WELCOME TO SACKBOY PLANET:
Connected Learning Among LittleBigPlanet 2 Players

by Matthew H. Rafalow
Katie Salen Tekinbaş

CONTENTS

So people build a lot of things and it's interesting because people build a lot of things in the game but they also build a lot of things outside the game … people are building everything. They are building story levels or puzzle levels and just any kind of game that you can imagine. But also, they are using it to build their homework. They are using it to do presentations. They are making music videos … people are really using it to just make anything they can think of. And it's also inspiring people to make stuff outside the game, so people are building, they are making cakes with *LittleBigPlanet* themes. They send us art and drawings all the time or they'll re-create one of the downloadable content items in the game so that we make one of the T-shirts that Sackboy wears or one of his hats. … They'll remake the characters out of papier-mâché … it's really interesting how it inspires people to create all sorts of things. Also obviously, the number one thing people will also create outside the game is that they crochet their own Sackboy.
— Spaff, community manager at Media Molecule

Sackboy, the main character of LittleBigPlanet 2, welcomes players to the game world.

INTRODUCTION

> When I joined *Sackboy Planet* I saw that people were putting out tutorials and saw what people were making and from there it just took off. There were some people who were doing things that I wasn't even aware the editor was capable of doing. From there it just got a whole new level of depth.
> — Sensei (27 years old, United States)[1]

Sensei, a math teacher, is an active player of *LittleBigPlanet* 2 (*LBP2*), a Playstation 3 game created by the company Media Molecule (MM). When interviewed about his early experiences with the game, he described facing major difficulties with the level editor, the game's most innovative feature. Although *LBP2* boasts that players can not only play the game but also create their own games with its level editor, Sensei's first design attempts were mostly futile: "I had no idea what I was doing." The mechanics of the level editor, which incorporate art, logic, and computer programming, were unwieldy and had a definite learning curve. After putting the game down for a few months, he returned with a new idea for a level he wanted to create and stumbled upon *Sackboy Planet*, an online community of fans devoted to the game. After he discovered this community, his experience with the game changed dramatically. He found not only hundreds of levels created by other players, but also resources they had assembled to teach fellow players how to design custom levels. During the course of a few years, Sensei honed his skills as a level designer and became an active member of the community, producing popular levels as well as text- and video-based tutorials for advanced design techniques that involve statistics and probability.[2]

The emphasis on community in *LittleBigPlanet* 2 is one of its most distinctive features, partly because the game does it so well. Players can play, build, and share levels with other players within the game itself. The culture of friendliness cultivated by the *LBP* community allows both experts and "n00bs" to feel at home. The developers remain active participants in the community, and players are supported with many opportunities to celebrate their own creations. From a wonderfully diverse array of ways to "like" player creations to tweetable level urls that can be shared across social networks, the game makes it easy to participate.

Like Sensei, many *Sackboy Planet* community members actively create levels and share them with other players. These levels operate like self-contained video games that exist within the game itself. While *LBP2* comes with its own playable game (players access it via the "Story" mode of the game), it also offers, within "Create" mode, a complex level editor that allows players to design their own games. Players using the editor are able to create all sorts of levels, including side-scrolling games and remakes or remixes of old games such as *Tetris* or *The Legend of Zelda*, and to produce machinima. Machinima refers to the process by which fans use the level editor to create animations such as music videos or their own movies. Like Sensei, many players describe their discovery of

---

1 To protect community members' anonymity, all participant names and user names are pseudonyms.
2 Links to outside content are not empirical examples from the studied community. Rather, to protect the anonymity of participants, we link to content that addresses similar themes but that is created by other communities.

Sackboy Planet as a gateway experience that reinvigorated their interest in the potential of the game through the support of their peers.

This case report describes one of a number of case studies from the Leveling Up project of the Connected Learning Research Network that explore the learning ecology of interest-centered youth contexts. In particular, this study and another on the online game *StarCraft II* are inspired by the theory of the *metagame*, a framework developed out of the study of role-playing and collectible card games (Salen and Zimmerman 2004). Designers of fantasy role-playing games such as *Dungeons & Dragons* and *Magic: The Gathering* first modeled an approach to game design that took into account a game's relationship to outside elements—player attitudes, play styles, social reputations, social contexts, and so forth. Kids poring over *Pokémon* strategy guides or discussing the configuration of their decks are activities considered part of the metagame, a term that refers to the way a game engages with elements outside its formal space of play. *StarCraft II* players preparing strategies for an upcoming e-sport match are engaged in *StarCraft's* metagame, as are the four DS-equipped 10-year-olds who trash-talk each other during a networked round of *Mario Kart*. In the case of the study at hand, players creating and sharing custom costumes for Sackboy between bouts of play represent a core piece of *LBP2's* metagame.

Understanding how to design for the metagame is a key consideration for game designers generally, because it is the strategy by which they can harness the power of player creativity and interest to fuel ongoing play. Game developers tend to think about the play communities that grow up around their game as rich spaces for learning and exchange—a kind of co-development mind-set demonstrative of connected learning's value around shared purpose. Developers use the communities to test out feature ideas and to get feedback; players use the communities to connect with like-minded players around a common interest, often developing tools and supports for fellow players as a way to share and hone expertise along the way. As a result, developers and players see themselves as part of a set of connected communities intent on improving, elaborating on, and celebrating the game.

LittleBigPlanet 2 and its associated player-created design communities constitute an exemplary case not only for a study of metagame activity, but also for connected learning environments that facilitate interest-powered, peer-supported, and academically relevant contexts for learning. The more than 1,000 active members of *Sackboy Planet* (23,000 have registered since its launch several years ago) collectively produce and curate in-depth tutorials and informational YouTube videos for new learners. Sections of the website are devoted to "feedback to feedback," where users reciprocally provide assistance to others as they work through issues with their designs. The level editor provides a low barrier to entry by making basic level creation as simple as dragging a paintbrush across a canvas. The design options available within the editor allow for very simple levels, as well as incredibly complex ones. Some of the more sophisticated player-created levels combine the use of programming

logic, custom art, sophisticated camera control, and music composition, resulting in a very high ceiling for achievement. Such activity requires players to call up skills in probability, logic, physics, and teamwork, to name but a few. In this way, *LittleBigPlanet* 2 provides an academically oriented context for players. Moving back and forth between the game and metagaming activities, players engage in production-centered level design and share their creations both in the game and on the Internet in online communities such as *Sackboy Planet*.

Before we get to details on the types of metagame participation and connected learning principles observed during the course of our study, we wanted to address the qualities of the development environment in which the *LBP* series was created. One aspect of our study was to look for connections between the design aesthetics and learning values of the game's developers as a way to say something about the style of connected learning made manifest through the play of their game. This focus on both the developer and player was critical to our understanding of how and why metagame activity in the service of connected learning was taking place within the *LBP2* world.

The LittleBigPlanet 2 game case [3]

The offices of the UK-based Media Molecule, the game-development company behind the *LittleBigPlanet* series, are brightly painted and dominated by fan art of their most famous character, Sackboy. The space also features a large communal dining table around which staff and guests can sit, eat, chat, and relax. The table is enormous (it can seat close to 24) and wholly symbolic of the games Media Molecule loves to create—games such as *LittleBigPlanet* 2, which nurture creativity in the context of community.

As a studio, Media Molecule is itself highly collaborative and feels at times like an artists' collective. With a social vibe, the studio is filled with examples of fan creativity such as Sackboy Halloween costumes and handwritten bug reports produced by nine-year olds. The staff seems to believe almost fearlessly in the idea of engagement in a community as a way in to learning, a vision even more realizable today with the wealth of social supports available via digital media and technology. For Media Molecule, learning and making are possible only within a community founded on knowledge sharing and support. As level designer Christophe Villedieu said in an interview, "Sharing is the gift for the community—you don't expect anything in return. It's just that I know how to do something so I share my knowledge … take it and use it. It's like free food, like open knowledge, for every creator."

---

[3] This and all images used in this report are from promotional material provided by Media Molecule, the game developer, with permission via its website.

Allison (2006) argues that "the work of the imagination inheres in the social condition itself; societies have always transcended and reframed ordinary life by recourse to mythologies of various kinds." Interviews with Media Molecule developers and players of its game revealed a dual narrative of the imagination. While the game's narrative implicates players in the protection and maintenance of the Dream-o-sphere and Craftworld that make up the *LittleBigPlanet* environment, player narratives centered on the creation, sharing, and discovery of creative work between players and their peers. As such, we might say that players value participation in a collective that dreams and plays together, continually inspiring, supporting, and challenging one another. Support of such an imaginary necessitates social interaction—and connected social interaction at that. Thus, we will show that the principles of connected learning were not only present in one of the game's many communities, but that they are also present in the design fabric of the game-development environment itself.

For example, we found during the course of our study that the artists, level designers, and engineers at Media Molecule refine and share their ideas with each other in ways strikingly similar to players on *Sackboy Planet*. Media Molecule employees describe their working environment as deeply collaborative, noting that the best ideas emerge through team-based projects; they believe that sharing ideas early on is among the best ways to solicit feedback and spur development of great additions to the game. A number of employees were, in fact, *LBP* players first, discovered later by Media Molecule after creating their own levels using the game's level editor. One designer, a former construction worker and *LBP* player, described how he and a colleague built one of the most popular game-design tools through a back-and-forth of ideas and tweaks to the tool's design. The culture of collaboration among employees at Media Molecule reflects many of the principles employed by players in their online communities, including strong peer supports and a shared sense of purpose.

This report begins with a description of the study, including its methods and a sketch of the observed learning environment. Next, we provide a brief background on the game itself, including the in-game story and gameplay mechanics. We then describe how the *LBP2* community bridges the three key spheres central to a theory of connected learning—interest-powered, peer-supported, and academically oriented—in order to cultivate an ideal context for knowledge sharing and skill building. Thereafter, through an analysis of the various features of the *LBP2* community and its activities, including its social, technical, and cultural facets, we show how *Sackboy Planet* engages with the tenets of connected learning and complicates some of its assertions. In particular, we identify how player demographic differences and the prevalence of attention scarcity both enable and constrain learning opportunities.

DESCRIPTION OF RESEARCH STUDY

Although many fruitful contexts exist for studying online communities and learning, we selected several popular websites centered on an interest in *LBP2*. While we initially selected three websites for study, here we focus on the largest of the communities, *Sackboy Planet*. After conducting fieldwork in the forums and interviewing community members, we quickly discovered that the site with the highest level of activity provided the greatest visibility into how people take up *LBP2* and participate in companion online communities in ways that facilitate learning. Examples used in this report emerge from interaction only on this one site, though we emphasize that our observations and interviews reflect themes found in the other two sites, but to a smaller degree.

