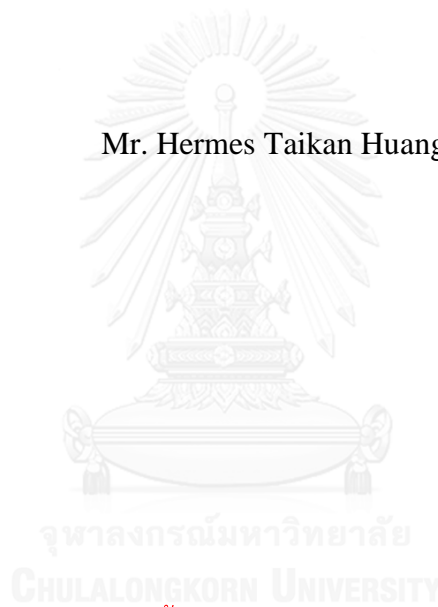


NETWORKS OF PRACTICE AROUND OPEN SCIENCE: A CASE STUDY ON
THE HOUSE OF NATURAL FIBER FOUNDATION IN YOGYAKARTA,
INDONESIA

Mr. Hermes Taikan Huang



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เซอร์เมส ไทกัน ฮวง : การวิเคราะห์กระบวนการปฏิบัติจริงตามแนวคิดวิทยาศาสตร์เปิด: กรณีศึกษา มูลนิธิ เฮ้าท์ ออฟ เนเจอร์ล ไฟเบอร์ เมืองชอกฮาการ์ตา ประเทศอินโดนีเซีย (NETWORKS OF PRACTICE AROUND OPEN SCIENCE: A CASE STUDY ON THE HOUSE OF NATURAL FIBER FOUNDATION IN YOGYAKARTA, INDONESIA) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: การ์ล มิคเคิลสัน, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: Denisa Kera, หน้า.

วิทยาศาสตร์เปิด เป็นแนวคิดและการปฏิบัติแนวใหม่ที่กำลังได้รับการต่อยอด โดยแนวคิดนี้สนับสนุนการสร้างสรรค้องค์ความรู้ทางวิทยาศาสตร์ที่สามารถเข้าถึงได้ มีความโปร่งใสและครอบคลุม แนวคิดนี้ได้รับการพัฒนาในเมืองชอกฮาการ์ตา ประเทศอินโดนีเซียตั้งแต่ปี ค.ศ. 1999 โดยความพยายามของ มูลนิธิ เฮ้าท์ ออฟ เนเจอร์ล ไฟเบอร์ ตลอดกระบวนการทางมูลนิธิฯ ได้สร้างเครือข่ายผู้เข้าร่วมและมีส่วนเกี่ยวข้องมาโดยตลอด วิทยานิพนธ์นี้ประเมินความหลากหลายของเครือข่ายดังกล่าวและมุมมองเกี่ยวกับการเปิดกว้าง ความร่วมมือ วิทยาศาสตร์ และการพัฒนาชุมชน ในทวีปเอเชีย ยังมีช่องโหว่ของงานวิจัยเกี่ยวกับสังคมวิทยาศาสตร์เปิดอยู่มาก ต่างกับอินโดนีเซียที่ผลงานของชุมชนเหล่านี้มีความสำคัญต่อการเข้าใจศักยภาพความพยายามในการพัฒนาสากลทั้งระดับท้องถิ่นและนานาชาติ จากการสังเกตผู้เข้าร่วม การวิเคราะห์บทความและเว็บไซต์ การสัมภาษณ์ผู้รู้ และแบบสอบถาม งานวิจัยนี้พบว่าเครือข่ายการปฏิบัติจริงตามแนวคิดวิทยาศาสตร์เปิดใน ชอกฮาการ์ตา มีศักยภาพสามารถเป็นต้นแบบในการพัฒนาชุมชนในบริบทอื่นๆ



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Open science is a burgeoning concept and practice that promotes the production of scientific knowledge in a way that is accessible, transparent, and inclusive; in this sense, it is relevant to development studies. The house of Natural Fiber Foundation has been involving the practice of science, as well as art and other creative endeavors, in Yogyakarta, Indonesia since 1999. In the process, the House of Natural Fiber Foundation has created a cosmopolitan network of participants and collaborators, which has implemented various interdisciplinary projects and events between formal and informal institutions of science. This thesis assesses this network's diversity and its views on openness, collaboration, science, and community development. There is a profound gap in research regarding open science communities in Asia, much less Indonesia, and the work of these communities is critical for understanding the potential for international development efforts both locally and internationally. Through a combination of participant observation, textual and web analysis, key informant interviews, and survey questionnaires, this research found that the community of practice around open science in Yogyakarta has the potential to represent a model for community development.



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CHAPTER I

INTRODUCTION

1.1 Problem Statement

In Yogyakarta, Indonesia, collaborative practices and programs around art, science, and research and development (R&D) have been active in various forms since the beginning of their practice in 1999. These practices and activities have been crossing the boundaries of formal and informal, and local and global, organizations and communities. For the purposes of this research and to capture these boundaries, the concept “networks of practice” will be used. This concept delineates the variety of professions, and institutions including, but not limited to, art, academia, medicine, non-governmental civil society, and local government that are involved in the network surrounding the House of Natural Fiber Foundation. The House of Natural Fiber (HONF) Foundation, led by Indonesian citizens educated in Indonesian institutions have sustained the growth and stability of its networks that have explored science through art, technology, and community development for over 15 years. Specifically, these efforts have included research and development of open-source hardware for scientific research, including the repurposing of existing hardware, which supported missing infrastructure for science and continued to grow as the community’s practices and goals grew in both definition and breadth. This growth and drive for impact on local communities can be observed through the development of local and international collaborations and partnerships over the last 15 years of the HONF Foundation.

The acts of tinkering, repurposing, destroying, and creating have been a part of human culture since the creation of the first tools (Lévi-Strauss, 1966). The development of tools has largely defined human survival in its explorations of the world (Kuznetsov & Paulos, 2010), its search for knowledge and understanding. A revival in interest in the practices of tinkering, especially with the development of hardware incorporating low-cost technology and free and open source software began

around the early 1990s (Kao, 2014). Greater internet access allowed for new ways to document tinkering practices and for instant communication between people. The internet also enabled larger networks of collaboration between people through digital collaboration, information access, and facilitating the organization of in-person meetings, exhibitions, conferences, and summits.

With this revival also came interest in practices related to science and research and development (R&D) at the individual and community scale (Kera, 2012). These practices can be understood as a citizen-based approach to science, which envisions the possibility of anyone (scientists and non-scientists) engaging in scientific practice. For this research, the term “open science” will be used to describe the practices and activities related to science described in this thesis. “Open science” itself is still being defined, but generally has principles that relate to applying and promoting openness of data and publications and accessibility of its practice for all people through synergy with open access, open data, education, citizen science, and science communication networks (OpenScienceFederation, 2015).

This research seeks to discuss open science in the specific context of Yogyakarta, Indonesia by understanding local characterizations of collaboration, openness, science, and community development. It will also detail the development of the House of Natural Fiber Foundation’s programming and network from its start in 1999. The House of Natural Fiber is considered in this research as representative of open science development in Indonesia, as it was the first and only community-based organization doing scientific research and development in a way that was open and inclusive for many years. Their work may also be the first of its kind in Southeast Asia, and thus presents an opportunity for learning by other communities in the global south. Local definitions of community development in Yogyakarta, Indonesia have since blended with international and national influences, such as the Indonesian Government’s national community development programs of the early 2000s (WorldBank, 2009, 2014). Initial observations of open science practice in this context are that it is inclusive, collaborative, and diverse, and contains a sense of purpose.

These factors contribute to the potential of characterizing a model for community development through the local lens.

1.2 Research Questions

This research seeks to answer the following question and accompanying sub-questions:

1.2.1 Principal Question

In the case of the House of Natural Fiber Foundation of Yogyakarta, Indonesia, how has the development of the Foundation grown to become a cosmopolitan network around open science, and how does this network define itself in terms of diversity, collaboration, openness and contribution towards community development?

1.2.3 Supporting Questions

How has the House of Natural Fiber Foundation developed its program of open science?

How do actors collaborate around open science and R&D practices?

How do actors describe their participation in and understanding of open science and R&D practices?

1.3 Objectives of Research

To document the development of open science programs around collaborations related to the House of Natural Fiber Foundation from 1999 to the present.

To detail attitudes, motivations, and organization around openness, collaboration, and science and R&D within networks related to the House of Natural Fiber.

To define, through the words of the actors, the role of community development in the practices of open science and R&D in Yogyakarta, Indonesia.

1.4 Conceptual Framework

Four main concepts frame this research, which connect international development studies to the potential of open science, as a concept and practice, to define potential models of open and citizen science for the global south. These concepts are open science, cognitive justice, knowledge democratization, and community development. These four concepts are detailed below, and followed by a discussion on their supporting intersections.

1.4.1 Open Science

Often, citizen science efforts are framed as institution-to-public educational opportunities for non-scientists, and utilize volunteers as data gatherers (Lakshminarayanan, 2007; Michael P. Mueller, 2012; Silvertown, 2009) which actually put these non-scientists in a non-participatory category in both research design and the research itself. Open science is a burgeoning discourse where the recognition of different ways of knowing, various disciplines, open access rights, and different modes of participation recognition and attribution are being debated. It is a constructivist tool that recognizes the potential for a variety of contributions to understanding the world. Thomas Kuhn (Kuhn & Hacking, 2012) argued that views of reality by scientists contain historical and subjective elements, which also result from group dynamics, “revolutions” in scientific practice, as well as changes in paradigms. In the contemporary period, where closed science practice in industry and academia, at its core, no longer serves the best interests of the greater community, but rather the interests of corporations and individual researchers (and their affiliated research teams), there is a need for change. For the purposes of this thesis, the focus will be on increasing access and usage of open science practice as an opportunity for community development through creative collaboration and communication between citizens of both scientific and nonscientific, formally educated, and non-formally educated, backgrounds. Thus, creating networks of practice. The phenomenon detailed in this research is potentially a form of open science that can be framed by the following

concepts of cognitive justice, knowledge democratization, and community development. Open science is a practice that strives to enable participation by individuals and groups with full agency to determine their actions freely and openly.

1.4.2 Knowledge Democratization

International knowledge institutions, commonly funded by democratic nations, often lack the constraints seen in national-level institutions of funders' own democratic societies, in regards to multi-level societal participation and criticism (Miller, 2007). They also project power as institutions backed by governments through international funding sources. These institutions often utilize a science-based approach, as an order of objectivity, in their recommendations and solutions. Unfortunately, the design of participatory action by these institutions in their research and development often equals a level of participation that ends at rungs 3 (Informing), 4 (consultation), and 5 (placation) of Arnstein's "ladder", which is defined as tokenism rather than true participation (Arnstein, 2011). In contrast, the kind of science practice described in this research strives to be a participatory practice that would fall within the "citizen power" tiers of the Ladder of Citizen Participation¹ (Arnstein, 2011). Power, as it is projected through science, actually limits the ability of these institutions to utilize the scientific method as an objective, equalizing force in international development. This is perhaps best summed up in the statement by Wynne that "Power is able to control scientific reason through rituals which lend a rational image to decisions whilst restricting the real scope for rational criticism" (Wynne, 2011). Wherein these "rituals" are existing and conventional funding and research and development models for international development implementation and practice. This research does not discount the efforts of the aforementioned institutions, but rather critiques the level at which these institutions and funding sources are able to engage actors and beneficiaries.

1.4.3 Community Development

The United Nations (UN) originally defined community development as "a process designed to create conditions of economic and social progress for the whole community with its active participation and fullest possible reliance upon the

¹ See Section 2.4

community's initiative" (United Nations, 1948). Since then, however, the definition has become more general. The latest term is defined as "a process where community members come together to take collective action and generate solutions to common problems" (United Nations, 2013). Still, with the proliferation and breadth of programs, specialized agencies, and local translations, the UN maintains a large list of terminology that contains variations on community development. As far back as 1956, has there been internal debate on how to use and define community development at the UN (UNESCO, 1956).

At the national level, in Indonesia, these variations were used and blended with local terminology to create national programs for community development. Funded by the World Bank, Indonesia has had several iterations of a contemporary community development program since 1998 (World Bank, 2014). Beginning as Kecamatan Development Program, this program pushed for the principles of participation/inclusion, transparency, open menu², competition for funding, decentralized, and simple with "all KDP activities aim at allowing villagers to make their own choices about the kinds of projects that they need and want." This program began with a rural component before launching a parallel urban component. Eventually all programs were combined into the National Program for Community Empowerment (PNPM Mandiri) in 2007.

Community development also has a long standing part of the local vernacular, for example in the word *kampung*, which in urban Javanese, roughly translates to "home community" and is even reflected in administrative bodies as a communal structure (Sullivan, 1986). Specifically in Yogyakarta, with its organization around the historical compound, *kraton*, of the sultan, there are historical discrete divisions between social classes in Yogyakarta. A unique historical patronage by the sultan of artists, artisans, and craftworkers contributes to the role of Yogyakarta as a cultural and arts center in Indonesia. *Kampung* also represents a version of *gotong royong*, which has several meanings whether one is in urban or rural Java. On one hand, this term can simply mean, "hang out" or "gather" in local slang, but on the other hand it represents "a mode of social organization developed in Javanese farming communities" and literally means "to share a burden" (Sullivan, 1986). The diverse vernacular of the

² "Villagers can propose any activity, except for ones on a negative list." World Bank, 2015

region presents itself as a puzzle for the local understanding of many terms being characterized in his research, including “community” and “development.” Add another layer regarding openness and science, and it is a patchwork quilt of possibilities that could be formed.

Between international and local ideas of “community development,” it is also pertinent to note that the word “community” alone is problematic, regardless of the context, and is especially problematic in Indonesia, where the vernacular is so diverse. The reality of the community described in this research is also that it is not spatially designated by physical boundaries, such as in a specific neighborhood, or the walls of a building. It is a community of practice. This community of practice around open science uses scientific protocols, laboratory equipment, design, art, and locally contextual culture. The inclusive of disciplines and diversity of this community is the reason for this term, community of practice. This term points to a highly fluid and contestable nature differentiating between network and community. Therefore, for the purposes of this research, an open science community is considered to be a network of practice consisting of individuals, events, and projects that recognizes itself as a fluid and open community that is diverse, collaborative, and socially minded. An open science community recognizes the differences and contestations that can occur within the network, and is reflective and respectful regarding these differences to a point that does not disrupt the overall progress and advancement of open science practice for the greater good of the community.

1.4.4 Cognitive Justice

Open science practices in Yogyakarta, Indonesia, actively acknowledge forms of knowledge, known locally as *ilmu*, as forms of science (Irene Agrivine, 10 June 2015). Local communities have long recognized the value of their own knowledge in medicine, tradition, and culture. This is in contrast to the United Nations, bilateral aid agencies, and international non-governmental organizations, which have only more recently recognized the rights, value, and dignity behind these forms of knowledge. One example includes the fact that the Declaration on the Rights of Indigenous Peoples was not adopted by the UN General Assembly until 2007 (United Nations, 2007). In the concept of cognitive justice, the plurality of knowledge systems and

sources of knowledge are recognized and viewed as equal (Santos, 2013; S. Visvanathan, 2006). Cognitive justice forms one of four pillars of the idea of “alternative science” born out of the efforts of feminist, anti-development, human rights, and environmental group in the 1980s and 1990s. It “goes beyond the concepts of voice or participation to emphasize that the victims of development were theorists, i.e. men and women of science. It holds that the tribal, the patient, the worker, the nomad are scientists and that they carry their own notions of coping and inventing with them. Such a notion of knowledge cannot be reduced to a patronizing or romanticized idea of ethnoscience as an inferior or defeated science.” These concepts advocate a level of citizen participation that achieves rungs 6 (Partnership), 7 (Delegated Power), and 8 (Citizen Control) on Arnstein’s “Ladder of Citizen Participation” (Arnstein, 2011).

Open science practices generating knowledge, especially those in the global south, are of equal and valid value as knowledge created in the north. Discourses from the north, however, due to greater resources and access to communication channels, especially those touting specific terminology such as “maker,” “hacker,” and “fablab,”³ pose the risk of labeling concurrent practices in the south, which may not be accurately represented by these terms, without the input from the south. This research seeks to prevent the entrenchment of such terms at the burgeoning of these practices around open science in order to prevent the creation of another hierarchy of knowledge production, such as the one seen at the top and institutional levels in science research and development post-decolonization.

1.5 Hypothesis

Beginning with principles of openness, collaboration, and curiosity, a network of practice around open science emerged surrounding the House of Natural Fiber that is diverse in both visible and non-visible factors. These principles have lasted the test of time since 1999. This network crosses boundaries between formal and informal institutions and organizations, while also bridging the gap between local, national, and international participation in its breadth of activities. The participants, who make up this network, alongside the events and projects, recognize the strength of their

network in its diversity, collaborative efforts, in practicing openness, and in contributing to ideals of community. Furthermore, the participants of this network recognize a social aspect of their work as something that benefits the greater good of the environments and communities in which they practice, which can be described, by the participants of the network, as a form and model of community development..

1.6 Research Methodology

This research encompassed a single case study revolving around the activities and practices related to science and R&D in Yogyakarta, Indonesia. It was a mixed methods study involving primarily qualitative methods with some quantitative methods to gather data. Quantitative methods were mainly utilized in the analysis of the community sample assessed in the survey, which includes information regarding demographics and attitudes towards major research concepts. Qualitative aspects of this research included open-ended questions, unstructured key informant interviews, and participant observation. The resulting data was analyzed using a modified social network analysis. This was intended to make this research more useful to a wider audience, especially the research subjects themselves.

The researcher spent a total of 50 days in the field in Yogyakarta, Indonesia. Of this time, 40 days were spent in participant observation, 21 days were spent gathering survey data, and 10 days were spent interviewing key informants. The researcher lived with participants of the House of Natural Fiber network, and spent most days in HONF facilities alongside employees and participants.

The following table describes the methodological approach in relation to the research questions:

In the case of the House of Natural Fiber Foundation of Yogyakarta, Indonesia, how has the development of the Foundation grown to become a cosmopolitan network around open science, and how does this network define itself in terms of diversity, collaboration, openness and contribution towards community development?	Data Needed	Source of Information	Tools/Met hodologies
How has the House of Natural Fiber Foundation developed its program of open science?	<ul style="list-style-type: none"> - Timeline and History of Events - Motivations for creating HONF - Principles of organization, collaboration, culture - Views on science, collaboration, and art - Demographics 	<ul style="list-style-type: none"> - Individuals involved with HONF - Social media - Websites with HONF-affiliated contributions 	<ul style="list-style-type: none"> - Archive and text analysis - Key informant interviews - Participant-Observation
How do actors collaborate around open science and	<ul style="list-style-type: none"> - Demographics - Attitudes and motivations about collaboration - Deterrents to collaboration 	<ul style="list-style-type: none"> - Individuals involved with HONF - Social media - Websites with HONF-affiliated 	<ul style="list-style-type: none"> - Key informant interviews - Survey

R&D practices?	<ul style="list-style-type: none"> - Methods and tools for collaboration - Methods of direct interaction with other individuals in the Maker Movement - Attitudes towards HONF - Engagement with HONF - Understandings of Community Development 	contributions	<ul style="list-style-type: none"> - /Questionnaire - Participant-Observation
How do actors describe participation in and understanding of open science and R&D practices?	<ul style="list-style-type: none"> - Attitudes and motivations about sharing and documentation - Deterrents to sharing and documentation - Methods and tools for sharing and documentation - Understandings of Science - Motivations to work with HONF 	<ul style="list-style-type: none"> - Individuals involved with HONF - Social media - Websites with HONF-affiliated contributions 	<ul style="list-style-type: none"> - Key Informant Interviews - Survey /Questionnaire - Participant-Observation

Table 1 Methodology Table

1.6.1 Case Study Selection in Yogyakarta, Indonesia

Yogyakarta, Indonesia was selected as the primary field site for this research due to the history and context surrounding this location that has enabled the environment for contemporary activities that relate to open science. With an abundance of institutions of higher education and arts and culture, including what is regarded as Indonesia's top public university, Universitas Gadjah Mada, Yogyakarta is both of a historical and contemporary center of education for the country. It is Indonesia's only special region administered as a sultanate, which was granted due to its prominence during the Indonesian independence movement (Anderson, 1983). The sultan's family also takes a special place in the development of arts and culture in Yogyakarta and nationally, as they have provided historical patronage to artists, which manifests itself

in a physical location in Yogyakarta where artists have taken residence. In this environment organizations such as the House of Natural Fiber have been able to flourish over its 15 year history, as a breadth of individuals migrate to Yogyakarta to pursue artistic dreams.

Furthermore, because of its proximity to the historic sites of the Prambanan and Borobudur Temples, as well as, Mount Merapi, Indonesia's tallest and one of its most active volcanoes, Yogyakarta is Indonesia's 2nd most popular tourist destination after the island of Bali. This constant flow of domestic and international tourism provides fresh exposure to art being produced in Yogyakarta, further facilitating a market for art and jobs in a variety of sectors.

The House of Natural Fiber was by and large the only new media organization in Southeast Asia for a large part of its history, and the fact that it also utilized scientific principles in its practiced contributed further to its uniqueness in Southeast Asia. Its history is worth studying as a case for not only Southeast Asia but for the global south as a whole.

