

Creating a Collaborative Space for Creativity through a Pervasive User Experience

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ABSTRACT

This paper explores the potential of a pervasive user experience to inspire, provoke and support creative thinking amongst participants in an intensive ideation workshop. The pervasive experience used a iPad-based virtual narrator to guide groups of participants around a physical and digital environment. It took place towards the start of a three-day workshop and the playful, self-directed nature of the experience was designed to align with subsequent workshop activities. This paper describes the user experience, presenting observations and findings through the lens of space (facilitation, augmentation and story), considering how the experience related to and supported the overall workshop aims of ideation and creative thinking. We conclude by examining some of the tensions that emerged, namely; 1) the disconnect between researcher and participant expectations, 2) the potential trade off between 'authentic' outputs and participant engagement, and 3) bridging the knowledge within the workshop with the world outside the workshop.

Author Keywords

Creativity support tools; design methods; reflection on design processes; storytelling; narrative; games and play.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Increasingly, design and creative thinking is being heralded as an attitudinal shift and approach that can solve societal and economic problems, moving beyond the tradition craft and design (product, user experience (UX)/user interface (UI)) provinces [31,43]. Social media as well as mass media is awash with articles advising readers of techniques to improve their and their companies innovation and creative capacity through design. This is mirrored by a call for design, computing and engineering education to adopt similar transferable, problem solving approaches [8, 20, 21].

At the same time, universities are increasingly encouraged by government and funding bodies, particularly in the arts and humanities, to show the value of research activities through interdisciplinary knowledge exchange across academia, industry, and third sector. The model of the sole genius artist or designer is dead. Fast ideation in groups, we argue, is rapidly becoming the norm, and a proliferation of service and UX design toolkits (e.g. IDEO, Nesta) have emerged to support such activities. Creating collaborative spaces for creativity therefore is also increasingly sought after, yet successful crafting of design and creative thinking environments can be challenging.

The workshop or sandpit [26] as a learning and thinking space has become a dominant paradigm. Maxwell & Williams [29] note that significant challenges can occur in facilitation and ownership in ideation workshops, whereby compliant participants, 'privileged' to be part of the workshop, are content to be led through workshop processes unquestioningly. Similarly, there is the danger of

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groupthink [24], particularly in intensive, pressurised workshop scenarios, such as the workshop that forms the focus for this paper.

This paper explores the potential of a pervasive user experience, the *Broonie Experience*, that was developed as a bespoke activity to inspire, provoke and support creative thinking amongst participants within one of these relatively conventional ideation and ‘design thinking’ workshops. The *Broonie Experience* was conceptualised in response to the challenge of introducing workshop participants from different backgrounds to service design methods and a range of digital technologies. The research question for this work was then: How might an interactive, technology-driven group experience support creative thinking for participants at an ideation workshop?

RELATED WORK & MOTIVATION

The *Broonie Experience* was created as an attempt to address the challenges of ‘hothousing’ participants in a workshop and as a way to mitigate against groupthink [24]. Service design tools appear to offer a route to empathetic design, and the use of personas [18] in HCI and design is well documented as a means to externalising and considering end users. Whilst often cited, the relevance of personas is not universally acknowledged – Chang et al’s [17] study observed how practitioners actually use personas in their work, discovering that this is not always as originally intended, but rather they “might be generated based on designers’ own thoughts and experiences, instead of on user research results” [p 442]. In order to pre-empt this stereotyping and insular thinking, the *Broonie Experience* drew on existing empirical data (VisitScotland’s visitor market segmentation report [37]) to provide a framework for personas that groups of participants would progressively annotate during the *Broonie Experience*.

Persona design [18] is just one example of the storytelling techniques employed across research processes as well as outputs [30]; for instance as visual storyboarding, animatics, scenario design [15] as well as setting up user experiences [41], role playing [10], and user enactments [33], where users ‘act’ out “loosely scripted scenarios” [p338] on existing and new technology concepts. The use of personas beyond collaged or text-driven formats have been explored, e.g. Shyba and Tam [38] consider convergence points between theatre art and Cooper’s personas and Goal-Directed Design, offering a means of embodying and experiencing a persona through acting and creative writing exercises. Given ‘design thinking’ context of the workshop described in this paper, we decided to employ a collaborative persona activity that drew on research from pervasive user experiences and HCI to create a blended digital-physical experience that through embodied play would encourage participants to develop empathy for their created persona characters. This approach, as realised largely through digital technology, would introduce

participants to a range of technologies in a non-threatening playful environment and would, we felt, be engaging and spark creative thinking between participants.

In order to support creative thinking and flow (Csikszentmihalyi’s [19] notion of ‘flow’ is the intense state when “people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it,”), we considered carefully the trajectory [5] of the user experience and journey. By conceptually situating the *Broonie Experience* as a pervasive technologically-mediated experience, with a richly constructed underlying rationalised narrative from folklore, we attempted to create a complex user experience such as those described in Benford et al’s work on pervasive gaming and experiences [5, 6, 25], but applied to creative thinking and design tools. Spence et al [40] identify characteristics of such performative experience designs, characterising three key strands, including Staging with multiple users and one device, where the “focus here is often on interaction and/or movement in public settings” [p 2052], and the *Broonie Experience* most closely fell into this category.

