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**Hive Research Lab Interim Brief
Innovation Practices and Hive NYC
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Networked Innovation Research Strand

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Hive Research Lab Interim Briefs are designed to provide the Hive NYC community with ongoing frameworks, findings and recommendations related to the Lab's two research areas: supporting **youth interest-driven trajectories and pathways**, and developing the Hive as a context for **networked innovation**. The briefs are part of a broader effort to connect current research and emerging findings to issues of practical importance to the community in order to improve network activity. Recommendations are preliminary and based either on existing literature or observations of practice within the network.

I. Introduction

Hive NYC has as its tagline "explore+create+share". It's a sentiment that expresses many of the core principles the community holds in terms of its pedagogy - one in which youth *explore* interests and identities, engage in *creation*, production and expression, and then *share* this work in authentic contexts. But explore/create/share can also be seen as a loose framework for how those in Hive NYC, as educators, designers and activists, engage in the practices of innovation. It is these practices of innovation we focus on in this brief.

In a [previous brief](#) we discussed ways we might understand the dimensions of an innovation, focusing on the "thing" aspect of innovation - the technologies, curricula, program models and more that are produced and the qualities they have. Here, we shift to focus on the processes that that lead to those "things"; what we call the *practices* of innovation. The brief aims to advance the work of Hive members through sharing (1) an articulated and well defined set of innovation practices and (2) early stage findings and reflections on distinctive exploratory innovation practices, those associated with early stages of the innovation process, that we've seen enacted within Hive NYC.

II. Innovation Practices

Innovation practices, as opposed to "innovations", operate on the level of verbs – they're not things, but rather actions, activities, and processes. They make up the evolution or life-cycle of innovations, from brainstorming and iteration to implementation and scaling. Innovation practices are often invisible and taken for granted aspects of organizational and professional cultures, and part of the value in naming them is to bring them to the surface and give language to Hive members so that they might better recognize and call out everyday activities that are central to how Hive NYC works together as a network.

To offer a framework, we'll draw on the work of James March; a scholar of organizational learning who famously offered that the process of innovation can be broken up into two primary sets of activities – the work of exploration, and the work of exploitation (1991). According to March, exploration "… includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery", while exploitation "… includes such things as refinement, choice, production, efficiency, selection, implementation, execution."

Put another way by the scholar Kwaku Atuahene-Gima (2005), **exploration encompasses a set of innovation practices that aim to develop new knowledge** (broadly defined – ideas, technologies, program models, design principles, etc.) within a given context, and supports greater departures from current knowledge that exists in that context. And **exploitation encompasses a set of innovation practices that aim to hone and extend current knowledge**. Exploitation, rather than departing greatly from existing knowledge, hews closely to it in order to further and deepen it. It aims to "make the most" of an area that's already familiar.

So what, more precisely, are the actual activities that might make up these two areas of innovation? We focus below on a set of practices and associated working definitions associated with exploration. Those related to exploitation we touch on more briefly since they're somewhat less the focus of this brief and our research.

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Based on what we've seen in Hive, on what the literature discusses, and general induction, we've identified a set of ten exploratory innovation practices:

- **Discovery** - the act of coming across an innovation or knowledge about an innovation either unintentionally through an encounter (exposure) or intentionally through directed activity (search).

- **Sense-making** – the process of coming to understand the nature of an innovation, information about an innovation, and/or the innovation's potential relationship to a given actor's goal(s) in either a structured (intentional) or organic (unintentional) way.

- **Recontextualization** – the practice of adapting a given innovation to a particular context to better meet the needs and priorities of said context.

- **Reinvention** – the practice of re-conceptualizing a given innovation such that it takes on a substantively distinct new form within a context where it either originated or was adopted.

- **Ideation** – the practice of intentionally generating ideas for potential innovations that might be further developed by a given actor.

- **Prototyping** – the practice of creating early-stage pilots or models of a given innovation for the purposes of gaining information that would further the design.

- **Experimentation** – the practice of engaging in early-stage implementation of a prototype within a variety of possible contexts with the intention of gaining information that would further the design.

- **Evaluation** - the practice of assessing information gained from initial prototyping and experimentation around an innovation in order to further the design.