1.6.2 Respondents and Sampling Procedures

Respondents in this research were composed of participants who have previously engaged or are currently engaging with the House of Natural Fiber Foundation through participation in events, collaborating on projects, or otherwise communicating regularly with members of HONF. Beginning with initial key informant interviews with the founders of HONF, a network of events, projects, and participants was populated detailing their 15 year growth.

Unstructured key informant interviews were then conducted with five individuals identified as integral to the development of the House of Natural Fiber in its different phases. A survey questionnaire, divided into two representative surveys (Appendix A1.1, 1.2), and was distributed to approximately 900 individuals with a final response of 85 completed surveys. Surveys were distributed using a combination of mailing lists maintained by HONF and through personal contacts. Survey

respondents were self-identified as current or past participants within the HONF network, which is in line with the operation practices of HONF, and its open and collaborative methods.

Following the initial key informant interviews, a detailed archive analysis was also conducted in order to structure the development of the organization and its networks over the last 15 years. This was complemented by participant observation of daily activities of the organization in Yogyakarta. The combination of demographic data, attitudes and perceptions, archival information, key informant interviews, and participant observation help frame and characterize the breadth of seemingly random activities of HONF.

1.6.3 Research Instrument for Measuring Openness, Collaboration, and Diversity

1.6.3.1 Archive and text analysis

Archive and text analysis was mainly done through HONF's website (natural-fiber.org), posters of past events, archival documents including diagrams and visuals of HONF's development. These documents were used to triangulate data about HONF's history through key informant interviews and participant-observation.

1.6.3.2 Survey Questionnaire

See Appendix for Questionnaires

A survey was designed and tested in order to gather data about demographics, motivations for collaboration, deterrents for collaboration, understanding of openness, methods for sharing openly, deterrents for sharing openly, attitudes about the House of Natural Fiber, understanding about the House of Natural Fiber, understanding of science, and understanding of community development. This included 9 multiple choice and free answer demographic questions given to all survey participants regarding age, gender, ethnicity, nationality, associated institution, profession, religion, languages spoken, and the person, place, or thing that first introduced the survey participant to HONF. These demographic questions contribute to the

discussion on diversity. The survey then follows with 93 questions regarding the remaining topics. Of these questions, 4 were free-response, 7 were multiple choice, and the remaining 82 questions were spectrum-based on the strongly disagree-strongly agree scale.

The master survey was divided randomly into two surveys to be distributed to the sample population. Questions in each section were divided 50/50 into each of the two distributed surveys in order to gather data about the same topics. Both surveys were tested to take approximately the same time, and the completed surveys were both analyzed as representative of all respondents and thus the network of the House of Natural Fiber Foundation. The survey was completed by 83 individuals during the period of May 23, 2015 and June 23, 2015. One survey was completed by 37 individuals and the other was completed by 46 individuals.

1.6.3.3 Key Informant Interviews

Key informant interviews were conducted with the three main founders of HONF, and its primary leadership today. These were conducted as long format (1 hour+) unstructured interviews about pre-determined topics including openness, documentation, motivations, knowledge development, science, and future aspirations for the Foundation.

1.7 Data Treatment

Data was compiled and recorded in two main ways. Quantitative data was access in Microsoft Excel and then processed into graphs and charted before being analyzed and then integrated in this thesis. Qualitative data was recorded using Cogi, recording software available for Android smartphones, and then transcribed into Microsoft OneNote to keep the data digital and organized. Most data and writing by this research is also backed up on Google Drive, and with appropriate permissions will be released to the public or other researchers as possible.

Data is presented in this thesis in the following ways. It is presented in narrative form as a result of the participant observation, key informant interviews, and open

ended questions from the survey. It is also presented quantifiably with charts and graphs based on the survey data and analyzed as according to research objectives and chosen indicators in line with the conceptual framework.

1.8 Research Scope

For the purposes of this thesis, analysis took place at the individual level with the expectation that future analysis may be done at higher levels of organization. The primary geographic area of analysis was the urban core of Yogyakarta, Indonesia, but as the methodology was a snowball method, this remotely took the researcher beyond the city in order to obtain data from external/international actors who have participated significantly in the efforts of the House of Natural Fiber Foundation over the years.

1.9 Limitations

The primary limitations of this research was lack of language ability on the part of the researcher, refusal of research subjects to speak about certain topics regarding the 2011 split in leadership, and accessing certain key informants due to geographic and technical access.

1.10 Ethical Issues

The major ethical issue that may arise in this research is the disclosure of names and maintaining the privacy of individuals that may not want to be published in the manner of a thesis or in the body of academic work. I expect that this research will be of minimal risk due to the outward lack of significantly violent, emotional, or traumatic current or past events in the proposed research site. The researcher does not expect to work with minors as major or minor informants, but minors could potentially be included as coded/anonymous nodes in the proposed network analysis if they are connected to other actors within the network. Consent will be obtained from actors in the research.

1.11 Significance of Research

This research acknowledges the contribution of local communities in Yogyakarta, Indonesia to the body of science. By characterizing the community's attitudes, motivations, and understandings of their work, this research will give quantitative data on the effects of their efforts over the last 15 years it will contribute to a burgeoning discourse of open science. This research seeks to give representation to and advocate for the recognition of Global South experiences, practices, and activities related to science against the reductionism of Northern discourses surrounding similar open science activity in the Global North.

1.12 Structure of Thesis

This thesis is organized into 6 Chapters. Chapter 1 is an introduction to the problem and research methodology. Chapter 2 is a literature review and background on the location and phenomenon. Chapters 3-5 is the main body of the thesis and describes the data collected and framed as presented in the conceptual framework. These three chapters are organized into three phases identified in the development of the House of Natural Fiber. Chapter 3 details the activities and network during 1999-2004, and includes an introduction to the Javanese and Bahasa Indonesia terminology used by the community to describe them. Chapter 4 details years 2005-2011, which is a period of growth and further organization and the inclusion of a greater amount of international connections. Chapter 5 details the period from 2011 onwards, which is when HONF became a formal organization. Throughout these chapters, analysis will be focused on the purpose, motivation, intentions, outputs, and diversity of the HONF community in regards to science as characterized by participants, events, and projects. Chapter 6 concludes the thesis, but rather than concluding this research, it opens the door to further work that will allow for greater representation of the HONF community on the larger international stage.

CHAPTER II

LITERATURE REVIEW AND BACKGROUND

2.1 Introduction

This literature review is divided into topics that set the global frame regarding science and international development in a post-colonial world. The discussion will begin with a lead-up into the overvaluing of Northern science as an institution in decision making by international bodies after decolonization. This topic was chosen in order to frame a top-level review of the influence of science in decision-making processes in international development. While this thesis research focuses on a local scale, it ties into global phenomena of open science efforts at the community level. These global community-level science efforts are contributing to the definition of open science as a burgeoning concept at both the top and bottom level. Therefore, this literature review continues with an overview of the proliferation and adoption of Northern discourses, where the incorporation of Southern voices is often absent or overshadowed by the North. This talk about representation by the voices in the South is important in the way that science works, which is largely collaboratively. Science collaboration as a topic of research has been quite developed at the institutional level, but less so at the community level. This is largely because community-level international science collaboration has not been accessible for as long as the institutional level, largely because of technological barriers. The final section is titled Globalized Science, and will briefly discuss the acknowledgement of multiple ways of understanding the world and the experience of the Global South as equally cosmopolitan to the North.

2.2 Colonialism, Science, and Development

Science in the Global South has been characterized in the lower rungs of the hierarchy in knowledge production between North and South, as the installation of Northern science came largely with colonial powers. In the development of science institutions post-decolonization, these institutions can be described as fragile, fragmented, and incoherent. There are, however, countless differentiations between the experiences of this institutional development across different contexts and countries. In the wake of decolonization in the mid-20th century, vestiges of colonial science, a hierarchical, extractive, and manipulative form of science from the Global North (Vessuri, 1994), continued to influence science development, and international development aid programs, in the Global South (Sooryamoorthy, 2015). The institution of Northern science, a specific culture of norms, values, and practices around the Western scientific method, became a projection of political power in the post-colonial development era. The institution is recognized, valued, and utilized in exclusion of other forms of science and knowledge (S. Visvanathan, 2006) for decision-making processes often seen in international development efforts, including those of international knowledge institutions. A large part of the development discourse attempts to depoliticize international development efforts (Ferguson, 1990), and the institution of science, presented as an objective process, contributes to this veiled attempt. The spread of Western science began in the late 1800s through institutions established in the colonies. These were largely used to determine more efficient ways to exploit natural resources. These institutions of “colonial science” were discriminatory towards native populations with a lack of training for local capacity in applied science. In many cases, higher level education and training was reserved for locals destined for civil service (Vessuri, 1994). Another key player in the development of global knowledge networks, were and are American private foundations. These included the Ford, Rockefeller, and Carnegie Foundations. Their investments were largely placed into the development of higher education, think tanks, and research centers around the world (Vessuri, 1994).

Development strategies in the post-World War II areas by the Global South largely favored industrial development, including import-substitution or export-led liberalization. This reflected the hierarchy that continued following the decolonization of the Global South, and where developing countries became production centers for more “advanced countries.” With the rise in increasingly liberal intellectual property laws, especially in the granting of patents, so followed the increase in a politicized science driven by business interests in the United States and the European Union (Boldrin & Levine, 2008). The notion of a technological “leapfrog” failed, as technologies transferred from the North needed to be adapted and re-learned for use and application in developing contexts. These contexts were largely created to enable the conditions for private sector investment that entrenched large industrial corporations into these newly industrializing economies (Rock, Murphy, Rasiah, van Seters, & Managi, 2009).

The second half of the 20th century created a more public global governance system. This has also contributed to the creation and re-working of international knowledge institutions whose role is no longer only deliberative, but also to build a standing knowledge base that “can command transnational credibility.” These bodies often have large scientific committees, such as the Intergovernmental Panel on Climate Change, which lends them “objectiveness.” However, when the majority of scientific power comes from the Global North, this is a form of power imbalance (Miller, 2007). International knowledge institutions have the flexibility (Unesco, 2009) to exploit the geopolitical power divide in knowledge production between North and South to heavily influence agendas of international development (Stone & Maxwell, 2005), development of Global South knowledge institutions (Sooryamoorthy, 2015), and reach of transnational corporations (Archibugi & Pietrobelli, 2003). There is a disproportionate lack of research, representation, and recognition of knowledge from the Global South in international decision-making processes (S. Visvanathan, 2006).

The unfortunate reality of dominant discourses in science, mainly Northern science, is how they often maintain their dominance despite having holes and inadequacies of the process exposed. This, in combination with Northern science’s historical exclusion of “other” knowledge, has created a struggle in the hierarchy for recognition (Gallopín & Vessuri, 2006).

Official development discourses touted by national and international organizations are often different from the work of the practitioner on the ground. Specifically in the case of Indonesia, the use of certain words in the vernacular represents many different things on the ground, as opposed to the official language used in documentation. The difference between the official and the reality is also potentially an attempt to depoliticize the discourse surrounding development aid (Dove & Kammen, 2001). In regards to the use of science in decision making processes, the unfortunate reality of dominant discourses in science, mainly Northern science, is how they often maintain their dominance despite having holes and inadequacies of the process exposed. This, in combination with Northern science's historical exclusion of "other" knowledge, has created a struggle in the hierarchy for recognition (Dove & Kammen, 2001).

A common feature during this period, however, is the marginalization of science institutions by the state in the post-decolonization period (Vessuri, 1994). Knowledge, which was something that could be considered a common good, one that is non-rivalrous (Hess, 2006), became limited during the 20th century. This change in the way that knowledge could be accessed opened the door for creating a hierarchical system in the processes of globalization; one where the South must depend on the North for innovation, and where the South provides the manpower and the test bed for implementing such innovation. To be clear, there are several ways of identifying technology in the processes of globalization (Hess, 2006). In the instances where specific actors were able to convince policy-makers of the relevance of their work, concrete change did manage to happen, but only when these actors were able to play the political arena to buffer their projects from state interference. Successful examples include the Bose Research Institute and the Tata Institute of Fundamental Research in India, the Maguinhos Institute in Brazil, and Gabaldon's anti-malaria campaigns in Venezuela (Vessuri, 1994). These examples highlight, however, the critical role of the state in developing scientific capacity. The policies that enable the creation, adoption, and adaptation of new technologies for research can only be enabled by the state in partnership with the human capital that it possesses (Vessuri, 1994). The unfortunate case of working within a hierarchical globalized system, however, means that a huge

amount of well-trained scientists, from the South or the North, continue to largely work towards the benefit of the Global North, rather than the South (Vessuri, 1994).

The creation of knowledge is practical, and when a community is affected by a science-driven development decision cannot access the process, the knowledge is less useful than it could be. If local communities do not understand the science being used, then that contribution does not mean anything to local communities. This also blends with the need for trust in the creation of knowledge, as people need to believe the knowledge in a specific context for it to be understood and adopted (Gallopín & Vessuri, 2006). The use of science for development has to go beyond the limits of institutional Northern science. It must draw from the local context and understandings, and adapt in order to be useful (Gallopín & Vessuri, 2006). The addition of non-scientists into all phases of the science process has potential positive benefits at the ethical, political, pragmatic, and epistemological levels in regards to development. The participation of actors that will be affected by the process is an ethical consideration. Politically, the control of science processes and development by societal actors is crucial. The addition of people who actually understand the context in which a development solution will be implemented is common sense. Epistemologically, the consideration of multiple ways of understanding is necessary, as the view through one lens is limiting and potentially harmful (Gallopín & Vessuri, 2006).

2.3 Northern Discourses

In addition to be restricted by institutions of Northern science, open science communities in the Global South face being reduced to burgeoning Northern discourses without their recognition or input. Different forms of open science and R&D are often grouped under developing contemporary discourses from the Global North, such as Hacker and Maker Movement⁴, DIYBio⁵, Design for Development⁶, or

⁴ <http://www.bloomberg.com/bw/articles/2014-06-26/chinas-maker-movement-gets-government-support-for-diy-workshops>

⁵ <http://diybio.org/>

⁶ <http://www.fastcoexist.com/3045768/why-design-for-development-is-failing-on-its-promise>

New Media⁷. These discourses are composed of relatively fluid definitions. However, as popular and academic discussions surrounding the characterization of these discourses continue to grow, the loudest voices are largely represented by Northern institutions (Vessuri, 1994).

These different discourses could be understood as technology movements, which often concern themselves with the idea of innovation. They can be understood as both a disruptive force, in the greater global system, but also as a way of thinking for communities and individuals to interact, create, and learn. Innovation occurs at many levels, including the personal, community, global, industrial, and more (Kera, 2012, 2014). Innovation structures at the global level have sought to dominate the discussion, however, and are a less inclusive model than those at the community level. They involve science, technology, and internationally funded institutions as vectors for “innovation.” While they may be innovating, it does not necessarily hit the target of inclusion, and thus neglecting many beneficiaries of potential innovation in the process (Heeks, Foster, & Nugroho, 2014). They may actually be exploitative, utilizing local and unique knowledges to bolster the overall survival of the discourse, rather than recognizing the value of the smaller pieces.

The inclusivity of movements such as the Alternative Technology Movement (Smith, 2005), the Maker Movement (Kera, 2012), and ideas such as the “Cradle to Cradle Manifesto” (Heeks et al., 2014; McDonough & Braungart, 2010) are well touted. With contemporary discourses, however, this inclusivity only goes so far before they begin to impose certain principles that have developed, and often so without taking into account communities that came into existence later. There are also trends that show the the Maker Movement is moving towards an enterprise model for sustainability. It shows a gradual parallelism with the startup scene and high tech industries, which may or may not be appropriate to push for in all contexts in which tinkering communities may be located.

⁷ <http://www.newmedia.org/what-is-new-media.html>

2.4 Scientific Collaboration

The way that people collectively create objects, tools, or processes is dependent on communication networks in communities. It is often that these communities need to share information among typically competing parties. Early studies on innovation located 3 places where invention happens: (1) non-profit institutions, (2) profit-seeking organizations, and (3) individual inventors. A study by Robert Allen in 1983 identified a fourth location, which is the collective of individuals and organizations. These collectives are identified by two features: (1) the sharing of potentially competitive information, and (2) individual nodes within a collective devote relatively few resources to the process of discovery of knowledge itself. This second point is critical because it focuses the productive nature of the collective on the flow of information within the community, rather than the actual intention of discovery. It expresses a possibility for creativity within the circus of free flowing ideas, experiences, and actions (Cowan & Jonard, 2001).

Collaboration in science between the Global North and Global South is replacing other models of building scientific capacity and addressing various divides (Hirosue, Kera, & Huang, 2015). Reasons for this include the expense of developing infrastructure for scientific capacity, and the lack of return on the part of the donor in providing aid in the form of scientific infrastructure (C. S. Wagner, I. Brahmakulam, B. Jackson, A. Wong, & T. Yoda, 2001). In Asia, science collaboration links are predominantly with United States' institutions. 40-49% of co-authorship links are between the United States and China, India, Pakistan, Hong Kong, Singapore, Indonesia, Thailand, and the Philippines. In the case of South Korea and Taiwan, they exhibit collaboration with other advanced countries rather than countries typically categorized into the Global South (C. S. Wagner, I. T. Brahmakulam, B. A. Jackson, A. Wong, & T. Yoda, 2001).

The internet has accelerated the way that people communicate, and changes the dynamics of information flow. For an individual to utilize knowledge floating in the world wide web, an extremely low amount of resources are put in compared to previous ways of accessing knowledge, such as through physical libraries and public archives. The internet is also critical in the dissemination of open source software,

which enables the manipulation of knowledge and productivity at scales previously unavailable to the individual user (Cowan & Jonard, 2001).

There are definitely barriers to entry for different kinds of collectives, whether it is an software group or an artists' group or a science group. Unlike formalized institutions, however, there are potentially lower barriers to entry centered on the capacity for contribution by a potential member of a collective or the willingness of a collective to provide resources for a potential member to increase her technical capacity in joining (Cowan & Jonard, 2001). International scientific collaboration between North and South is influenced by several factors. These factors include: (1) geographic proximity, (2) historical connection, (3) common language, (4) specific problems and issues, (5) economic factors, (6) expertise, and (7) infrastructure (Wagner et al., 2001).

In regards the participation of non-scientists, citizen science as a term can be a general term that represents the participation of non-scientists in research projects. However, a closer look at the body of literature utilizing "citizen scientists" actually shows that it is mostly a one-way channel of communication. In this scenario there is a discrete flow of information going from an institution of expert body dictating the mode of data collection to a larger body of non-expert participants (Newman, Graham, Crall, & Laituri, 2011). This specific, and popular term, contributes to the idea of the "deficit model of science communication," which assumes that the general public lacks the willingness or the knowledge to understand science as it pertains to their day to day lives (Byerlee & Fischer, 2002; Forero-Pineda, 2006; Kera, 2012; Perez & Soete, 1988). There is a push by some academics and scientists to recognize the role of non-scientists in the research process. In this mode of thinking, there needs to be new ways of attributing contributions to research, and the adoption of open access (Lakshminarayanan, 2007). Citizen science is just one mode of citizen-based approaches to science, of which Newman, et al has identified 14 different modes of collaborative work.

An interesting, and simple way to see the participation of individuals in any process is Arnstein's Ladder of Citizen Participation. The eight rungs of this ladder are: (1) Manipulation, (2) Therapy, (3) Informing, (4) Consultation, (5) Placation, (6) Partnership, (7) Delegated Power, and (8) Citizen Control. Rungs 1-2 are categorized

as non-participation, 3-5 as tokenism, and 6-7 as citizen power. The bottom rungs are non-participatory in the way that there is only one way flow of information and that the primary body gives up none of their power to other sources. The level of tokenism allows for a voice, but ultimately non-power holders have no final vote in the decision-making processes. The final three rungs listed as citizen power include more elements of actual power delegation and power sharing in decision making processes. This is a simplified model, which neglects the reality of the power nuances that different stakeholders can carry in a process, but it at least breaks down the possibilities that different individuals and groups can hold in a specific scenario (Arnstein, 2011).

2.5 Globalized Science

Science at its core is an exploration in attempt at understanding the world. This is something as timeless as human culture itself. The concept of exploration and discovery, including through science, is something cosmopolitan. It promotes the exchange of culture, ideas, and knowledge across borders. This research and literature review, however, will focus on science post-World War II with an eye for the influence of colonial science practices. Science became wrapped up in the power politics of international governance. This research will be taken in an environment considered to be wary of competing knowledge structures; where every 'other' idea needs to be categorized in contrast to the dominant mode of knowledge production (S. Visvanathan, 2006). Throughout the 20th century, more international knowledge institutions were invested in and created by global powers, including the United States (Vessuri, 1994). Colonial science was structurally biased against local people, and this is evident in the way that education systems were developed. Colonial powers all had different foci regarding the development of science in their colonies. For the purposes of this research, the Dutch in Indonesia focused on academic, administrative, and commercial interests and the basis for science practice. This negative bias, specifically in Indonesia, is evident in the education provided for citizens trained for the bureaucracy, where research training was a minor part of the overall science education. The case of science in the post-colonial period regarding the Global South

also adds insult to injury. Well-trained scientists from the South largely contribute to the development of the North, rather than the science communities of their home countries (Vessuri, 1994).