The research design focused on observation and interviews with members of the *LittleBigPlanet* 2 universe, including not only participants in the *Sackboy Planet* player communities but also game designers at Media Molecule. We include interviews with the game's developers as a strategy for understanding the ways in which design decisions made by the creators of the game might lead to or discourage connected learning practices. Would overall design values held by the developers around "designing for friendliness," for example, lead to lower barriers of entry for new players in community forums? Could we understand the existence of such strong production-centered participation by *LBP2* players as a reflection of a core stance by Media Molecule to empower players to play, create, and share? At its heart the study tries to link a set of sociotechnical design concerns expressed by the game's developers with a set of observed metagame practices taken up by its players. Understanding the ways in which such practices might be better enabled from a design perspective is a critical strategy for moving a theory of connected learning forward.

We obtained data through several means: in-person interviews with 10 members of *LBP2*'s development team, observation in *Sackboy Planet* forums, and interviews with *Sackboy Planet* community members. Developer interviews were conducted on-site and videotaped in Media Molecule's offices in the UK over the course of three days. We then edited the footage into a series of stand-alone clips, organized around key connected learning design principles. Observation in *Sackboy Planet*'s online forums was conducted during a nine-month period in which we visited the websites several times a week and observed interaction in the forums and the forum chat rooms. We chose to conduct observations in the forums and the chat rooms instead of exporting large numbers of forum threads for later coding, because while many posts are stand-alone communications, they are interactive and best analyzed in the context of other interactions on the forums. Users frequently linked to other posts both at *Sackboy Planet* and elsewhere, and so often interactions occurred simultaneously and across multiple threads. Observations, including quotes or excerpts from dialogue on the website, were recorded in field notes compiled the same day of observation. While excerpts from these notes are included in this paper, they have been modified to protect users' anonymity while maintaining the essence of the excerpt.

Observation in the forums was coupled with interviews of community members throughout the nine-month period. Interview samples were collected through several strategic means. We began by interviewing the creator of *Sackboy Planet*, as well as the publicly identified moderators of the community. With the permission of the site's creator, we posted an open call for interviewees, noting that we sought to speak with players both new and more experienced with the community and with *LBP2*. We ultimately draw from interviews with 24 community members who vary by age, race-ethnicity, gender, and geographic location.

Interview questions were informed by observations in the forum. The questions were used to conduct semistructured interviews, allowing us to probe for emergent themes, as members clarified questions that had emerged from our observations. For example, we added questions to our interviews as we observed participants talking about playing the game in the forums, and we discussed with participants the standards of the community and how they were maintained.

Interview Respondent Characteristics	
Race-Ethnicity	
Asian	1
Black	1
Latino/a	3
White	16
Unknown	3
Gender	
Female	3
Male	21
Age	
13-19	6
20-29	13
30+	2
Unknown	3
Nationality	
United States	21
Philippines	1
Unknown	2
Total N	24

Table 1.
Interview Respondent Characteristics

BACKGROUND: LITTLEBIGPLANET 2

LittleBigPlanet 2 is a puzzle-platformer video game that was released in January 2011 for the Playstation 3. The game quickly gained popularity and garnered a major following in the United States and United Kingdom (Cowan 2011). Central to the design of the game are a number of digital tools that give players the means to create their own levels, animations, character art, and soundtracks. Through use of the tools, players gain technical expertise, get practice in creativity and problem solving, and have numerous opportunities to collaborate and share their creations. This focus on production—the game's tagline is "Play, Create, Share"—is enabled through the game's careful scaffolding: the game fluidly guides players from the play of a traditional side-scrolling game to use of the level editor, teaching players how to use the tools as part of actual gameplay. Players learn how to use the game controller to select and modify objects, place stickers, use power-ups, and most important, to navigate the physics-based world. This scaffolded approach couples play with production, minimizing barriers to the construction of unique levels that can be shared and played by others. One designer described the game as "a creative tool, which just allows you to make whatever you like, really. It's a whole tool kit of materials, of bits of electronics." This framing of the game as a platform for player creativity permeates the game's marketing

materials and is expressed across all levels of the game's design, from the embedded design tools, to community features that enable sharing and feedback, to the structure of actual gameplay. We found that because of the game's strong emphasis on production and creativity, online communities such as *Sackboy Planet* are strongly oriented toward a metagaming practice of production, too, a theme we will revisit later in this case study.

When players first start *LBP2* on their Playstation 3 consoles, they are prompted to begin in Story mode, which represents the main side-scrolling platform game designed by Media Molecule. The Create mode, a deceptively advanced space for player design, is not available at the start of the game—one must earn the right to participate in creating by playing through at least part of Story mode. The benefit of this gated design is that players (1) have a chance to learn basic gameplay mechanics, which they can draw on once they enter Create mode, and (2) they can experience some great level design as they play through levels created by the game's developers. Because the game's developers used the same tools available to players in Story mode to create the game's levels, playing through them serves to expose players to the range of design choices possible and introduces them to novel uses of the game's mechanics. Players therefore build up a repertoire of ideas for design as they play.

An opening cinematic for the LittleBigPlanet 2 Story mode.

In the first few levels, players learn basic gameplay mechanics, such as how to use the controller to move around the main character, Sackboy, and how to pick up and place objects. A nonplayer character (NPC) named Larry Da Vinci follows players around, providing tips and suggestions, including what to do with the items they collect. Collectible items include costumes that can be used to dress Sackboy; others include power-ups and other materials that players can use to design their own levels later on. Some of the more powerful collectible items include a grappling hook that lets Sackboy grab and swing from objects, grabinator gloves that give players the strength to pick up and throw heavy and dangerous objects, and scuba gear that gives Sackboy an ability to swim underwater without having to seek out oxygen-filled bubbles or come up for air. The most flexible power-up, though, is the creatinator—a helmet worn by Sackboy that can be used to fire projectile-like objects, including those created by other players. This thoughtful integration of designer- and player-created content is one of the qualities that drive player innovation in the metagame—by seeding the game with flexible tools that invite incorporation of player-created content, *LBP2* encourages and supports creative production.

By the end of the first series of levels, players are clued in to the main story arc of *LBP2*: Larry Da Vinci saved you from being sucked into an abyss created by the big baddy of the game, the Negativitron, and you are to join Da Vinci and some other NPCs to defeat this evil entity. This narrative serves to fuel a universe of creative invention, from the design of the game's many background environments to the design of unique levels and characters inhabiting the story world. The sheer amount of creative expression inspired by the narrative serves to model for players ways they might use their own story ideas to drive creative production.

Sackboy (left) and Larry Da Vinci (right).

In the first level, Da Vinci shows players how to use two tools central to production in the game. First, as players are taught how to change their costumes, they are shown how one of the controller buttons opens a small menu just over the head of the Sackboy. This menu, used to change the player's costume with the context of the tutorial, also serves as the key go-to or utility belt for level design options in Create mode. Second, Da Vinci introduces to the player his or her "Pod," or main base. This Pod exists outside of the playable levels in Story mode and serves as the main menu; here the player can access all of the features of the game, including additional playable game levels and, later, Create mode. Story mode and Create mode tutorials gradually ease the player into the basics of the editor, providing a scaffolded entry into the mechanics of level design. And while the examples supported by the tutorials tend to be simple, as we will see in the next section, these tools when used in combination give players a powerful platform to draw on to construct complex levels that rely on object design and advanced logic.

The "Pod," or main base/main menu for the player.

CHRIS (AKA GADGET42)

Chris, also known as Gadget42 on the *Sackboy Planet* forums, is a 10th-grader in high school from the United States with passions for theater, English literature, and gaming. He loves school and spends most of his time with other thespians practicing for upcoming theater productions. Although he describes himself as an average student, he is definitely "more of an English/history person." He does well in science, "but English and talking and stuff is more my personality." When not at school, Chris enjoys playing *LBP2* and hanging out on *Sackboy Planet*. A friend introduced him to the game a couple of years ago, and he was hooked immediately and began experimenting with the level editor. "I liked it right away. I would build little cars … it was fairly simple at first but when I started to try more advanced things it got more difficult." Once he began tackling harder design challenges, he searched the Internet for help and stumbled upon *Sackboy Planet*, where he found tutorials and a kind community. "The people were friendly … we all have something in common, which is *LittleBigPlanet*." He posted questions about design to solicit guidance from more experienced members, and as he honed his skills he began to regularly offer help to those who had questions just like he had had. For Chris, the *Sackboy Planet* community revitalized the potential of the game and magnified his interest in learning how to design levels among supportive peers.

Like other *Sackboy Planet* members we spoke with, Chris finds connections between his own academically oriented interests and the types of design challenges he tackles in the game. In particular, his experience with English literature lends itself to level creation. As an English student, he writes lots of stories that help him brainstorm better level designs. "I learn to develop a story arc, which then I use for *LittleBigPlanet* to create the beginning, the middle, and the end of the story level I'm making. Currently I am writing and making a murder mystery point-and-click adventure game." For Chris, the skills he developed in school as a student of English literature have productive overlap with level design. To create a successful level, he mixes both computer programming with story development to make a murder mystery game.

Sackboy Planet was also a place where Chris made new friends who became fellow gamers and co-collaborators on design creations. After hanging out with other players in the forums and in the chat room he began building closer friendships with people who challenged his design thinking. "It's nice seeing other people's views about the game." As far as his day-to-day activity in the forums, he spends most of his time hanging out with his friends online, talking about shared interests, and helping them with design puzzles. "Most of the time I'm helping out friends. Trying to figure out the [design] logic for *LBP* 2 and story and gameplay and stuff like that." Often, he and his friends will play *LBP2* levels together or co-create new levels:

> On *LBP* 2 we can have four people online in Create mode. We all create the story as we go. Sometimes we write it out before. One of us creates the gameplay and the other does the aesthetics of the level. We all decide if one part isn't good enough to be in it or if it needs a little work.

Chris is a great example of connected learning at work through interest-driven, peer-supported, and academically relevant activities in *LBP2* and on *Sackboy Planet*. His interest in the game, as well as his passion for English literature, overlap in ways that make learning complicated computer programming and game-design skills much more fun. When he or his peers need help, they reach out through email, text or video chat, and assist each other. Sometimes they even design together and do so by generating their own management style agreed upon by the group. They develop roles (i.e., writing, aesthetics, gameplay) and frequently run ideas and creations by each other to ensure high-quality designs.