We sought then to explore the potential of a multi-layered narrative, attempting to blur the boundaries between digital and physical, fact and fiction, as described by Stenros et al [42] and incorporating elements of gamification [22]. The pervasive user experience, the *Broonie Experience*, made use of Scottish folklore (seldom employed in interactive narratives or pervasive games) to construct a meta-narrative and narrator that determined the design, implementation, and orchestration of the experience. Folklore forms part of the traditional oral culture of storytelling in Scotland that exists to this day [39], and within the tourism and cultural heritage theme of the workshop it was natural to embed folkloric elements within the experience. The accessibility and familiarity of storytelling and narrative structures through childhood and media (e.g. films, novels, folktales, even the structure of news articles) further supports this. Indeed, many interactive narratives (e.g. [13, 36]), closely aligned to pervasive user experiences, have often drawn on narrative frameworks (e.g. Propp’s Morphology of the Folktale [35], Georges Polti’s The Thirty-Six Dramatic Situations [34], Labov and Waletzky’s functional narrative analysis [27], and Campbell’s Monomyth [14]) to develop algorithms and computational models.

METHODS

The *Broonie Experience* described in this paper was conceptualised and developed as part of a larger residential workshop, which took place in Edinburgh, UK, in February 2014, as part of the Design in Action research project. The overall workshop brought individuals together from different backgrounds, including designers, academics and business, using creative thinking as a catalyst to generate

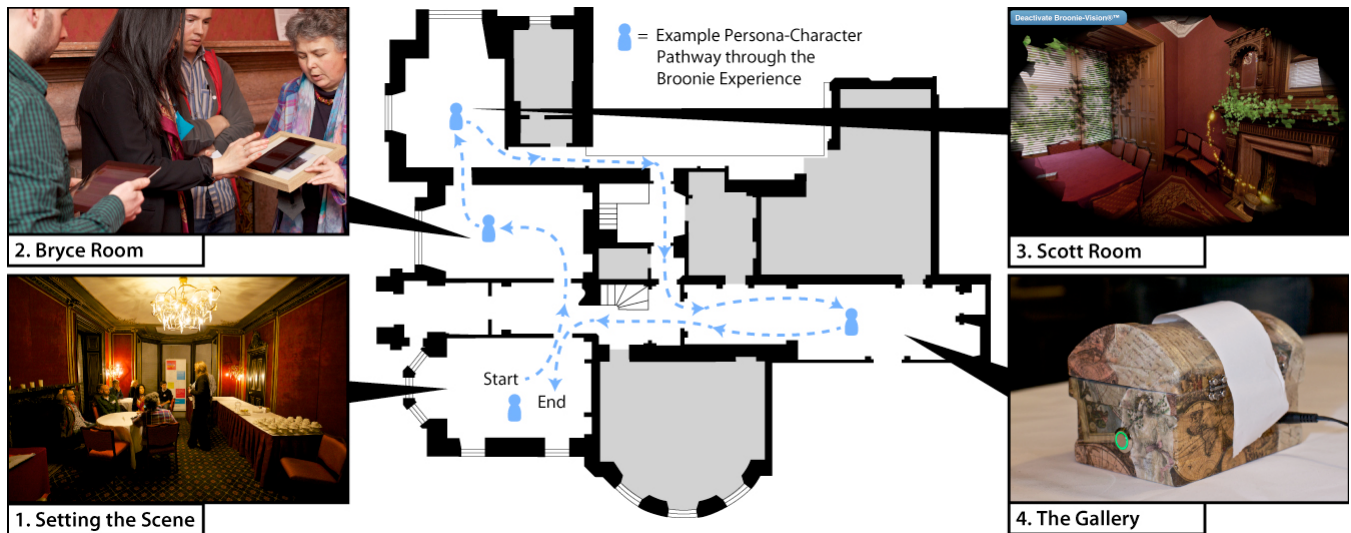


Figure 1: Pathway through the Broonie Experience with images indicating some of the technology and environment in each room.
©Deborah Maxwell

new business ideas around a central topic. Post-workshop, seed funding was available to support these new business ideas. Participants were introduced to service design tools as an alternative way to approach problems, whilst also networking and working collaboratively with other participants. It is worth noting that the workshop was not intended as a codesign process, as participants were not necessarily stakeholders nor end users of the business ideas they developed.

The workshop referred to in this paper was centred on new technologies in tourism and cultural heritage in Scotland. 20 participants were selected following an online application process and with few exceptions had never met each other before. By intention, they encompassed a wide range of backgrounds: computing academics and developers, digital publishing start ups, museum and heritage consultants, and product and graphic designers.

The *Broonie Experience* was conceived as an experimental activity that would support the ideation and creative thinking process of the overall workshop, providing a means for informal story sharing and group bonding amongst participants.

Data Gathering

The *Broonie Experience* was designed as a one-off event; this meant that there was essentially one opportunity to gather data. Therefore, to both mitigate risk and maximise data triangulation, a variety of qualitative data gathering techniques were employed to capture the multimodal experience, namely: 1) visual documentation by a photographer, 2) audio recordings of participant dialogue during the experience, 3) written researcher observations, documented immediately following the experience, and 4) individual semi-structured interviews with six participants conducted 2-3 weeks after the workshop. All participants

completed ethics forms agreeing to data gathering methods and interviews. All sources were collated and analysed using an open coding scheme to enable thematic findings to emerge from the data.