Post-colonial science and education was disadvantaged by a number of factors, which prevented nations from truly breaking away from the bounds of colonial science and education. These factors include (1) high cost of development, including access to hardware and equipment, (2) massive increase in rates of educational enrollment, (3) lack of human resources trained in science, (4) poor instruction quality, and (5) privatization of higher education, including over 50% of private enrollment in Indonesia (De la Vega & Vessuri, 2008). In this system, development arises to assist these deficits. Science is posed as a solution, one that is both objective and effective. However, it still struggles to grasp the plurality of knowledge in local contexts (Shiv Visvanathan, 2005). This deficit is perhaps also seen as a kind of “epistemic violence” (Spivak, 1998), which contributes to the constant hierarchy of research and development in the global system. It is the lack of recognition of knowledge plurality that also prevents people from understanding or remembering the transboundary and transcultural flows of knowledge and information pre-colonial era.

Science in Asia is receiving more recognition these days, but much of the literature concentrates on the existing system within academia which focuses on the number of publications that Asian institutions have been producing in recent years (Holmgren & Schnitzer, 2004; Posadas, 1999). This does nothing but reinforce the rat race that academia has become without acknowledging the structure of “catching up” that has been set in place. This is even in regards to countries that have achieved “developed” or North, status (Hwang, 2008).

2.6 Gaps in Knowledge

2.6.1 Knowledge of Open Science Efforts

The first gap in research that has been identified in this literature review is the lack of knowledge regarding open science in Asia. Overall, the body of research has seen a lack of literature regarding open science in general, although there are beginnings of defining what open science means. However, as with most new definitions around science, there is the distinct possibility for this term to be solidified without representation from the Global South. There are many factors for this,

including language, context, lack of prestige, etc. The potential for contribution to the body of knowledge on open science globally is limitless in Asia due to the huge divergence in cultures, economic environments, geographies, governments, and more. Existing work that has been done shows the diversity of these achievements already (Hirose et al., 2015; Kao, 2014; Kera, 2012).

2.6.2 Contribution of Open Science for Development

More specifically, however, is the potential for development impacts as a result of increased community exploration and innovation through contact and participation in the characterization of open science globally. This is a major divide in the recognition of science, and even citizen-based science, in the Global North and Global South. Where existing international development programs have tried and failed for decades to improve living conditions and to prove widespread positive impacts, citizen-based organizations and efforts have the potential for true citizen participation in local and community development. It is yet unknown whether these spaces have already made impacts. This is all the more reason for developing research that not only looks more closely at the efforts of community activities related to science and R&D in the Global south, but also to continue supporting these efforts.

2.6.3 Organization of Open Science Communities

A gap that has been identified by Heeks, however, is the lack of analysis on the description and experience-based outputs of new innovation models at the grassroots level. The need is identified for more analysis of new models that will allow for greater “critical mass of understanding” and for the potential of more policy influence. This inclusivity has also been identified as a critical factor in ensuring the success of the post-2015 Sustainable Development Goals being developed by the United Nations (Heeks et al., 2014).

Also integral to the downstream impacts of the characterizing open science in a local context, is understanding the way that people organize, collaborate, and motivate each other within the community. There has been little to no prior research regarding the organization of individuals within these communities, much less within Asia. Taking a Social Network Theory lens, this research will also contribute to a general lack of consensus among social network theorists regarding the central pillars

of the Theory (Friedkin, 2004). Community activities and practices related to science and R&D, as a phenomenon with a large number of sub-cultures, motivations, and associations, present a unique opportunity for investigating the reasons for why such a breadth of people choose to associate with each other. Insight from other communities associated with different tinkering movements will be useful for the data collection of organization within this specific context. However, while there are a number of parallels between other tinkering movements, this research recognizes the unique context of practices around science in Yogyakarta, Indonesia, and participants' contribution to the overall body of work without the need to ascribe to a specific and potentially limiting external discourse.

CHAPTER III

HISTORY OF THE HOUSE OF NATURAL FIBER FOUNDATION

3.1 Introduction

This chapter details the growth and development of the House of Natural Fiber within the context of Yogyakarta, Indonesia from 1999 onwards. It addresses the research question of: **How has the House of Natural Fiber Foundation developed its program of open science?** This chapter is divided into four sections: (1) Context of Yogyakarta, (2) The Early Years of HONF (1999-2003), (3) The Middle Years of HONF (2004-2010), and (4) The Contemporary Period (2011-Present). The chapter begins with a description of Yogyakarta highlighting the pieces that have contributed to the unique and diverse environment that has allowed for open science practices to develop as HONF grew over the years. Each of the sections following the first will talk about a different major period in the growth and development of HONF as an organization from 1999 until the present. They highlight not only the growth of HONF and detail key events, but serve to characterize the development of open science efforts over the years of HONF's history.

3.2 Yogyakarta Context

The distinct history and culture of Yogyakarta and its surrounding areas contribute to the development of its contemporary culture that blends diverse local, national, and international influences within a unique administrative division of Indonesia. Following the Indonesian National Revolution that resulted in the Republic of Indonesia, and in recognition of its support during the Revolution, the Special Region of Yogyakarta was formed. During the Revolution, Yogyakarta was the capital of the Indonesian Republic from 1946 to 1948. This region is the country's only administrative division headed by a monarchy. It is formed from the Yogyakarta Sultanate and the Pakualaman Principality, which both pre-date the colonial era in Indonesia. In this administrative capacity, the sultan acts as the governor of Yogyakarta and the Prince of Pakualaman as the vice-governor.

Administratively, the mix of a hereditary monarchy with a national government system produces unique scenarios. In day to day life, the Sultanate takes a personal role, and family-related conflicts often delay administrative formalities required of the Sultan from being completed (Jakarta Post, 2015). The presence of the Sultan and his family, however, is integral to the development of arts and culture in Yogyakarta, both in preserving Javanese tradition and in fostering new areas of expression.

Patronage by the royal families of Yogyakarta is a key factor in the development of the arts and its prominence in the region and country. Patronage by both the Yogyakarta Sultanate and the Pakualaman Principality date back as far as the 18th century with the founding of the Sultanate with patronage in performance of song and dance (Arps, 2005). Evidence of literature patronage by the Pakualaman has been seen since the 19th century (Pigeaud, 2012). The 19th century also saw the beginnings of patronage in the visual arts with influences by European styles (Ricklefs, 2008). Diversity of patronage through a variety of arts continues to the present day, and has contributed not only to the development of traditional or *kraton*-based practice, but also that of contemporary and alternative arts, including new media and open science practice. The act of patronage has persisted, even as other forms of practice, including

formal arts education, such as through the Institute of Indonesian Arts in Yogyakarta, have been established alongside other institutions of higher and formalized education.

Yogyakarta, in addition to being an arts and cultural center, is highly regarded as a center of education in Indonesia. Hosting Universitas Gadjah Mada (UGM), Indonesia's top public university, among dozens of other prominent public and private institutions, Yogyakarta attracts young people from all around Indonesia to study. The diversity of Yogyakarta, due to its historic prominence and significance as a cultural, educational, and tourist center contributes to a practicing and learning environment unlike many other places in Indonesia. This diversity and prominence enables great potential for collaboration and interaction between wide varieties of people simply by bringing them together within a single geographic region.

These connections are further fostered by the public-service oriented nature of universities in Indonesia. One example of such community-focused efforts was pioneered by UGM, whereby undergraduate students, in order to graduate, must complete a term-long residential rural community service project. This program is now known as the Student Community Service - Community Empowerment Program (KKN-PPM) (UGM, 2015). It was adopted by other universities in Yogyakarta and elsewhere. Programs like these give students a shared experience in a coming-of-age period of life. These universities and institutions of learning, embedded within one of Indonesia's major centers of culture, is an environment that also represents the blending of the roles of arts, education, and culture in national development.

Culture is tightly integrated with Indonesia's education system and institutionalized in the Ministry of Education and Culture (Arps, 2005). The combination of education and culture, further manifesting itself in the national motto of "*Bhinneka Tunggal Ika*" or "Unity in Diversity," tightly focused on the development of a national Indonesian identity in the development state era post-decolonization. This tight integration of culture and education in Indonesia may contribute to differences between Global North universities and the contemporary iterations of tertiary research institutions established in the colonial era or post-colonial Northern-inspired institutions. KKN-PPM at UGM is an example of these differences, where the public service nature of a public university has managed to be developed and maintained despite increasingly influential private and corporate forces

that affect academic institutions worldwide. Specifically, in Yogyakarta, this research highlights a mode of collaboration that seems to occur organically and with a sense of purpose that reaches beyond the network alone. The way that people learn and work together in this setting crosses the lines between institutional and informal. It has created an environment for new ways of seeing, doing, and understanding. This is especially interesting in the area of science because of both the context and the time in history which open science efforts are emerging on a broader scale.

This context and history is a huge part of what enabled HONF to progress in the way that it did from art to contemporary explorations in a variety of formats and knowledge production processes.

3.3 The Early Years (1999-2003): Seizing Opportunity in Every Idea

The first five years of the House of Natural Fiber were characterized by organic self-supported collaborations between friends and family. The initial group consisted of just six individuals. Activities were driven by curiosity into different ways of presenting personal projects and events through creative collaborations that merged individual skills and interests to support each others' pursuits. These years of HONF was a period of learning through informal workshops and gatherings punctuated by events, shows, and exhibitions that showcased the development of these new skills. The connections made in these early years through this events were also some of the longest lasting collaborators in the 15+ year history of HONF. In the last two years of this period, a greater sense of organization emerged as the original group of friends and collaborators began working around the concepts of new media art. At this time, with the flexibility of the new media concept, early explorations of analog and digital electronics became more structured as the group launched a research and laboratory program that would become central to their practice.

Emerging from civil crises throughout the nation following the Asian Financial Crisis, the House of Natural Fiber began as a group of friends looking for a way to express their creativity through collaborative efforts. In 1999, three friends, Irene, Venzha, and Tommy, began gathering at a home in Yogyakarta, Indonesia. Recent graduates of art school with different interests, they worked together to

support each other in their individual endeavors in visual arts, graphic design, music, and writing.

The group grew, and friends came together with no particular goal except to find “how to make many ideas become together, just as simple as that” (Venzha Christ 10 June 2015). The organic nature in which this group formed and developed could best be described by a simple phrase in Bahasa Indonesia that often resurfaced in discussion throughout the period of research. This phrase is *Gotong Royong*. This literally means “working together,” but as is common with words in Bahasa Indonesia, there are many different meanings depending on the place, the people, the time, and the history around its use in a given moment. In one moment, *Gotong Royong*, may mean simply “hanging out,” while in another could be “the joint sharing of burdens together with trusted friends.” It is a term that is easy to speak, but with a depth that ultimately shows trust between individuals in a space that can foster greater relationships or intense productivity.

Irene, Venzha, and Tommy would form the driving force for new media art, and later, research and development in what can be considered the first open science efforts in Yogyakarta and also Indonesia as a whole. It was the researcher’s understanding that Venzha was already the most prominent of the three founders at the start, but he stated otherwise that,

“Not yet, not yet at all because even in the art map is not... my name is not appeared yet. So just make small small thing and then, some of my seniors, some of them sometimes asking me to follow or just to contribute small things, and also invite me to the discussion or just to get me into the contemporary art scene. In that moment I never read about new media things in Indonesia. So I just every night can start doing something related not only in the contemporary art scene, but something else, but I don’t know what exactly something else, so I just start with what I can do, which are music things” (Venzha Christ 10 June 2015).

The early years consisted largely of individual projects that were supported by friends through supplementary collaborations. This is perhaps best illustrated through Venzha's description of their early collaborative work. In this response, Venzha explains how a request for a collaborative effort in the early years occurred.

"I ask him, for example, 'Tommy, can you make some visualization with that [music things] visualization software or that VJ⁸ stuff that you've already done?'...Ira also, 'Ira, can you also do like a small performance with the fashion things?'" (Venzha Christ 10 June 2015).

to both of which Venzha responds matter of factly, "Ah, okay, so this is good" (Venzha Christ 10 June 2015). This explanation highlights the casual nature of their interactions. It was not uncommon for the researcher to be surprised by how simply and spontaneously collaborations came about in relatively large-scale and time-intensive projects, such as the mixed media interactive exhibitions that HONF has produced since its first days. This type of collaboration continued throughout the early years. The first exhibition under the name Natural Fiber was in Solo, a city near Yogyakarta, in 1999 at Padepokan Lemah Putih, an "interdisciplinary arts institution" whose mission is

"to creatively and critically engage with traditional and contemporary ideas and arts practice with a local, national and international focus; to encourage experimental, innovative and high qualified works; to support artists at all stages of their career and across art forms by providing space and opportunities to present; to support non-academic arts education through professional workshops, open lectures and study club; to regard the development of arts and relate it with cultural, environmental and humanity issues" (lemahputih.com, 2015).

One of the first exhibitions independently organized and promoted, recognized by Irene as one of the group's early major collaborations, was the opening of her solo project in 2000, "Pulp Philosophy Performance," which combined the efforts of Irene with 5 other individuals with skills ranging from music, computer programming,

⁸ video jockey

photography, and visual art. These 6 individuals formed the core of the House of Natural Fiber in its early years.

When asked to define themselves and the way that they work and collaborate, their extended responses paint a broad picture that, in the end, explains everything that they do, yet also draws no lines or boundaries around their work, personality, motivation, or dreams. When posed with the question, “What did you expect HONF to be?” The response by Irene was, “Yeah we expected to be like a group, doing like unlimited things” (Irene Agrivine 10 June 2015). This was a response that was echoed by the other leaders of HONF and by participants who were active during various years of the organization.

This response, while unified in its broad individual understandings of collaborative efforts, didn’t reveal the diversity of individual interests, skills, and experiences unless one dives deeper into the history of each individual involved in this network and how they affected the network through their actions producing events and projects that brought together more people and events.

In 2000, the members of the House of Natural Fiber began working with a local organization called Yakkum, a rehabilitation center for disabled people. HONF began their work with Yakkum as a facilitator of workshops and enrichment activities for children hosted by the center. These activities were designed to allow the children to think more creatively about the world around them, and drew upon all the skills of the members at the time. The activities manifested themselves in the form of weeklong workshops throughout 2000 and 2001 ranging in topics including music, electronics, photography, drama and theater, textiles, painting, crafts and origami, upcycling, and music composition and production, and computer animation. In 2001, the children were able to present their skills at an exhibition organized with HONF at a professional gallery in Yogyakarta. This event featured work by both the children and members of HONF, and explored themes of disability and perceptions of reality through projects that explored the intersection of electronics and computers with interactive physical space. As both participants and facilitators, this was also an important time of learning for the members of HONF in both particular skills and to gain confidence as emerging leaders in their fields. The relationship between HONF

and Yakkum continued to grow through active collaborative efforts over the next nine years and they continue to enjoy a strong relationship in 2015.

2002 saw HONF's first major collaboration with an international group, Club Automatique, from Berlin. It was during this collaboration that the ideas of "new media" were introduced to the members of HONF. This was a major international influence on the work and external identity of HONF in the years to come. The event was a prototype of the events to follow, and consisted of a two week workshop run by a large group of artists from France, which concluded in a 36-hour party that included art, food, drink, and emphasized interactivity with the environment and place. It was noted that "They [Club Automatique] are the one who taught us how to work as a team as new media artists. Club Automatique was chef, artists, scientists. They are the avant garde of new media in Europe" (Venzha Christ 10 June 2015). Many of the collaborators in organizing this event went on to become prominent musicians and artists and continued collaborators of HONF throughout the years following.

Coming out of the workshop with Club Automatique, Irene launched a newsletter in 2002, which would later become a local sub-culture magazine, titled 10:05, which focused on nightlife after 10pm in Yogyakarta. It was free, and become popular, as it covered topics that more were underground, including parties and the electronic music scene. It was through collaborative efforts around the writing of this publication that key individuals became involved with HONF, and would later form a separate organization focused on open science known as Lifepatch. At the end of 2002, a series of audio-visual performances in collaboration with Energy Room, a local community of DJs, was conducted. Electronic music, as a result of the Club Automatique collaboration would also become a central pillar of HONF's activities in the years to come.

Halfway through 2003, the House of Natural Fiber self-identified itself as a group, something more formal than its original iteration, but still not institutionalized or constrained by space. Eight individuals became founding members of this group, including the original three, Irene, Tommy, and Venzha. With the establishment as a group, HONF launched its first formal programming into "Laboratory Works and Technology Research" and organized their first event, "Electroponic Analog," which was a multimedia performance. The group's understanding of laboratory is as follows,

“Laboratory means a laboratory space: laboratory as a physical space and laboratory as conceptual space. Laboratory as a physical space is assumed to be research and experiments in a specific room, intended for accuracy, and the achievement of set goals. This constitutes Laboratory Research for our group. We carry out work for data and research for and from the general community, obtaining certain results. The room can also be abstract, ‘built’ around the people themselves. Here, we see the laboratory as an environment” (natural-fiber.com, 2015).

This was the precursor to the next iteration of HONF just one year later.

Open science efforts in Indonesia have humble beginnings. Open science as a distinct concept cannot really be found in the early years of HONF. The organic growth in curiosity surrounding topics that were more technology-based and required more systematic research and development of media that could be utilized in artistic pieces, however, was critical in opening a gateway to more experimentation of various media. The collaborative efforts in the early years also set up the foundations for long-lasting partnerships. The free-form collaboration, one where each individual’s skills are adapted to the project with an open mind and effort, kept the doors open for a diverse range of projects. This kind of collaboration set the foundation for opening the doors to greater scientific efforts on the part of HONF through its collaborations with a wider range of people, professions, and skillsets.

3.4 The Middle Years (2004-2010): Emergence of a Collaborative Cosmopolitan Network

The next eight years of the House of Natural Fiber were characterized by an immense amount of change, growth, and maturation in event and exhibition programming. With the launch of HONF’s research and development efforts in 2003, the time was right for re-organization. The establishment of a more formal group allowed the members and participants of HONF to enjoy greater recognition under their brand. Their work was recognized in both its creative nature and in the way that they worked with other people, institutions, and organizations. While the first few years after 2004 mostly included greater experimentation in electronics, including a

large emphasis on analog devices, forays into chemical and biological sciences began in 2004. These forays began in tandem with the launch of the Education Focus Program (EFP), which would form the foundation for translating their research work into activities for dissemination to a larger audience. This period was also characterized by expansion into international and institutional collaboration with a greater number of European civil society organizations and local academic and civil society organizations. Both groups had profound influence on the direction of the group in terms of organizational capacity and skill acquisition, which in turn influenced HONF's movement towards more scientific efforts.



Figure 1 House of Natural Fiber (2004-2010), v.u.f.o.c. and artists' residence (2011-2015)

In early 2004, the House of Natural Fiber officially became a New Media Laboratory. This event was marked by the understanding that “I think this changed the behavior, we were no longer performers because all we did before was like a performance. I think that’s when we also started calling ourselves a hackerspace, but that time I think hackerspace was not really popular” (Irene Agrivine 20 April 2015). New media is “21st Century catchall term used to define all that is related to the internet and the interplay between technology, images and sound. In fact, the definition of new media changes daily, and will continue to do so. New media evolves and morphs continuously. What it will be tomorrow is virtually unpredictable” (New Media Institute, 2015) or alternately “a broad term in media studies that emerged in

the latter part of the 20th century. For example, new media holds out a possibility of on-demand access to content anytime, anywhere, on any digital device, as well as interactive user feedback, creative participation and community formation around the media content. Another important promise of new media is the "democratization" of the creation, publishing, distribution and consumption of media content" (Wikipedia, 25 June 2015). By forming around the idea of a new media *laboratory*, HONF set itself up to enable the use of a wide variety of techniques, skills, and media in its work. This also means that as a principle, a wide of people could not only access, but participate in their work, which sets the stage for the including the breadth of people that call Yogyakarta home. This includes the diversity of students, artisans, locals, and even tourists from around Indonesia and the world. As HONF's prominence grew in this openness, the Sultan recognizes HONF's work as a positive point of influence in the city and beyond. This support continues to help facilitate HONF's efforts locally and internationally today.



Figure 2 Posters of various events throughout the years

It was also around early 2004 that the members of HONF changed twofold: (1) the departure of several members of the original group, and (2) the beginnings of hanging out with Venzha's brother and his group of friends all of whom were doctors. In the casual nature of their interactions came the idea for drawing upon the design and art skills of HONF to help visualize the doctor's research in new ways. This was

the first major collaboration where the members of HONF formally worked with (Northern) science as part of their work. Working on science communication and visualization piqued the interest of the members of HONF, and they volunteered to do more projects. It was a way, working through medical science in order to present it differently, to learn about science without necessarily engaging in the actual act of research or conducting laboratory research. The enthusiasms of this collaboration on the part of HONF lead to increased efforts on both sides to engage deeper. It was seen as a challenge by the doctors and the members of HONF to bridge the space between academia and art.