ANALYSIS: CONNECTED LEARNING AMONG LITTLEBIGPLANET 2 PLAYERS

Connected learning is a model that seeks to integrate learning experiences across the oft-segregated spheres of formal and informal learning environments, harnessing and translating popular peer culture and community-based knowledge for academic relevance. The theory calls on today's interactive and networked media in an effort to create learning experiences that are more effective, better integrated, and broadly accessible for more youth (Ito et al. 2013). It builds on the presence of the kind of participatory culture outlined by Henry Jenkins (2009), Douglas Thomas and John Seely Brown (2011), and others in which young people are supported in becoming producers of knowledge and culture. Connected learning is oriented around three core design principles, which describe qualities of the learning environments in which learners are immersed: They are production-centered, openly networked, and as noted in some of the examples above, organized around a shared purpose.
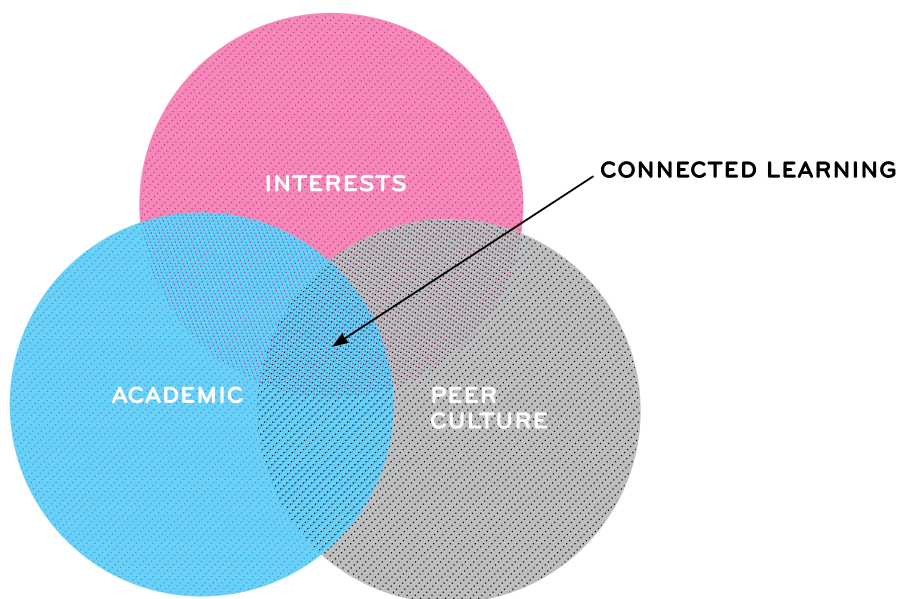

INTERESTS

CONNECTED LEARNING

ACADEMIC

PEER CULTURE

Figure 1
Connecting the Spheres of Learning, from Ito et al. 2013

LBP2's game design and its player community provide a holistic account of connected learning at work. MM's design principles emphasize the importance of bridging interest-driven activities with peer interaction and academic skills and experiences. The youth who inhabit *Sackboy Planet* are able to simultaneously hang out with peers and geek out over acquiring technical skills required to design game levels. Through a tethered experience between *LBP2* gameplay and interaction with peers online, youth engage in a learning process that is socially embedded, interest-driven, and oriented toward the educational affordances tied to game design (including math, logic, and physics). Play of *LBP2* and participation in *Sackboy Planet* showcase the way in which typical metagaming activities, including the production of player-created content, the trading of tips and tricks among players in forums outside of the game, and the expansion of the game narrative through player-created stories, achieve the connected learning goal of bridging interests, peer networks, and academically oriented design

goals. Interviews with the game's developers revealed an intentional goal to create a community for creativity, in which production tools with low barriers to entry were paired with community features that supported openly networked sharing practices among players. As Spaff, *LBP2*'s community manager notes:

> The "Share" vision for *LittleBigPlanet* 2 is really kind of what holds the other elements together. … You can create your own levels, your own games, and then people can play them, but they can't play them if you can't share them. So the community really is filled with people who are spending hours and hours and hours building their own levels, their own games, then they publish them onto the Internet. … We have just over six million levels and games up there now … other people can find those levels and play them, rate them, be inspired by them, create their own things.

In both conception and practice, players of *LBP2* actively contribute content and expertise to the online *LBP* communities of which they are part, building skills and then helping others learn in turn, in the interest of creating high-quality work. In the following section we document the properties and supports of one such community— *Sackboy Planet*—including its social, technical, and cultural metagaming features, which serve to enable connected learning.

INTEREST-POWERED

Patterns of interaction within networks, when seen from a learner's perspective, matter most when they center on an area of interest. Research has shown that having a passion for a topic or activity has a strong correlation with higher learning outcomes (Halpern 2002). It makes sense that when an individual or group becomes interested in something, be it a subject area, a hobby, or person, that engagement translates into a motivation to learn. Often it does not even feel like learning, so powerful is the interest. Our fieldwork on *Sackboy Planet* indicated that participation in the online community, as well as related activities on the forums and in the game itself, are highly interest-powered. Interviews with community members revealed that people engage with the website as part of an interest-driven enterprise and that it is entirely voluntary. One member, Ninjadude (18 years old, United States), explained that he participated because he met someone from another forum:

> I was on another online community first. I was trying to get in tune with that community but found them a little hostile. I happened to talk with someone I really liked posting blogs on *Sackboy Planet*, and I got over here and joined the community. I really like it because it seemed like there was a lot more friendly people.

Ninjadude joined *Sackboy Planet* because it was a friendly place. Another user, PonyPal (19 years old, United States), joined because he liked developing game designs among a community of peers:

I enjoy building things and seeing things come through, and the kinds of levels I ended up making seemed to be different from what other people were making at the time. The few people who would experience them seemed to get a lot out of it. I guess that's why I kept going with it initially.

Like PonyPal, some members joined because they sought a community centered on production and sharing. Others, like Ninjadude, joined for a friendly environment of peers. These two users' experiences were typical of the players with whom we spoke. Some found the website after searching for forums related to the video game and registered because they wanted to learn how to play the game better. Other members found the website after playing levels in the video game that noted they were created by a member of *Sackboy Planet*. But almost all players describe joining the community as an experience that revitalized the potential of the game ("It opened my eyes to what the game could be like!"), providing access to other members' tutorials and to opportunities for feedback from other users on their level design skills. *Sackboy Planet* provides its members a context to pursue their interest in the game.

PEER-SUPPORTED

Connected learning depends on an inclusive social environment where youth can contribute, share, and provide feedback among a network of peers. *LBP2* presents invitations for players to participate in peer-supported learning contexts. Communities of players provide invitations in the form of community activities and events centered on a shared purpose. These provocations often provide entry pathways for members who are new to the game, and they facilitate numerous opportunities for players to seek out information, share their work, and receive feedback.

Upon registering an account at *Sackboy Planet*, players are directed to the "Introductions" page on the website forum. This page provides the first set of invitations for players to participate in the peer-driven affordances of the community. An announcement at the top of the forum thread advises new members on their first steps: "Welcome to *Sackboy Planet*! Tell us who you are and why you love the game!" Users are prompted to create and share an introductory post telling a little bit about themselves, why they like *LBP2*, and what they plan to do in the forum and with the game. One or more members of the community respond to every introduction post, usually within a day of posting. Most of the responses begin with eager messages, such as "Hi there!" or "Welcome to *Sackboy Planet*!" However, responders also provide detailed feedback and suggestions based on the information provided by the new member. For example, new members often share that they are eager to learn how to improve their level design skills. Responses to these kinds of posts typically include tailored suggestions:

Hello and welcome to *Sackboy Planet*! This is the perfect place to you. To help you get started, I'll provide some links just for you. You might want to check out the Level Arena where you can share ideas you have for new levels to create. You

can also ask others for help on your ideas and can receive advice about design.

Players join *Sackboy Planet* for a variety of reasons, and many community members actively assist in guiding new members to the resources that might best suit their interests, including specific directions and links to resources provided by other community members on how to improve those skills. Resources and relevant activities shared by the *Sackboy Planet* community include user-generated *tutorials, feedback-to-feedback* forums, and *contests*.

Tutorials created by *Sackboy Planet* members take several forms, but their primary purpose is to provide step-by-step instructions for improving players' skills as *LBP2* level designers. For example, Sensei created a series of video-based design tutorials that gained notoriety in the community because they provide clear instructions for solving complex design problems. One tutorial shows viewers how to use *LBP2* tools to incorporate probability into their designs. Sensei explains how to create a realistic flicker effect for a broken lightbulb. With the game's design tools, he creates randomizers that determine whether or not the light flickers, and he binds a flicker sound to the flickering to create the final overall effect. Tutorials, such as this probability demonstration, are peer-created resources players can draw from the community at any stage in the level design process.

While tutorials are typically created by more advanced designers in the community, they are live documents that are updated by other members within the post as people test the tutorials in their own projects. Although many of the comments left by other users on the probability tutorial page are supportive or appreciative ("This is great!"), some of them offer follow-up critiques or questions. Several users noted an error on Sensei's discussion of ratios and probability. Some liked the background images or materials incorporated into the video, and others figured out where to find the material and provided the information. While Sensei created the video to provide a very specific lesson about probability and design in *LBP2*, users engaged with the document through the comment thread in ways that broadened and clarified the knowledge shared about the game and the design process.

Another resource provided by community members at *Sackboy Planet* is the feedback-to-feedback forums. In these forums, users post questions they have about any part of the level design process. A member named Raybeam posted this question about gravity: "Does anyone have any suggestions about how to create a moving elevator that keeps the feet of the character firmly on the ground? Whenever my elevator stops at the top it launches my character off to the roof because of the gravity." Raybeam's question is one about game physics; he wants to create a realistic elevator in his game, but to do so required knowledge of the design mechanics that manipulate gravity. His question received eight responses. "Have you tried using a material that sticks the character to the elevator?" "What about setting air resistance to 100% on the elevator so the character stays put?" After some back-and-forth, Raybeam shares the link to his level so readers can test it and offer more

detailed suggestions. The last response to his post offers the most conclusive suggestion: Create a sensor on the elevator with a timer tied to the strength of gravity so that the character moves slightly but not so much that it launches off the elevator. Raybeam's post, like others in the feedback-to-feedback section of the forums, allows members to draw on knowledge from the community to improve their games and their own skill sets. Sometimes, users post questions that are already answered by tutorials provided elsewhere on the website. Others will often respond to these posts with links to the existing tutorials. In this way, community members assist not only by applying their own knowledge about the game but also their knowledge about available community resources.

Learning how to create with a mind to gravity is a key aspect of level design.

When asked about why users participate in *feedback-to-feedback* forums, community members said that not only was it fun to help other people and share their own expertise but they also considered it an investment in a peer-supported community: "I help out whenever I can. When I need help people help me so it's kind of nice to do the same." This is the sentiment shared by Christophe, the level designer from Media Molecule who talked about sharing as a kind of gift. Many players also believed that helping was simply part of the ethos of their community, and they did it to make the community a better place. Feedback-to-feedback forums are not only functional resources to aid the level design process, but they also reproduce a sense of shared purpose within the culture of the community.

