engagement typically dropping within the first month as novelty wears off and users lose motivation to return [28, 30, 31]. Even sophisticated 3D visualisation platforms and virtual reality environments, whilst offering immersive experiences for exploring proposed developments, introduce new technical barriers that systematically exclude citizens without access to specialised hardware, high-bandwidth connections, or technical expertise [8]. These limitations often result in elaborate platforms with extensive features but minimal sustained user activity, essentially becoming digital ghost towns after initial promotional campaigns end. Furthermore, the disconnect between contribution and visible impact discourages continued participation, as citizens invest time providing input without seeing how their contributions influence planning decisions, perpetuating the same consultation theatre that plagues traditional methods [7, 18].

In stark contrast, gamification - broadly defined as adding game elements to non-game processes to increase user motivation to engage with a system [14, 19] - has proven remarkably effective at motivating sustained engagement, particularly in crowdsourcing contexts [24]. Commercial applications such as Pokémon GO motivate millions to explore urban spaces whilst generating location based data and maintaining active user bases years after launch through carefully calibrated reward systems and social features [3, 20, 21]. Academic platforms demonstrate more limited success: *StarBorn* collected thousands of land cover observations through conquest mechanics [4], *FotoQuest* Austria motivated citizens to validate land use through location-based quests [6], and *Window Expeditions* gathered rich landscape descriptions during COVID-19 lockdowns [5]. These examples reveal that thoughtfully implemented game mechanics can transform tedious data collection



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into engaging experiences users voluntarily sustain over extended periods.

Here, we present *HereSay*, a gamified crowdsourcing application specifically designed to bridge the gap between proven gamification strategies and participatory urban planning needs. The platform transforms routine urban observation into engaging tasks whilst collecting structured data about how citizens perceive and use public spaces. Through affordance-based prompts focusing on what spaces enable users to do rather than solely relying on abstract functional categorisations, *HereSay* generates rich insights about human-environment interactions that traditional surveys cannot capture. By implementing five comprehensive gamification mechanics adapted from successful applications, we aim to address the dual challenge of sustaining long-term participation whilst generating meaningful planning data that reflects the lived experience of diverse urban populations.

2 Design Philosophy and Theoretical Foundations

HereSay's conceptual foundation rests on the deliberate wordplay that encapsulates our approach to participatory planning. The name combines "hearsay" - traditionally referring to second-hand information of uncertain validity - with "here, say" - an invitation for citizens to express situated knowledge about specific locations. This duality reflects our transformation of informal experiential knowledge, often dismissed as mere *hearsay* in traditional planning processes, into structured, validated data that complements professional expertise. Professional planners possess theoretical knowledge and technical skills but sometimes lack intimate understanding of how spaces function in daily life for diverse user groups. Citizens conversely possess rich experiential knowledge but lack channels to communicate this knowledge in forms that planning processes can incorporate. *HereSay* bridges this gap by providing structured yet flexible frameworks for capturing and translating experiential knowledge into actionable planning data.

Gibson's ecological psychology provides our foundational approach through the concept of affordances (what environments offer or enable for different perceiving organisms [12, 16]). Rather than viewing urban spaces as collections of physical features with predetermined functions, affordance theory recognises that environments offer different possibilities for action based on observers' physical capabilities, cultural backgrounds, and immediate needs. By including these perceived affordances rather than solely collecting abstract functional categories, *HereSay* captures the multiplicity of ways citizens actually use and experience urban spaces.

Behaviour change principles from successful platforms like Duolingo inform our retention mechanics. Their model, maintaining hundreds of millions of active users through calibrated progression systems and streak mechanics, demonstrates how consistent small actions build sustained habits [17, 26]. *HereSay* adapts these proven patterns to spatial contexts, transforming daily language lessons into neighbourhood observations.

We employed Design Science Research (DSR) approaches to systematically translate identified gaps in existing platforms (see [10] for a scoping platform review), into a functional artefact [23, 34]. DSR's problem-driven orientation ensures our design addresses specific shortcomings in current tools, whilst its emphasis on theoretical grounding connects design decisions to established knowledge. This approach enabled iterative refinement through cycles of design, demonstration, and evaluation, creating traceable links between identified problems and implemented solutions.

Two primary design objectives emerge: (1) implementing comprehensive gamification with multiple motivation pathways recognising diverse user preferences, and (2) capturing rich data on urban landscape perception whilst ensuring accessibility without specialised hardware, making participation inclusive rather than exclusive.