2004 was rounded out by several events including collaboration with the UGM Department of Physics called “Hey! ma ROBOT will find you!,” which focused on creating utility robots based on light sensors that could theoretically respond to and prevent household fires from escalating.” TheWGHTVKSCLPYTDHBCNXH Sound Project featured a number of recurring collaborators from Energy Room and the newly re-worked 10:05 Magazine, which at that point ceased to exist in newsletter form. Most significantly, however, was Bluepoproject, HONF’s first international exhibition, taking place in Singapore and at the National Gallery of Malaysia, and included workshops about interactivity with space and environment and culminated in a series of mythology-based interactive audiovisual performances. A chance meeting with a participant in Singapore in 2004 led to the introduction of the European model for New Media Laboratories, especially in Berlin and Amsterdam, and the inviting of HONF to Transmediale in 2005, the foremost New Media Arts conference in the world. Participation in the Transmediale conference would cement the international connections and collaborations that would lead to the establishment of HONF as a leading consumer-level fabrication facility in later years.

2004 and 2005 represented major years of reorganization and renewed focus in the efforts of HONF. In addition to the establishment of HONF as a New Media Art Laboratory in 2004, 2005 saw the identification of the “Goggle 5,” Irene, Tommy, Venzha, Togar, and Andreas, naming themselves after the Japanese Power Rangers. These five individuals drove the direction of HONF’s activities from 2005 to 2011, where Togar and Venzha oversaw science programming, Andreas and Irene focused

on community development, and Tommy focused on open-source, software, and hardware. With increased activity and organization, there was also an increased demand for financial sustainability. HONF established an advertising business in 2005 to address these concerns.

2004 saw new major program developments as the House of Natural Fiber moved to establish its role in the community as an open space for creative works. This program came to be known as the Education Focus Program (EFP), and forms the foundation of HONF's efforts today. From the EFP formed three main pillars, including Cellsbutton, a series of science-based international media art festivals; the Yogyakarta International Videowork Festival (YIVF) series; and the HONF Open Community, which encompasses the breadth of collaborators for all of HONFs pursuits. Starting in 2005, YIVF became a platform for showcasing not only the work of HONF, but of the communities that they brought together and of the community that they were creating. YIVF lasted until 2012, and then was folded into Cellsbutton thereafter beginning with Cellsbutton 7 in 2013.



Figure 3 Poster of Yogyakarta International Videoworks Festival #3

Separately from these three pillars, however, were other series of events and projects that proved resilient throughout the years of HONF after 2004 known as Intelligent Bacteria, cellsKIT, cellsKID, VJ school⁹, and breakcore_LABS¹⁰.

⁹ A set of curricula and workshops focused on visual jockey culture, techniques, and tools

Intelligent Bacteria focused more intensely into scientific principles and processes in order to learn and utilize throughout other projects. A common theme that emerged is the use of scientific processes for aesthetically focused projects that critique and promote discussion around problems in the community or country. The first Intelligent Bacteria projects in 2004-2005 focused on polymerase chain reaction workshops for bacterial analysis. Themes for Intelligent Bacteria changed annually, with 2006 focusing on heavy metal contamination of local water sources, 2007 on nitrogen fixation bacteria for agricultural purposes, 2008 on fractal systems of microorganism communication, and 2010 on utilizing wild strains of *Saccharomyces cerevisiae* for do-it-yourself (DIY) wine fermentation. Significantly, in 2009, they began building DIY microscopes, where the initial purpose was for counting blood cells. Principal collaborators throughout these Intelligent Bacteria events were different departments at UGM, including the Department of Biotechnology, Microbiology, and Otolaryngology. The explorations of science through Intelligent Bacteria heavily influenced the exhibition and event content of HONF over the next few years. These activities fed into the cellsKIT series focused on “the practice of creating, "hacking", to re-design, and to share ideas, tools, and also useful tools for daily activities [sic], art, and even the development of technology itself, whether it be hardware or software” (natural-fiber.org, 2015), as well as the CellsKID program, which was a series of workshops for children focused on hands-on learning related to technology and art. There was a proliferation of events and workshops, in Malaysia, Indonesia, and Singapore with biological and medical science, and electronics and robotics themes. HONF’s increased activities locally and internationally also led to a greater prominence in wider regions and networks.

2007 signaled an increase in international collaborative efforts through both local events and international travel on the part of HONF members. This was the year that another of HONF’s flagship annual events launched: Cellsbutton. This event brought greater international recognition and traffic to Yogyakarta resulting in longer term relationships and further collaborations down the road in the sciences. Like HONF’s workshops, which seem to always come together at the last minute,

¹⁰ An open platform for experimental electronic audiovisual art performances

Cellbutton represented the melting pot nature of the collective interests of the participants who attended.

Beginning in 2008, the House of Natural Fiber's activity internationally, especially in European New Media Art networks, increased exponentially. Previous local collaborations with Japanese participants led to artist residencies by members of HONF in Japan and attendance at festivals in Hong Kong, Singapore, and Taiwan. In 2009, the core leadership of HONF went on a nine country trip throughout Europe on an Asia-Europe Foundation grant conducting workshops, performances, discussions, and cultural exchanges. Out of their stop in Amsterdam at the FabLab Amsterdam came solid discussions on the establishment of a fabrication lab (FabLab) in Yogyakarta.

Those discussions continued for the next two years as HONF continued to mature in their work and events. Their activities regarding Intelligent Bacteria and *S. Cerivisae* was probably the most significant action and critique on current events by HONF that used scientific processes and collaborations. Around 2010, the Government of Indonesia created new policies that made it substantially more difficult to purchase liquor and alcoholic beverages for a significant amount of the population. In response, local homebrewing and distilling activity increased. Following a number of deaths in and around Yogyakarta due to methanol poisoning as a result of improper technique and lack of education around safe fermentation, HONF moved forward in their research on creating and teaching methods around safe fermentation in collaboration with the Department of Microbiology at UGM. Through their collaboration they were able to isolate local strains of yeast, develop safe brewing and fermentation processes, and conduct workshops locally to educate the community. Today, the original participants of this project have been able to take it a step further and created a dry yeast packet from the original that is able to produce up to 12% alcohol by volume fruit-based drinks. While this pursuit may seem quite trivial in the overall pursuit of development, it was representative of addressing a local need and desire, and it was done so through local capacity, education, and in the context of the problem itself. This example was only the beginning of the pursuit of doing research to collect data, experimenting with the processes to find potential solutions, and engaging with the public to build community.

These years, from 2004-2010, represented a huge step forward in the maturation of programming by HONF and in the confidence, recognition, and motivation of the members of the organization. They did things that had never been done before in Indonesia, and influenced everyone they worked with, taught, or interacted with both locally and internationally. Science, beginning with pursuits related to electronics, began developing into more biological and chemical science efforts in this period as a result of new collaborations. The reorganization as a laboratory and experimental space empowered their ability to create new pieces in a space that promoted a wide variety of mediums for expression. New media allowed HONF to pursue greater efforts in open science because of this freedom from specific media or technique. It allowed them to pursue collaborations that would otherwise be restricted by technique or skill in a traditional space. The EFP also ensured that their work would be shared among a greater body beyond the network around HONF. In the later years, as they began responding to the needs of specific problems, for example deeper collaboration UGM Microbiology to address homebrewing safety, the stage was set for more intentional action in addressing societal problems. The body of work created during this period would further inform their efforts in the Contemporary Period, which sees the movement towards creating distinct pieces of work that are no longer purely critique or aesthetic, but objects and processes that could become useable products and solutions.

3.5 The Contemporary Period (2011- Present): Maturation and Moving Forward

The contemporary period of the House of Natural Fiber is marked by the formalization of the organization as a legal entity that meant that it enjoyed the privileges that came along with operating formal programs and services, but also the responsibility of maintaining an organizational structure and culture that could withstand this legal basis. This meant that principles needed to be established that maintained the integrity of the organization and attribution of its work while also promoting openness and access for the greater public. This is especially true in the face of greater prominence and prestige on the national and international stage. It was also during this period that HONF has significant voice to make a stand internationally on its identity and the way that it is portrayed externally. This is a

point that had not been particularly addressed by HONF leadership in the years prior. As terms such as hacker, maker, DIYBio, biohacker, and other terms related to DIY and Maker Culture have come into mainstream use by communities, organizations, and institutions in places such as the United States, Europe, and other highly industrialized countries in Asia (Singapore, Taiwan, Japan, etc), there is a need for HONF to take a stand on how its work influences these terms on the global stage.



Figure 4 Current (2015) site of the House of Natural Fiber housing the HONF Foundation, the HONFablab, HONF FabCafe, and XXLab

In 2011, HONF formally became the House of Natural Fiber *Foundation*. For the first time in its 12 year history, HONF was a legally recognized organization in Indonesia; this was a blip, a mere formality, compared to its body of work over the years, but was a concrete step in its capability to function at greater scale moving forward. This registration as a legal organization was part of a series of actions taken in step with the WAAG Foundation of The Netherlands in order to create the HONFabLab with funding from the Netherlands' Ministry of Economic Affairs to purchase the tools and machines to create a fully functioning facility. This physical space, equipped with state of the art fabrication tools accompanied the launch of two new programs in 2011. HONFaktori and v.u.f.o.c. v.u.f.o.c. was HONF's first foray into astronomy and was composed as a mobile laboratory built inside a classic Volkswagen bus. HONF's first major project utilizing their new facilities was a prostheses prototyping project in collaboration with The WAAG Foundation and

Yakkum, and was originally designed under the HONFaktori program, but this program later was folded into the overall HONFabLab. The goal of the project was to create a locally-made set of prostheses for less than 50 USA dollars. The project produced a number of prototypes throughout the life of the project. Like most other projects up until 2014, however, this remained a pilot project, the documentation of which would be retained mostly in archives and in the experiences of participants.



Figure 5 The HONF FabCafe and HONFabLab

In 2011 and 2012 there was significant international collaboration, recognition, and activity. During this time, HONF co-organized the first Asia-Pacific DIYBio and Bioart Meeting entitled “Democratising the Laboratory.” It was during this meeting that this burgeoning community of practice gathered “to probe the territory between public, private and lab spaces and discuss various forms of biohacking, biopunk, bioart and molecular gastronomy” and to ask the questions How relevant are these citizen science practices for innovation and how can they support local communities? What are some new design and art ideas related to biotechnologies? How can we involve critical design practices in bioethics discussions? How can these probes and experiments enable local communities?” (Kera, HONF, 2011). After this, the Intelligent Bacteria *S. cerevisiae* project took the the road internationally and was featured in presentations, workshops, and exhibitions in Cologne, Rotterdam, Ljubljana, New York, Moscow and Nantes. It was also around this time that HONF

began winning a number of international awards. It was around 2012, perhaps in combination with HONF's prominence internationally, that people and the media began associating HONF more closely with terms such as makers, biohackers, hackers, DIYBio-ers, and more. Greater press, the speed at which news is shared among interest networks, and an unwillingness to draw boundaries for the areas that they address meant that HONF was represented in the media by a wide variety of labels. This sentiment was understood by one of the leaders as the role of HONF in the international scene in the following statement,

“ I'm also confused sometimes, we are famous as artists, we are known as artists, sometimes we are known as makers, sometimes we are known as biohackers, so sometimes it's even confusing us because internationally they want us to be what they want actually, but they don't let us to [define ourselves.] They want to see us as their perspective, not us to be, I don't know, what we wanted to be. Because we don't know what we wanted to be, but they are just, 'so you are biohackers,' and I'm like, 'uhh, i'm not sure,' 'so you're designers,' 'I'm not sure,' but actually we don't want to be in this box. That's why we started HONF because we didn't want to be like in this box that we are artists or designers or scientists” (Irene Agrivine 10 June 2015).

It was something both fortunate and unfortunate. Fortunate in the sense that the introduction of the terms allowed HONF to think critically about the work that they had done and where it could go, but unfortunate in that their work was being folded and appropriated into existing and emerging ideas without their direct input into defining the way that the terms would grow and solidify.

It was around this time that rifts also began to emerge in Yogyakarta. The balance of these communities is often difficult to strike, especially when resources ranging from prestige and recognition, money, facilities, and time are at stake. It may not take much to disrupt existing arrangements in informal organizations. Despite the formalization of HONF around this time, perhaps there were still working modes that reflected the previous years. Internal conflicts around this time resulted in a split of the core leadership at HONF resulting in the creation of a new, independent organization known as Lifepatch forging its own, however related, creative and

innovative path. From these conflicts, however, new beginnings also happened at the House of Natural Fiber Foundation. The remaining leaders after the split of HONF, the original three from 1999, all found new space for reorganization, growth, and responsibility moving forward.

This conflict and the resulting split at HONF highlights a less talked about aspect of these open communities. These communities, spaces, groups, and networks around open science, and the greater phenomena of Maker Culture¹¹, around the world, are often represented in the media, within public circles, and often by the participants themselves in an ideal way. They promote the ideals of openness, community, and sharing, but in practice, these ideals are often difficult to achieve given the variety of contexts that these networks can exist within.

2012 in many ways was a renaissance for existing programs and core members of HONF. The growth of the DIYBio movement internationally influenced their participation in international events. A greater focus on democratizing knowledge through dissemination projects and events found its voice in HONF's programs. Documentation, however, suffered after the split with the other leaders, and was left in a less than pristine protocol. It would be another three years before a clear focus on documentation took hold again. 2013 represented the rise of HONF's core leadership again in the international scene in a series of major collaborations in Asia and the Europe. In 2013, the HONF Foundation also launched XXLab, an all-women's open science community and lab. This group immediately began merging the interests of the six founding members in business, fashion and textiles, fermentation, electronics, and sustainability. Over the next two years, their activities would innovate upon some of HONF's previous work and drive it towards creating products and solutions that HONF had never done before.

If the middle years of HONF's growth were the years that it grew its programs and explored, 2014 was a year of real maturity on the part of HONF in terms of understanding HONF in its many forms, education, business, personal innovation, and facilitation. The concept of "Transformaking" emerged as a central idea this year. It is

¹¹ "Primarily the name given to the increasing number of people employing do-it-yourself (DIY) and do-it-with-others (DIWO) techniques and processes to develop unique technology product" (technopedia.com).

driving the HONF Foundation forward from the largely aesthetic and process-focused projects of the past, and towards creating solutions and communicating processes in ways that can be used by the community at large, especially using open science. It also represents the manifestation of the drive towards making their voice heard in defining emerging movements and terminology, such as maker, hacker, DIYBio, etc, internationally. In mid-2014, a mini-Transforming event, known as [proto:type]2014 was held in order to prototype the larger Transforming Summit in 2015; Cellsbutton #08 was formally folded into this event, and similarly Cellsbutton #09 will be folded into the 2015 Transforming Summit. The folding of Cellsbutton into these events marks a major transition from largely art-based events into research and development-based events beginning in 2015. 2014 saw the development of the Jogja FabCafe, which opened in early 2015, and gave the FabLab more exposure to the public than ever. XXLab continued their work, and in early 2015 won the prestigious “Next Idea” Award from Ars Electronica, a highly regarded digital and electronic mixed media arts institute, for their work on developing a soy-based textile. The House of Natural Fiber Foundation, as it moves into 2015 and beyond, will see its next chapter beginning with the Transforming Summit. The Summit has outlined that it will enable participants to “self-reflect, debate and put forth views with regards to their respective practices and dissect various complexities and questions that surround the areas of Critical and Transformative Making,” feature “completed and contextualized projects and productions,” and “produce a tangible outcome, of the first International Summit, that focuses on collating diverse views, practices and usable tools along with strategizing modes of academic publication and dissemination for furthering meaningful local transformations, globally” (transforming.org, 23 July 2015). The tone of these statements is decidedly more direct and intentional than many previous statements regarding goals for individual events and projects. The Summit also includes the participation of XXLab and an internationally-funded, but locally led workshop dedicated to open source scientific laboratory hardware, which will create infrastructure for furthering open science efforts.



Figure 6 An exhibition piece, “Tree of Life,” by XXLab featuring their original fermented soy waste-based textile and previous moisture detection and watering hardware

It is an exciting time not only for the Foundation, but Indonesia, and the Global South. The Transforming Summit is the first conference of this kind, developed by individuals from the Global South, raised and educated in the Global South. From the early years of the House of Natural Fiber, where friends and family came together merely expecting to pass the time and put their skills to use, to developing an organization with education programs and collaborative projects around art, science, and research, a community of practice around open science blossomed in Yogyakarta and beyond. The nature of the organization’s beginnings was rooted in their openness in collaborative partnership, and the willingness to

collaborate in such a way. These are two subtle, but distinct points that touch upon both how people work together, and the way that they approach such collaboration. These two points, in combination with the diversity of the overall network have been identified by the researcher as key areas of interest in determining the significance of this community of practice in developing, promoting, and defining open science. The leaders of HONF were able to create this community of practice in a way that allowed the merging of disciplines and immersed people of a variety of professions in the process, and introducing many of them to science in the process. This community, in its entire composition of individuals, events, and projects encompasses a body of work that has the potential to redefine what it means to produce knowledge not only outside of an institution, but in the global south and beyond.



CHAPTER IV

COLLABORATION AND COMMUNITY

4.1 Introduction

This chapter explores the efforts around collaboration and community development within the network of the House of Natural Fiber Foundation. It seeks to

answer the research question: **How do actors collaborate around open science and R&D practices?** It looks at the attitudes, motivations, and organization around the concepts of collaboration and community development, as outlined by the second objective of the research. Collaboration is an integral theme that was explored throughout the course of the research period. The ways that people work together are varied in the Indonesian context, where, as one survey respondent put it, “if the community is alive, it’s always being updated and maintained for the structural integrity of the community. Not only becoming bigger, but also alteration of the generation in the community is also development” (FormA37, 9 June 2015). The understanding of how one works with others can vary depending on the time, project, and people involved. The outcomes of collaboration are also potentially a community. The notion of community development was not defined during the course of the research in order to assess the understanding of the term from their own experiences. This was done in order to see how people associate the word community with development. For the purpose of contrast, community development is defined by the United Nations as a “process where community members come together to take collective action and generate solution to common problems.” This chapter analyzes the data collected from various members of the HONF network that help to characterize collaboration and community development in this context.

To provide a broad view of collaboration and community development, individuals surveyed and interviewed were given significant flexibility to define their own backgrounds and professional interests. Their main uniting feature, which was used for sampling, was simply interaction with HONF as a participant or collaborator on an event, with a regular member of HONF, or on a specific project since HONF’s inception in 1999. Data was gathered regarding the ways that people collaborate, their perceptions and motivations to do so, and their views on community development, broadly defined.

4.2 Diversity in the Network

4.2.1 Introduction

From international interactions to local collaborations, the work of HONF has been characterized by the diversity of its work with others. In Indonesia alone, with its

3,000+ islands and the second most diverse country, linguistically, in the world, the breadth of diverse life experiences and ways of thinking is boundless. The survey distributed in this research was completed by 83 individuals whose active participation spread throughout the history of HONF from 1999 to June 23, 2015. The participants of the survey were introduced to the HONF network through interaction with 59 unique individuals, events, or projects/objects; this served as each individual's main prerequisite for participating in the survey.

4.2.2 Age

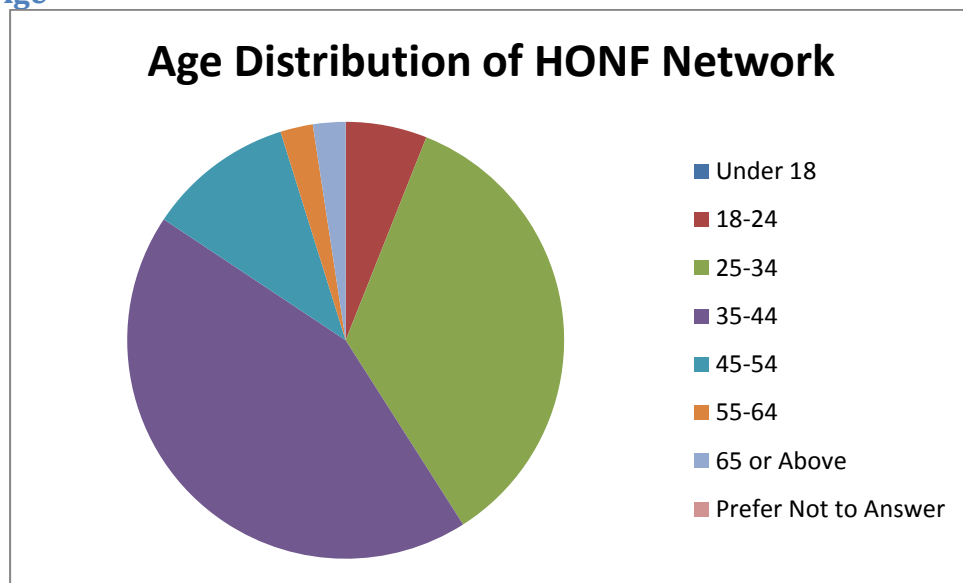


Figure 7 Demographics: Age

Survey respondents' ages ranged from 18 to 65 and above with a majority of respondents within the network in the 25-44 range. This range represents 78% of all respondents. Within this range, 25-34 and 35-44 represent 35% and 43%, respectively, out of the overall respondent pool. 11% were represented in the 45-54 range, 2% in the 55-64 range and the 65 and above range. Finally, 6% were in the 18-24 range.

4.2.3 Gender

Survey respondents were overwhelmingly male at almost a 2:1 ratio to women at 63% male and 33% female. 4% of respondents indicated a non-cisgender, and 1% preferred not to answer the question.

4.2.4 Ethnicity

This question was optional to fill out, but 59 individuals chose to report their ethnicity, and 17 ethnic backgrounds were self-identified by the survey participants. The largest group reported was Javanese, followed by white, and then individuals of mixed ethnic background.