Community members at *Sackboy Planet* provide peer support to other members through the creation of tutorials and feedback-to-feedback forums, imparting ongoing assistance to players looking to improve their skills as designers. Through their work in providing these resources, community members cultivate a shared purpose around mutual assistance, encouragement, and recognition of high-quality work.

ACADEMICALLY ORIENTED

Connected learning bridges interest-driven activities with academically relevant goals, civic engagement, and career opportunities. In particular, this model of learning argues that youth realize their maximum potential when they can actively connect their interests, such as video games and level design, with academically meaningful outcomes. *LBP2*'s game design, with its emphasis on creativity and logic-based problem solving, and *Sackboy Planet*, populated by a community of expert learners, facilitate academically oriented engagement across a wide variety of skill sets, including computer programming, mathematics, physics, logic, art, music, and story development, as well as management and team-building skills. Sensei, professionally a math teacher, explains that the level designer encourages the development of skill sets that are valuable for academic and career work:

> It's critical thinking. You have these rules in the *LittleBigPlanet* universe and you work within the construct of those rules to try to reach a main goal. It's exciting that there are so many young people that are trying to be successful with this game and this editor. And they are learning things that will help them with problem solving and critical thinking when they go on to take math or programming or anything.

In particular, two player-driven level design projects—*Craft Galaxy* and Team Apple—are exemplary illustrations of how these skills are developed in the game and through the community.

Craft Galaxy is a game in development that a user called Sackdude is creating in *LBP2*. In his description of the game, and via updates he shares in the form of image and video posts from gameplay, Sackdude illustrates how he refined many academically relevant skill sets to produce his game: "I'll keep everyone updated in a central place, and maybe it will encourage me to work harder on the game!" First, Sackdude created the aesthetic of the game through the development of objects, landscapes, and music that fulfilled the theme of his project. For his side-scrolling platformer, reminiscent of an old Atari game from the 1980s called *Galaxy Invaders*, he created intricate spaceships that the user can control, crafted enemies and objects that interfere with the spaceship's path, and developed scenery that the spaceship courses through on its missions. To construct these objects, Sackdude used the level editor's creation tools. These tools require the manipulation of shapes, various materials that have different textures, and color palettes. As noted earlier, these tools are the same tools that the game's developers had to learn and then use in the creation of all levels within Story mode—the skills Sackdude developed as he mastered the tools mirror the skills needed by the game's expert designers.

Many of the objects Sackdude designed for his game are animated. For example, an enemy design must have an animation for when it attacks the player or when the player attacks or destroys the enemy. Sackdude also used music software to create six original songs for the game. Some are designed to be background music, and are only about a minute or two long, but they are looped through the game to enable continuous

play using the same soundtrack. Other songs were designed for boss battles—or final challenges to the level—and are dramatic and evoke the intensity of the battle.

In addition to the game's aesthetic elements, Sackdude uses in-depth knowledge of logic, physics, and mathematics to construct a playable level. A basic tenet of *Craft Galaxy* is that the user controls a spaceship capable of using weapons to destroy enemies as it navigates through different environments. Sackdude created the weapons and weapon effects through the level editor (see screen shot of the *LBP2* level editor, below). Some of these weapons include laser beams that explode in a bright light upon contact with an enemy or object.

Next, Sackdude assigned different objects to certain kinds of activity. For example, the player can press a particular button to shoot a laser beam, and upon contact it destroys an object. This requires knowing how to map actions onto particular objects, as well as knowledge of physics, such as how objects behave in collisions. Through programming and use of the game-design tools, Sackdude determines exactly how the ship moves through space, at what speed, and in what direction objects fly when they are attacked. One feature of the game is that the level of difficulty increases as the user progresses in the game and accumulates enhancements to the weapon system. Player-designers can manipulate difficulty settings in the level editor to choreograph this change. In one update, Sackdude described his design philosophy, discussing replayability and his built-in difficulty settings: "I take game replay value very seriously. I like playing games that continue to give me a challenge … this game's replayability comes from its difficulty settings and a player's intent to beat their high score." To program this feature, Sackdude must use logic within the game programming, or a set of commands that the game recognizes when the player adjusts the difficulty and that results in changes to the dynamic of the game itself. The higher the setting, the more difficult it is to defeat the enemies. The production of *Craft Galaxy*, like most levels designed using the *LittleBigPlanet* 2 level editor, requires not one but many academically relevant skills—including computer programming, math, physics, and art—to be completed successfully.

As illustrated in the case of *Craft Galaxy*, one could spend much time learning just one of the many facets of design, including art or programming. Fortunately, both the design of *LBP2* and its player community take advantage of group-based design to produce high-quality products. The following example of Team Apple, a group of players and level designers in the *Sackboy Planet* community who build projects together, illustrates how *LBP2* promotes academically relevant skills in team leadership, management, and project planning.

Team Apple creates posts in an area of the forum designated for sharing project ideas to actively recruit new players who specialize in a particular component of game design. Specialties are organized into four broad categories: creators, brainstormers, artists, and sound specialists. Creators include designers who use logic or math to create events in the game and produce the layout of the game levels, or assign actions to particular objects. Brainstormers generate story ideas, scenarios for particular events in the game, or ideas for different stages of the gameplay. Artists decorate the levels once they have been constructed, using drawing tools, stickers, and other materials within the level

editor to provide an aesthetic finish to the game. And sound specialists create ambience, including music and sound effects. To draw all the skills together effectively, team leaders developed a plan to coordinate team efforts:

1. All team members come up with a game concept for us to think about and settle on.
2. The creators and brainstormers map out the game in a flowchart showing how it will work.
3. The artists come up with an overall theme.
4. The game is then developed by creators.
5. The sound specialists then develop the music and sound effects after playing the game.
6. The creator then adds final details, monsters, logic, etc.
7. The brainstormer and artist then finalize the piece.

By breaking up game-design projects into chunks assigned to specialized teams and in creating plans for design, Team Apple members are innovatively employing team-management skills to create levels. Through combined skill sets and proper organization, the team is able to tackle much more ambitious game-design projects. This structure mirrors the methodology of professional game-development teams, which employ similar, skill-segregated roles.

Not all team-based projects, however, are successful. Many *Sackboy Planet* community members we interviewed shared that without strong leaders and project planning, team-based projects self-destruct. In one example, Jellybean (23 years old, United States) said that a level design project without effective leadership and teamwork results in designers' interfering with each other's designs: "It's kind of rough because the person you're going to work with, you have to really respect what they want to do too and their art style, because if you think your stuff's better you're constantly not going to want to use their stuff." The game's level editor allows multiple designers to enter the same project at the same time, and both can be adding elements to the game that may interfere with others unless both designers are strategic. To avoid such interference, Team Apple's leadership uses the four designer categories to differentiate not only the designers' skills but also the types of work that they can do. Each contributor works with others in the same design category, and then leaders from each of the categories work together to coordinate the overall project. In a way, Team Apple functions much like a small organization or business, with different departments that work together to meet a particular objective or goal.

Both the *Craft Galaxy* project and the work by Team Apple illustrate how multiple academically relevant skill sets, including computer programming, math, logic, art, and music, are employed in and around *LBP2* through level design. While these skills can be refined by players in isolation, often multiple skill sets are required to effectively produce a game through the level editor and make it accessible to the game community on *Sackboy Planet*. Additionally, players can cooperate with others to attempt more ambitious game-design projects that require effective team-management and planning skills for successful completion.

PRODUCTION-CENTERED

Production and learning by doing is a key element of connected learning. Learning is experiential and part of the pursuit of meaningful activities and projects (Ito et al. 2013). The tools in *LBP2* provide a number of opportunities for youth to engage in creative production of new levels, including stand-alone games and movies. Our fieldwork at Media Molecule and on *Sackboy Planet* showed that production is central to the life of their respective communities—level designs are the cornerstone of everyday activity at Media Molecule and on the website. *Sackboy Planet* members express their passion for the game by sharing individually produced or coauthored levels, launching contests around particular design challenges, and providing feedback on others' game designs. The game's developers similarly bring their vision of a creativity tool to life by designing experiences and tools to be used by players to express their own creativity. In both cases, *LBP2's level editor* is a key link between gameplay, design, and community activities. *Create* is the linchpin in MM's Play, Create, Share equation.

The level editor in *LBP2* is a sophisticated design engine that includes a number of tutorials that players can use to improve their production skills. In the level editor, the movement of the Sackboy character is much different from that in Story mode: Sackboy seems to ignore physics and can float around the screen at will to place objects wherever the player wants on the canvas. Sackboy is not only the avatar who plays levels in the game, but he is also a tool to be used to produce levels.

Screen shot of the LBP2 level editor.

Two of the level editor's tutorials provide strong examples of how players develop production skills through design tools in the game: placing and editing objects, and logic. The tutorial on placing and editing objects introduces the player to the "Popit Cursor," a tool that allows the player to "manipulate time and space." Sackboy carries the cursor, which lets the player point and aim a lasso at an object in the editing room. In this tutorial, the object is a wooden stick figure. In the background of the tutorial is a smaller television screen that shows a video of yet another Sackboy moving a stick figure around. This video allows the players to mimic what the narrator describes—moving their cursor over to the stick figure to select it, and then moving the stick figure around the screen as it remains tethered to their Sackboy—making it easy for them to understand what they are supposed to do next as they learn the features of object movement and editing. At the conclusion of the tutorial, players know the basics of manipulating objects on the canvas.
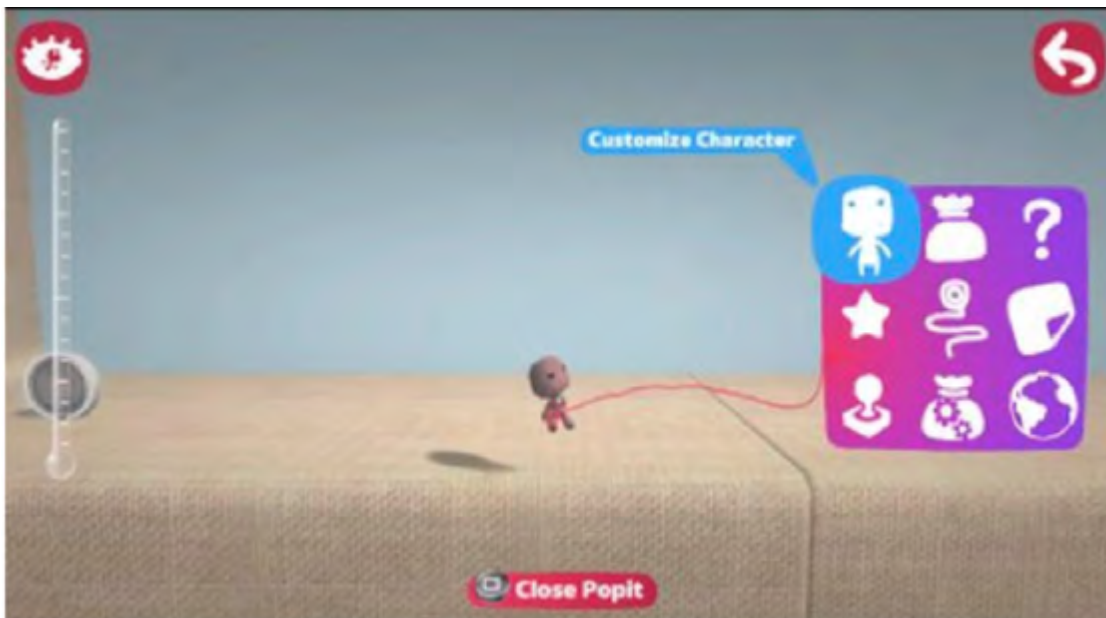
Sackboy character in design mode using his "Popit Cursor."