The Broonie Experience

The central concept of the *Broonie Experience* for participants was to support the fleshing out of four characters using a digital narrator that would enable self-direction through a physical, digital, and story environment, incrementally revealing narrative information. To facilitate this, we employed a central trickster narrator character drawn from Scottish folklore, a Broonie. The experience was introduced and told through Jack the Broonie, a little known creature from Scottish folklore (reworked in contemporary fiction as ‘house elves’ in J. K. Rowling’s Harry Potter series). Broonies are reclusive creatures, never seen and easily offended, who typically live in farmsteads, doing chores in return for a bowl of cream and some cake. Jack was a modern day Broonie, au fait with social media that allowed him to have a social life without having to interact face to face with people. Jack is also a trickster [3], disruptive, evasive but, hopefully still entertaining and in some ways endearing. This was delivered through a conversational, sometimes cheeky, dialect presented as both on-screen dialogue and audio [2] via an iPad.

In the *Broonie Experience*, each of the four persona-characters played by participants had lost an object, see Figure 2 (i.e. an old mobile phone, guidebook, glove, or map). To find their missing object each persona-character team (or player) had to undergo a quest [12] through the hotel public rooms, gradually building up the character’s persona along the way, guided by the dubious trickster narrator, Jack the Broonie.

Inspiration for the aesthetic of the experience came in part from the affordances of the hotel and their marketing brochure, which included a floor plan that was reminiscent of a board game (i.e. Cluedo). This map layout manifested into the primary navigation metaphor of the HTML5 app that participants used to negotiate the physical environment (see figure 1 for example map). This material formed the underlying framework for the experience, providing clear opportunities for the participants to develop character personas through text fields on an iPad.

Design Approach

The implementation of the *Broonie Experience* was informed primarily by a second person scenario script that was written by one of the paper authors to convey the concept to the rest of the research team. The scenario, which walked through an idealised version of the *Broonie Experience*, presented the story arc as well as envisaging how a range of digital technologies might be embedded in the physical space;

[...]the researcher closes the door behind you, and the next iPad screen encourages you to look around for Alice's missing map. You notice that the mantelpiece is thick with dust and that there is a saucer of cream and a small honey-covered sponge cake on the main table, with a 'not for the consumption of hotel guests' admonishing note placed strategically alongside them. [...] The iPad room plan seems to indicate that there is something of interest near the window [...] on a table there is a small box containing a receipt printer, highlighted by a table lamp, which begins to print. You and your team go over and rip the print out from the box [...]

This scenario guided the flow of the *Broonie Experience* in terms of plot, interactive elements, and physical movement round the space. It served as the starting point for the paper authors to develop a set of discrete digital media components, including the core HTML5 Web App, complemented with an augmented reality panorama, a Raspberry Pi driven thermal receipt printer and a Near Field Communication (NFC) web-linked photograph frame. The transition from text-based scenario to working prototype evolved through an informal development process, that included in-depth discussions, storyboard sketches, and walk-throughs amongst the research team.

What Actually Happened?

The *Broonie Experience* took place on the first evening after dinner following participants' arrival late that afternoon. Two groups of participants (4 in each) simultaneously took part in a first round of the narrative, each following a slightly staggered pathway through the space (see figure 1), followed by a second round of two groups (6 in each), so that all 20 participants were involved in total.

Participants self-selected into two groups and were verbally introduced to the activity by a researcher. Each group had an iPad and was issued with a small laminated physical profile card that provided information on their persona type, as characterised by VisitScotland's visitor market segmentation [30], e.g. Younger domestic explorer, average age 42, above average income, holiday motivations: escape from routine, convenience, love UK breaks. Through on-screen prompts and text fields, participants named and provided background information on their persona-character (e.g. where they lived and who they lived with) and 'met' Jack the Broonie through Twitter like visual interactions and audio. They were made aware of their character's lost object (see Figure 2) and were invited to begin their search through the hotel by following the iPad onscreen map.



Figure 2. The quest objects, showing typed and written character prompts. ©Deborah Maxwell

In each subsequent room, participants were introduced to an additional technology or prop, each of which prompted the groups to consider their persona-character and input their answers into the iPad app. For instance, a Raspberry Pi computer connected to a thermal receipt printer. On pressing the button (Figure 1) it printed:

Gosh, this is a cosy space, those sofas look like they'd never let you go. I'd love to relax on holiday and just do nothing (no printing at all), go totally off-grid. What about your persona? What do they like to do on holiday? What is their most important factor in choosing a holiday destination? [Hint: Press the button again for more info]

On pressing again statistical information from visitor surveys was printed. Additional information was provided upon repeatedly pressing the button.

The quest concept was continued throughout the rooms, moving between physical and digital environments; for instance an augmented image of one of the rooms overlaid a 'Broonie trail' to the mantelpiece (Figure 1). As the iPad was moved so the stitched panorama also rotated to reveal more of the room, according to the accelerometer (see Figure 3). In the physical room, participants found a

scrunched up piece of paper where the ‘Broonie trail’ indicated, containing the prompt question for their persona-character along with supplementary written and visual information about the role of Scottish culture to visitors.