4.2.5 Nationality

Among survey participants, 22 nations were represented. Approximately half (49%) were Indonesian. The second largest single group of respondents was citizens of the United States of America, with 7% of participants, followed by the Netherlands, composed of 6% of respondents. The next two largest groups, both at 5% were from Australia and France. By world region, 27% of respondents were from Europe, 9% from North America, 2% from South America, 4% from Oceania, and 52% from Asia. Significantly, however, only 3% of respondents were from Asian countries not including Indonesia.

4.2.6 Associated Institution and Professions

Out of the 83 survey participants, there were 61 institutions represented, including those who identified as independent. Institutional categories represented include, academic institutions, such as universities; arts and culture organizations; non-profit organizations, such as affiliates of bilateral aid donors; and other institutions related to professional trades, such as hospitals. This means that 22 individuals, the largest group represented, also identified as independent of affiliation. This is also important because it inserts a group of people who are unbound from typical constraints of an institutional job including a fixed work location, hours, and project. Professionally, survey respondents identified 67 different unique titles, including different classes of artist and indicating combinations of different professions to indicate the inability of many members of this network to fall under one area of expertise. Interesting self-identified professions include workshopologist, art hustler, puppeteer, fabcrew, space systems researcher, and biohacker among artists, lecturers, journalists, audiovisual engineers, and medical doctors. What is key about the mix between associated institutions, including those who identify as independent, and also the breadth of job titles and roles that one individual sees for him or herself, is that bringing these people together into one space creates random combinations of

perspectives, working styles, and ideas that would not otherwise happen with an organizations. This is reflected in a free response by a survey participating that states, “Through my exploration of contemporary musical instrument building techniques, such as engagement with materials, sonic potential, participatory engagement and performance, I seeks to expand the role of the musical instrument. It is here that I wish to highlight our symbiotic ontological relationship with sonic apparatus as a site where the human and the non-human meet. From this I see that all reality is a dance between object, action, communication and materiality. I strongly believe we all make and share our realities together and places like HONF allow this to happen” (FormB34, 15 June 2015).

4.2.7 Religion

Survey respondents were given the choice to select one of 11 options, including choices for “not-religious”, “spiritual/free-form”, and “other.” The most frequent response was “not-religious” representing 35% of all respondents. This was followed by Islam at 29%. 12% represented Christianity, split evenly between Protestants and Catholics. 12% identified as having a “spiritual/free-form” mode of religion. 6% identified as Buddhist, 1% a Jewish, 1% as Hindu, and 7% marked other for their responses.

4.2.8 Languages spoken

This area of the survey was broken into three parts. It asked survey participants to identify the first three languages that they have learned. For respondents, 45% had Bahasa Indonesia as their first language. The second largest group was English, at 21%. The third largest groups were Dutch and French at 6% each. 12 European languages, including French and Dutch, represented 28% of the respondents. This puts 51% of respondents speaking an Asian language as their first language, and 49% within the European family of languages. 16 languages in total are represented in this question, including three languages from Indonesia.

There are 15 total second languages reported, including 7 languages from Indonesia. 46% reported that English was their second language. This was followed by 18% reporting Javanese, and 11% reporting Bahasa Indonesia. No European language reached 5% or above as a second language. 41% represented an Asian language, and 54% represented a European family language including English. For European languages not including English, this number is 8%. 5% of respondents reported not knowing a second language.

Finally, there are 13 total third languages reported, including 3 languages from Indonesia. 34% reported English as their third language, 18% reported Bahasa Indonesia, and 11% reported Javanese. 33% of the languages represented are Asian languages. 54% are European family languages, and 13% reported that they do not identify as trilingual.

It is also important to note that in addition to specifically identifying the breadth of languages, it is equally important to acknowledge that there is a countless number of ways to communicate with people in one language depending on the context and subject. In the case of science discussions, this means creating a mode of communication that both preserves the nature of the topic while also making it accessible for larger audiences. This is highlighted in an example as follows,

“So recently we asked the mothers in the village to make cellulose seed, so we tried to explain in a scientific way at first because they have to know the specific and right things to do. It was very difficult in the beginning, but then we have to speak in their language after, so actually we don’t have it [way of speaking]. It is very silly if you heard from scientific part; it’s like very very so actually it goes, ‘you make the cellulose into crisp, you coloring the cellulose with the wood, and then you will get this crisps and then you have to oil it.’ It’s not scientific at all, but then that’s the word they understand. But they make it in the right way, better than us. The result is very good, better than us. I don’t know like, according to the language, linguistics way, so I think if you want to make citizen science, there is some terminology that, or a space with science, citizen then have to release [to change or remove]” (Irene Agrivine 10 June 2015).

4.3 Demographic Analysis

This data on demographics shows an amazing level of diversity among the network of HONF. While the sample size is small, it represents the possibility of much greater diversity, and offers insight into the directions that HONF has grown over the years. This is especially true in the breadth of institutions and professions represented among the survey respondents, and thus the network overall. The breadth of differences in interest and professional background among the network of HONF is critical to understanding the sustainability of the organization over the course of its history. This is reflected in the motivations that people have described for themselves because they were intertwined with the work that they do. They reflect individuals' vision for their work, for example "Being a full-time "artist", living and working in the same place, little or no difference between the private and the public" (FormB35, 18 June 2015) shows an individual's thoughts on the space that they occupy. Another example states, "I use puppets as a way to convey a message (usually in favour of change in this world towards more sustainability and more fairness, in line with human rights). I deliver training for educators on participatory education and Human Rights Education. So, contributing to a better world, is part of my motivation in what I do" (FormB27, 11 June 2015). One third example says "My creative endeavors (such as my art-based projects, informal research) often include the tenets of do-it-yourself Biology and a focus on non-human, human symbiosis. A motivation behind what I do is lesser about community development but in elucidating particular modes of empathy for a non-human being or other less highlighted figures and cultivating a certain kind of worldliness" (FormB18, 8 June 2015). These are three extremely different examples of the kinds of work that people within the HONF network do, but all state, in some form or fashion, that they are connected to the public through their private work and do so in a way that is meant to promote stronger ties between the individual and the larger community or within the larger community itself.

It may be, that the organic, almost lackadaisical, nature of the way that HONF has found, or stumbled upon, collaborators over the years is a key element in the sustainability of the overall organization. By spreading out its work across anyone who is open to working with the members of the organization, HONF has been able to

invest time and capacity-building, including learning, facilitating, and finances, through a variety of sources that are unrelated except in the desire to collaborate. Another important aspect is the linguistic diversity of the group. In terms of the way that people process and think, a breadth of languages can also represent a breadth of ways in thinking. In a world where English is the dominant language in academia, representation and creation of knowledge in other languages is an important step to recognize. The next step then, is to determine how people have worked together, and their understanding of how participants share their work between one another.

4.4 Motivations for Collaboration

The next section of the survey focused on the ways that people collaborate, and their motivations and attitudes towards working with others within their own work and within the network of the House of Natural Fiber. Most questions were asked on a 5 point scale, where the responses were “Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.” The titles of the sections of the survey that are covered here are: (1) “Motivations for working with other people,” and (2) “Deterrents for working with other people.”

4.4.1 Motivations for working with other people

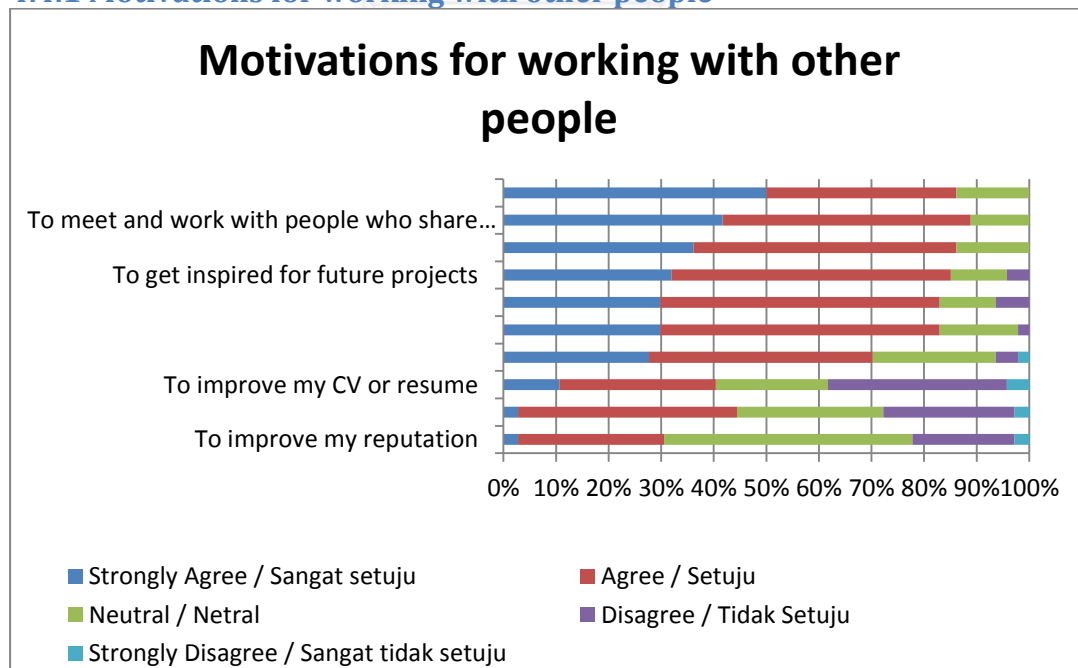


Figure 8 Distribution of responses regarding collaborative efforts within the network of practice

In regards to motivations for collaborating with other people, survey participants were given ten statements. Five of these statements could be considered more group/community-oriented (“to build networks that I can use in the future,” “to meet and work with people who share similar interests,” “to meet and work with people who have different interests,” “to reinforce existing knowledge about certain topics,” “to get inspired for future projects”), while five may be considered more individual-oriented (“to learn new skills,” “to challenge myself,” “to improve my CV or resume,” “to find employment opportunities,” “to improve my reputation”).

There were 6 motivations that had overwhelming majorities, which ranged in agreement from 83% to 89%. 89% (42% strongly agree, 47% agree) of participants are motivated to do so “to meet and work with people who share similar interests.” The second greatest motivation for collaborative efforts are “to build networks that I can use in the future” and “to learn new skills” with 86% (50% strongly agree, 36% agree & 36% strongly agree, 50% agree, respectively). “To get inspired” had 85% (32% strongly agree, 53% agree) positive response, “to meet and work with people who have different interests” and “to reinforce existing knowledge about certain topics” both received 83% (30% strongly agree, 53% agree) positive response. All five group/community oriented statements are included in this grouping along with “to learn new skills,” which is considered an individual-oriented statement. Despite this last statement being more individually oriented, it may actually be a form of self-improvement that will then be delivered again to the greater public through workshops, and other informal learning events, and so the development of the individual skill creates greater opportunity for social good. This is perhaps reflective in Indonesia, as explained by a survey participant who says,

“civil society and home industries seem to have always had created their own tactics, usually working together to create a shared space of shared facilities where people can access information, network, and create, thus encouraging shared production and consumption rather than relying on the state. This can be in the form of libraries, bookstores, rental comics, internet cafe, etc. So I see the labels of makerspaces, hackerspaces, coworking spaces,

as basically a shared space, of which in Indonesia we can find a long history of existence” (FormB15, 5 June 2015).

The next most positively received statement, “to challenge myself,” had a 71% (28% strongly agree, 43% agree) positive response. This statement might also be considered the least individual-oriented statement in that grouping because it is an inherently self-reflective statement. It is one that asks the participant to acknowledge whether he or she is willing to take steps in directions that they may not understand or know that he or she will be critiqued or challenged. This is an important statement because it also begins to bring in the idea of trust in others, which is something that cannot necessarily be measured directly, and so it ends up being a factor that is neglected quantitatively. In regards to HONF, the challenge is to create a community where people feel comfortable being challenged. The development of HONF is described by Venzha as “you're describing a sort of community that is very about trust, about family, but the question is also if HONF's work is about creating” (Venzha Christ 10 June 2015).

The last three statements did not receive so much of a large negative response as they did a neutral one. With a significant neutral response to the last three statements, positive and negative reception was nearly evenly split in the final three statements. The most negatively received statement was “to improve my CV or resume” with 38% (34% strongly disagree, 4% disagree), but this was also a relatively well-received statement positively, at 41% (11% strongly agree, 30% agree), and 21% responding neutrally. In the survey responses on motivation for an individual’s work, the idea that one’s own work should influence the greater surrounding population in a positive way is pervasive. It is reflected in a response that says describes this individual's motivations as “personal interest on certain disciplines, with their possibilities for the future, and their potentials to bring good effects on a bigger scale in Indonesia and the world” (FormB24, 9 June 2015). To communicate with others and to share these ideas, survey respondents indicated that they preferred working and communicating with people via in-person meetings (33%), email (30%), Whatsapp Messenger (11%), and Facebook (10%). Twitter, Line Messenger, Blackberry Messenger, Path Social Media, and Other methods all received less than 6% response rates.

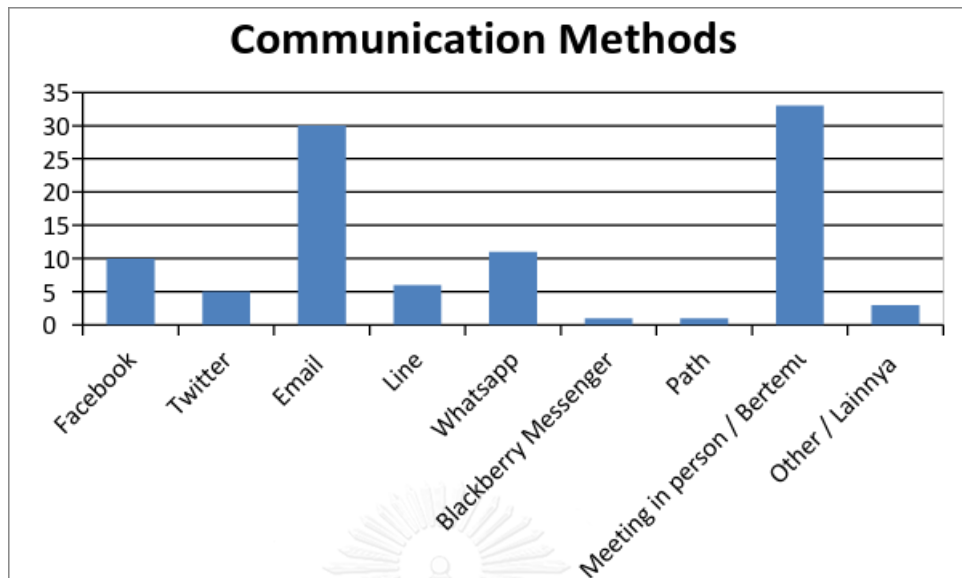


Figure 9 Methods of communication within the network of practice

4.4.2 Deterrents for working with other people

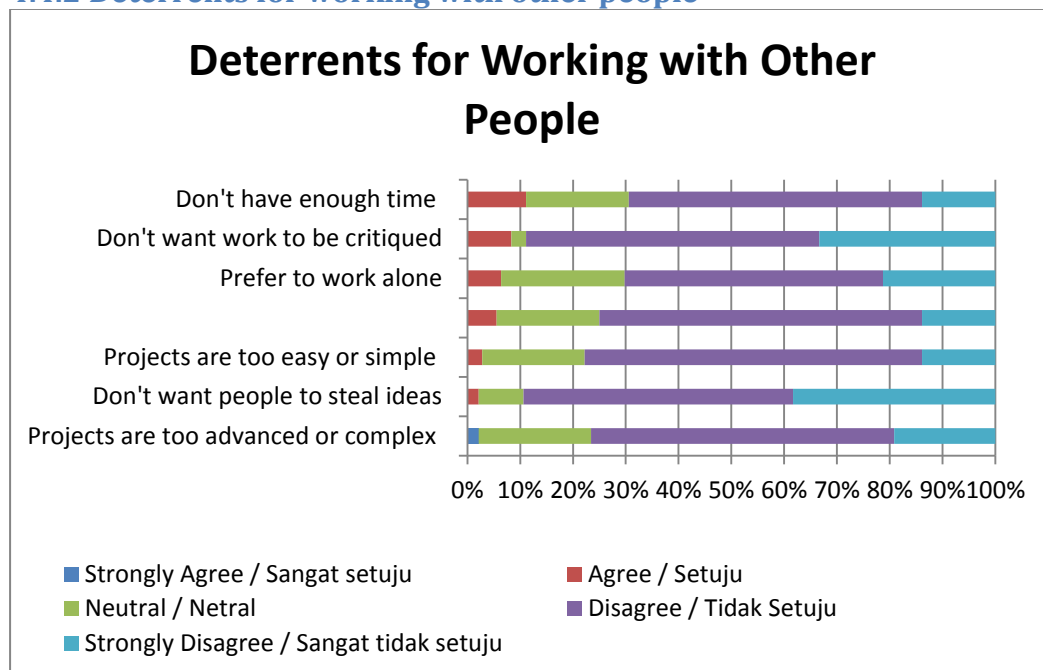


Figure 10 Deterrents for Collaboration

In order to determine contrasting attitudes, the survey distributed also included questions regarding deterrents towards collaboration with others. Questions were included in the same format as the motivations section on the 5 point spectrum. 7 Statements were included in this section, beginning with “I do not like to work with

other people because I...,” “don’t have enough time,” “don’t want to be critiqued,” “prefer to work alone,” “want to avoid misunderstanding and miscommunication,” “my projects are too easy or simple,” “don’t want people to steal my ideas,” “my projects are too advanced or complex.”

None of these were significant deterrents. 11% responded in agreement that not having enough time to work with others was a deterrent. For all statements, there were no strongly agree responses, except for a 2% response on “projects are too advanced or complex.” The most negative survey response that may touch upon these topics is the issue of dealing “
with the tensions of ephemeral collaboration and physical separation as we negotiate relationships of presence filtered through networked objects via computer software and digital networks (FormB37, 9 June 2015). This statement however was written as a motivating factor, which shows this individual’s encouraging welcome to the presence of negotiation, conflict, and discussion through the working modes that the HONF network utilizes, as an international and boundary-crossing community of practice.

4.4.3 Community Development and the House of Natural Fiber

The next section of the survey focused on the ways that people collaborate, and their motivations and attitudes towards working with others within their own work and within the network of the House of Natural Fiber. Most questions were asked on a 5 point scale, where the responses were “Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.”

4.4.4 Understandings of Community Development

This discussion on collaboration would not be complete without looking at perceptions of community, development, and community development. While the researcher is approaching this network and community from an international development studies perspective, he did not want to impose those ideas on the characterization of the phenomena in Yogyakarta. The limitations of time and language were also considered in this decision.

Questions ranged from general perceptions of community problems to the actions of HONF in the community. The questions posed regarding these topics in the survey and in interviews were left up to interpretation in some cases by the survey participant and interview subject. This was especially true in the free-response question in the survey, which asked, “How do you define community development?” The researcher anticipated a variety of interpretations. Responses included definitions that were related to international development, national development programming, development of communities of practice, and network development, among others. This was even acknowledged by several free responses from survey participants on the complexity of community development. For example, one respondent states that,

“I prefer to talk about collaboration with local groups, as often community denotes too strong degrees of belonging. Development is a tricky one, as it also has geopolitical histories as a term. Often enhancing means of self-expression and ways of developing practices and skills together, or simply moderated dialogue are those things that mark positive aspects of community development” (FormA11, 30 MAy 2015).

While another says,

“The idea still needs to be figured out within different circumstances. For example when one tries to engage with individuals from a variety of backgrounds (education, economy, practices, etc.) one should be wary of using the term community for it is potentially misunderstood as attempts of doing social work. Community empowerment is however, another creature” (FormA23, 2 June 2015).

There were several statements that asked survey participants to assess their own ability to affect change, and then one statement about development as a concrete designed and delivered process. The first statement was “My work contributes to alleviating specific problems in my community” This statement received a 67% (6% strongly agree, 61% agree) positive response with another 33% responding neutrally. No one who completed the survey felt that they were not somehow contributing to problems in their communities. This was reflected in the survey free responses regarding personal motivations for work. The next statement, “I do not have the skills to make a difference in the problems that affect my community” was included to see

perceptions on an alternate statement regarding individual ability to affect positive change. Interestingly, the answer was exactly opposite of the earlier statement, and was met with 68% (21% strongly disagree, 47% disagree) and 30% neutral responses. These two questions were distributed on separate surveys as described previously. The statement on development was, “Development is something that only the government or large organizations should work on.” This statement received a 92% (50% strongly disagree, 42% disagree) negative response and a 6% neutral response. This was paralleled in the free response statements regarding the definitions of community development. No responses highlight specifically the use of an institution for community development, whether in discussions about the development of a network, or the raising up of a community. The HONF community on the whole feels empowered to do good work in their own, individually perceived, communities.

Two questions were dedicated to the work of HONF, and added to assess perceptions of HONF’s capabilities and work in general. To the statement “I see HONF as a resource that I can use to make things to improve my community” there was a 61% (11% strongly agree, 50% agree) positive response and a 36% neutral response. The next statement, “I work with HONF on projects to solve problems in my community” received a largely neutral response of 57% whereas 17% had a positive (17% agree) response and 25% (4% strongly disagree, 21% disagree). This may be in acknowledgement that there are other organizations beyond HONF that also deserve to be recognized for their work “trying to improve the society, the country, the earth, by organising many interesting, useful and educative events, workshops, etc” (FormA8, 28 May 2015), and are recognized by individuals of the HONF network as equally deserving of recognition.