- **Refinement** – the practice of using information gained through prototyping, experimentation and evaluation processes in order to change central aspects of an innovation's design.

- **Iteration** – the practice of repetitively engaging in cycles of prototyping, experimentation, evaluation and refinement for the purposes of systematically improving an innovation.

Obviously, many of these practices are intertwined or encompass one another. For instance, "iteration" is a sort of meta-practice that subsumes prototyping, experimentation, evaluation and refinement. The processes of "recontextualization" and "reinvention" imply that exposure or search must have occurred, as well as some sort of sense-making. These practices are not linear, but rarely occur in isolation of one another. We also know that Hive members use plenty of other terms to talk about the same practices; terms like "piloting", "curriculum design", "playtesting" and others encompass many of these practices.

On their own, each of these exploratory practices offers a distinct lens into the microdynamics of early-stage innovation. Taken together, they can be seen as encompassing a broader endeavor of departing from existing knowledge.

Exploitation has a very different form, more focused on making the most of existing knowledge. It could include practices such as:

- **Production** – the creation, manufacturing or design of a given innovation at a degree of refinement and scale such that it is ready to be implemented in its intended context(s) of use.

- **Implementation** – the execution and/or release of a given innovation within its context(s) of intended use.

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- **Establishing Efficiencies** – refinement to non-core aspects of an innovation or the processes surrounding the production or implementation of an innovation for the purposes of making its continued production or implementation less resource intensive.
- **Institutionalization** – the development of increased capacity and expertise vis-a-vis a given innovation within an organization or system as well as establishment of norms of acceptability and expectancy of use.

We could possibly leave the story of innovation practices at those two buckets of exploration and exploitation, but as we look at the Hive and consider the networked nature of innovation that occurs here, two other linked practices are important to mention - documentation and circulation:

- **Circulation** – formal or informal sharing of an innovation and/or knowledge relating to an innovation across multiple actors (individuals, organizations, communities). Actors engaged in circulation may or may not be associated with original development of an innovation.
- **Documentation** – the practice of creating artifacts and representations relating to a given innovation to help achieve a variety of functions across the spectrum of innovation practices.

In terms of "networked innovation", these two final practices are central to the ways that innovation is captured, spread, and accumulated throughout Hive NYC, operating as a sort of connective tissue in terms of innovation. They speak to the process of "diffusion of innovations", made famous by innovation scholar Everett Rogers (1962).

In the next section, we'll speak to how we've seen these practices, specifically those related to exploration, play out in the context of Hive NYC organizations.

III. Exploratory Innovation Practices in Hive NYC

As we've dealt with these concepts and engaged in fieldwork within the network, it's become increasingly clear that the real value of the articulation done in Section II is in how it helps us understand the particular ways that organizations string all of these different practices together. If the individual practices are the innovation equivalent of walking, we want to understand and be able to talk about how different Hive organizations dance in their own unique ways by stringing these practices together and adding their own unique spins as they enact them on the ground. In this section, we'll share preliminary data collected on two areas of exploratory innovation: (1) Playtesting and User Testing and (2) Structured Sense-making. While these data should not be seen as representative of all Hive organizations, we feel that the offer an important window into how exploratory innovation actually plays out in context.

a. Playtesting and User-testing

The first area we'll share is one we've seen enacted with some regularity in Hive NYC: playtesting and user-testing, terms we'll use interchangeably in this section. These touch on exploratory innovation practices we shared in Section II such as prototyping, experimentation, evaluation, refinement and iteration. User-testing and playtesting of course have a rich history in the design world, and take many forms. In the activities we've observed in Hive NYC, an organization will often gather a small group in order to have them engage with a

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project under development, be it a game, an app or design tool, in order to get feedback for the purposes of refining the innovation.[1]

The sessions are explicitly planned and designed in a similar way as an educator might structure a workshop with youth. The instances we've observed largely have organizations engaging adults, though we've also seen instances of user-testing with youth as well. And for some of the organizations we observed, it seemed that engaging in user-testing was simply a "go to" practice, a regular part of the organizational culture, though we've seen evidence that the user-testing and play-testing cultures in organizations can have very different roots. In this section we'll describe some of the specific instances of user-testing we've seen, the distinctive ways that organizations use this practice to advance their projects, and how they see this practice.