Another series of tutorials show how to incorporate logic into game design. The tutorial introduces the designer to a series of logic commands in the menu that tell the game to do different things under certain conditions. The tutorial opens with a cow named Elderflower and an alien spaceship hovering ominously above her. A video in the background shows the designer how to use different logic tools to instruct the level on how to abduct the cow. One logic tool allows the player to connect a switch to the cow, and then the cow to a pulley on the alien ship. After this logic is assigned to the switch and the spaceship, pulling the switch results in the spaceship's lifting the cow. ("Sorry, Elderflower. Resistance is futile!") Another logic tool shows how the designer can swap the inputs and outputs for the same assigned objects. Instead of pulling the switch to lift the cow, the switch can now be used to save the cow—pulling the switch lowers her back to the ground.

Members of Sackboy Planet describe a number of products that they create through the level design editor. Most enjoy creating new games: side-scrolling games, role-playing games, and arcade games. Many game creators challenge themselves to re-create or reimagine older games, such as *The Legend of Zelda* or *Tetris*. Others prefer to create miniature movies, sometimes referred to as machinima, that can include music videos and actual movie-length films. Within these genres, players sometimes focus on particular skill sets that they develop as they learn how to use the editor. One player we interviewed became very skilled at logic ("I love all the different things you can do with it!") and so would create levels that used advanced features of the level editor, including probability and physics. Others took a liking to the music editor and would create music and sounds in the game that they then shared with other players ("There are many different instruments you can play with."). And yet others enjoyed creating levels that show only particular kinds of events or actions, such as creating fireworks or explosions, designed to wow players when they experience their levels.

One of the more interesting design principles to surface from our interviews with *LBP2*'s development team about the approach it took to supporting player learning in the game centers on the idea of "minding the gap." This refers to the practice of leaving open a space of creativity and production for players by not spending resources on comprehensive tutorials. One engineer remarked:

> We found that if we didn't do the players would. At first it was the product of simply running out of time—the game had to ship. But we quickly realized that players would do a much better job of teaching each other how to play than we ever could.

Thus, Media Molecule took the stance that tutorials are not where the "real" work of learning should occur. Rather, learning should happen by doing, in the creation of levels. Further, by leaving some ambiguity in how tools are "supposed" to be used, MM leaves open a space for players to discover new ways of making the tools do interesting things. Thus, we can view the design ethos of the in-game tutorials, which provide only the briefest of technical introductions, along connected learning lines.

Despite its cartoonlike appearance, the level editor in *LBP2* is an advanced application that enables users of a variety of skill levels to find challenges in level creation and design. MM's Story mode and Create mode tutorials gradually ease the player into the basics of the editor, providing a low barrier for entry into level design, and just enough information to inspire exploration. And while the practices of production enabled by the level editor run the gamut from simple to radically complex, the learning taking place is in all cases significant and shared.

OPENLY NETWORKED

A key design principle of connected learning environments centers on the idea that "everyone participates." This means that participants are provided with multiple

learning contexts for engaging in connected learning—contexts in which they receive immediate feedback on progress, have access to tools for planning and reflection, and are given opportunities for mastery of specialist language and practices (Ito et al. 2013). One of the key mechanisms that makes this possible, both in games such as *LBP2* and in online communities such as *Sackboy Planet*, is sharing. Conversations with *LBP2*'s developers surfaced an emphasis on *design for sharing*, a dimension of connected learning that emphasizes openly networked learning.

This principle suggests that students' learning activities are best situated across different publics, including intergenerational audiences, consumers, and producers of the game. A learning environment that emphasizes openly networked design enables connected learners to make learning resources accessible and transparent to all members. Media Molecule developers create new aspects of *LittleBigPlanet* and new levels with the intent to inspire further creative production among fellow workers and the players. Alex Evans, the technical lead at Media Molecule, explains the design-for-sharing principle:

> When we started Media Molecule it was really, really key to us that we kept the company small and we didn't really have a rationale for that. It was a gut feeling … when you work together and when you inspire each other, it just doesn't scale. But it's actually even more true in terms of creative inspiration. You want to have a small group of people around you, and be constantly aware of what they are doing and what they're into … that way the amount of cross-fertilization is through the roof. … But I love the fact that we still inspire each other every day. … If someone has an idea, I'm probably going to see it within 10 minutes.

Sharing opportunities are realized in *LittleBigPlanet* 2 through its completeness as a metagaming platform: a creative tool that is not only a publishing tool, but also an inspirational tool. The opportunities are further extended by features that allow players to see another individual's or group's work, comment on it, contribute to it, or even use it as a starting point for one's own idea, creating opportunities for multiple forms of creative expression. This breadth of opportunity for participation was driven by the developers' seeking to answer the question, "What does it mean to be creative?" To draw people in, *LittleBigPlanet* 2 was designed to be "charming and disarming." Critically, it couples that aesthetic with a developer bias against hiding work in private folders and only sharing polished creations. Instead, the craftlike aesthetic and easy ability to create levels encourages players to publish and share ideas, even as half-complete thoughts or experiments. Sharing even partially complete work can be valuable as inspiration for others and creates learning opportunities.

This ethos is mirrored at Media Molecule, where employees strive to share still-nascent ideas to build team support around the ideas and enable cross-fertilization. The design-for-sharing principle also maps out on the player communities. Evans reflects again on the principle in action:

As we watched the reaction of all the kids playing the game, we realized that it was that cycle of showing something off that really motivated and allowed people who didn't consider themselves creative to totally get motivated and make stuff. And I love that idea. As a kid, I had never reached an audience. I could make my LEGO model and I could never show it to anyone.

Media Molecule employees and *LBP2* players alike design with the spirit of sharing in mind; the design-for-sharing principle enables people to design and share partially complete work for feedback and encouragement. Design-for-sharing allows the designers to receive helpful feedback about their own work, and it also allows those giving feedback to provide insight into the development process.

Further, we can look to specific design features of the game that directly push players together, either to play together or to encounter each other's creative work and provide feedback. For example, the game supports collaboration by requiring that there be multiple players to earn all the items in some levels, and by prompts at the start of each level encouraging players to play together. Such design features often lead to friendships as players collaborate, and they create random opportunities to learn about another player's designs. Additionally, to assure a tight feedback loop between player production and feedback, the designers decided to make giving a thumbs-up the primary mechanism for feedback, a feature pushed to the player immediately at the end of each level. The game's original design included a thumbs-down, but the developers thought it went against the culture of friendliness they were trying to engender. As community manager Spaff noted:

Once you put something up on there and then if someone just rates it boo, they don't like it, it's really, it doesn't encourage creativity and sharing. It just makes you feel personally hurt that someone played your 100-hour creation and didn't like it. So we figured that no feedback is as good as negative feedback.

Favoriting and commenting are also supported but are less prominent.

A key feature of *LBP2*'s design that reflects the design-for-sharing principle is how it creates invitations for players of the game to participate in other game publics. In this way, the design of the game facilitates engagement in an openly networked context for learning. For *LBP2*, the best example of an openly networked design is *LBP*.me. *LBP*.me is essentially an online database of game information created by the game designers that connects gameplay or level designs in *LBP2* on the game console with online publics, such as *Sackboy Planet*. Through *LBP*.me, players can use designs they created in the game and share them in other contexts and for different purposes, such as to solicit feedback or participate in contests on *Sackboy Planet*.

As discussed previously, while players are prompted to begin in Story mode when they first start to play *LBP2*, they are soon guided by the game to create their first levels. After saving their first levels, the players return to the main menu and find that the levels they just created now exist in a small region of each player's own world map.

Within the level editor, they are also able to publish their level through *LBP*.me. The game prompts players to answer a few questions about the level before they publish it through *LBP*.me:

- What is it titled?
- Do they want an icon or small picture to be associated with their level?
- What are the game's major features or characteristics?
- Is it single player or multiplayer?
- Short, long, challenging, or easy?
- Is it a cinematic movie, or is it a side-scroller or a puzzler?

After the player answers the questions, these details are added to an entry on the *LBP*.me database and then transmitted online. Other players may now find the players' published levels by accessing *LBP*.me within the game or by accessing the *LBP*.me website from a computer. After creating and publishing their levels through *LBP*.me, the players' work becomes *networked* and is accessible through other contexts connected to *LBP*.me. *Sackboy Planet* is one such context whose community members actively use *LBP*.me to find players' levels and engage in peer-supported and academically relevant activities.

The LBP.me interface includes multiple ways to search for published levels.

The experience described above is typical of most players who play *LBP2* and are part of the *Sackboy Planet* community, though many reflect on more nuanced ways in which they take advantage of the openly networked link that *LBP*.me provides between activity in the console game and online activities. One player, QueenBee (19 years old,

United States), created her level in the game and then logged in to *Sackboy Planet* to share her level for feedback from other players. She visited *LBP*.me on the web to find the link for her recently created level, and then she created a post in the *Sackboy Planet* community where she asked for others to play the level and let her know how to improve it. Many players who saw her message on *Sackboy Planet* then used the link to find the game on their own game consoles, played the game, and responded to her on *Sackboy Planet* with feedback. *LBP*.me also allows players to keep track of other kinds of data used by designers and players. Every time someone finds and plays the game through *LBP*.me, it keeps a record, called "plays." Players have other options to evaluate levels shared on *LBP*.me—they can "heart" it, or tell *LBP*.me that it is a favorite level, and they can also leave comments on the level where it is shared on the database: "I got all sorts of comments like, 'Great game. That was awesome.'… It was kind of cool." QueenBee said that it was exciting to see how her published level showed progressive increases in the numbers of plays, hearts, and comments after she advertised her level on *Sackboy Planet*. "People are still leaving comments and playing." *LBP*.me enables players to interact fluidly between *LBP2* and online communities such as *Sackboy Planet*.