4.5 Conclusion

The data gathered for this section, regarding the question **How do actors collaborate around open science and R&D practices?** produced a wide range of answers across the survey, interviews, and participant observations. In working with the House of Natural Fiber, assumed in this research to be the main protagonist of open science efforts in the research site for a majority of the period between 1999 and 2015, participants are included in the development of open science efforts by HONF.

Actors collaborate in a variety of ways, and are driven largely by a sense of greater good beyond the individual. This bodes well for the idea of a science that is open and collaborative. The diversity represented in this group is also a highlight of the network that has helped sustain and enrich HONF over the course of its history by opening up new areas of discussion, skill development, and outreach creating “an active exchange in giving and learning from all participants. the open flow of information, of the strengthening of all involved” (FormA2, 27 May 2015). This is as opposed to the diversity dividing the network into fragmented areas, which would be a detriment to the overall growth and health of the network as a collaborative group of individuals. This growth in the breadth and depth of healthy collaborative efforts over the years definitely contributed to the development of openness and science efforts at HONF, and this is recognized by the survey participants and representative of the statement, “during years of observation I think that they [HONF] became a catalyser of ideas and growing number of participants that make community stronger” (FormA21, 1 June 2015) It did so by both introducing the topics of science through informal collaborations as well as allowing it to dive deeper into scientific topics through existing and new collaborations as a result of those original projects and events in 2004.



CHAPTER V

OPEN SCIENCE

5.1 Introduction

This chapter brings together the context, history, collaborations, and research work of the House of Natural Fiber Foundation and the growth of its networks and efforts around open science. It will explore its potential as a model of community development that bridges the local and international environments. It seeks to answer

research question: **How do actors describe their participation in and understanding of open science and R&D practices?**

HONF's growth, its activities, and the kinds of collaborations that it has achieved over its history are unique. From the humble beginnings to the organic emergence of HONF's interest in using science as a tool for art, education, and research, there are possibilities for further learning from the way that participants within this network understand openness and science. The findings of this research can serve as a starting point for dialogue between different people on the characterization of open science locally and globally. In the words of one participant, "science has such a large scope. Nowadays it is not constricted to fixed data anymore. Science is also our surrounding. What can be seen and not seen. It is more and more easily connected with arts. Especially in the scope of focus that I do. Culture, arts, technology, then of course, science" (FormB5, 30 May 2015). The work that HONF and its related network has done over the course of its development is a form of understanding the world. These findings show that there is a diverse way of understanding and practicing openness and the breadth of science practice.

Building upon Chapter 4, regarding diversity and community, this chapter integrates these areas into an overall understanding of open science. This chapter reports and analyzes data from the survey sections regarding openness, science, and science practice within the HONF network, as well as the details of the key informant interviews regarding the development of scientific knowledge and the direction and purpose that HONF is taking their aspirations moving forward. It is organized under the three main survey areas regarding openness and sharing, science, and HONF as a representative of open science practice in Yogyakarta. Each of these sections corresponds to a section of the conceptual framework introduced in Chapter 1. Data gathered regarding openness and sharing (including sections on understandings, methods, licensing, expectations, and deterrents) are aligned with cognitive justice and knowledge democratization. Questions regarding the House of Natural Fiber in this section touch upon community development as a process and concept to be defined locally. Finally, understandings of science fall under open science as a concept within the framework, but the overall conceptualization of open science, as outlined in Chapter 1 is a practice that is also characterized by the open sharing of

knowledge (knowledge democratization), acknowledgement of actors (cognitive justice), and development of a network of practice around these principles (community development).

5.2 Understandings and Methods about Sharing, Documentation, and Openness

Statements to be evaluated in this section cover the details of how individual survey respondents feel about openness and sharing in regards to their own work. There are four statements that were evaluated by the participants and 2 multiple choice questions that specifically assessed the kind of tools that each individual uses to share his or her work with the public at large.

Documentation is a difficult subject that even the best open organizations must constantly struggle with. Being open is one thing, but also being able to accurately take down the data and experiences of one's process is an added layer for others to iterate upon and being open to critique. This survey questions how participants both document and share their work as a function of openness. This is something that the House of Natural Fiber tries to do to achieve their mission, but from the observation of the researcher, there was little systematic and detailed written documentation being done during the time of research. This was also evidenced in the lack of detailed processes on their website although it was determined through interviews that a lot of data was lost during the administrative split in 2011. The primary repository of knowledge is located physically within HONF's physical spaces of operation and in the participants themselves, who practice openly, as seen in their collaborative efforts. That being said, as a science practice, the methods are still developing and becoming more intentional as participants realize the value in their work as potentially reproducible objects. The attitudes of individuals within the network of practice are critical to understanding how knowledge is spread, which forms the basis of knowledge democratization. This then also leads into how it is recognized, and thus bearing the question of whether cognitive justice can even be applied without documentation and access to that documentation.

5.2.1 Creative Commons Licenses

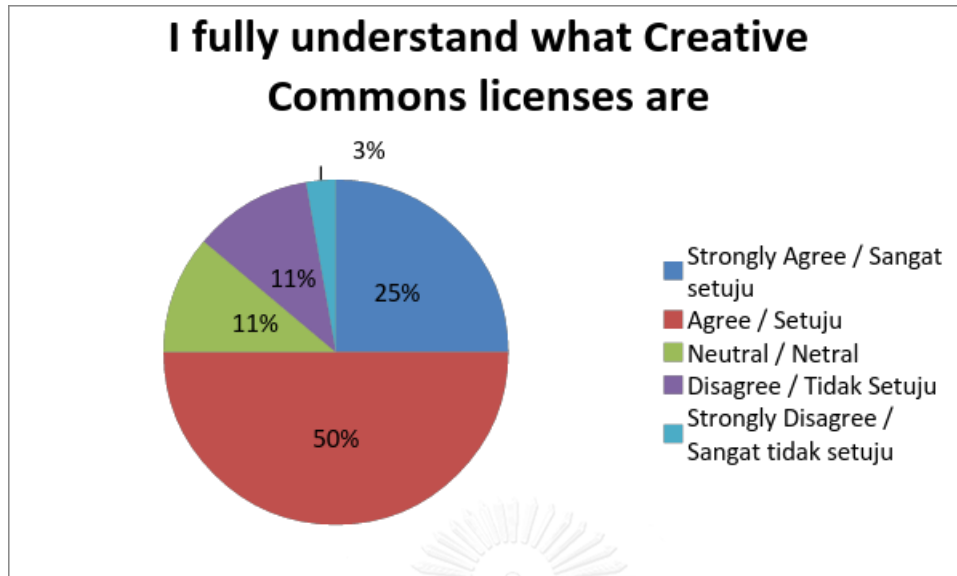


Figure 11 Understandings of Creative Commons Licenses within the Network of Practice

Creative Commons are a relatively new type of license available for creatives, scientists, or other professionals who produce original work to openly and freely license their content in 6 attribution levels. The most restrictive license, CC BY-NC-SA, “lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms” (creativecommons.org), while the least restrictive license, CC BY, “lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials” (creativecommons.org). By assessing the understanding of Creative Commons among the HONF network, the researcher intended to achieve greater insight into the sustainability and understanding of openness as a commercial professional individual. 75% (25% strongly agree, 50% agree) of survey respondents acknowledged that they positively agreed to this statement. This indicates that there is a high level of understanding within the HONF network to the rights of licensing openly and freely. This is a licensing scheme that has not yet been adopted by HONF as an organization, but was included in the survey due to interest in participant observation as a potential method of licensing work in the future. It ties into the concept of cognitive justice because this licensing method is an alternative to the traditional patent model, which

is closed beyond a limited number of holders of those rights, whereas this model not only allows for open sharing, but requires the acknowledgement of the creator of the content.

5.2.2 Expectations of sharing

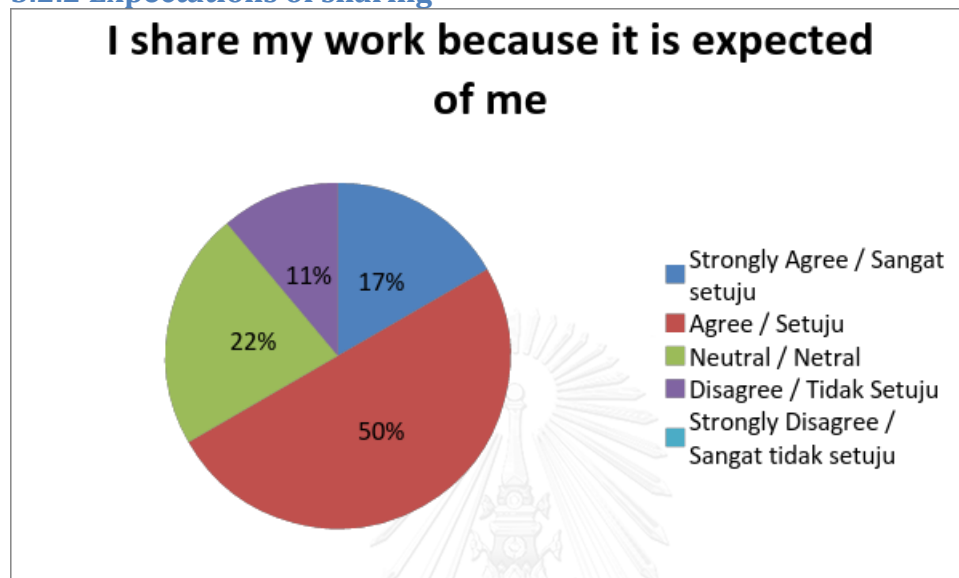


Figure 12 Expectations of sharing and openness

This statement was intended to assess the level of willingness that an individual feels to share his or her work, as opposed to feeling pressured into doing so. This statement garnered a 57% (6% strongly agree, 50% agree) positive response. This indicates that people generally may not feel so individually inclined to share their work with others, but feel obligated to do so. It is also possible that people feel that documentation is important, but lack the time or will to dedicate to the process. However, there is also the possibility that this expectation may not actually be true, and needs further assessment. It seems there there is generally not so much of an expectation for things to be documented despite recognition of its importance. Though, this may also be a confusion of disconnect between being open and documenting practices. Irene says, “I think it was the practice in here [at HONF], so I don’t really need to open anything at all because that’s already the culture in Jogja. That’s like, do it with others is very common” (Irene Agrivine 10 June 2015). Although, from the researcher’s experience in international development, it is not uncommon for programs and projects to put monitoring, evaluation, and documentation efforts at a lower priority. Being expected to share one’s work is not necessarily a negative thing,

but the way that people are attributed is important, and if people expect to share their work, then there is a structure in place where knowledge is somewhat compelled to be spread, if not openly shared, but at least accessible in some form.

5.2.3 Utilization of workshops as a dissemination tool

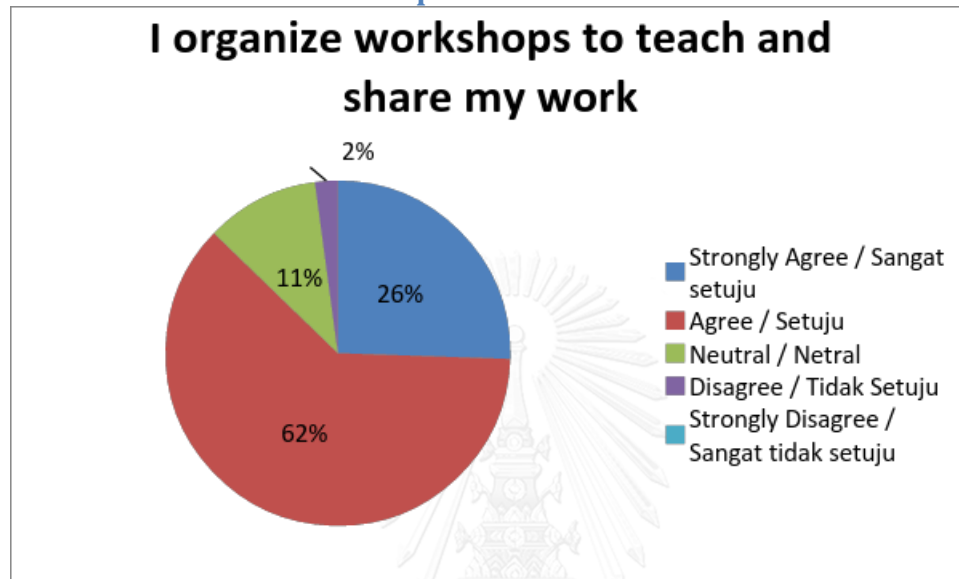


Figure 13 Using workshops to share work

This statement achieved an 88% (strongly agree 16% and agree 53%) positive response among survey respondents. The kind of workshop was left to the interpretation of the survey participant. This response is in line with the aforementioned comments on how the primary access to the open knowledge created by HONF is in-person sharing, whether participants are in Yogyakarta or if HONF travels abroad to run workshops or exhibitions. This in line with Irene's acknowledgement of the Foundation's role as facilitators of "people collectives, we give them like a space, space to do something, to collaborate under HONF. We have the equipment and the network" (Irene Agrivine 10 June 2015). HONF, as Irene stated, provides a space for exhibiting strong facilitation practices and the sharing of knowledge in person. The use of workshops is important to open science, cognitive justice, knowledge democratization, and community development because it requires presence. It requires the active participation of people leading and attending. It is hands-on in the sense that they require questioning or discussion between different parties, or at the very least, listening about something new. The practice of science

requires one to use tools, whereas the practice of open science also means sharing and openly using those tools and the work done with them. The high percentage of individuals agreeing that workshops is a primary way to spread information and knowledge is an indicator that science practice is likely shared through this manner, and is a popular form of knowledge sharing within this community of practice.

5.2.4 Openly publishing work online

The statement assessed was “Data, projects, and processes should be published online for other people to use.” The respondents of the survey gave this question an 83% (34% strongly agree, 49% agree) positive response. These results indicate positive prospects for open science in Indonesia, but in terms of how well people document and how well that documentation can be used for further iteration and repetition by others still needs to be improved. This is acknowledged both by HONF when it was said in an interviews, “but in fact, we don’t have much documentation left” (Venzha Christ 10 June 2015), and in the early years “the first thing we were very experimental, so we didn’t do all the documentation, really good documentation,” where strong documentation is considered to be “kind of like an interview, so we can also see how much we develop or thin or change or change our mind from the beginning. We don’t really have those pictures of the things from the archive, and sometimes we lost it” (Irene Agrivine 10 June 2015). Irene went on further to identify that documentation may need a full time job just to make sure that everything is being captured. This addresses some of the major challenges of how shared knowledge is accessed today, and that is through the internet. There is a strong acknowledgement of the strength of the internet as a tool for knowledge democratization, or sharing of work, including data, projects, and processes, but it is difficult to do well, but remains a key aspect of open science.

5.2.5 Methods and tools for sharing and documentation

87% of respondents use photos to document their projects, followed by writing at 72%, 60% use video to document his or her work, 34% of respondents use audio, 32% use other, and 2% do not document his or her work. Aspirationally, however, HONF, as an example, would like to document with “not only facts and pictures, but also the story, people for example, are trying to get many people who want to help us

with this kind of idea. They just write the story, and the timeline, and in combination with a lot of research and interviews, you can put it into a single story” (Venzha Christ 1- June 2015). Also, however, are hopes for new ways of documentation on the horizon with Venzha’s thoughts that “I’m sure in the next next next level of mobile technology, or the way that people get documentation online now... maybe in the next five years we will invent something else, and it will be very easy to get all the conversations that we have now” (Venzha Christ 10 June 2015). He continued with his response by connecting the way that we document stories and processes in the future to the conservation of energy, where people will never lose the things that they do, including the stories, feelings, thoughts, processes, etc, but rather they are converted into different formats and ways to re-access.

In the next steps, the reporting of documented work, 72% reported sharing their work using workshops, 68% reported sharing their work via social media, 53% reported sharing with physical exhibitions, 40% used blogs to share his or her work, 28% used group chats through smartphone applications, 26% reported using open sharing websites, such as Instructables, GitHub, Thingiverse, and wikiHow, and 15% reported using wikis to share.

5.2.6 Deterrents for sharing and documentation

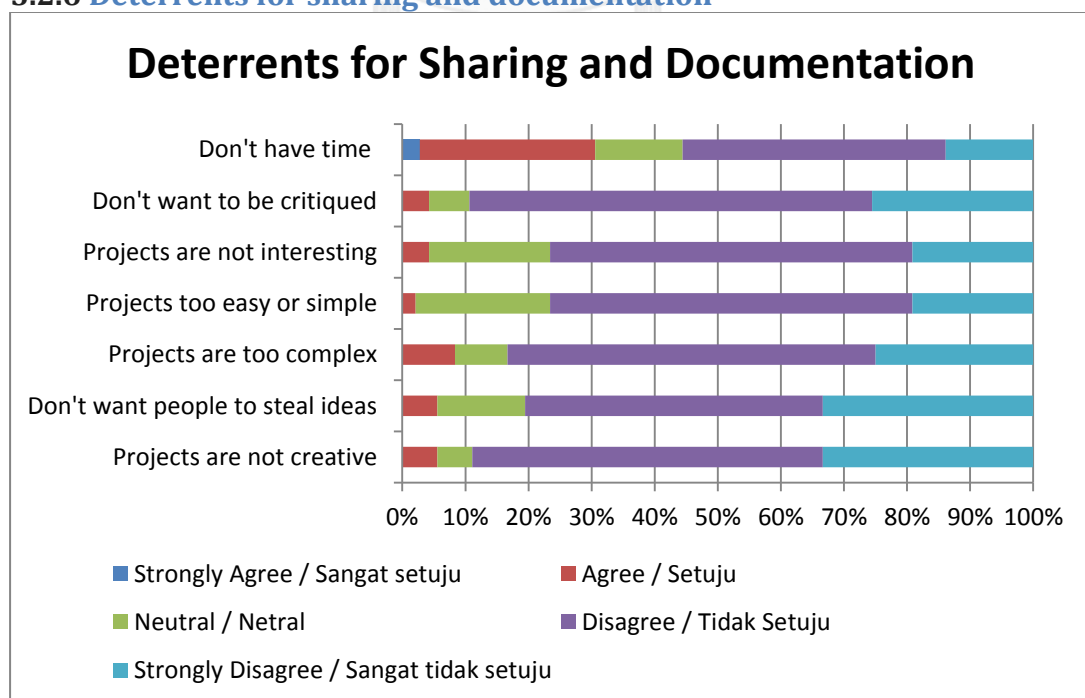


Figure 14 Deterrents for Sharing and Documentation

In order to determine contrasting attitudes to Section 5.2.5, the survey distributed also included questions regarding deterrents towards sharing and documentation. Questions were included in the same format as the motivations section on the 5 point spectrum. 7 Statements were included in this section, beginning with “I do NOT share my work (projects and processes) because my/I...,” “don’t have time,” “don’t want to be critiqued,” “projects are not interesting,” “projects are too easy or simple,” “projects are too complex,” “don’t want people to steal my ideas,” “projects are not creative.”

None of these were significant deterrents. 11% responded in agreement that not having enough time to work with others was a deterrent. For all statements, there were no strongly agree responses, except for a 2% response on “projects are too advanced or complex.” These responses showed that there is a strong agreement within the network of practice that there is a need for documentation, and that there are few deterrents, whether from the work itself or externally to decide not to share. The main constraint is time, which does however mean that there are potential concerns around priorities, despite a strong understanding of the importance of documentation. This warrants further research around the use of time and priorities in individual efforts within the network.