3 System Architecture and Implementation

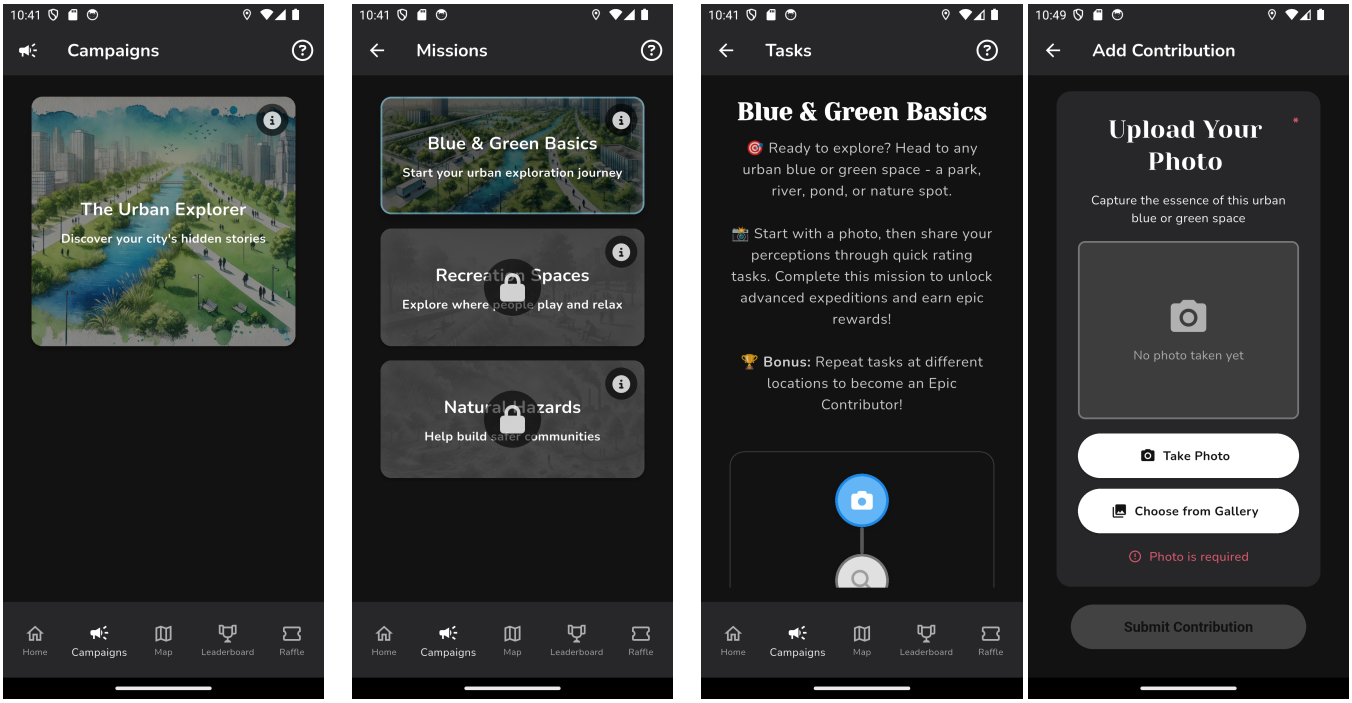
HereSay's technical architecture balances scalability and accessibility. The frontend employs Flutter, Google's cross-platform framework, reducing development overhead whilst ensuring consistent user experience and providing reactive UI capabilities necessary for smooth animations that enhance gamification feedback. Flutter's widget-based architecture suits our modular content system, allowing rapid iteration based on user feedback. The backend leverages Firebase's backend-as-a-service platform, providing robust infrastructure without server management overhead. Firestore stores user contributions, profiles, and gamification states with real-time synchronisation. Firebase Authentication manages user accounts securely, whilst Cloud Storage handles user-generated media with automatic on-device compression, maintaining analytical quality whilst reducing bandwidth requirements.

The application features a hierarchical content structure which provides flexibility for diverse planning needs: a *catalogue* contains *campaigns* (thematic initiatives like "Urban Explorer"), which contain *missions* (grouped tasks like "Blue & Green Spaces"), which comprise individual *tasks*, each containing one or multiple *items* representing specific data points (cf. figure 1). This modular structure enables deploying new content without application updates, crucial for responding to seasonal patterns or emerging planning priorities. Each contribution is reviewed by a moderator before being shown on a public map.

Five interconnected gamification mechanics create multiple motivation pathways. *Progressive unlocking* scaffolds users from simple observation tasks (taking photographs) to complex analysis (identifying hazards and community preparedness). *Daily streaks* add proven retention mechanics, with loss aversion psychology aiming to transform sporadic participation into habits. *Experience points* and *levels* provide immediate feedback and long-term goals through exponentially increasing thresholds. Multiple *leaderboards* as well as *sharing* of moderated contributions on a public map enable social comparisons (cf. figures 2d & 3c). A *notification system* provides users with immediate feedback regarding their contributions (cf. figure 3d).

4 User Interface and Experience

HereSay's visual design philosophy balances playfulness with credibility, creating aesthetics that appeal across demographics whilst maintaining professional standards appropriate for planning contexts (cf. figure 3). Custom illustrations (cf. figure 1) provide personality without overwhelming functionality. Smooth animations



(a) (b) (c) (d)

Figure 1: *HereSay*'s user interface: (a) the campaign view with a custom image (b) the mission view showing available missions (c) the task view showing individual sequentially unlocking tasks (d) the individual contribution task showing one of the data collection features.

enhance feedback (e.g. points counting up, progress bars filling) adding game-like juiciness that makes interactions feel responsive and rewarding (cf. figure 2).

The onboarding process (cf. figure 4) represents a critical juncture forming lasting impressions. Users begin selecting nicknames and avatars through a playful generation feature allowing personalisation without privacy concerns. Task flow follows consistent patterns (cf. figure 1) reducing cognitive load for repeated contributions. Clear objectives explain data collection goals, creating transparency that builds trust. Immediate feedback after contributions shows points earned with additional breakdown explanations and newly unlocked content (cf. figure 2c). Celebratory animations and sound effects create triumph moments that emotional research shows to build positive associations.

5 Evaluation Study

Our mixed-methods evaluation assessed both engagement effectiveness and user experience quality through naturalistic testing. Seven participants used *HereSay* over one week with their personal devices in real-world settings, providing more valid insights than laboratory testing by capturing integration with daily routines and competition for attention with other applications. A comprehensive post-test survey (cf. supplementary materials) examined motivation factors through gamification assessment scales alongside custom urban planning questions. Likert scales and single-/multiple-choice questions enabled quantitative comparison whilst open-ended responses provided rich qualitative insights about experiences, frustrations, and suggestions. Participants had a chance to win a small monetary reward for participation, however, the results show this not being a key reason to contribute to *HereSay* (cf. figure 6).

5.1 Participant Characteristics

Participants were strategically recruited representing diverse engagement profiles. Gaming experience ranged from enthusiasts playing over ten hours weekly to complete non-gamers who never play (cf. figure 5). Participants' exposure to location-based games (LBG) was of particular interest with 43% reporting never to have played a LBG and only one participant having played LBGs a couple of times (cf. figure 5). Familiarity with citizen science painted a similar picture with 43% reporting to be complete novices and 57% stating to have some experience. Interestingly, all participants were either *somewhat interested* or *extremely interested* in shaping the future of their cities. However, when asked *why* participants chose to contribute data, 57% explicitly selected *disagree* or *neutral* to the statement that they *want to shape their city's future* and 43% selected *disagree* or *neutral* for the statement *"... you were interested in citizen science"* (cf. figure 6). Ages spanned twenties to sixties (cf. figure 5), representing key demographic groups for urban planning participation. This diversity helps identify which gamification elements have universal appeal versus those resonating only with specific populations. Overall, the results of the survey show that