Figure 3. Using the iPad to see the ‘Broonie Vision’. ©Deborah Maxwell

In addition, in an attempt to bridge the digital and physical interactions and avoid a ‘heads down’ focus on a screen, ‘Easter Eggs’ in the form of additional background information were placed around the hotel. For example, a saucer of cream and a cake with honey (a folklore reference to the only reward a Broonie might accept) was set up one of the rooms.

Upon both groups being guided by Jack the Broonie to the starting point, they discovered that each group had found the other’s missing object, whereupon they swapped objects and completed the quest.

FINDINGS

We here consider the findings grouped within the broader concept of space, that is, how the *Broonie Experience* was navigated through: 1) facilitation space, 2) augmenting space, and 3) story space. Following this, we consider how far these facets of space support the notion of developing a collaborative space for creativity for participants.

Space through Facilitation

Critical to the design of the *Broonie Experience* was a handing over of control from the research and facilitation team to the participants themselves. The central task of the experience was for each participant group to develop a design persona; for this to work effectively we believed that participants should take ownership of their group’s persona-character. This began with a physical handing over of an iPad device to each team, with no restriction or direction about how or who should take charge of them. This ‘stepping back’ was afforded by the distributed (i.e. digital and physical artefacts placed in different rooms of the hotel) and self-directed nature of the experience, with the iPad-based Broonie character guiding participants through

on-screen text, visuals, and accompanying audio to explore and engage with the technology and props in each room to build up their persona. The role of the researcher team then was primarily as observers, not leaders or directors.

This intentional deferring of control and opening up of facilitation was mirrored by subsequent workshop activities. For instance, midway through the workshop on the following day, teams were assigned their ‘first group task’, where teams were explicitly given permission to make their own decision about what to do over the next hour. This activity served to alter the pace and provide a change of scenery, as well as afforded significant intergroup networking and conversation around the ideas from earlier discussion sessions.

In an attempt to mitigate potential power dynamics that may have emerged through the use of a central iPad, the *Broonie Experience* extended beyond the screen based device (e.g. search for a physical key to open a chest, receipt printer, physical objects, Jack the Broonie audio comments), thereby encouraging all team members to be involved. Even with this approach however, the use of an iPad meant that one person was predominantly driving the interactions; some of the groups varied this role, rotating who held and inputted response into it, while other groups did not. The research team did not attempt to influence control of the device, merely observe.

Space through Augmentation

The hotel environment provided the physical space for the experience, offering a series of interlinking rooms and blank canvas for augmentation with both lo-fi and digital props. The use of multiple rooms in the hotel afforded lots of short movements, which have been shown to promote creative thinking [4, 9] but could be construed as problematic in terms of required levels of organising and planning. However, pervasive gaming experiences, which “extend the gaming experience out into the real world” [6], require significant planning, performativity, and orchestration [6]; the *Broonie Experience* described in this paper was no exception.

The importance of movement and space was a recurrent theme of the workshop, with follow on activities making use of the rooms to ‘force’ participants to move, e.g. to get coffee, hear keynote talks, find pre-allocated seats at different tables for mind mapping etc. All of this required informal participant negotiation.

The physical space lent itself to a pervasive experience or game. It was a blank canvas with marble and carved wooden fireplaces and large tables that could be easily populated with props and technologies. Unlike some of the painstakingly crafted Nordic live action role-playing games (e.g. [44, p1550]), we did not seek to create a ‘Three-Sixty Illusion’ [44], rather to provide just enough tangibility to situate technologies and encourage group interaction by reducing the predominance of a single person holding an

iPad. The props were therefore in some cases quite subtle, and not necessarily picked up on by all participants as they looked quite incongruous. For instance, a bowl of cream and honey cake set out for the 'Broonie' was unnoticed, and even the documenting photographer did not realise that this was part of the set up.

A key challenge within intensive ideation workshops (such as sandpits) is recognising that the knowledge and expertise contained within the workshop, whilst considerable, is finite. This is particularly pertinent for design-led workshops such as the example described in this paper, and therefore awareness of and empathy for context-led ideas and solutions is paramount. The *Broonie Experience* offered a means to ground the workshop in a wider setting, using empirical published data about user markets and encouraging participants to think outside the physical and mental spaces of the workshop. This shifting of perspective parallels with the notion of *immediacy* of media; that is, the ability of media to open a window into another reality, for example, a film attempting to put the viewer inside the action. Bolter & Grusin [11] describe what they call the 'double logic of remediation'. New forms of media seek to provide such immersion with the content that the medium itself 'disappear[s] from the user's consciousness.' That is, 'the logic of immediacy dictates that the medium itself should disappear and leave us in the presence of the thing represented: sitting in the race car or standing on a mountaintop.' [11, pp. 3] O'Neill [32] explains immediacy through the useful analogy of looking through a window. The main focus is of the view outside the window rather than the window itself.