In our first example, the organization involved has deep roots in the game design community, and was looking to playtest a number of both digital and analog learning games that it was developing for classroom use. A public-facing call was put out on the organization's blog, the Hive NYC minigroup and other organizational communication channels for any educators that were interested in engaging in what they explicitly framed as a playtest around these learning games.

In the session we observed there were multiple games being play-tested, with the group of play-testers, mostly teachers but some informal educators, divided into separate rooms with separate staff running the play-testing of each game in the different rooms. One striking feature of the room we were able to observe was the amount and diversity of documentation that was visibly occurring. Numerous employees of the organization were taking pictures and video in addition to the individual actually running the playtest, Max[2], who was regularly asking questions, observing, and, at the end of the session, had participants fill out a paper form where they gave addition feedback through both "1-5" ratings and open response questions.

While we immediately assumed that all of these forms of documentation would be used later as sources of data that could be evaluated and used to refine the prototypes being tested, Max shared that most of the video and photos being taken were in fact for usage in external facing documentation, and that his own observations of the session would form the basis for iteration of the game. He talked about his role as the playtest facilitator in this way:

> My role facilitating the playtest is mutli-fold - I have to facilitate the game to make sure that people can play it, but I'm also there to observe them, and so my play-testers give me feedback both intentionally and unintentionally. Just by me being there observing them and seeing how they're interacting with the game I'm learning, but also by getting their direct feedback both verbal and written.

Something he said later indicated that he saw being in a play-testing facilitation role as very different from running educational activities, something he also regularly does in his work:

> I saw a few moments where [the playtests] had some confusion with the colors and I had to sort of

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[1] We've also observed play-testing in less structured environments that are not explicitly or solely designed for such purposes, such as Hive Pop-Ups, a phenomenon we'll discuss in a future brief.
[2] All names are pseudonyms.

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bite my tongue, because I know I'm not supposed to intervene; I'm supposed to just learn.

This impulse not to intervene, as an educator might usually in order to help a learner, is important in that it sheds light on the ways that user-testing is seen as emphasizing learning *for the organization*, rather than learning for the participants. This is a distinction that perhaps might seem obvious on reflection, but we can see from Max's statement above that in the moment, these sorts of educator impulses to help do come up and there were moments where he had to hold back from doing so and "bite his tongue".

Another interesting feature of this particular play-testing session was the role that Max saw it playing in his organization in terms of spreading the priorities and mission of the organization into other educational spaces:

> For some reason it's striking me that we have repeat visitors coming to these sessions, the session is almost like it's hitting two birds with one stone, it has synergies with other things that we're doing. Like we're not just getting feedback on this particular game, we're also building a community and kind of outreach, it's almost like we're creating leaders, it could possibly affect practices in their own schools, I think that it's really powerful what we're doing here.

Play-testing then is being seen here in two senses when it comes to innovation practices - the primary purpose is around *experimenting* with and *refining prototypes* the organization is working on, which is explicitly about exploratory innovation practices, and the second, mentioned above, touches on *circulation* practices, where the ideas and pedagogical approaches of the organization are spread by the very means through which they are *refined*. This is a phenomenon we've seen in other cases as well, and something we'll touch on in future briefs.

In a second example of user-testing, a Hive member organization reached out, again through minigroup and other channels, to "workshop an app for educators" that was in development. It's important to note here that this organization never actually used the words "play-testing" or "user-testing", but rather framed the call as a "workshop" where they would "love to get your feedback". This indicates that a similar phenomena might be referred to in different ways, and, as we'll see, with different meanings and roots.

Many of the features of the workshop were similar to the play-testing session described in the first example - there was a mix of observation on the part of Margaret, the facilitator, of a number of educators using the app, as well as extensive conversation about the app, its goals and how it would be used. On asking Margaret how she got the idea to do these sorts of sessions, something interesting was revealed:

> It's part of our methodology with all of our community education work, specifically in making policy public, it's really important for us to deeply involve the people who are going to be users in the process, and not just to test it, but in terms of partnering with advocacy organizations, they're the ones who know the content the best and they experience it, and they teach us all that stuff so everybody gets on the same page.

The roots of engaging in such feedback seeking weren't found in a formal culture of user-centered design and game design, as with the first organization, but rather were seen as connected to the sphere of public policy education - a core part of this organization's mission and field affiliation.