5.3 Science and the House of Natural Fiber

5.3.1 Understandings of Science

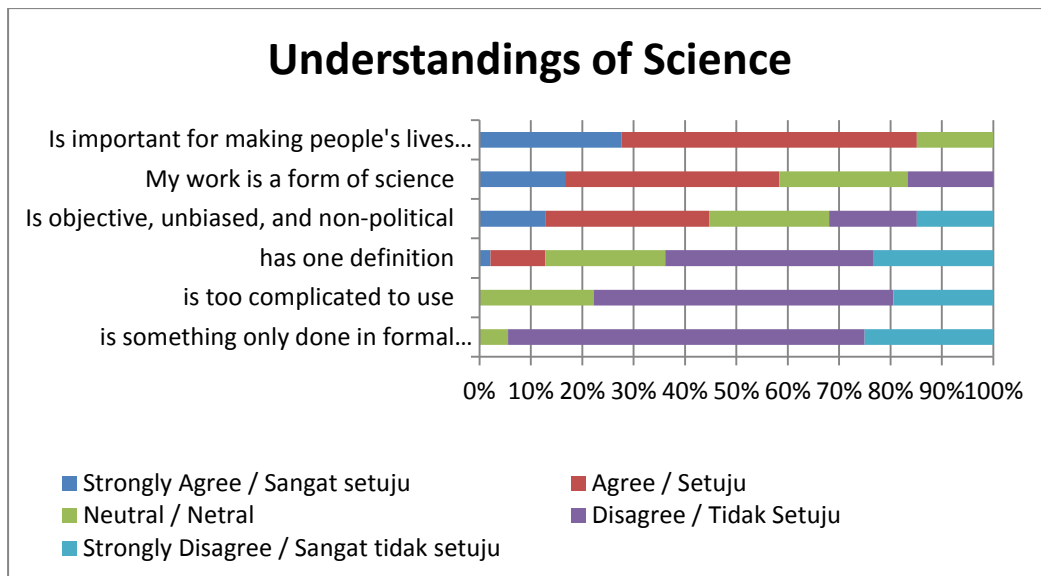


Figure 15 Various understandings of science by individuals in the network of practice

This survey also included six statements on the understanding of science. These statements, all beginning with “Science...” are: (1) important for making people’s lives easier, (2) My work is a form of science, (3) is objective, unbiased, and non-political, (4) has one definition, (5) is too complicated to use, (6) is something only done in formal institutions. Statements 1-2 garnered positive majority responses. Statement 1 had as 85% (28% strongly agree, 57% agree) positive response. Statement 2 had a 59% (17% strongly agree, 42% agree) positive response. An interesting point is the broad distribution of answers regarding Statement 3. Statement 3 had a 45% (13% strongly agree, 32% agree) positive response rate and a 32% (15% strongly disagree, 17% disagree) negative response rate, and a 23% neutral response. This is definitely an interesting mix of responses for one of the most controversial statements of the six presented. This was also left as a broad question to be defined by the survey participant, and as the data shows, a variety of perspectives exist about how science and its characterization could be interpreted. However, all of the responses generally revolve around science being a process or a tool that has the potential to be used in many ways, whether it is political or nonpolitical, or open or closed. The interesting thing, however is the way that artists describe science, for example “I see science as alchemy - in fact alchemy wasn’t considered occult until religion and later science and technology rivalled and marginalized it. The technical principle of alchemy, controlling matter through manipulation of symbols, is the

technical principle of materials and modern day computer software as well...” (FormB22, 9 June 2015) or “for me, science is a secret that's been provided by the Almighty in the universe. It is need to be explore by mankind, even more to bring a harmonious, sustainable, humane and dignified life” (FormB28, 11 June 2015). The final two statements had overwhelmingly negative responses. 77% (19% strongly disagree, 58% disagree) of participants believed that science is not too complicated to use. Finally, 94% (25% strongly disagree, 69% disagree) of participants believe that science is something done outside of formal institutions, which bodes well for the advancement of open science based in the community especially with the understanding that “The constructing and becoming of knowledge requires a prior understanding of how knowledge is produced and transferred. Once recognising that, science, like other knowledges, can find easy overlaps and similarities with other disciplines” (FormB18, 8 June 2015). From HONF, there is a strong understanding and acknowledgement of science in many forms. This is potentially in the Bahasa Indonesia word *ilmu*, which simply means knowledge. It does, however, usually have the understanding of traditional, cultural, local, or indigenous knowledge, as opposed to the imported word *sains* (science). With changing understandings and the flexibility of Bahasa Indonesia, there are elements of change in linguistic understanding happening. This is explained by Irene, in response to the question, “How do you think people understanding science in Jogja?”

“very academic... and then uh, and only for clever people. It's very difficult. It's only for academic people and clever people... [to local people] we then say, ‘but you are also doing science.’ People here they say *ilmu*, that's knowledge, *ilmu* is like wide, and knowledge is wide, and then sometimes [knowledges] are not, sometimes science is not involved in [*ilmu*]. So sometimes when we say to the farmer, ‘you actually are using science; you are using knowledge for your projects,’ and they say, ‘nonono I am just using the knowledge from my grandpa, grandma, from their ancestors,’ so [when it is] not really from academic, so they said this is not science” (Irene Agrivine, 10 June 2015)

There is a strong recognition by the survey respondents in both the quantitative and qualitative sections that science is a tool that can be manipulated for

many uses. The data also shows that there is a strong understanding of science to be used as a tool for positive action in one's own community, and that is a socially-minded perspective that would serve as an understanding of science for community development.

5.3.2 Attitudes and understandings about HONF

The House of Natural Fiber Foundation for many years, and is still in many ways, the sole representative of open science efforts in Yogyakarta, Indonesia. As such this research and survey assumes that their work in regards to scientific research and development is representative of the development of open science in Yogyakarta, and potentially Indonesia as a whole during the period from 1999-2011 when Lifepatch formed from the leadership of the House of Natural Fiber splitting. As such, however, the attitudes and understandings about HONF from the network itself are invaluable in characterizing open science, especially because the term "open science" has not yet permeated the mainstream academic literature. Attitudes about HONF can range from being "a bridge between science, art, and community development" (FormA7, 28 May 2015) to an "exclusive closed group" (FormA10, 30 May 2015) to "it's difficult to describe, because I know how it has constantly changed and evolved throughout the years" (FormA31, 6 June 2015).

As such, there were 20 questions, divided into three sections, asked about HONF's work and the survey participant's interaction with HONF as a body that was conducting potentially scientific research and works. These three sections are: (1) attitudes and understandings towards the House of Natural Fiber, including 7 statements, (2) HONF's science efforts, including 6 statements, and (3) working with HONF, including 7 statements. Sections 1 and 2 led with the following statement: "The House of Natural Fiber is....," whereas Section 3 led with: "I would work with the House of Natural Fiber...."

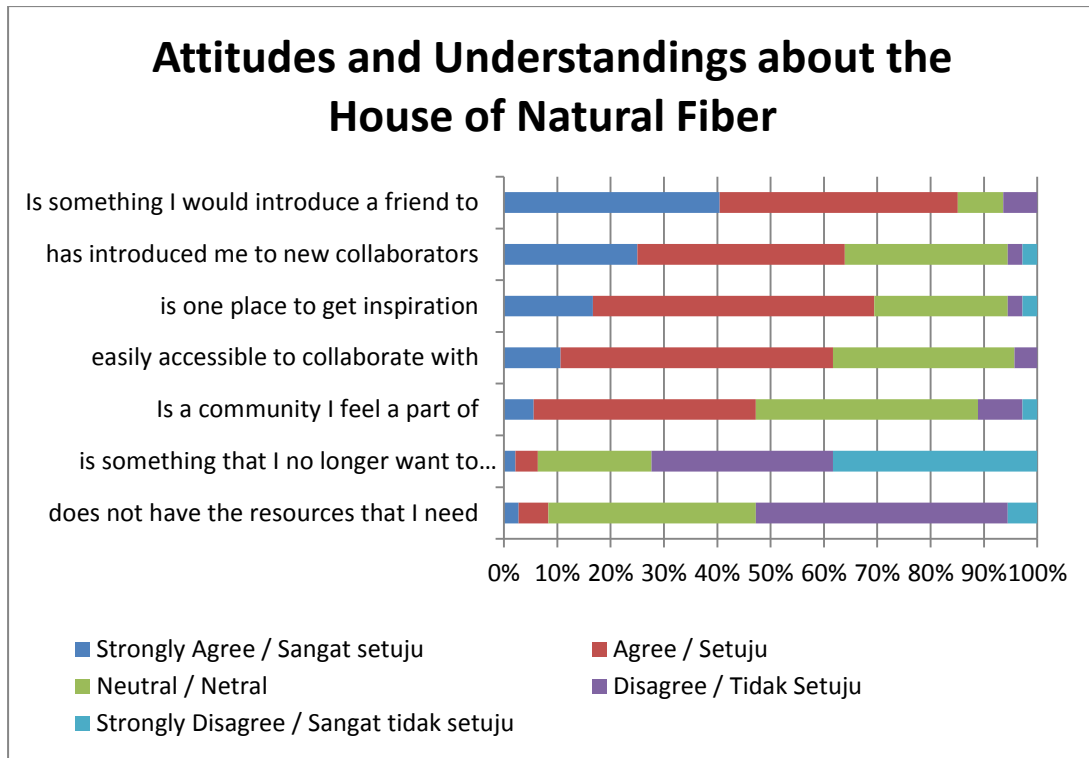


Figure 16 Attitudes and understandings about HONF from members of the network of practice

For Section 1, participants overwhelmingly stated that HONF is an organization that they would introduce a friend to (95%; 40% strongly agree, 45% agree), has introduced him or her to new collaborators (64%; 25% strongly agree, 39% agree), gives inspiration (70%; 17% strongly agree, 53% agree), and is easily accessible for collaboration (62%; 11% strongly agree, 51% agree). Approximately half (48%; 6% strongly agree, 42% agree) of participants felt that they were a part of a community around HONF, while another 42% felt indifferent or neutral to this statement though one survey participant described HONF as “One of the most interesting collectives that work between arts, research and communities...It should also be said, that they are a lovely group of people, with whom dialogue, sharing a meal and cooking together are as important as the work done” (FormA11, 30 May 2015). The final two statements: HONF as an organization that he or she no longer wants to engage with, and as an organization that does not have the resources he or she needs are both strongly rejected by survey participants with 72% (38% strongly disagree, 34% disagree) and 53% (6% strongly disagree, 47% disagree) negative responses, respectively. It should be known, however, that there were negative

statements that emerged in the free response statements. One statement was particularly articulate in its perspective stating,

“I do not understand the purpose HONF. If the development is now echoing jargon they use science to facilitate the lives of many people, it seems there is no project HONF I hear succeeded in providing an effective solution. HONF as a group in the realm of art, his works became a sort of a polished presentation of the project to make it more artistic (but still not able to move the feelings should see artwork). Gloss was solely made into an object presented project it as very sophisticated, complex, and suggests that science is haunted” (FormA26, 3 June 2015).

This statement has points of concern that are in fact echoed by the founders of HONF themselves. They are working towards changing some of these efforts, especially in the 2015 launch of Transformaking. These are also similar to the understandings of HONF whose first impressions consisted of “when I was a student, HONF was known as party brats. However once I got to know them a little better their individual interests are quite diverse. I didn’t get that impression from it as an organization, though” (FormA23, 2 June 2015); this was also reflected in the comment that simply stated their answer as “too much party, hahahaha...” (FormA27, 5 June 2015), and in the sentiment that “right now HONF is an institution that do a lot of works, just like any other common institution, working on proposal and run it” (FormA43, 10 June 2015)

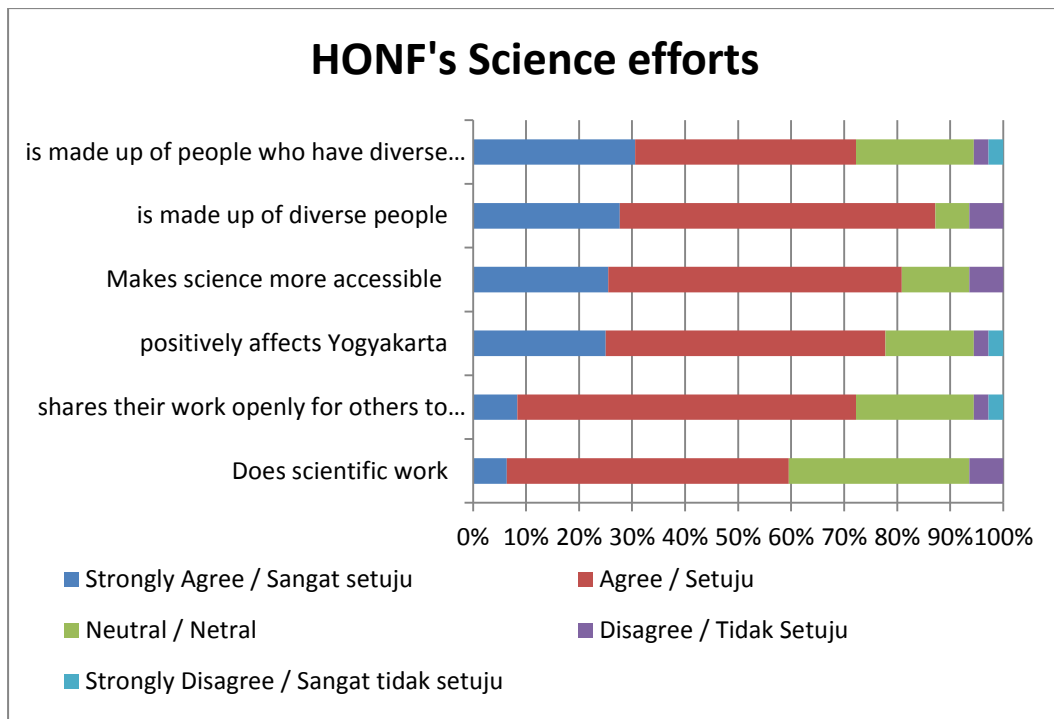


Figure 17 Various understandings of HONF activities as science

For Section 2, the answers were quite interesting. All statements received majority positive responses, but for the statement “HONF does scientific work” the least positive (59%, 6% strongly agree, 53% agree) was received, and this is in contrast to the statement, “HONF makes science more accessible,” which received a 81% (26% strongly agree, 55% agree) positive response. This may point to their strengths in programming, facilitation, and pedagogy, rather than the work that they produce as a scientific object itself. One participant stated that,

“I had never thought about this before. As my background is not closely related to science, I see science as something big I can't reach. When I met HONF and they told me their way to think about it I was inspired to see how much close the work between their way of understanding science and what I do...can be related” (FormB27, 1 June 2015)

The two highest scoring positive responses were regarding the diversity of the HONF network, which exhibits both high regard for diverse thought (73%, 31% strongly agree, 42% agree), and diverse people (88%, 28% strongly agree, 60% agree). These are reflected in the sentiments that HONF is made of “fresh people” (FormA16, 1 June 2015), that they are “artists at heart, a dynamic group of excellent, creative

people with good ideas a very positive, hands-on attitude to problem solving” (FormA19, 1 June 2015), and their role with the “workshops that they conduct bring enlightenment to be able to make the participant ‘well-equipped’” (FormA22, 2 June 2015). As the sole representative of science and art efforts for the majority of its history, HONF’s principles of being open and collaborative help to characterize the “open” side of the science practice. Maintaining their principles of openness to collaboration with a wide variety of individuals, institutions, and organizations enabled HONF and its leadership to approach science practice with an inherent openness that became part of the DNA of the network of practice around open science in Yogyakarta.

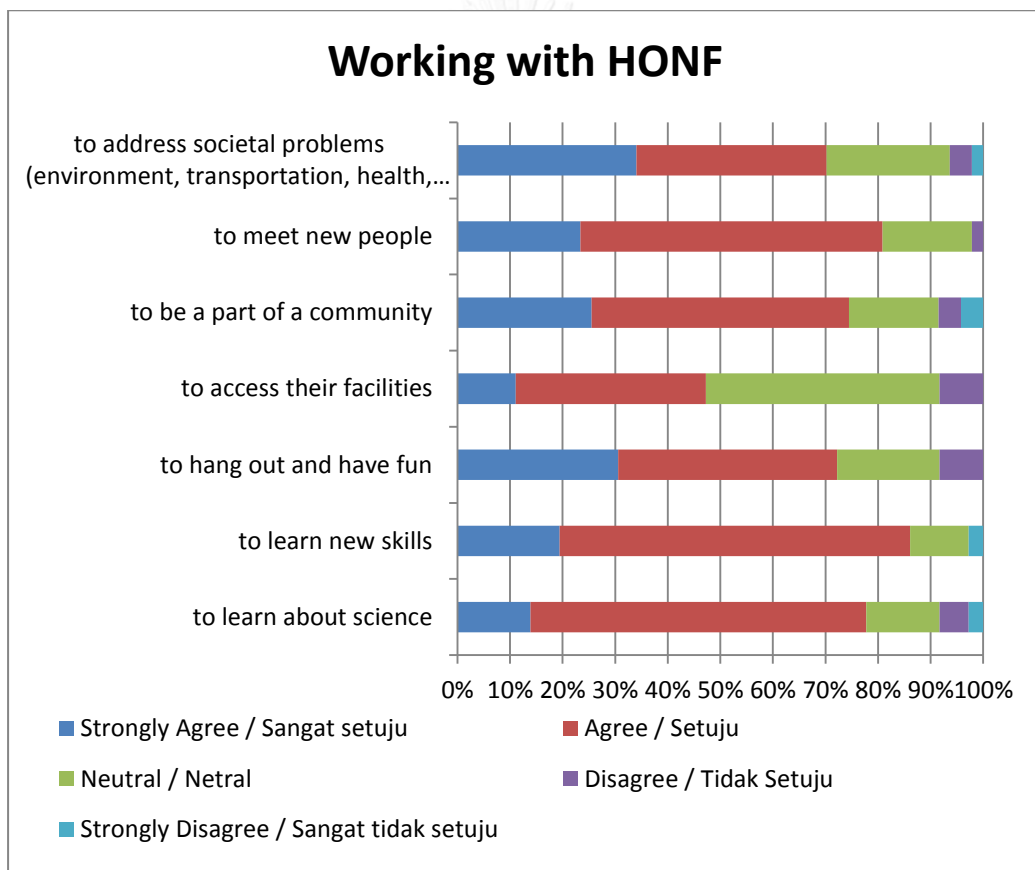


Figure 18 Attitudes and understandings about working with HONF

Section 3 addresses the topic of working with the House of Natural Fiber, and thus integrating with the main organizer of this network of practice around open science. All of the responses received an overwhelmingly positive response ranging from 70% to 90% positive. The only statement that did not receive a majority positive

response was “I work with HONF to access their facilities,” which only received a 47% (11% strongly agree, 36% agree) positive response compared to the other statements. In the same strain of topic as Section 3, two final questions were asked with multiple choice answers. The first question addresses the way that individuals have engaged with HONF. 64% report attending a workshop or event, and 57% report working together with HONF on an event or workshop. The next highest at 40% is working together on a project. The frequency of which survey participants engage with HONF stands at approximately 30% at “several times a year,” whereby 43% report that they previously worked with HONF, but no longer do. This is interesting in terms of turnover, and may present the fact that many collaborators are in fact one time collaborators within projects, and contribute time and skills as needed for those projects. With largely positive responses to working with HONF and being a part of this network of practice around open science, there is a sense of social action, openness, and understanding of science that blends with the diversity of the overall network. It has produced a network around science that is fluid and dynamic, and open and collaborative.



Figure 19 Workspace at HONFabLab



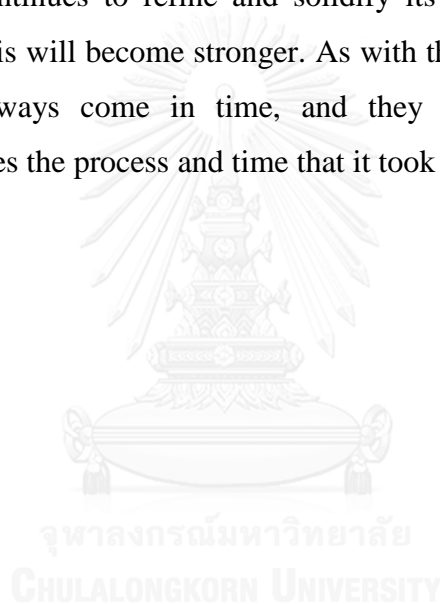
Figure 20 Workspace at HONFabLab

5.4 Conclusion

The way that open science practices have been shaped in Yogyakarta, Indonesia are combinations of a variety of factors including context, history, diversity, collaborations, and the organizational leadership style of the House of Natural Fiber. Building upon the research regarding collaborative efforts and the diversity of the HONF community, data on attitudes toward openness and science was taken in order to come towards a holistic and comprehensive view of what open science is in Yogyakarta, Indonesia, and how these efforts can influence the larger international body of practice. Participants in this network of practice around open science understand their participation within this network from the frame of their own experiences, and are influenced by their interactions with individuals who are directly related to the House of Natural Fiber. They are driven by motivations that expand their potential for greater communication, collaboration, and skill-building. Similarly, they feel a need to give back, which is often done through in-person workshops, rather than through non-interactive and one-way instructional documentation through the internet. They do, however, see the potential in sharing in such a way, but often do not prioritize the time to do so.

The efforts of HONF are largely positive, and flaws are recognized already by leadership as points of improvement, including areas of practice in documentation and

communication of previous work. This is also recognized by the network of practice, which exhibited a breadth of positive and negative opinions and attitudes towards HONF as an organization that does both potentially scientific and non-scientific inquiries, processes, and activities. There is no doubt among the survey responders, however, that HONF does spread and recognize ideas and knowledge across all their work and collaborations at the local, national, and international levels. This connects back to the concepts of cognitive justice and knowledge democratization, which in turn has the potential for building trust and community, and thus forming a potential model for community development. This can also contribute to the definition of open science, but as it continues to refine and solidify its documentation of processes, methods, and data, this will become stronger. As with the efforts have always been in Indonesia, things always come in time, and they do so with a strength and organization that belies the process and time that it took to get to the finish.



CHAPTER VI

CONCLUSION

6.1 Introduction

Further analysis of the data will be detailed in this chapter, and it is followed by a conclusion. This conclusion will address the main research question, and its associated supporting questions: **In the case of the House of Natural Fiber Foundation of Yogyakarta, Indonesia, how has the development of the Foundation grown to become a cosmopolitan network around open science, and how does this network define itself in terms of diversity, collaboration, openness and contribution towards community development?** The research objectives of this thesis are to: (1) To document the development of open science programs around collaborations related to the House of Natural Fiber Foundation from 1999 to the present, (2) To detail attitudes, motivations, and organization around openness, collaboration, and science and R&D within networks related to the House of Natural Fiber, and (3) To define, through the words of the actors, the role of community development in the practices of open science and R&D in Yogyakarta, Indonesia. Suggestions are offered regarding the potential development of a model and further research for open science in Indonesia and the global south.