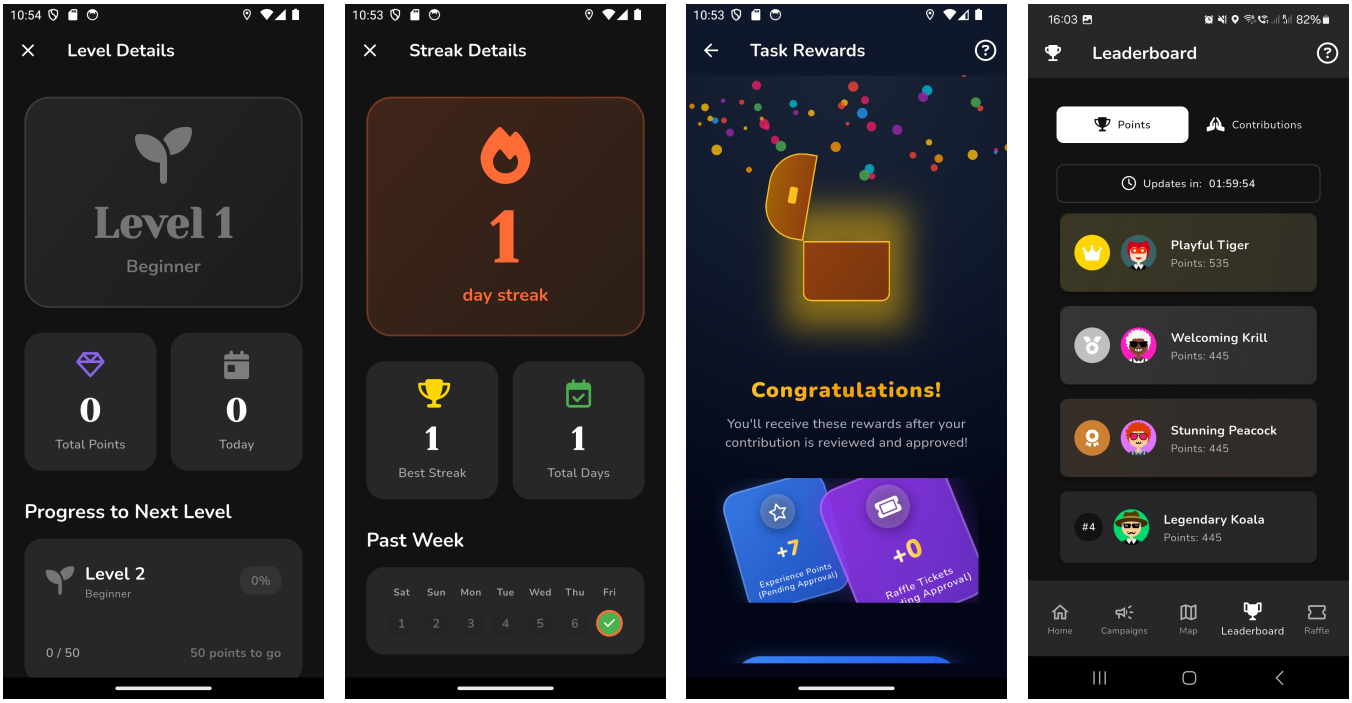


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Figure 2: *HereSay*'s user interface: (a) the level screen including the user's points, (b) the daily streak screen, (c) the reward screen demonstrating game-like juiciness, (d) the leaderboard screen allowing for in-app comparison of performance.

participants contributed voluntarily and primarily because it was perceived as a fun activity (cf. figure 6). In addition, the participants unanimously stated *wanted to support the researchers* as a highly motivational element, indicating that personal networks may play a pivotal role in early adoption.

5.2 Application Design and Stability

Technical performance proved robust with unanimous agreement on stable operation. Visual design received consistent praise: `"Nice design, cool look"` and `"Nicely Designed, looked professional"`, supporting the assumption that a clean minimalist design is appropriate for a gamified urban crowdsourcing app. In particular, users stated enjoying the playful username and avatar selection: `"The nickname selection and the profile picture are really fun"`. The map used in the application implemented a custom style to show minimal environmental features as not to bias contributions, as well as to fit the overall style of the application. Participants generally enjoyed the map with only one participant reporting not liking the map at all and 57% stating liking the map a lot. Participants unanimously agreed that it was easy to locate themselves on the map. However, one participant noted technical issues with tile granularity: `"Tiles seem quite small: The park I was in was covered by 10 tiles, but my feedback was about the entire park"`, suggesting potential improvements in spatial aggregation mechanisms.

The onboarding emerged as a primary point of friction with complaints including `"felt very tedious to get started"` and `"(too?) many individual steps before you can start the tasks"`. This feedback highlights tension between demographic information collection to support scientific analyses and lowering barriers for first time user adoption. In addition, the natural hazards assessment proved unexpectedly challenging with users reporting `"I feel very few people have any idea about natural hazards in their neighborhood"` or `"Thinking about possible hazards in a place was something I hadn't considered before"`. Users seemed to feel unqualified for natural hazard risk evaluation, which is a valuable insight into community resilience and risk mitigation.

5.3 Motivational Dimensions

The post-intervention questionnaire explicitly asked participants about the motivational dimensions of specific features (cf. figure 7). Even though the participant number is small, the results provide initial insights into gamification mechanics and motivational incentives that will guide future development.

Contribution visibility (*seeing your own contributions*) emerged as the strongest motivator with 43% deeming this element *highly motivating* and 29% *somewhat motivating*. This addresses common frustrations where contributions disappear into opaque processes, highlighting the importance of feedback transparency in crowdsourcing applications. Interestingly, *seeing others' contributions* received mixed responses: some found collective progress motivating whilst others felt discouraged by comparison to more active users, suggesting careful framing of competitive elements.