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Margaret later shared that they actually usually didn't utilize such feedback session in their youth-oriented work, but rather more in their work that deals with educating adult community members about policy issues. At the same time, it was something in the organization's repertoire of work routines that she recognized as relevant for this app development initiative. From an innovation practices perspective, this user-testing approach might be seen as itself being *recontextualized* within the organization to meet emergent needs. In a sense, the example shows how innovation practices in and of themselves can be the 'subjects' of other innovation practices, in this case "moving" from one area of an organization's work to another in order to meet emergent needs.

She shared as well that this was her fifth time doing such feedback sessions around the app in recent months, but that she had wished she had talked to this group in particular, one with a number of Hive members as well as designers, before the previous sessions, which were mostly attended by teachers. In specific, she saw this group's particular expertise around technology development and usage being of particular value:

> I do wish I had talked to the kinds of people that were in this group earlier, actually, much earlier in the development process. That's something where I think this (apps) being a medium that we're less familiar with-- we know how to make fold-out posters, so we don't need to talk to somebody about the mechanics of making fold-out posters early in the project, and I think that's something I'm learning. I think this group had a lot more insights around really asking hard questions about the audience, and their experience using the tablet, and also I think good, tough questions about the interactivity and whether it was interactive in the way that I was imagining it.

This reflection evidences another aspect of these user-testing sessions that was echoed by Max, from the first example: that the process of user-testing is not just one where an organization learns and gets feedback about the innovation it's developing, but also one in which the organization learns more about how to engage in the practice of user-testing. This, of course, makes sense, and aligns well with Hive's broader pedagogy - just as kids learn by doing, so do educators. In this case we can see how the ability to engage in exploratory innovation practices is itself seen as a developing and evolving competency within organizations and a place of professional learning.

b. Structured Sense-making

Sense-making might be considered the most critical aspect of exploratory innovation - as people encounter new ideas, technologies, and pedagogical approaches, they must inevitably go through a process where they assess the relevance of this external information, come to grips with it, and see how it might, or might not, be applied in their organizational context. For educational organizations, an initial part of this sense-making process might be about considering various dimensions of an innovation, as we discussed a in prior brief, to address issues like whether it's too complex to take on, or whether it will successfully get taken up in their organization. And of course, understanding how something new "fits" with existing organizational mission and priorities is a big part of sense-making that educators in nonprofits engage in as well. Beyond this, if educators decide after initial discovery and assessment that a given innovation *is* something that want to pursue further, there's a more intensive and complex process they might go through to learn more and deepen their understanding that involves both accessing additional information as well as engaging in experimentation and piloting within their organization. All of these activities can be seen as relating to sense-

making.

In this section, we draw on our preliminary fieldwork to share examples of internal processes we've seen some Hive NYC member organizations engage in that we call **structured sense-making** - *intentional* and *formalized* work routines that have the goal of allowing an organization or team to come to grips with external information. While there's of course a sort of organic and ongoing sense-making that happens for people around new ideas, technologies and practices, we focus here on these highly intentional organizational routines as distinct in their "designed" nature.

We'll focus here on one particular form of structured sense-making we've seen: formal meetings organizations hold that are characterized by loose interaction protocols for assessing and understanding new technologies and digital tools. Put plainly, these are meetings to check out new stuff. It's a practice we've seen on a number of occasions, with each being somewhat distinctive in their approach. We'll share two instances here.

The first example was shared in the context of a larger innovation strategy, and the educator we spoke with explicitly articulated the ways such meetings were used to engage in sense-making:

> One of the things that we do is Tech Playshop[3], which is every Wednesday, a half-day in the morning, playing with new digital tools, the sphero, makey makey, and finding how can these be used for science learning.

In this case, the sense-making was oriented towards applicability of various technologies towards the organization's pedagogical priority, science learning. In the space on this educator's blog dedicated to documenting the results of these Playshops, a brief header describes what this process is about for him:

> This is where my colleagues and I try out the latest and greatest digital tools to evaluate if they have learning potential.