Media Molecule's strategic development of *LBP2* and *LBP*.me reflect openly networked design principles that facilitate sharing and feedback. Players do not build in isolation; rather, they design levels in participatory ways through fluid interaction between the game, the *LBP*.me platform, and the online communities where they share, receive feedback, and grow as designers.

SHARED PURPOSE

Connected learners depend on a strong shared purpose among the learning community. Through shared purpose, communities provide opportunities for intergenerational and cross-cultural communication centered on learning activities. Additionally, a shared purpose can tie together interest-driven, academically oriented activities of peer communities and can enable skill building and creative production. In this section, we discuss two important features of *Sackboy Planet* that create a shared purpose: community contests, and community moderation.

CONTESTS

Contests, a part of *LBP2*'s community structure since its inception, are a major community ritual on *Sackboy Planet*, providing opportunities for feedback on users' creations and a chance for the spotlight and rewards from the community for high-quality work. Geno (17 years old, United States), a *Sackboy Planet* member, described the Level Spotlight contests:

> On *Sackboy Planet* we have this thing called the Level Spotlight and it's like a collection of levels that are recognized for being really well made. There is a Spotlight team that goes through and plays each level that is submitted and every Sunday they post a list and write their thoughts about what they liked

about the level. Anyone can be part of it as long as they post their level in the part of the forum designated for submitting levels, and it's a good way for people to get their work noticed or to show off their creations.

Geno submitted several levels to the Level Spotlight, and one was finally selected. The experience was exciting:

> I've submitted my levels and I had one of them spotlighted. It was really cool because a lot of people were drawn to it and they expressed how much they liked my level. I was like, "This is cool. People like what I make."

For Geno, contests provide an opportunity for feedback and validation for creating good work.

As soon as contests are announced, *Sackboy Planet* members typically generate hundreds and sometimes more than a thousand responses. The most popular contests, such as the Level Spotlight contests, provide opportunities for members to submit original level designs created through the game's level editor. Contest judges select a theme that must be used in the submissions, such as re-creating an old video game or developing a unique movie production using the game's design tools. After users submit their levels on the forum, peers often provide support through comments such as "Great job!" or "Try to improve this part of the level." For some contests, contestants are allowed to revise their levels as they receive community feedback before judges ultimately evaluate them and announce a winner. Rewards for winning also vary and have included badges and even small gift cards. However, a primary motivation behind the contests is the opportunity to share creations with an engaged community that supports players' hard work at improving their craft.

COMMUNITY MODERATION

A challenge for any community is to define and maintain its central purpose among group members. On *Sackboy Planet*, new members are automatically sent messages generated by the forum system that direct them to guiding principles of the community. The welcome message includes discussion of proper behavior. First, it states that some players are appointed as moderators, or officials who lurk in the forums and watch out for misconduct. Second, the message notes that there is a formal reputation and infraction system within the design of the web community:

> Any time you break a rule, you will get a private message (called an "infraction"). … Once you reach a predefined number of points, the system (read: not a human being) will automatically ban you for a predefined number of days. … Overall, this system will be much more standard and automated, so you can keep track of how close you are to a ban.

This welcome message, which includes information about rules and regulations, is part of the community leadership's efforts to cultivate a shared purpose through

the development of ideals of interaction among members. When players drift from those ideals the moderators penalize them. On *Sackboy Planet*, social regulation takes a number of forms and includes both penalties to other players (such as bans or community removal) as well as badges or rewards for good behavior. All of these mechanisms revolve around a *reputation system* in the community that maintains a shared purpose.

Reputation on *Sackboy Planet* is multifaceted. One dimension of reputation is facilitated through the design affordances of both the web forum and *LBP2* itself. Players and moderators can click a button next to each forum post that either "thanks" players for helpful information they shared or "reports" bad behavior, and each of these ratings is tabulated for individual players and has different consequences or rewards. These evaluation systems also exist within *LBP2*: Players can evaluate others' game creations, including rating another's level as good or bad, and marking it as a "heart," or as their favorite. The game design also tracks how many times a user's level has been played. These data are collected through game-design algorithms that publicize the metrics of a particular user's level on his or her game profile and forum account. *Sackboy Planet* community members sometimes use these metrics to signal a dimension of their reputation.

As stated on the rules and regulation page of *Sackboy Planet*, *formal moderation* by officially designated moderators is a form of mediating misconduct in the forums. However, interviews with moderators reveal that social control in the community is much more complex than this introductory rules and regulations post suggests.

> Moderators just keep order and assist the new people as they come in and make them feel welcome … everyone pretty much polices themselves, helps each other out. … If they are doing something wrong and someone takes offense to it generally the person will let us know. Otherwise we really can't tell unless someone reports it.

Moderators on *Sackboy Planet* view their role as important to the overall health of the community by assigning infractions and serving as greeters to new members. But because there are so many users and so much activity in the forums, they actively rely on members to report bad behavior and maintain community standards. Moderators depend on *community policing* as a form of social control to provide a context of support and help for its members. When nonmoderator community members were asked about community regulation, they confirmed its prevalence and importance. "I've [reported bad behavior] once or twice too. I also report a lot of spam and advertising. So yes all of *Sackboy Planet* try to make it a nice place to be part of." For members, community policing is an important component of maintaining the standards of the community and is understood as a collective responsibility.

Community contests and community moderation are two distinct but important features of *Sackboy Planet* that establish a shared purpose centered on interest-driven, peer-

supported, and academically-oriented production. Contests provide exciting competitions that create opportunities to develop challenging levels that improve design skills while getting more publicity for their work. Community moderation, often in the form of community policing or regulation, maintains standards of the community that create a safe space for learning and design. A strong shared purpose is central to the function of *Sackboy Planet* as a supportive place for leveling up as a budding game designer.

Alex Evans is Media Molecule's technical director, although he started in the company as a graphics programmer. He shifted his position as he got more and more interested in the online side of things:

> We realized that it was that cycle of showing something off that really motivated and allowed people who didn't consider themselves creative to totally get motivated and make stuff. You know, as a kid, I had never reached an audience. I could make my LEGO model and I could never show it to anyone. But now, you know, the generation younger is capable of reaching millions of people through the Web or through games like *LittleBigPlanet*.

Evans's interest in making things started around electronic music. In the 1980s, when he was growing up, synthesizers were still very expensive, so he taught himself how to program so that he could make music. He loved the way that when he switched on his 8-bit home microprocessor, it said, "Ready," as if it wanted him to type programs in. This idea of a piece of software inviting creative participation was one inspiration for the *LittleBigPlanet* series, which Evans describes as "LEGO crossed with YouTube crossed with a platform game." The game intentionally situates making within a social context, so that it is easy to see and learn from others. This ethos of social inspiration permeates the culture of Media Molecule. "You want to have a small group of people around you and be constantly aware of what they are doing and what they are into. That way, the amount of cross-fertilization is just through the roof."

Interest-driven learning within contexts supported by peer-to-peer exchange is one of the key hallmarks of connected learning. As a professional, Evans is able to create and share ideas almost simultaneously with a close cohort of peers and to push ideas out the door for uptake by the larger *LBP2* community. So as he is learning, others are learning, too. When pressed to pinpoint an experience that he had as a young person that best represented to him the ideas of connected learning, he pointed to an internship he did as a 16-year-old at Bullfrog, a game-development studio in England founded by Peter Molyneaux. His job was in the Research and Development Department and he was tasked with making tea.

What was interesting was not the job itself, but the way Bullfrog organized the young graduates and interns into groups of three or four and sent them off to complete tasks in semicompetitive ways. The youngsters were competing with each other and working with each other, and they were doing so in an environment where they could be mentored— where they could ask questions and be inspired by all of the experienced people around them. "In the course of that first summer, I think I learned at such a phenomenal rate from that process of mentoring, from that process of friendly competition with my peers, that, to this day, that summer was the best learning experience I've ever had."

At the end of the summer when he returned to school, he started to see math, a subject he had always liked but found boring in school, in a new light. "I started to think … linear algebra … ok, that is going to let me do 3D graphics." His summer internship not only linked him to a network of peers and mentors, but it also gave him a context to which he could connect a latent passion around math.

When we look at Evans's story we see all the pieces of connected learning at play, albeit not in a single environment, but one distributed over home, work, and school environments. He had peer supports and mentorship, which in combination helped to reframe his interest in math. The work he does today as a developer of games and online communities draws on these early connected learning experiences, which may be one reason *LBP2* is such a rich space for learning how to make and share.

REFLECTIONS

Our *LBP2* case articulates many of the ways that connected learning occurs within metagaming practices. At the same time, it also poses new and challenging questions to the model. These questions center on three major themes: barriers tied to gender, gamification and reputation systems, and the challenges and opportunities presented by a phenomenon termed *attention scarcity*. In this section we elaborate on these three categories, offering challenges and qualifications to successful implementation of connected learning in this environment and potentially others.

BARRIERS TIED TO GENDER

One player who stood out in our data was Abby (21 years old, United States), a well-known *Sackboy Planet* community member and respected level designer. She considers herself quite tech-savvy, much more than most women she knows both in the game and locally. During interviews, she confirmed that she believed that there were few other women who played *LBP2*, let alone participate as level designers on *Sackboy Planet*, but she viewed her minority status as an opportunity rather than a hindrance. Introduced to the game by her older brother, Abby reflected that gamer guys treat women players much differently from how they do other male players, noting that the majority of them think it is really cool when a girl is a gamer. As a result, she receives more attention among gamers: "It's fun to win against a bunch of guys in a game (i.e. *Call of Duty*) because at the beginning, they just think 'Oh she's a girl, she probably isn't a real gamer.'" For Abby, holding a female gamer identity affords an "underdog" effect in a community dominated by male gamers. This effect reveals, however, that the cultural assumption in this context is that the categories of "woman" and "gamer" represent an exception to the norm.

Abby's reflections are important to educators and researchers in the context of the increasingly documented sexism in gaming communities (O'Leary 2012). In fact, much scholarly work during the past decade has focused on documenting how sexism, racism, and homophobia persist in many online communities, including gaming communities (Kafai, Cook, and Fields 2010; Nakamura 2009; Steinkuehler 2006). Several recent studies, (e.g., Kow 2012), however, also reveal the persistence and success of some female gamers such as Abby. Sexism in online communities is an important barrier to examine in the interest of understanding how to make connected learning environments inviting and relevant to all learners.