This was echoed through some of the technology employed; the implementation of the custom built augmented reality HTML5 panorama controlled by the iPad's accelerometer was quite novel, however no participants, even mobile developers, commented on this in any way. The relative invisibility of these components and props is indicative of the appropriateness of the inventions within the game mindset of the participants;

"It's not just that the technical underpinnings of theatrical performance are unimportant to audience members; when a play is "working," audience members are simply not aware of the technical aspects at all." [28, p15]

We could argue therefore that the Broonie was in some ways an immersive experience, opening a window out onto the 'real' world, as afforded by the technology and interaction mechanisms and through the persona technique. However, as a counterpoint to this, in pervasive gaming and media terms, the prototype nature of the experience meant that the *Broonie Experience* was a seamful design experience [16] where the underlying technology intentionally showed through. We could have used more of a Wizard of Oz approach relying on the research team as human agents, however given a desire within the wider workshop aims to open up discussion and awareness of new

technologies this was deemed inappropriate. In general participants were very forgiving of the prototype nature of the *Broonie Experience*; this may have been in part due to the way the research team presented the experience as an exploratory activity.

Space for Story

The *Broonie Experience* was not a typical interactive narrative or pervasive game (e.g. [25]). Groups did not follow a multi-branched path, nor were they able to dictate the course of the experience or influence the scripted dialogue between their persona-character and Jack the Broonie. They were on a Quest [12], yet the conventional dramatic structure [1, 13] of conflict-diversion-resolution (in this case finding their persona-character's missing object, which had been stolen by the Broonie) was downplayed in favour of exploring the environment and developing their persona-character. Therefore, despite nominally following a simple story arc through the meta-narrative, character creation was the primary goal, a pre-story activity, with a potential next step in a user-centred design process being to create scenarios for the persona-characters to inhabit [15].

The meta-narrative in the *Broonie Experience* was in some ways quite subtle and underplayed; rather it served the role of directing action and suspending disbelief. The development by the research team of the narrator's (Jack the Broonie) backstory was important in design decisions when planning the experience, but this central importance was not carried through into the execution; rightly, the focus was on creating the persona-characters. Similarly, the quest objects served their purpose in driving action forward but were not of primary importance, also suggesting that they worked well as a mechanism. Participants saw the experience as a game, but without any elements of competition; this is reflected in the variable and relaxed pace that each group took – groups did not display any urgency to complete the 'game' first or race to find their persona-character's lost object first. This was therefore experienced as intended, the objects were devised to create the incentive to explore the physical space, taking the both the persona-character and the participant groups on a 'trajectory' [5], maintaining a coherent narrative within which rich discussions could take place.

The understated story arc within the persona-character process provided space for participants to layer into the story content by adding somewhat irreverent persona-character conflict and undercurrents. For instance, out of the four persona-characters, two were secretly gay (one male, one female) unbeknown to their fictitious partners, and a third (male financial manager) loved ballroom dancing but dreamt of becoming a belly dancer. These backstories became increasingly elaborate throughout the experience, and scenarios were created without prompting as reasoning for their persona-characters' preferences in holiday choices, attitudes towards technology. For instance,

here one group collaboratively discusses the gadgets their character owns:

[Group debating the fitness and tech gadgets their character has. Group laughter and all talking at same time.]

ParticipantF7: *What about cooking gadgets?*

ParticipantM8: *I think he's quite old fashioned, he kind of leaves that down to the wife. [All laugh] I'm thinking Hugh earns enough money that maybe his wife does all that for him. [Group laughter]*

ParticipantF7: *Something for blood pressure?*

ParticipantM5: *That heart thing you run with.*

ParticipantM8: *Pacemaker?! [Group laughter]*

ParticipantM5: *Heart monitor.*

ParticipantM9: *50's a bit young for that!*

ParticipantM5: *It's been a stressful life! [Group laughter]*

As the above extract demonstrates, group discussions were not dominated by one individual, all group members contributed, indicating the accessibility of the experience (see Figure 4).

Creating immersive experiences is challenging yet participants certainly appeared to suspend their disbelief whilst taking part. The introduction of Jack the Broonie as trickster narrator immediately set the scene as other worldly, placing it firmly in the fairy tale or fantasy world. Consequently, we argue, the premise of the missing objects, or MacGuffins, was unchallenged, and further set the experience as outwith the previous networking and workshop setting into a more playful domain (i.e. that of a Quest [12]). As soon as participants began to input information into the iPad about their persona-character (name, hometown, lives with) they interpreted the experience as a game. Whilst the authors would not define the *Broonie Experience* as a game, it does contain game design elements [22, p12], i.e. game design patterns (time constraint and resources) and game models (challenge, fantasy, curiosity), and so according to Deterding et al. [22] could be classified as Gameful Design or Gamification.

In addition, participants quickly began to enter into the spirit of the activity, talking back to the Broonie character, e.g. ParticipantM4: "Hi Jack!" [Group laughter]; and even trying to intertwine their own reality into the persona-character:

[In a discussion about persona-character and what kinds of activities they might enjoy and where they might visit in Scotland...]