This again evidences the way this educator sees this process of structured sense-making; as a means of collective evaluation of the affordances of new technologies to support learning. Throughout this section of the blog there's documentation of tinkering, play and assessment of the relevance of a variety of technologies. In describing the Playshops with us, he shared that these meetings ended up playing a role in the development of new organizational initiatives:

> ...so we did those [Playshops] for many months, many of our programs grew from that.

While there are naturally many other steps in the process to get from the point of holding such sessions to one where new programs are actually put in front of youth, the statement above makes clear that, in this educator's eyes, the structured sense-making practices his team engaged in were part and parcel of a larger innovation process that led to new initiatives within the organization.

In the second example we'll share here, an educator spoke of how his team engages in a somewhat similar

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[3] Note that names of initiatives have been changed to maintain anonymity.

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meeting routine as the one we described above:

> Usually, every week, maybe every other week, [we] get together to look at new stuff. Tom's job will be to organize it for us, to organize the agenda and what we're going to look at, he'll bring stuff in, show us what it is and what it does. So we might take a music theory app, we'll see in here and kind of play with it, talk about what it does, and what it does well, and what it doesn't do well.

There is a similar evaluation of new technologies here as with the first example, but further discussion revealed a somewhat different motivation and context for the structured sense-making routines in this organization:

> I could say also that part of the reason we do it is because I think that historically [our organization] has tried to develop different games and different interactive stuff on its own, before [my] team existed, and given the rapid pace of development of apps and the sophistication of technology and other digital things out there, we're not in a position that has the internal capacity to do that. But we are in a position to help be a filter on that, and maybe curate selections of apps, and help educate teachers in how apps could be used in educational setting and things like that.

The evaluation of particular technologies for specific pedagogical application within this organization's programs is not evidenced in the rationale he gave, rather, the place that these work routines had for him was in developing his organization's capacity to "help be a filter" and play a curatorial role with teachers that the organization interacted with. This motivation is certainly not mutually exclusive with a desire to use structured sense-making routines as part of a larger program experimentation and development process, as was indicated in the first example. Rather, it gives us insight into how these structured sense-making routines might be framed and understood in different ways in different organizations.

We see the sorts of evaluative processes found in these examples of structured sense-making as vital to exploratory innovation in Hive NYC. In addition to serving the core sense-making function, such structured sense-making creates distributed knowledge within organizations, building capacity and understanding in not just one individual but multiple. In the case of the first example, the practice of structured sense-making was also linked with public documentation in the form of blogging, making the results of the sense-making available to a much broader set of constituents and contributing to a process of field level knowledge-sharing.

The examples we shared above do not represent the only form that structured sense-making practices can take. We've also found organizations that go on "fact finding" missions in places like conferences or other public events and then confer internally on return or write up internal memos to make sense of what they saw and circulate this knowledge within the organization, an example that couples the practice of sense-making with the practice of discovery (which of course are often intertwined). Additionally, we know that structured sense-making can be "networked" as well, that is, it's not something that simply happens as an internal process for organizations in Hive, but rather one that often occurs across organizations and in a distributed way across the Hive NYC ecology as people leverage social ties in order to learn more about things they're interested in (a theme we'll touch in a future brief). Acting as a means of sorting through increasingly complex information ecosystems relating to digital learning as well as pedagogy more broadly, structured sense-making practices might allow a context for organizations to question and understand the value of innovations they encounter, a critical function to separate hype from substance.

IV. Conclusion

In the first part of this brief, we outlined two "legs" of the innovation process, the earlier stages of *exploration,* characterized by practices of discovery, sense-making and experimentation, and later stages of *exploitation,* characterized by practices of implementation and institutionalization. While generally there is of course much to learn about both areas, our instinct, supported by the literature (Coburn et al., in preparation) is that in the education world there is not a great deal of formal understanding of how educators engage in early stage, exploratory innovation practices.

It's clear from the examples we share in the second part of the brief that there exists substantive activity and capacity around exploratory innovation in the Hive, which is of course to be expected given both the range of expertise found in the network as well as the broader orientation towards experimentation in the community. Activities like playtesting and user-testing and structured sense-making shed light on the specific practices that Hive members are engaged in, the dynamics and decisions involved in these practices, and the ways that they represent a space of learning for members of the network. In a future memo we will explore the ways that such practices intersect with organizations participation in the Hive NYC community, and some of the ways that network participation is consequential to the ways Hive members innovate.

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