Contemporary research on technology, gender, and selfhood finds that technologies can become gendered through their cultural appropriation, and that women differ in the ways that they engage with technology. Most pertinent to the case at hand, Royse et al. (2007), in their study of women gamers, find that women adopt three types of gendered selves with regard to gaming. Some women, including Abby, are "power gamers," who play many kinds of games and employ gaming technology in ways that contest and produce different kinds of gendered selves that enable gaming. "Moderate gamers" play games casually as a distraction, and in doing so typically reinscribe gender

divisions. And last, "non-gamers" see games as a waste of time and reproduce a gendered femininity that is opposed to gaming altogether. No research to date has quantitatively examined whether these identities are adopted in different magnitudes and can be used to explain observed gender differences, but it remains a likely possibility.

Consistent with studies of female game adoption (Cassell and Jenkins 1998; Hartmann and Klimmt 2006), other than Abby we did not find many active and/or prominent women gamers on *Sackboy Planet*. However, among the few whom we did identify, we found that they tended to adopt variations of "moderate gamer" and "power gamer" identities, and that these variations informed the kinds of activities that they pursued in the online community and in *LBP2*. One moderate gamer, Julie (29 years old, United States), is an active leader of a game-based competition modeled after the *Survivor* television series; as part of her job, she oversees the organization of the contests that occur in both the game and in the forums, and she handles conflicts between players. She is not interested in other aspects of the game, such as level design, which is widely held by the community to be the most desirable activity. Julie could not pinpoint exactly why she was not interested in level design—she simply was not interested. Mary (26 years old, Philippines), another player, is respected by the community for, and prides herself in, regularly welcoming new members on the Introductions page of the community. Her own avatar wears a dress and has lipstick, which many consider to be female-identifiable clothing. She also favors community management over level design. These two players represent women in the community who are not typical game players, but who rather engage in community- and game-level activities not atypical of women in other settings. Abby, mentioned earlier, was an exception to this moderate gamer type among women on *Sackboy Planet*.

This same pattern of roles was reproduced within Media Molecule, which counts many women among its staff. Rather than holding positions as level designers or engineers, the women who worked on *LBP2* did so in the capacity of producer, artist, and administrator. These women were responsible for much of the behind-the-scenes work of the game, including product management, team coordination and hiring, communications with fans, and so on. Many of these female staff self-identified as gamers—most played games either moderately or frequently. While female game and level designers are still the exception to the rule within the game industry, the number of women working at game-development companies continues to grow, as exemplified by the staff profile of Media Molecule. In interviews we found no evidence of any particular boundaries within the company that kept women from taking on level design or engineering roles—the lack is symptomatic of larger trends generally, where science, technology, engineering, and math fields are continuing to fail to attract large numbers of women.

So while the work culture of Media Molecule may provide a space where female and gamer identities can coincide, our *Sackboy Planet* data reveal that cultural assumptions persist among community members regarding a perceived lack of alignment between the female gender category and gamer identity. These assumptions may persist as part of the identities of the women within the community, but they certainly persist

in the cultural context of the players. A more interesting question to explore may be how online communities vary in the extent to which these supposed competing codes of "woman" and "gamer" are policed; *LBP2* online communities typically have low barriers for entry across a number of skill and status characteristics, and they may be less sexist than other contexts as a result. Identifying characteristics of online communities that maintain low barriers for entry, including the maintenance of a gender-inclusive environment, is an important goal for research on peer-supported learning and engagement. Such an exploration was out of the bounds of this study, but it is a question we will take up in future work.

Demographic characteristics like gender are tied to barriers to entry and participation for players. Interestingly, these barriers emerge from community-driven cultural norms rather than from design-level mechanisms. However, game developers or creators of fan communities such as *Sackboy Planet* could alleviate some of these barriers. Media Molecule, for example, offers a wide array of downloadable game content, including new costumes of Sackboy. Many of these costumes can be used to create versions of Sackboy that run the gamut of gender and age. *Sackboy Planet* organizers could consider running contests across a wide variety of genres that female players inhabit, increasing their odds of achieving visibility within the community.

GAMIFICATION AND REPUTATION SYSTEMS

Sackboy Planet is host to a number of different metrics that represent a kind of gamification of the community experience that are intended to drive interest, persistence, and create a shared set of benchmarks. These metrics include reputation bars that signal experience on the website, hearts for high-quality levels, and likes for comments. However, when asked about the game metrics and the infraction system, community members responded with mixed levels of indifference. Some say they do matter: "If your profile has 2,000 hearts than everybody knows you." Respondents described other metrics as completely unimportant: "I personally never even look at that stuff. … I don't even notice it, basically." They explained that other social status indicators more meaningfully inform reputation and community role models:

> High reputation bars just mean they participate a LOT in the forums. I suppose if someone is a higher level, they'd be less likely to have their posts skimmed. But if it appears to be a "n00b" then their post will most likely be skimmed/ skipped. After a while, you really learn who the big names are on the site. :P

While the stated rules and regulations clearly express that metrics and formal moderation ensure that community members are behaving properly in the forums, moderators rely on community policing to maintain its standards. Community members view community regulation as a responsibility and an important way to maintain the collective good. This last quote, however, suggests that other social status indicators, such as "n00b," more meaningfully inform interaction in the community.

On *Sackboy Planet*, "n00bs," along with other status categories such as "troll" and "idol," are employed by community members to identify behavior or content typical of novice players (n00bs), mean people or bullies (trolls), and revered celebrities (idols). Community members said that these categories are identified through discourse in the forums. One player reflects on behavior typical of n00bs: "If they're like 'ZOMGZ PLAY MY LEVELZ PLZ! YOU WILL LOVE IT! OMG!' All lower case, run on sentences." As a category, n00bs are the least reputable members of the community and represent members who are not yet socialized into the etiquette of the forum. They tend to use all capital or all lowercase lettering, or use run-on sentences. Players do not typically report or attack people who are identified as n00bs; they are simply ignored until they demonstrate proper standards of interaction. Some described n00bs as a useful category to distinguish members who need help and encouraged more seasoned members to follow a "lead by example approach."

Another status category that surfaced in the forums and during interviews was the "troll." On *Sackboy Planet*, the community heavily polices trolls, or people who engage in bad behavior. One respondent described an experience when he was labeled a troll:

> I called [other forum members] noobs and all these people were sort of like in response they were making jokes and making fun of me. … I edited my post to get rid of it. Basically what I'm saying is people won't be mean but they'll be sarcastic or make fun of it and it makes you stop … like this is basically what happens if you're like a troll or being mean on the forums.

For this member, both the n00b and the troll status categories are enacted through discourse. He described his bad behavior, which was interpreted as violating community standards of decency and was heavily policed, as troll-like behavior. In this community, these status categories are primarily used to identify and regulate certain types of interaction deemed to be a detriment to maintaining the shared purpose of the community.

While n00bs and trolls are low-status categories on *Sackboy Planet*, "idols" are members who represent the values of the community. Although the *Sackboy Planet* community now considers Sensei to be a celebrity or idol, he spoke of idolizing another player in his early days as a designer: "When I first started playing there were some levels that I played through the community and I discovered my idol. The levels he made were so awesome and I wanted to know his secret. What was he able to do that I wasn't?" Sensei idolized another player because of the appreciation he had for the player's levels, and it motivated him to learn more about design and set goals for future success. Eventually, Sensei had the opportunity to work on a tutorial project with his idol: "He was creating the visuals while I was doing the logic concepts. We became really good friends." For community members, idols provide motivation to achieve certain skill sets or design a level that others would appreciate.

Sensei's passion for figuring out puzzles with the game design overlapped with his interest in helping others; through time, he became a celebrity for the aid he provided

to the community. During the first couple of years of his work with *LBP2*, he regularly spent time in the forums helping other *Sackboy Planet* members with questions they had about level design. His reputation as a skilled designer grew as he continued to help solve problems for other community members, making him feel he was a valuable member of the community:

> It's rare that I would find a post that I can't figure out. And if I do it generally gets some pretty nice discussion because I've gotten a reputation that if I can't figure it out it's probably a pretty significant problem. So that's kind of nice. I'm a helper by nature.

Sensei's high status among the community grew as he helped others and produced tutorials for other community members. Others' appreciation of his willingness to help motivated him to continue to aid the community.

The reputation system on *Sackboy Planet* and in *LBP2* is complex and multifaceted. Metrics in the forum and in the game are tabulated as players "thank" or "report" others' behavior or content, and these statistics have some effect on what kinds of interactions are appreciated or policed by the community. Community members, in particular, are very active in upholding the standards of the community through community policing of others' interactions in the forums. In addition, community members draw on status categories, such as n00bs, trolls, and idols, to identify good and bad behavior and uphold the ideals of the community. These mechanisms function simultaneously to collectively uphold the ideals and maintain a sense of shared purpose on *Sackboy Planet*.

Community members and forum organizers bear a great deal of responsibility for defining, maintaining, and policing the standards of their community culture. For example, after speaking with various leaders of the *Sackboy Planet* forum, we learned that they adjusted their forum ranking metrics to encourage friendlier interactions. For example, the forum used to allow members to not only "thank" or "like" a user's post or comment but also to "thumbs-down" a comment. They found that allowing people to rank down others' comments provided too much opportunity for trolling or being inconsiderate to others. Separate from making design modifications to the forums, certain players also have stronger pull in defining community norms than others. As described earlier, idols are players who represent the ideals of the community, and once they become idols these users have a significant amount of power to generate attention and push and pull the community in certain directions.

ATTENTION SCARCITY: CHALLENGES AND OPPORTUNITIES

Getting noticed on *Sackboy Planet* is not always easy, especially for new members to the community. Scattered throughout the forums are posts by members asking people to play their levels and provide reviews so that they can earn play counts, hearts, and other metrics that garner increased attention to their creations. This is symptomatic of a phenomenon researchers have termed *attention scarcity* (DiMaggio et al. 2004; Hargittai

2000). Because of the incredibly high volume of content and means through which to interact with others online, *Sackboy Planet* members use game and forum metrics, as well as n00b, troll, and idol categories, to delineate whose creations are worthy of their time. Although many academics assume that attention scarcity is inherently bad because of its capacity to marginalize people, on *Sackboy Planet*, it creates both challenges to participation as well as enables unique opportunities for learning. Attention scarcity can deny some people the ability to share their work and receive feedback, but designers can also be strategic agents as they navigate the *Sackboy Planet* public to garner the exact kind of attention they need for their own growth as budding level designers.

As discussed earlier, the labels n00b, troll, and idol are used strategically through discourse in the forums to delineate who is worthy and unworthy of attention amid frequent waves of new content on the forums. These cultural categories, which are applied by individuals to others in the community, allow users to sort through the high volume of forum posts and available game levels. However, we have documented how these categories allow users to weed out not only inflammatory content, but also creations by people with undesirable status characteristics, including people who are "children," seen as immature, or who do not demonstrate certain proficiencies in English. Community members also attempt to gain attention in ways that break the rules of the formal metric and ranking system. One way that they do this is by requesting "hearts for hearts." A user named Jimbob (26 years old, United States) explains:

> Someone was asking for hearts for hearts and that's not allowed on the site. … *Sackboy Planet* looks down on that because you're not really giving feedback to the creator, it's like you are just promoting your level without really playing it … sometimes they don't really play so it's not really fair, that's why the forum doesn't like it.