ParticipantF3: *The Wickerman Festival then? Lots of gay people there.*

ParticipantF10: *Right the Wickerman Festival then. My God you're persuasive.*

ParticipantF3: *I want her [Character] to go near me you see, I'm always trying to attract people. [Participant ran a guesthouse near the festival location.]*



Figure 4. Showing group interaction and laughter. ©Deborah Maxwell

Despite the mixed responses to personas as a design tool, discussion around their characters was rich and appeared to create genuine empathy, with groups debating at some length (and good humour) the types of interactions and motivations that their characters had. For instance, one group created a fictitious dog for their persona that determined his travel requirements when booking hotels, and also led to the use of various wearable gadgets to monitor his fitness whilst out walking the dog. Another group had to eventually compromise on their character's personality due to increasingly heated but good natured debate:

ParticipantF3: [Reading] *What will the year of homecoming mean for your character? Will they visit Scotland, make the most out of the 430 events or deliberately avoid the crowds? I think they'll deliberately avoid the crowds.*

ParticipantM4: *Noo! She's a-*

ParticipantF3: *She's a quiet-*

ParticipantM4: *She's a senior sales-*

ParticipantF3: *She's fed up with all the hubbub.*

ParticipantM4: *No she's going to – she wants to be at the opening ceremony of the Commonwealth Games. There's definitely something for her to go to.*

ParticipantF3: *Where does she live? She lives in London, she wants to escape the crowds.*

ParticipantM4: *No, she's used to the crowds. The Commonwealth Games? That's no crowd for her! [Group laughter] She can easily handle that, you know.*

As can be seen from the above quotes, the *Broonie Experience* enabled participants who had only recently met to learn more about each others' attitudes and personalities,

as group dynamics and strong characters emerged. This was an unintended side-effect of the Experience that was valuable for the wider workshop and later group formation.

Summary of Findings

Space for Story, Space for facilitation, and Space through Augmentation all illustrate the ways in which participants collaboratively negotiated the *Broonie Experience* and how it helped to scaffold this pop-up community of practice. Erden et al. [23] argue that knowledge creation and innovation, primary aims of the larger workshop environment that forms the context of this paper, is often “not the product of a single person but a collective work of a group of people or a team” [p5]. This “group tacit knowledge (GTK)... is socially complex and difficult to imitate” [p5]. They identify four levels of quality of GTK, from Groups as Assemblages with “nearly no shared experience”, through to Collective Improvisation where groups develop “a collective mind which leads not only to coordination in certain situations but also to collective intuition”. Whilst it is unrealistic to expect that group dynamics would develop to the level of Collective Improvisation, we did hope that the *Broonie Experience* would go some way towards developing a sense of shared memory amongst participants. ParticipantF1, on being asked whether she had used their *Broonie Experience* persona during an interview post-workshop, indicated that it had formed part of a shared history between her and a fellow participant;

ParticipantF1: ...when we were thinking about our avatars, we were thinking about making personas for them. [...] Because I think two of us, yeah, [participant name] was in that group with us as well, so we, you know, we just talked about George [persona-character], or we talked about the line dancing. So that just made it fun.

It is clear that the gamification and fantasy or folklore elements embedded in the experience were taken as permission to ‘play’ with the persona-characters. In addition, despite the limited usage of the persona-characters in the overall residential workshop, they were memorable, with all interviewees able to recall (some with striking clarity) the persona-character that they had developed 2-3 weeks previously. Additional, though anecdotal, evidence was a conversation between a researcher and a participant who had missed the first evening (and therefore the *Broonie Experience*) who confided that she felt she had missed out on a significant ‘group bonding’ experience after hearing about it from other participants. Therefore, the perception was that it had been a valuable shared group experience.

TENSIONS

The *Broonie Experience* described in this paper brought to light several tensions, namely 1) the disconnect between researchers’ expectations and participants’ perceptions of the experience as a game, and how this was negotiated, 2) the apparent trade off between ‘authenticity’ and

engagement in this context, with the creation of engaging and outlandish stories that deviated from more conventional realistic, arguably more ‘authentic’, persona-characters, and 3) providing a bridge to consider not only the knowledge and experience contained in the workshop environment, but the experience and wide world out with the workshop.

The inherent ‘game’ like quality of The Broonie meant that participants treated it as such, and so the character-personas, whilst raising discussion and indicating what kind of material might be included in them, had limited value in and of themselves as tools for informing design. The specific character-personas were not used explicitly during the rest of the workshop by participants in their wider design processes; although personas as a method were independently initiated and employed by several of the workshop groups that emerged over the following two days. It was clear from follow up interviews that participants enjoyed the *Broonie Experience*,

“I actually thought it was more of a get to know you exercise which is breaking down barriers [...] we just enjoyed ourselves” [ParticipantF1]; and *“I thought that was cool yeah. It was like Crystal Maze. [laughs] That was fun. [...] I think everyone else, it helped them relax a bit as well ‘cos we were kind of moving around and talking to each other”*. [ParticipantF7]

On reflection therefore, the primary value of the Broonie Experience was as a means to provoke discussion around technology and encourage the formation of working groups.

CONCLUSIONS

The development process for the *Broonie Experience* was motivated by rethinking the way in which ‘hothousing’ workshop participants leads to limitations on the creative process, such as groupthink. The research aimed to demonstrate that through embodied play, groups may seek to extend the narratives of specific character personas given their experiences within those personas, using empathy as a creative catalyst. The work brought to light several tensions as noted above, but let us consider the *Broonie Experience* in terms how an interactive, technology-driven group experience support creative thinking for participants at an ideation workshop.