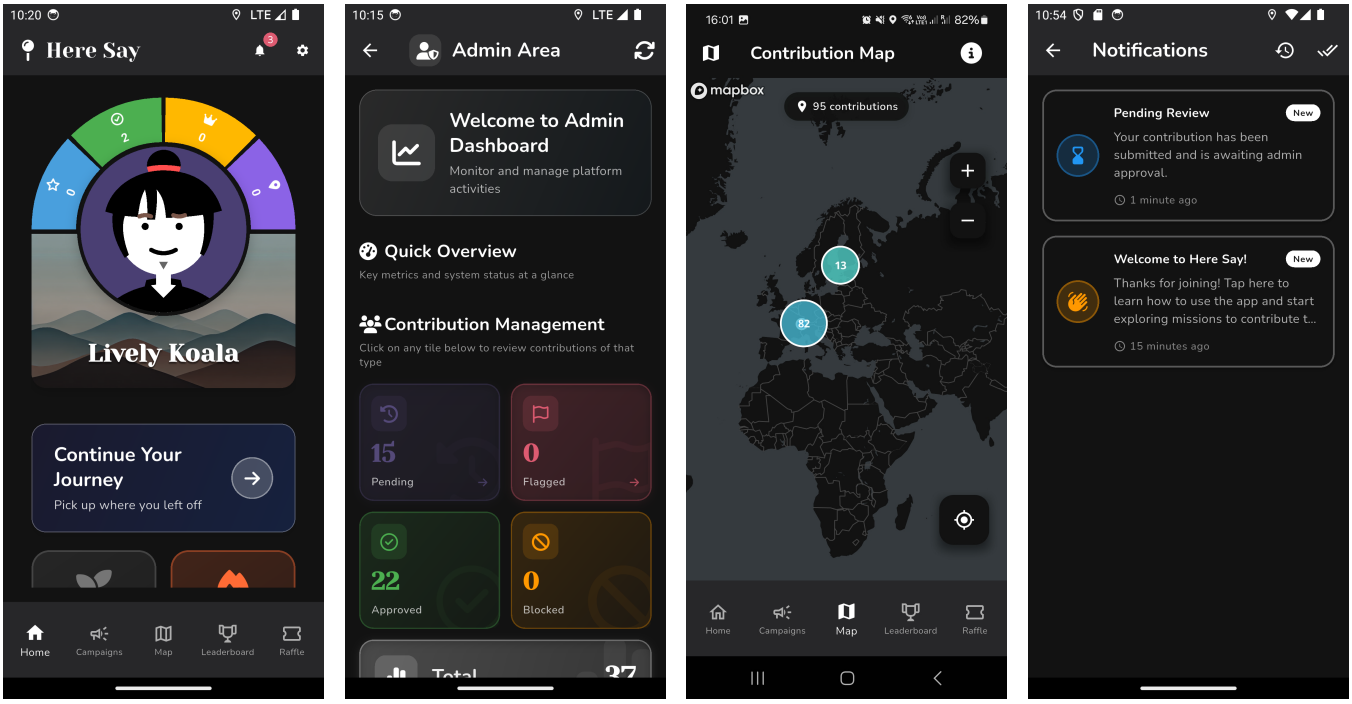

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Figure 3: *HereSay*'s user interface: (a) the home screen showing user data, (b) the admin interface with which contributions are moderated, (c) the map screen showing moderated and approved contributions, (d) the notification screen demonstrating immediate contribution feedback.

Experience points also emerged as strong motivators with 71% rating them *somewhat* or *very motivating*, confirming that immediate quantifiable feedback provides powerful reinforcement universally. Level progression showed less strong motivation with 29% reporting levels as very motivating and 71% neutral, potentially seeing levels as mere proxies of points. Sequentially unlocking content aimed to counteract repetitiveness plaguing many citizen science applications. However, no explicit mention of this motivational dimension was observed. **Leaderboards** were generally perceived as motivating (57% *very / somewhat motivating*, 43% *neutral*), with users stating they "`liked the leaderboard and the fact that you can compete with others`". This reflects broader gamification research on competition as motivation. Daily streaks showed stronger motivation than expected (14% very motivating, 14% somewhat motivating), though 57% remained neutral, suggesting this retention mechanic may increase in effectiveness as streak length grows. Finally, participants were divided on **publication and licensing** incentives. 57% were neutral about having contributions published, whilst responses to licensing options were polarised with 57% finding them *very or somewhat demotivating* and only 29% *somewhat or very motivated* by license choices. The narrative elements were perceived as overwhelming textual content and were understood as informational content and not as narrative elements. Multiple participants stated disliking "`Long texts to read`" and "`Quite a bit of text to read`", suggesting that future redesigns should focus on small concise narrative texts supported by visual aids such as in-app characters that guide the user through the narrative. One participant specifically suggested: "`The avatars could be more present throughout the interaction [...] like popping up sometimes and giving instructions`".

5.4 Urban Exploration

The app was reported to have a noticeable behavioural impact with 57% agreeing the app motivated visiting different locations. Participants reported visiting known locations with the app being the sole incentive for visitation: "`I wouldn't have gone there without the app`". This behaviour change demonstrates the successful motivation of participants to visit real-world locations and contribute data in-situ, significantly increasing scientific data collection opportunities. However, exploration of entirely new areas remained limited during the brief study, with 86% disagreeing or neutral about visiting unknown locations, likely reflecting both study duration and psychological barriers requiring stronger incentives. Perhaps more importantly, multiple participants reported changed perception of familiar spaces. Comments included "`made me look more closely at the places I pass by every day`", "`to observe more carefully areas in my daily life walking route`", and discovering previously overlooked aesthetic qualities like "`morning sun rising over the fog covering the [...] lake`". These observations suggest structured prompts