Skipping the often slow process of reviewing levels one at a time by requesting hearts from others for hearts in exchange is frowned upon. "Hearts for hearts" is an example of gaming the metrics system in order to overcome attention scarcity on the forums and generate increased plays and ratings to a user's own creation. Attention scarcity can impose barriers to participation by making it harder for members, especially those who are new, to meaningfully engage with others in the community.

While attention scarcity can pose problems by denying people opportunities to participate, it also presents new avenues for members to cultivate the kind of publicity they need for their own work. During our fieldwork in *Sackboy Planet*, we observed community members sharing their designed levels with others for various purposes. Usually, players share their levels-in-progress on the website's forums for feedback from other players, to improve their skills and designs, to promote their own content, and to participate in level design contests that have exciting rewards. Most often, levels were shared in areas of the forum designated for self-promotion. But on occasion players would share their content elsewhere on the website to strategically garner the kind of attention they wanted for their projects.

One such example of this can be seen in a post in the forum created by a community member named Sacklad. His post, which existed in a highly visible section of the forum designated for feedback on level design, was among the most popular posts in the section. The post, however, did not in its entirety meet the rules of this section of the forum. The administrators of the forum leave notes, called sticky posts, that set the terms for what can be shared in this section of the forum. Without these rules, discussion would be too unwieldy and difficult to navigate for people looking for other kinds of content or conversations. The first third of the more than 150 pages of responses to Sacklad's post was devoted to topic-appropriate talk about idea development and designer recruitment for his own project, but after a certain point Sacklad stopped soliciting new ideas and new teammates. Instead, he used the remaining 100 pages of posts to share updates about the game and entice readers to follow the project until its release. Some community members became irritated that the thread drifted from the stated topic and requested that the discussion move to a private group. However, Sacklad thought that keeping it public was important:

> EVERYBODY JOIN THE PRIVATE GROUP!! NEVERMIND BECAUSE THIS THREAD IS STAYING! LOL!!
>
> I said that because I want the rest of *Sackboy Planet* to know that this project is still in development … and by the way, this is the most visited thread on the site. … I want everyone to know ;)

To promote his own content, Sacklad strategically navigated not only the rules of *Sackboy Planet* that restrict certain kinds of off-topic discussion, but also the publics of the online community. In doing so, he developed an approach that functioned similarly to the use of a megaphone in a crowded room: He was able to capitalize on attention conditions to generate an incredible amount of interest in his work while being part of a community saturated by others' projects.

Sometimes players preferred sharing their levels-in-progress in less public environments, and they used different content-sharing mediums, as well as privacy settings, to reach the kind of audiences they were looking for. Instead of posting on the forums, Luchadoro (23 years old, United States) created a blog post in the online community announcing his project and requesting feedback:

> I need a group of testers to play my level, identify bugs or problems with the game, and submit these errors to me. If you are interested I will send you a private message containing a highly secret code needed to access and play the level. Then you can find some friends (three, for the most fun!), play the level a lot and share any problems with me!

Blog posts exist in a separate area of the website, and while most are viewable to the public they are less readily visible than the forums. Luchadoro used privacy settings within the game design itself to require a code or password to view his project. We asked him why he used blogging and passwords instead of simply posting in the
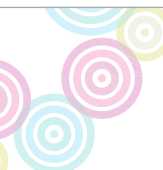
forums: "I wanted to make sure [the level] was bug-proof and that everything worked smoothly. And I also wanted to award players with a preview of the level. I wanted feedback. That was my main goal." The use of blogs and codes allowed him to solicit feedback and avoid sharing a level that had lots of bugs, or problems, in its design. We followed up by asking him if he would have received the same kind of feedback if he posted in the much more public forums. For Luchadoro, the use of blog posts and privacy settings in the game design enabled him to reach his desired audience:

> I would have gotten feedback I think. But for one thing the level could have had a lot of bugs. And for another it's much easier to get feedback if you actually ask people for feedback. It's way more likely to get detailed, very informative feedback. Actually I got a message for two full pages of feedback, so it was worth it. After about six testers I turned everyone down.

By sharing his level-in-progress through blogs, a quasi-public medium on the website, and using game codes, or privacy settings in the game that restrict who sees your project, Luchadoro strategically navigated online publics in *Sackboy Planet* to reach his desired audience. He sought this particular audience because he was not ready to share it with everyone yet—it had bugs and was still in development. While the website does officially designate spaces to share levels for feedback, these message boards reach a very broad public. Luchadoro used blogs and passwords to innovatively negotiate online publics in *Sackboy Planet* to create a context for level development and learning most ideal for him.

These examples stand to show how attention scarcity can actually enable new avenues to share work, solicit feedback, and learn. Not every level is played by everyone and receives feedback and commendation. But sometimes attention scarcity is not simply about the need to reach any audience; rather, it is a challenge to reach the *intended* one amid a larger crowd. In her research, boyd (2014) shows that teens navigate multiple channels of communication online for varied purposes and with different consequences. Similarly, members of *Sackboy Planet* strategically negotiate online publics to share their work with peers, creating the kind of connected learning experience they seek as community participants and budding level designers.

CONCLUSION

This exploration of *LittleBigPlanet* 2 and its companion community, *Sackboy Planet*, enables us to examine metagaming practices among youth online. In particular, we observe connected learning principles at work in an atypical setting for learning. It challenges us to consider how video games and online communities might offer unique opportunities for young people to learn academically relevant skills, including design, math, programming logic, and team management. The developers of *LBP2* specifically sought to create a tool that would serve to inspire creativity and empower players as makers. Many of the design decisions made in the creation of the game supported metagaming practices that in turn supported connected learning. These include an orientation toward designing for sharing, minding the gap, and designing for friendliness.

A direct product of these decisions is the existence of the robust fan community site *Sackboy Planet*. In ways similar to the game, *Sackboy Planet* provides a peer-supported, resource-rich environment for youth to focus their interests in a way that establishes a high ceiling of achievement. Players describe finding the community as an experience that changed their appreciation of the game and maximized their learning potential. Yet despite the potential academic benefits of *Sackboy Planet* participation and design, differences in players' demographic characteristics were sometimes the source of barriers to successful entry. Women and children were either atypical and/or underappreciated members of *Sackboy Planet*, perhaps reflecting broader societal beliefs about these groups and subsequent inequalities. However, youth demonstrated innovative ways to cultivate their own learning environments by managing their own publicity as they participated in the forums. While barriers certainly exist in the community, youth can and do have agency in creating a safe space for themselves to learn and grow as level designers by using the tools available to them.

For educators interested in how games can provide new models for student engagement, the design of the community for *LBP2*, including "official sites" such as *LBP*.me and player-created communities such as *Sackboy Planet*, and their approach to open knowledge might serve as an inspiration. The barrier to entry into the community is incredibly low, it is filled with social supports for learning that come from fellow players, and players can develop interest and build expertise through the design of their own levels. The game not only empowers players to believe that with the right tools creativity knows no bounds, but also to believe that players can only learn from what they have made if their creativity is shared with others. The result is a robust community where players are constantly growing and learning together, which makes *LBP2* a promising vision of connected learning in action.

REFERENCES

Allison, Anne. 2006. *Millennial Monsters: Japanese Toys and the Global Imagination*. Berkeley: University of California Press.

boyd, danah. 2014. *It's Complicated: The Social Lives of Networked Teens*. New Haven: Yale University Press.

Cassell, Justine and Henry Jenkins. *1998. From Barbie to Mortal Kombat: Gender and Computer Games*. Cambridge, MA: MIT Press.

Cowan, Danny. 2011. "Saling the World: *Valkyria Chronicles 3* Tops Japanese Charts." *Gamasutra.com*, January 28. Retrieved January 31, 2014 (http://www.gamasutra.com/view/news/123161/Saling_The_World_Valkyria_ Chronicles_3_Tops_Japanese_Charts.php).

Halpern, Diane F. 2002. "Cognitive Science and the Work of Reform." *New Directions for Higher Education* 2002(119): 41–44. doi: 10.1002/he.68.

Hartmann, Tilo and Christoph Klimmt. 2006. "Gender and Computer Games: Exploring Females' Dislikes." *Journal of Computer-Mediated Communication* 11(4): 910–931.

Ito, Mizuko, Kris Gutiérrez, Sonia Livingstone, Bill Penuel, Jean Rhodes, Katie Salen, Juliet Schor, Julian Sefton-Green, S. Craig Watkins. 2013. *Connected Learning: An Agenda for Research and Design*. Irvine, CA: Digital Media and Learning Research Hub.

Jenkins, Henry. 2009. *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. Cambridge, MA: The MIT Press.

Kafai, Yasmin B., Melissa S. Cook, and Deborah A. Fields. 2010. "'Blacks Deserve Bodies Too!': Design and Discussion about Diversity and Race in a Tween Virtual World." *Games and Culture* 5(1): 43–63.

Kow, Yong Ming. 2012. "A Female StarCraft Player's Entry into the World of Competitive Gaming." *Connected Learning Research Network*. Irvine, CA: Digital Media and Learning Research Hub. Retrieved February 6, 2014 (http://clrn.dmlhub.net/content/a-female-starcraft-players-entry-into-the-world-of-competitive-gaming).

Nakamura, Lisa. 2009. "Don't Hate the Player, Hate the Game: The Racialization of Labor in World of Warcraft." *Critical Studies in Media Communication* 26(2): 128–144.

O'Leary, Amy. 2012. "In Virtual Play, Sex Harassment Is All Too Real." *New York Times*, August 1. Retrieved January 31, 2014 (http://www.nytimes.com/2012/08/02/us/sexual-harassment-in-online-gaming-stirs-anger.html).

Royse, Pam, Joon Lee, Baasanjav Undrahbuyan, Mark Hopson, and Mia Consalvo. 2007. "Women and Games: Technologies of Gendered Self." *New Media & Society* 9(4): 555–576.

Salen, Katie and Eric Zimmerman. 2004. *Rules of Play: Game Design Fundamentals*. Cambridge, MA: The MIT Press.

Steinkuehler, Constance. 2006. "The Mangle of Play." *Games and Culture* 1(3): 199–213.

Thomas, Douglas and John Seely Brown. 2011. *A New Culture of Learning: Cultivating the Imagination for a World of Constant Change*. CreateSpace Independent Publishing Platform.

ACKNOWLEDGMENTS