Firstly, the *Broonie Experience* was deployed as a session within an overall workshop as a deliberate contrast to the intense, ‘hothouse’ atmosphere of the event, where participants were aware that they had to ideate, self-select into groups, develop, and pitch a business concept in under 48 hours. The *Broonie Experience* provided an early reminder that the workshop challenges should be considered in a wider frame, opening a virtual window onto the world outside the workshop, in this instance, through data about cultural heritage and visitors to Scotland. This opening up discouraged the circular ‘re-cooking’ of ideas, and groupthink, as was evidenced by the wider workshop.

Secondly, the manner in which participants immediately and instinctively engaged with the experience as a game, recognizing playful and narrative elements led to the embroidery of elaborate backstories for their persona-characters, demonstrating creative thinking. In Scottish oral tradition, the only ‘rule’ for a storyteller when asked about an aspect of the story by a listener is that the answer can never be, ‘I don’t know.’ In a similar manner, participants justified their persona-character responses to questions (e.g. the places their persona-character would want to visit) by elaborating on the backstory, thereby creating plausible reasons for their character’s behavior, and arguing for the validity of their response to the rest of the participant group.

Third, and finally, as discussed in the Findings section, discussions and participant groups that emerged during the *Broonie Experience* did, at least to some degree, translate to the rest of the workshop, evidence that the legacy of the experience extended beyond its duration. This suggests that the experience supported participants’ ideation and creative thinking process throughout the extended workshop.

The role of technology within the *Broonie Experience* worked well as a neutral actor; had the research team taken on the role of the narrator through role play, given the wider ideation workshop context, participants would not have engaged in the same way. The Broonie character as realized through an iPad was distinctive, and we argue, helped to suspend disbelief and immediately situated the experience as a ‘game’. In addition, the range of technology provoked debate and peer learning across the groups, as those with more technical experience explained technology (such as Raspberry Pi) to others.

The *Broonie Experience* had significant value in sparking group discussion on and around persona-characters and technologies, working well to generate a shared experience and group history. In particular, unanticipated persona-character elaborations into short stories within the wider metanarrative of the Broonie demonstrates the potential for future development of this type of design-led experiences.

Design and HCI practitioners and researchers may want to consider therefore the potential of rich, embodied user experience journeys, as augmented with digital media, as collaborative and/or empathic tools within design processes. Future work, we suggest, lies in investigating the optimum interaction framework for such experiences, i.e. ranging from fully constructed preexisting persona-characters to be explored through for instance geo-tagged media, to more open frameworks that allows participants to construct and populate with personas and scenarios on-the-fly. These design tools and approaches, we posit, may be particularly valuable when working with and across diverse groups of participants and stakeholders as a non-threatening way of provoking rich discussions and reflections.

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REFERENCES

1. Appan, P., Sundaram, H., and Birchfield, D. 2004. Communicating everyday experiences. *Proc. SRMC 2004*, ACM Press (2004), 17-24.
2. Aylett, M. P., and Pidcock, C. J. The CereVoice characterful speech synthesiser sdk. *Proc. AISB 2007*, 174-178.
3. Barbara Babcock-Abrahams, B. “A Tolerated Margin of Mess”: The Trickster and His Tales Reconsidered. *Journal of the Folklore Institute*, 11, 3 (1975), 147-186
4. Beatty, E. L. & Ball, L. J. (2011). Investigating exceptional poets to inform an understanding of the relationship between poetry and design. *Conference Proceedings: DESIRE 11*.
5. Benford, S., Giannachi, G., Koleva, B., and Rodden, T. From interaction to trajectories: designing coherent journeys through user experiences. *Proc. CHI 2009*, ACM Press (2009), 709-718.
6. Benford, S., Magerkurth, C., and Ljungstrand, P. Bridging the physical and digital in pervasive gaming. *Communications of the ACM* 48, 3 (2005), 54-57.
7. Benyon, David, Oli Mival, and Serkan Ayan. "Designing blended spaces." *Proceedings of the 26th Annual BCS Interaction Specialist Group Conference on People and Computers*. British Computer Society, 2012.
8. Big Beacon Manifesto [Accessed on 12 January 2015] <http://bigbeacon.org/big-beacon-manifesto.pdf>
9. Blanchette, D. M., Ramocki, S. P., O'del, J. N., & Casey, M. S. (2005). Aerobic Exercise and Creative Potential: Immediate and Residual Effects. *Creativity Research Journal*, 17 (2 & 3), pp. 257-264.
10. Boess, S., Saakes, D., and Hummels, C. When is role playing really experiential? Case studies. *Proc. TEI 2007*, ACM Press (2007), 279-282.
11. Bolter, J. D. & Grusin, R. A. (1999) *Remediation : understanding new media*, Cambridge, Mass. ; London, MIT Press.
12. Booker, C. *The Seven Basic Plots: Why We Tell Stories*. Bloomsbury Publishing, 2004.
13. Brooks, K. M. Do story agents use rocking chairs? The theory and implementation of one model for computational narrative. *Proc. MULTIMEDIA 1996*, ACM Press (1996), 317-328.
14. Campbell, J. *The Hero with a Thousand Faces*. Fontana Press, 1993.