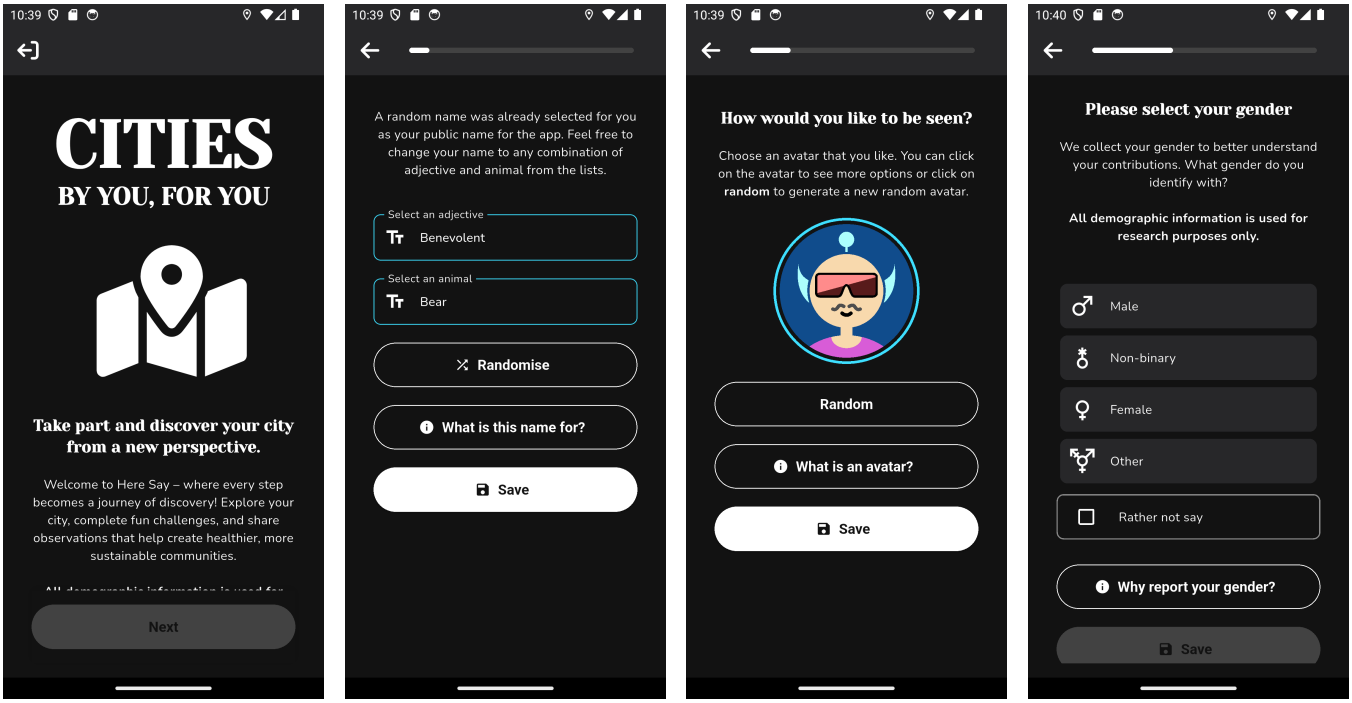

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Figure 4: *HereSay*'s user interface: (a) the onboarding information screen, (b) the user name selection screen, (c) the user avatar selection screen, (d) the gender selection screen showing the "rather not say" option.

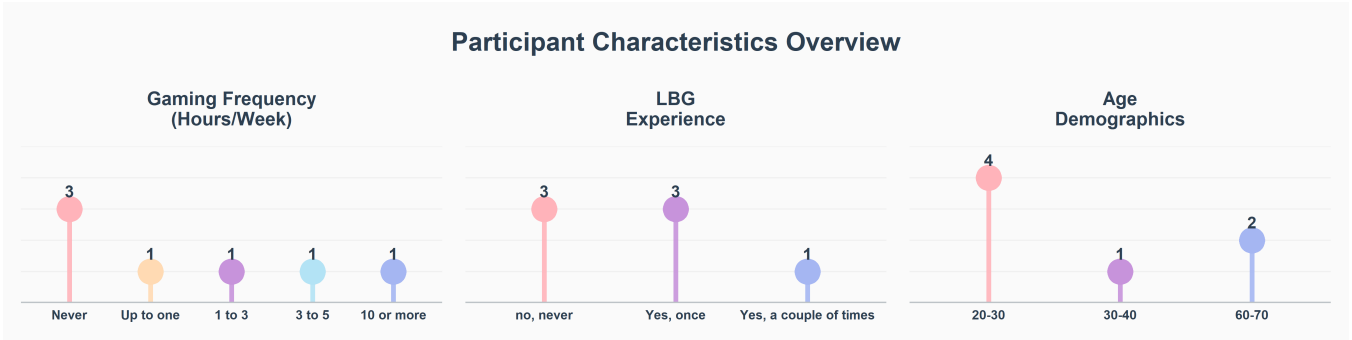

Figure 5: Plot summarising the general user-test participant characteristics

enhance environmental awareness even in familiar settings, providing value beyond data collection through fostering deeper place connection.

6 Discussion

Our one-week in-the-wild deployment provides initial evidence that *HereSay*'s combination of location-based missions and multiple gamification mechanics can motivate urban observation and contribution behaviour in real-world contexts. While the evaluation is intentionally small, the results are useful for interpreting which mechanics appear to matter most, which introduce friction, and which design choices should be prioritised in the next iteration.

6.1 Interpreting the Motivational Effects of Gamification Features

A clear pattern in the results is that *transparent self-feedback* was the most consistently motivating element. Seeing one's own contributions on the map and within task progress was rated positively by most participants, aligning with prior work emphasising that sustained volunteered geographic information (VGI) [13] engagement benefits from visible acknowledgement and feedback rather than black-box submission flows [2, 11]. This finding is practically important: feedback visibility is both comparatively cheap to implement and directly aligned with the participatory planning need to build trust and legitimacy in data collection.