15. Carroll, J. M. *Making Use: Scenario-based Design of Human-Computer Interactions*. MIT Press, 2000.
16. Chalmers, M., and Galani, A. Seamful Interweaving: Heterogeneity in the Theory and Design of Interactive Systems. *Proc. DIS 2004*, ACM Press (2004), 243-252.
17. Chang, Y. N., Lim, Y. K., and Stolterman, E. Personas: From Theory to Practices. *Proc. NordiCHI 2008*, ACM Press (2008), 439-442.
18. Cooper, A., and Saffo, P. *The Inmates are Running the Asylum*. Sams, Indianapolis, 2004.
19. Csikszentmihalyi, M. *Flow: The psychology of optimal experience*. Harper & Row, New York, 1990.
20. Denning, Peter J. "The whole professional." *Communications of the ACM* 57.12 (2014): 24-27.
21. DesignX: A Future Path for Design. The Design Collaborative. [Accessed on 12 January 2015] http://www.jnd.org/dn.mss/designx_a_future_pa.html
22. Deterding, S., Dixon, D., Khaled, R., and Nacke, L. From Game Design Elements to Gamefulness: Defining "Gamification". *Proc. MindTrek 2011*, ACM Press (2011), 9-15.
23. Erden, Z., von Krogh, G., and Nonaka, I. The Quality of Group Tacit Knowledge. *Journal of Strategic Information Systems*, 17, 1 (2008), 4-18.
24. Esser, J. K. (1998). Alive and well after 25 years: A review of groupthink research. *Organizational behavior and human decision processes*, 73(2), 116-141.
25. Fosh, L., Benford, S., Reeves, S., Koleva, B., and Brundell, P. See me, Feel me, Touch me, Hear me: Trajectories and Interpretation in a Sculpture Garden. *Proc. CHI 2013*, ACM Press (2013), 149-158.
26. Giles, J. "Sandpit initiative digs deep to bring disciplines together." *Nature* 427.6971 (2004), 187-187.
27. Labov, W., and Waletzky, J. Narrative analysis: oral versions of personal experience. *Sociolinguistics: The essential readings* (2003), 74-104.
28. Laurel, B. *Computers as Theatre*. Pearson Education, 1993.
29. Maxwell, D., Williams, A. 2014. Pragmatics, Plasticity, and Permission: A Model for Creativity in Temporary Spaces. *Proc. 19th DMI: Academic Design Management Conference* (London, UK, September 02 - 04, 2014).
30. Maxwell, D., Woods, M., and Abbott, D. StoryStorm: A Collaborative Exchange of Methods for Storytelling. *Proc. DIS 2014*, ACM Press (2014), 207-210.
31. Norman, D. *State of Design: How Design Education Must Change* [Accessed on 12 January 2015] <https://www.linkedin.com/pulse/20140325102438-12181762-state-of-design-how-design-education-must-change>
32. O'Neill, S. *Interactive media : the semiotics of embodied interaction*. London, Springer (2008).
33. Odom, W., Zimmerman, J., Davidoff, S., Forlizzi, J., Dey, A. K., and Lee, M. K. A Fieldwork of the Future with User Enactments. *Proc. DIS 2012*, ACM Press (2012), 338-347.
34. Polti, G. *The Thirty-Six Dramatic Situations*. JK Reeve, Boston, 1954.
35. Propp, V. *Morphology of the Folktale*. University of Texas Press, 1968.
36. Robertson, J., Luckin, R., and Gjedde, L. *Inside stories: A Narrative Journey*. Lulu.com, 2008.
37. Scotland: An Insight into our Customer Segments, VisitScotland Report, 2011. [Accessed on 12 January 2015] <http://www.visitscotland.org/pdf/An%20Insight%20into%20our%20Segments%20updated.pdf>
38. Shyba, L., and Tam, J. Developing Character Personas and Scenarios: Vital Steps in Theatrical performance and HCI Goal-Directed Design. *Proc. CandC 2005*, ACM Press (2005), 187-194.
39. Smith, Donald. *Storytelling Scotland: a nation in narrative*. Interlink Publishing Group, 2001.
40. Spence, J., Frohlich, D. M., and Andrews, S. Performative Experience Design. *Proc. CHI EA 2013*, ACM Press (2013), 2049-2058.
41. Stappers, P. J., Saakes, D., and Adriaanse, J. On the Narrative Structure of Virtual Reality Walkthroughs. *Proc. Computer Aided Architectural Design Futures 2001*, Springer Netherlands (2001), 125-138.
42. Stenros, J., Montola, M., and Mäyrä, F. Pervasive Games in Ludic Society. *Proc. Future Play 2007*, ACM Press (2007), 30-37.
43. Verweij, L. *We are coming to view design more as a mentality than a skill*. [Accessed on 12 January 2015] <http://www.dezeen.com/2014/03/25/opinion-lucas-verweij-design-education/>
44. Waern, A., Montola, M., and Stenros, J. The Three-Sixty Illusion: Designing for Immersion in Pervasive Games. *Proc. CHI 2009*, ACM Press (2007), 1549-1558.