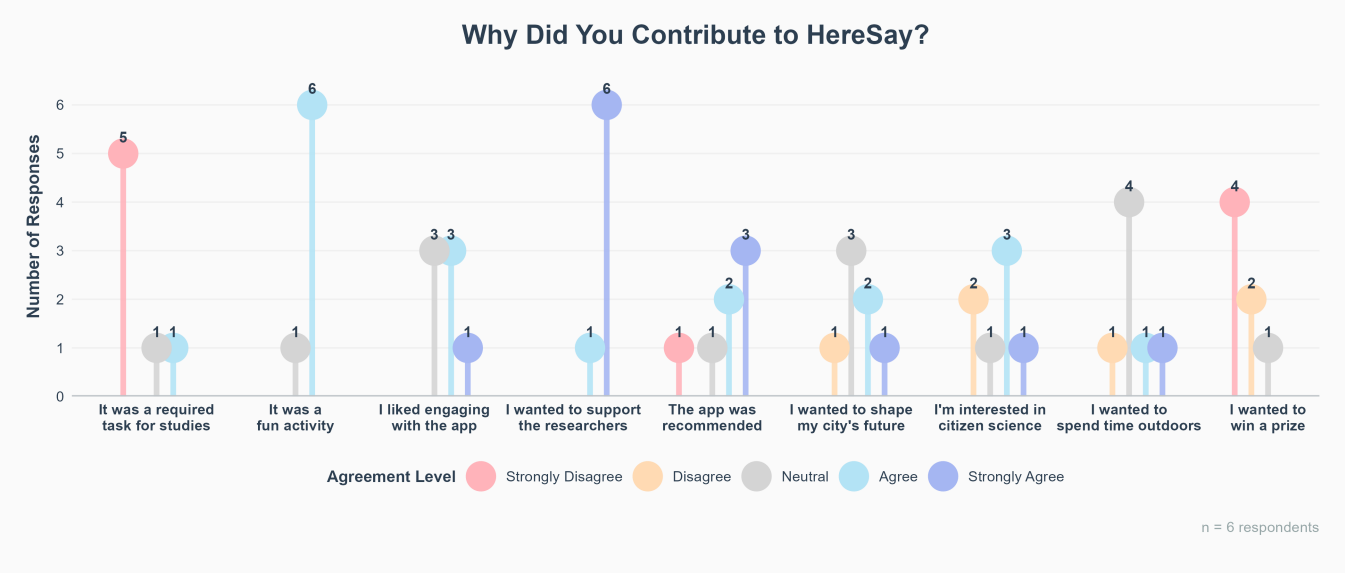

Figure 6: Survey responses regarding the reason for contributing to *HereSay* grouped by reason and agreement level

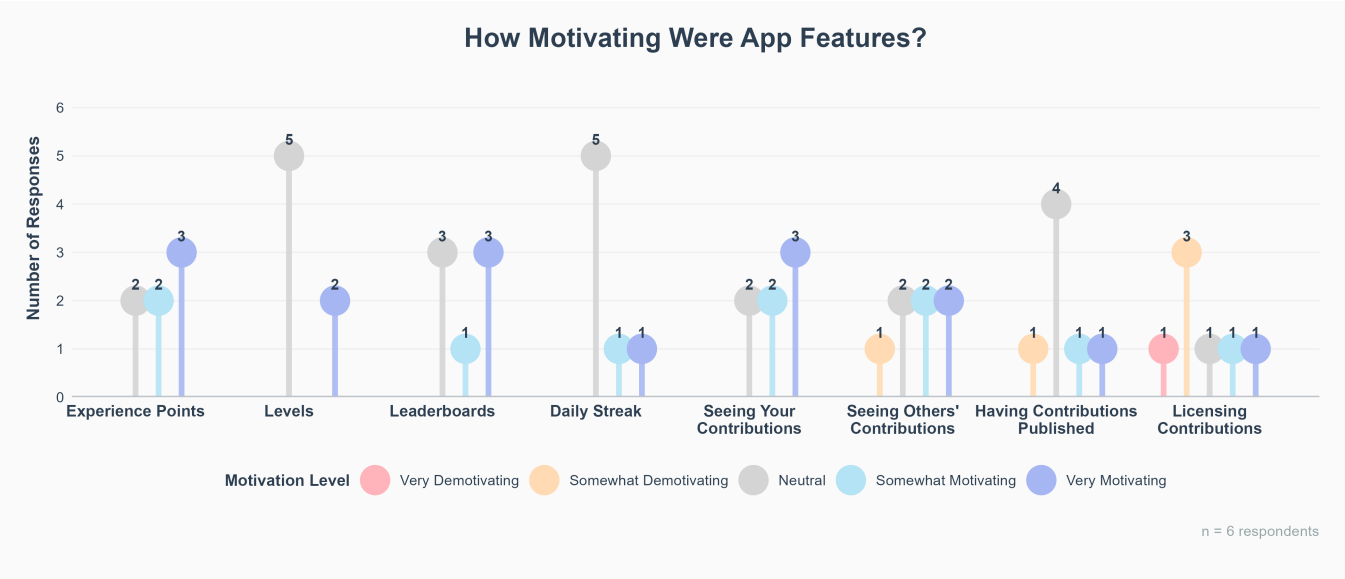

Figure 7: Survey responses regarding the motivational aspects of different features grouped by feature and motivation level

Similarly, *experience points* provided immediate reinforcement for completing tasks, which participants generally perceived as motivating. This is consistent with broader evidence that feedback-heavy mechanics can effectively sustain contribution behaviour in crowdsourcing settings when paired with clear task goals [14, 19, 24]. In contrast, *levels* were largely perceived as neutral in our study. This suggests that in *HereSay*, levels currently function more as a symbolic wrapper around points than as a distinct motivational driver. A design implication is to strengthen the semantic meaning of levels (e.g. unlocking recognisable roles, tools, or mission types) so they represent competence growth rather than only more points.

Social comparison features (leaderboards and visibility of others' contributions) yielded more mixed reactions. While several participants enjoyed competition and explicitly liked leaderboards, comparison can also discourage participation for users who contribute less frequently or feel they cannot catch up, a tension well documented in gamified crowdsourcing [25]. For a participatory planning context, where inclusivity is central, the design challenge is not whether to include social mechanics, but how to frame them.

A promising direction is to offer alternative social framings (e.g. cooperative community goals, neighbourhood-level collective milestones, or opt-in competitive boards) that preserve the motivational effects of social features without implicitly excluding less competitive users.

Daily streaks were moderately effective in this short deployment: most participants were neutral, some found the streak mechanic motivating, and at least one found it demotivating. This mixed response is not surprising given that streaks typically gain motivational force over longer periods, when loss aversion becomes salient. If streaks are retained, they should be supported by careful notification design to avoid fatigue and to preserve the perception that participation remains voluntary and meaningful (an approach commonly used in habit-forming systems such as language learning apps) [17, 26].

Finally, responses to *publication and licensing choices* indicate that transparency features can sometimes create friction if they impose cognitive or normative burden at the moment of contribution. While open publication can support re-use and public value, licensing decisions may feel too serious or complex during a playful mission flow. A practical implication is to redesign licensing as a progressive choice (e.g. a clearly explained default with optional later refinement), preserving transparency while reducing decision friction during contributions.

6.2 Affordance-Based Contributions as Planning-Relevant VGI

Beyond engagement, *HereSay*'s key contribution is the *type of data* it is designed to elicit. Many digital participation tools collect reports about issues, preferences, or votes, but struggle to capture the lived, situated qualities of places that determine whether citizens can comfortably use them. By grounding prompts in affordance theory [12, 16] and operationalising citizen input as perceived action possibilities (what a place enables or inhibits for different people), *HereSay* targets a layer of planning-relevant knowledge that is often underrepresented in conventional PPGIS and survey instruments [29]. The evaluation hints that this approach may also create *participant value* beyond data production: several participants reported paying more attention to familiar environments and noticing qualities they usually overlook. This resonates with work suggesting that structured observation can foster place connection and reflective engagement rather than purely extractive data collection [32].

6.3 Comparison to Existing Gamified VGI Platforms

HereSay builds on insights from both commercial and academic gamified VGI systems, but differs in its primary data goal and its planning-oriented design constraints. Commercial location-based games (e.g. Pokémon GO) demonstrate that place-based reward systems can motivate large-scale exploration and sustained engagement in urban space [3, 20, 21]. However, these systems are not designed to collect planning-relevant experiential data; any geographic data they generate is incidental to entertainment goals.

In contrast, academic gamified VGI platforms often target specific, well-structured data types such as land cover and land use validation. For example, *StarBorn* collected land cover observations through conquest mechanics [4], and *FotoQuest* Austria motivated in-situ land use validation through location-based quests [6]. *Window Expeditions* captured rich natural-language landscape descriptions, but in a context shaped by lockdown constraints and not primarily aimed at participatory urban planning decisions [5]. These platforms illustrate that gamification can improve contribution volume and quality, yet the data targets are typically narrower than the multi-dimensional, lived-experience questions planners increasingly need to address.

HereSay's distinctive contribution is therefore twofold. First, it operationalises affordance-based data collection to capture how spaces enable or inhibit actions for different citizens, addressing calls to better integrate experiential, qualitative knowledge into spatial participation [29]. Second, it combines this data model with a modular campaign structure and a deliberately multi-mechanic gamification design (progressive unlocking, points/levels, streaks, leaderboards, and contribution visualisation) intended to support both episodic and repeated engagement [19, 24]. The result is a platform positioned between *single-purpose gamified data collection* and *pure entertainment LBGs*: it adapts proven engagement mechanics while prioritising planning-relevant, situated citizen knowledge and transparent contribution feedback [2, 11].

The design of *HereSay* was directly informed by the gaps and recommendations synthesised in [10], where we derive a set of design guidelines for next-generation participatory platforms, particularly around sustaining engagement, balancing gamification with civic seriousness, inclusive accessibility, and producing actionable data. Several *HereSay* design choices instantiate these guidelines in concrete form. Progressive unlocking implements an adaptive *from novice to expert* pathway by scaffolding users from lightweight observations to more demanding interpretive tasks. The prominent emphasis on contribution visibility and immediate feedback reflects the guideline that platforms should create meaningful feedback loops rather than treating submissions as one-way data extraction. The campaign–mission–task hierarchy supports episodic engagement by enabling periodic thematic campaigns without requiring continuous participation. Additionally, the multi-modal contribution format (e.g. photo and text inputs) aligns with the guideline to accept diverse forms of citizen expression, while the moderation step and licensing flow operationalise transparent data governance and quality control.

7 Limitations and Outlook

7.1 Limitations

This demo evaluation is necessarily limited in duration and sample size. Reported motivational effects should therefore be interpreted as *signals* rather than definitive evidence of long-term retention. Novelty effects are likely, and the short timeframe limits what can be inferred about sustained habits (e.g. the full impact of streak mechanics). In addition, participants' strong interest in shaping their cities suggests a potentially self-selecting sample, which may inflate engagement relative to a general population rollout.

7.2 Future Directions

Based on the results and the above interpretation, we outline concrete next steps that target both engagement robustness and planning relevance.

Reducing onboarding friction through progressive disclosure. The onboarding was perceived as tedious by several participants. A practical redesign is to defer non-essential profiling questions until after users have completed a first mission, and to integrate onboarding into a short, playful introductory task that demonstrates value immediately [27]. This can reduce abandonment risk at the critical first-use moment.

Strengthening exploration incentives without over-relying on competition. Since the app encouraged visiting different locations but did not strongly motivate exploration of unfamiliar areas in a one-week window, future iterations should experiment with location-diversity rewards (e.g. new area bonuses), time-limited events, and narrative missions that naturally span multiple places. Importantly, these incentives should avoid creating a winner/loser framing that undermines inclusivity [25].

Improving narrative delivery and perceived meaning. Participants experienced narrative content primarily as "too much text". Future versions should shift toward short micro-narratives embedded directly into mission steps, supported by visual cues (e.g. recurring characters), and used to explain *why* a task matters for planning outcomes (thereby strengthening perceived meaningfulness) [27].

Closing the loop to planning outcomes. The strongest motivator was seeing one's own contributions. This motivates an even more explicit impact visibility pipeline: campaign summaries, public dashboards, and (where possible) municipal integration for showing when and how collected input is used. Technically, this points to API-driven exports and lightweight analytical views that match planners' workflows.

Scaling up evaluation and deployment. After implementing the above revisions, the next research step is a longer deployment with a larger and more diverse sample to evaluate retention over time, differences across user profiles (e.g. gamers vs. non-gamers), and the extent to which changes improve both engagement and contribution quality. An iOS release is also a practical priority to broaden reach and reduce platform bias in recruitment.

8 Planned Live Demonstration at the Conference

At GamiFIN, we will demonstrate *HereSay* as an end-to-end contribution experience on a mobile device, focusing on the features most relevant to the demo track and to the paper's research claims:

- **Onboarding and personalisation:** nickname/avatar generation and the initial flow into a first campaign.
- **Campaign–mission–task structure:** selecting a campaign and progressing through sequentially unlocking tasks.
- **In-situ contribution flow:** completing at least one affordance-oriented task (including multi-modal input such as photo and text).
- **Immediate feedback and progression:** experience points, progress indicators, and unlocking of subsequent content.
- **Contribution visibility and social layer:** viewing one's own (moderated) contributions on the public map and exploring the leaderboard view.

9 Conclusion

We present *HereSay*, a mobile crowdsourcing application that turns in-situ urban observation into an engaging activity while collecting planning-relevant VGI through affordance-based prompts. By combining a modular campaign structure with multiple complementary gamification mechanics, *HereSay* aims to sustain participation beyond initial novelty and to translate situated experiential knowledge into structured inputs usable for participatory planning. Our one-week user testing indicates that immediate feedback (particularly seeing one's own contributions and gaining points) can be strongly motivating, while onboarding effort and text-heavy narrative elements remain key areas for refinement. We will demonstrate the end-to-end contribution workflow at GamiFIN and continue iterating toward longer, larger deployments to evaluate retention, inclusivity, and data quality at scale.

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Supplementary Material S1: HereSay – App Survey

Introduction shown to participants

Thank you for taking part in the HereSay project. By participating you are providing the underlying data to build the cities of tomorrow. Each and every one of your contributions has helped paint a better picture of the urban environments that you enjoy and cherish, and also areas that you would like to see improved.

Now, help us improve the app by answering a few short questions. This survey takes approximately 15 minutes, and provides invaluable data to improve the app in the future.

As a thank you, everyone that completes the survey and ticks the corresponding box to enter the prize draw at the end has a chance to win a prize:

- 1 of 5 × 30€ Gift Cards

Note: In the original survey, required questions were indicated with an asterisk (*).

Survey items

Q1. Before we start, please enter the email address you use to log in to HereSay. (This will allow us to correlate this survey data with your in-app contributions.) *(Required; short answer)*

_____

Q2. How interested are you in shaping the future of your city? *(Required; single choice)*

- ☐ Not at all interested
- ☐ Somewhat interested
- ☐ Quite interested
- ☐ Extremely interested

Q3. How many times have you participated in a citizen science initiative? *(single choice)*

- ☐ Never
- ☐ Once
- ☐ A couple of times
- ☐ Many times

Q4. How many hours do you play video games per week? *(Required; single choice)*

- ☐ Never
- ☐ Up to one
- ☐ 1 to 3
- ☐ 3 to 5
- ☐ 5 to 7
- ☐ 7 to 9
- ☐ 10 or more

Q5. Have you ever played a location-based game (e.g. Pokémon GO or INGRESS)? *(Required; single choice)*

- ☐ Yes, many times…
- ☐ Yes, a couple of times…
- ☐ Yes, once…
- ☐ No, never…

Q6. What was your first impression of the HereSay app? Please write a short sentence. *(Required; free text)*

_____

_____

Q7. When using the app, the app was stable and worked as intended… *(Required; 5-point Likert)*

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

Q8. If the app was not stable or did not work as intended, could you please add some information on what did not work? *(free text)*

_____

Q9. What did you like most about the app? *(Required; free text)*

Q10. What did you like least about the app? *(Required; free text)*

Q11. Did you like the map used in the app? *(Required; single choice)*
- ☐ No, not at all!
- ☐ Somewhat…
- ☐ Yes, a lot!

Q12. How easy was it for you to locate yourself using the map and location indication provided? *(single choice)*
- ☐ Very Difficult
- ☐ Somewhat Difficult
- ☐ Neutral
- ☐ Quite Easy
- ☐ Very Easy

Q13. What, if anything, would you change about the map? *(free text)*

Q14. The app motivated you to visit different locations… *(Required; 5-point Likert)*
- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

Q15. The app motivated you to explore an area where you have never been… *(Required; 5-point Likert)*
- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

Q16. Anything else you would like to tell us about how the app changed your perception of areas of your city? *(free text)*

Q17. In the following list of app features, please indicate how motivating they were: *(Required; matrix, single choice per row)*

	Very Demotivating	**Somewhat Demotivating**	**Neutral**	**Somewhat Motivating**	**Very Motivating**	**N/A**
Experience Points	☐	☐	☐	☐	☐	☐
Levels	☐	☐	☐	☐	☐	☐
Leaderboards	☐	☐	☐	☐	☐	☐
Daily Streak	☐	☐	☐	☐	☐	☐
Seeing your contributions	☐	☐	☐	☐	☐	☐
Seeing the contributions of others	☐	☐	☐	☐	☐	☐
Having your contributions published	☐	☐	☐	☐	☐	☐
Licensing your contributions	☐	☐	☐	☐	☐	☐

Q18. What are the main reasons you contributed to HereSay? How much do you agree with the following statements. *(Required; matrix, single choice per row)*

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
You mainly contributed to HereSay because…					
it was a required task as part of your studies	☐	☐	☐	☐	☐
it was a fun activity	☐	☐	☐	☐	☐
you liked engaging with the app	☐	☐	☐	☐	☐
you wanted to support the researchers	☐	☐	☐	☐	☐
the app was recommended	☐	☐	☐	☐	☐
you wanted to shape the future of your city	☐	☐	☐	☐	☐
you were interested in citizen science	☐	☐	☐	☐	☐
you wanted to spend time outdoors	☐	☐	☐	☐	☐
you wanted to win a prize	☐	☐	☐	☐	☐

Q19. Is there any other reason you contributed to HereSay? *(free text)*

Q20. If anything, what would you change about the app? Please tell us why and what you would improve. *(free text)*

Q21. Is there anything else you would like to tell us? *(free text)*

Q22. Would you like to enter the raffle for a chance to win: 1 of 5 × CHF 30 Gift Cards *(single choice)*

- ☐ Yes, Please!
- ☐ No, Thanks!
- ☐ Yes, but if I win, donate my prize…

Q23. Consent to data handling terms *(Required; single checkbox)*

- ☐ I have read and agree to the above terms

By submitting this survey, I consent to the following:

- My responses will be anonymised and used exclusively for research purposes within the HereSay project.
- Data may be published in scientific publications only in aggregated and anonymised form.
- No individual responses will be identifiable in any publications or reports.
- My data will not be shared with or sold to any third parties.
- The research team will handle all data in accordance with data protection regulations.

I understand that my participation is voluntary and that all personal identifiers will be removed from the dataset before analysis.
For any questions regarding data handling or to request deletion of your responses, please contact: `manbaer@ethz.ch`