These objectives outline the necessity of carrying out such research regarding open science, especially surrounding the network of practice developed by the House of Natural Fiber Foundation over its 15 year history. The case of the House of Natural Fiber Foundation is a unique example of open science development over a long period of time in a community-based context. The establishment of the organization by non-scientists, and maintenance of their principles of openness and collaboration organically created a diverse network of individuals creating equally diverse projects and events. These organic collaborations led to the appropriation and adoption of scientific principles and processes in their work, and thus forming a model for open science practice in the global south. The potential for their experiences to inform other

communities and networks of practice is great not only in the global south, but in the global definition of open science as well.

The structure of this chapter will follow the course of this thesis by discussing the three supporting questions in the following three sections in order to provide further insight in the development of this network of practice and open science in Yogyakarta, Indonesia. This will then be followed by a discussion on implications for policy and development, as well as address the hypothesis laid out in Chapter 1 of this thesis. The thesis will then conclude with a discussion on the next steps for this research as it moves forward.

6.2 History and Context around the House of Natural Fiber

This thesis began by detailing the growth of open science practice in Yogyakarta, Indonesia through a narrative history of the development of the House of Natural Fiber Foundation in order to answer the question: How has the House of Natural Fiber Foundation developed its program of open science? Marked by three distinct periods of growth, HONF, grew from an informal hang out to a self-acknowledged group collective to become a foundation with mature programming and self-reflective purpose of its impact on its community and the world. Throughout this process, despite not beginning with science practice nor intentionally using science as a tool or process, scientific ideas and concepts integrated as naturally in collaborative efforts as art, design, electronics, and education.

Yogyakarta represents a unique context historically, administratively, and culturally in Indonesia and Asia as well. Represented administratively by a hereditary sultanate within a larger governmental system, this family has long supported the arts and the local development of culture. Without this support, it is hard to imagine Yogyakarta as a lasting and thriving arts and culture center in the face of Indonesia's conflicts over the years. Such science practices would also have not emerged if it was not for the concentration of educational institutions in this Yogyakarta. The opportunity for members of the House of Natural Fiber to work with technical experts in medicine and science would have been greatly diminished, if not only by pure numbers, if there were not so many institutions in this area.

As acknowledged by the founders of HONF, a culture of working together and sharing is also compounded on top of these structural aspects of government and institutional support in knowledge development. This creates an environment ripe for knowledge democratization to take place not only at the community level, but through individual collaborations between diverse peoples, the possibility of spreading knowledge across traditional boundaries of institutions and communities. It is also through such interactions across boundaries that all people's knowledge development and contributions can be recognized as valid, useful, and valuable, which is a cornerstone of understanding cognitive justice. These two concepts are built into the science practice that the House of Natural Fiber has developed over the course of its history and continues to do evolve as it moves forward.

6.3 Diversity and Community in a Network of Practice

The way that HONF has approached collaboration allowed for the emergence of a diverse and international network. This research concludes that diversity in tandem with collaboration are critical aspects of the development of open science in the network of practice of the House of Natural Fiber Foundation. Thus, the question was asked: How do actors collaborate around open science and research and development practices? This research only presents a snapshot of the diversity that is represented by the network of individuals, events, and projects associated with the House of Natural Fiber Foundation. With an organization like HONF, whose development was built upon organic collaborations between friends and cemented through trust, diversity among participants is critical. Visible and non-visible diversity, including factors such as age, religion, ethnicity, languages spoken, profession, etc, composed a very important part in the way that HONF developed beginning in 1999.

With the founders' initial interests in electronics, programming, writing, music, and graphic design, curiosity led the way along with a sense of togetherness and openness that can be found in Yogyakarta, Indonesia, as characterized by the participants of this research. It was this spirit of openness that allowed for the merging of disciplines and the togetherness that enabled collaborative work. Cognitive justice is a concept that acknowledges the diversity of knowledge production by a breadth of people, but if there is not such diversity present to acknowledge, then the point is lost.

In the case of the network of practice around the House of Natural Fiber, there is a great diversity that can, should, and is acknowledged by a variety of people, and should consider to be acknowledged by a greater body of practitioners, policy makers, and communities.

The way that HONF's network developed to be a cosmopolitan group of individual participants is also part of this discussion of diversity. HONF's development as an organization is representative of the history and context of its location in Yogyakarta. Supported by a community of artists, academics, locals, and international participants, HONF is as much a product of local influences as it is an international institution shaped by colonialism and globalization. The diversity of HONF's network created collaborations among individuals and organizations that cannot be found anywhere else. It is through these collaborations that HONF is able to create a network of practice that can be a model for community development, as well as garner recognition through greater sources by appropriating power and voice through international collaborations. Global-level participation in HONF's local efforts and international communications are distinct steps in the way that HONF can influence the definition of open science because it is through participation that the HONF leadership shines, and has been able to change minds about the intersections of disciplines and the value of their work.

6.4 Participation and Understanding of Open Science

The organic nature of HONF's development through diverse and open collaborations allowed it to naturally progress from the arts towards science. Motivations behind the work of HONF gravitated from merely critiquing contemporary issues to thinking about ways to solve or otherwise support efforts to solve problems experienced by the community. In order to address these areas the research addressed the question: How do actors describe their participation in and understanding of open science and R&D practices?

Community is a widely contested term, and as such, to discretely describe the participants in this research the term network of practice was utilized. This does not remove the idea of community development, however, and this term will be debated and criticized. Regardless of the definition, there was a profound sense of

togetherness that this researcher found in the HONF network of practice, especially through participation and after being present in the space of Yogyakarta. This is seen even in the divisions that have occurred during the tumultuous events in the history of HONF. There is still a sense of family, even in conflict, and a feeling of hope that there will be something better. The research found that there is a desire and need among participants to develop not only the network of practice surrounding the House of Natural Fiber Foundation, but that of the participants' own communities as well. This was seen in participant observations across both HONF and other organizations and from the participant surveys that expressed negative comments regarding HONF, but still participated in the survey and contributing to the research.

Within this progression, came the influence that HONF had within its network of practice as a promoter of science, and position itself as an organization that does science and uses science to address and critique problems in the community. While not all efforts were framed as science, there was definitely a scientific quality that was adopted into the programming after HONF's first collaborations with the physicians, and taking a central role in their Cellsbutton events in the years after. People reported in surveys that they were able to see science in a new way in relation to their work after interacting with HONF. Nonetheless, there was also significant criticism of HONF's scientific efforts on the part of survey participants, but these criticisms were also already addressed by key informants during interviews. The criticisms and faults were recognized and are actively being reflected upon with hopes to change.

This research has determined that the development HONF from 1999 to 2014 shows that open science can be done at the community level through capacity building and creativity. The form of open science seen in the network of practice centered around Yogyakarta is both a concept and a practice that encompasses the recognition of the positive contribution that all individuals of various backgrounds can make in scientific inquiry and critique. It is the potential for all individuals to contribute to systematic inquiry, even if the practice is not yet completely refined. This research shows the potential for an organic grassroots community to develop, without necessarily any previous training, a wide-reaching network that encourages and supports interaction with scientific inquiry by individuals of all backgrounds. Developing these programs have led up to the next steps that HONF will take in 2015.

These are intentional steps to take previous efforts in scientific research, design, and development and reorient it towards a solutions, outward communication, and community-focused approach that will have more impact and ability to support not only local efforts and capacity, but national and international communities of open science practice as well through developing low cost, open, and accessible solutions for collecting data and enabling research practice. This is especially in their impact in Asia, where their work has the potential to make a huge difference in communities that are just beginning to develop their organizational cultures and portfolios of work.

6.5 Revisiting the Conceptual Framework and Hypothesis

This thesis was presented through the lens of a theoretical framework led by the concept of open science supported by knowledge democratization, cognitive justice, and community development. The hypothesis of this thesis states that the participants recognize the strength of its network in its diversity, collaborative efforts, in practicing openness, and in contributing to the ideals of community. They further recognize a social aspect of their work as something that benefits the greater good. This network of practice, through the lens of the conceptual framework, does acknowledge these points. While it is not without faults or criticisms, it is reflective and resilient. The development of this network of practice and its efforts, scientific or otherwise, is a model for the way that people can come together and advance individual interests while affecting good in the greater surrounding area and beyond. This is a model for community development. It is a model that benefits not only the community in which the network is embedded (physically and digitally), but also, through openness, diversity, collaboration, and resilience, the health of the network of practice itself, which is critical to its longevity. The health of the network of practice is critical to its ability to continue despite the departure of key individuals, the loss of data and archival material, and the shift of political environments. The findings of this thesis are only initial empirical evidence for its importance in the larger activities of community development programming and open science on the global level. As with many academic works, this thesis cannot fully portray the impact that the House of Natural Fiber has had on countless individuals in their promotion of open science and the otherwise blending of disciplines and education through their work since 1999.

The intentional steps by the House of Natural Fiber to develop new programs of open documentation for building capacity through science hardware have great potential. The ability of HONF to combine inquiry, tinkering, and creativity allows them to connect with diverse people. Their influence so far has shown that they can introduce scientific topics to a broad range of people who would otherwise not interact with systematic inquiry. It is at this interaction where HONF can work with communities to build, literally, the capacity for conducting research and gathering data at the local level in different contexts. Through science inquiry, building hardware, and staying true to their roots in art and culture, the House of Natural Fiber has the potential to use science for good in a variety of contexts across informal and formal, and local and international organizations, communities, and institutions.

6.6 Future Recommendations

This research begins to detail the characterization of open science by this community. However, the House of Natural Fiber, as it has always done, is already moving forward in defining their next steps. In 2015, they will launch a new program known as Transformaking (transformaking.org, 2015), which is more intentional in their motivations for finding solutions to societal problems. This research recommends future research about open science in Asia in order to understand the greater connections that the network of practice of the House of Natural Fiber is connected to. Potential research questions for these future studies may include:

1. What other open science networks are active in Asia?
2. How do or can these networks communicate with each other?
3. How does (another) community understand open science in their own context?
4. How has globalization and international collaboration affected science practice at the local level?
5. How often are documented practices, protocols, and designs shared, utilized, and re-uploaded for further sharing?

Furthermore, such research should be participatory, collaborative, and open. Follow-up research will include the development of open science workshops with the House of Natural Fiber Foundation and gather data on the experiences of participants in real-time engaging in the development of capacity to do science at

the community level. Participatory research of this kind will open channels of capacity building beyond open science in areas of social science regarding documentation, ethnography, and the social science of science practice. This kind of devolvement of power is community development that gives people the ability to understand their own context and utilize it for their own benefit, as opposed to a top-down program funded by international bilateral aid agencies whose agenda may blur the lines between political influence and aid in favor of international interests. Through action research, and building capacity for open science in Asia, international development has the opportunity to truly give agency and power to people on the ground level to advance their own interests in the face of changes in environment, government, and sovereignty over their own lives through community-based data collection and research and development.



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APPENDICES



APPENDIX A: Survey Questionnaire

A1: Science, Openness, Community Development A

This survey should take approximately 10 minutes to complete.

Sains, Keterbukaan, Pemberdayaan Komunitas B

Dibutuhkan kurang lebih 10 menit untuk melengkapi survei ini.

You were individually selected to complete this survey because you have previously attended a House of Natural Fiber event or worked with people associated with the House of Natural Fiber sometime in the last 15 years.

Anda dipilih secara individu untuk melengkapi survei ini, atas dasar partisipasi anda dalam acara atau proyek yang diselenggarakan House of Natural Fiber, baik sebagai partisipan kolaborasi ataupun sebagai pengunjung dalam kurun waktu 15 tahun terakhir.

About this Survey and Privacy Notice

This survey is being distributed as part of master's thesis research conducted by Hermes Huang in Yogyakarta, Indonesia regarding networks around the House of Natural Fiber over the last 15 years. This research will also contribute to a 2-year study on open science networks in Indonesia, Nepal and the Philippines.

The first section of this survey collects demographic data, including your name. For your privacy, your name, in association with responses provided here, WILL NOT BE RELEASED TO ANYONE, and will ONLY be seen by the researcher, Hermes Huang, and his research assistant, Kiki Rizqiana.

Mengenai Survei Ini dan Nota Kerahasiaan

Survei ini didistribusikan sebagai bagian dari penelitian tesis yang dilakukan oleh Hermes Huang bertempat di Yogyakarta, Indonesia, perihal jaringan yang dimiliki oleh House of Natural Fiber dalam kurun waktu 15 tahun terakhir. Penelitian ini juga akan diikuti sertakan dalam penelitian tentang jaringan sains terbuka (open science) di Indonesia, Nepal dan Filipina.

Bagian pertama dari survei ini mencari tahu tentang data demografi, termasuk juga nama anda. Untuk kerahasiaan identitas, segala respon yang dinyatakan disini, TIDAK AKAN DIBERITAHUKAN KEPADA SIAPAPUN, dan HANYA dapat diakses oleh peneliti, Hermes Huang dan asisten penelitiannya, Atinna Rizqiana

I have read "About this Survey and Privacy Notice" *

Yes, I have read and understood that my name, in association with the responses provided here, will only be seen by Hermes Huang and Kiki Rizqiana.
Saya telah membaca "Mengenai Survei ini dan Nota Kerahasiaannya" *

Ya, saya telah membaca dan paham bahwa nama saya, berikut hal-hal yang berhubungan dengan respon yang saya nyatakan disini, hanya dapat diakses oleh Hermes Huang dan Atinna Rizqiana.

I am willing to be contacted by the researcher, Hermes Huang, for further conversations about my work as part of this research project. *

Yes No Please contact me to discuss this possibility further
 Saya bersedia untuk dihubungi oleh peneliti, Hermes Huang, jika ada percakapan lanjutan berhubungan dengan kontribusi saya sebagai bagian dari proyek penelitian ini *

Ya Tidak Tolong kontak saya jika ada kemungkinan diskusi lanjutan

Email

Phone

Nomer Telepon

Demographic Data

Data Demografi

(Name) Nama*) Awal (second) Keluarga

(Age) Usia *

(Gender) Jenis kelamin *

(male) Laki-laki (I prefer not to answer) Tidak dijawab (others) Lainnya

(female) Perempuan

(Ethnicity) Etnisitas

(Nationality) Kebangsaan *

(Associated Institution) Institusi *

(Profession) Profesi *

(Religion) Agama *1st language spoken

Bahasa yang digunakan pertama *

Bahasa Indonesia Jawa Inggris Lainnya

2nd language spoken

Bahasa yang digunakan kedua

Bahasa Indonesia Jawa Inggris Lainnya

3rd language spoken

Bahasa yang digunakan ketiga

Bahasa Indonesia Jawa Inggris Lainnya

1st Person, Event, OR Object that introduced you to the House of Natural Fiber
 Orang pertama, Acara ATAU Obyek yang memperkenalkan anda pada House of Natural Fiber*

The main survey will now begin

Survei utama akan dimulai sekarang

Motivations for working with other people

Motivasi dalam bekerja bersama orang lain

I work with other people to reinforce existing knowledge about certain topics. *

Saya bekerja bersama orang lain untuk menambah pengetahuan mengenai topik tertentu*

Strongly Agree Agree Neutral Disagree Strongly Disagree
0 Sangat setuju 0 Setuju 0 Netral 0 Tidak setuju 0 Sangat tidak setuju

I work with other people to meet and work with people who have different interests. *
Saya bekerja bersama orang lain untuk dapat bertemu dan bekerja dengan orang-orang yang memiliki ketertarikan yang berbeda.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

I work with other people to get inspired for future projects. *
Saya berkerja bersama orang lain untuk mendapatkan inspirasi bagi proyek mendatang.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

I work with other people to improve my CV or resume. *
Saya bekerja bersama orang lain untuk meningkatkan kualitas CV atau resume saya.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

I work with other people to challenge myself. *
Saya bekerja bersama orang lain untuk menantang diri saya sendiri.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

Deterrents for working with other people

Yang memberatkan dalam bekerja bersama orang lain

I do NOT like to work with other people because I prefer to work alone. *

Saya TIDAK suka untuk bekerja bersama dengan orang lain, karenanya lebih baik untuk bekerja sendiri

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do NOT like to work with other people because I don't want people to steal my ideas *

Saya TIDAK suka untuk bekerja bersama orang lain karena saya tidak mau mereka mencuri ide saya.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do NOT like to work with other people because my projects are too advanced or complex *

Saya TIDAK suka bekerja bersama orang lain karena proyek saya terlalu maju dan rumit.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

Understandings and methods about sharing and documentation

Pemahaman dan metode dalam berbagi dan pendokumentasian

I organize workshops to teach and share my work. *

Saya membuat banyak pelatihan guna mengajarkan dan membagi pekerjaan/karya saya

Strongly Agree Agree Neutral Disagree Strongly Disagree
 Data, projects, and processes should be published online for other people to use. *
 Data, proyek dan proses harus dipublikasikan secara online agar orang lain dapat mememanfaatkannya.*

Strongly Agree Agree Neutral Disagree Strongly Disagree
 I document my work using... *
 Saya mendokumentasikan pekerjaan/karya saya lewat...*

Pictures Video Writing Audio Other I do not document my work

0 Foto 0 Video 0 Tulisan 0 Audio 0 Lainnya 0 Saya tidak mendokumentasikan karya saya

I share my work using... *
 Saya membagi pekerjaan/karya saya lewat.*

Blogs Wikis Social Media (Facebook, Path, LinkedIn, etc) Group Chats (Line, Facebook Messenger, Blackberry Messenger, etc) Open Sharing Websites (Instructables, GitHub, Thingiverse, wikiHow, etc) Physical Exhibitions Workshops I do not share my work

0 Blog

0 Wiki

0 Media Sosial (Facebook, Path, LinkedIn, etc)

0 Chat grup (Line, Facebook Messenger, Blackberry Messenger, etc)

0 Website open sharing (Instructables, GitHub, Thingiverse, wikiHow, etc)

0 Pameran langsung

0 Pelatihan

0 Saya tidak membagi karya saya

Deterrents for sharing and documentation UNIVERSITY

Yang memberatkan dalam berbagi dan pendokumentasian

I do not share my work (projects and processes) because my projects are too easy or simple. *

Saya TIDAK membagi pekerjaan/karya saya (proyek maupun proses) karena karya saya terlalu mudah dan sederhana

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do not share my work (projects and processes) because my my projects are not interesting. *

Saya tidak membagi pekerjaan/karya saya (proyek maupun proses) karena pekerjaan/karya saya tidak menarik

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do not share my work (projects and processes) because I don't want to be critiqued. *

Saya tidak membagi pekerjaan/karya saya (proyek maupun proses) karena saya tidak bersedia mendapat kritik.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

Attitudes and Understandings about the House of Natural Fiber
Sikap dan Pemahaman akan House of Natural Fiber

The House of Natural Fiber (HONF) does work that is scientific. *

House of Natural Fiber (HONF) melakukan pekerjaan yang tergolong ilmiah

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) is easily accessible when I need help, advice, or people to work with. *

House of Natural Fiber (HONF) memberi akses yang mudah kapanpun saya membutuhkan pendapat atau bantuan tenaga.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) is something I would introduce a friend to. *

House of Natural Fiber (HONF) adalah sesuatu yang akan saya beritahukan kepada teman-teman.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) is made up of diverse people. *

House of Natural Fiber (HONF) terdiri dari orang-orang dari latar belakang yang beragam

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) makes science more accessible for the community. *

House of Natural Fiber (HONF) membuat sains menjadi mudah diakses bagi orang-orang

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) is something that I no longer want to engage with. *

House of Natural Fiber (HONF) adalah sesuatu dimana saya tidak lagi mau terlibat di dalamnya.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

I have engaged with HONF by... *

Saya pernah terlibat dengan HONF lewat..*

working together on a project working together on an event or workshop

attending an event or workshop reading about HONF, in the media, but never

engaging none of the above other ways

0Bekerja bersama dalam sebuah proyek

0Bekerja bersama dalam sebuah acara atau pelatihan

0Mengunjungi acara atau pelatihan yang diadakannya

0membaca artikel tentang HONF di media, namun tidak pernah terlibat langsung

0Tidak satupun termasuk di atas

0Melalui cara lain

I would work with HONF to be a part of a community. *

Saya bersedia bekerja bersama HONF untuk menjadi bagian dari sebuah komunitas.*

Strongly Agree Agree Neutral Disagree Strongly Disagree

I would work with HONF to meet new people. *

Saya bersedia bekerja dengan HONF dalam rangka mengenal orang-orang baru

Strongly Agree Agree Neutral Disagree Strongly Disagree

I would work with HONF to address societal problems (environment, transportation, health, etc) in Yogyakarta. *

Saya bersedia bekerja bersama HONF untuk menyasar masalah-masalah sosial (contoh: lingkungan, transportasi, kesehatan, dsb) di Yogyakarta

Strongly Agree Agree Neutral Disagree Strongly Disagree

I work with aspects of the HONF Community (people, events, projects/objects)... *

Saya bekerja dengan elemen-elemen dari komunitas HONF (orang-orangnya, acara, proyek, karya), setiap...

Daily Several times a week Several times a month Several times a year

Previously worked with HONF, but not anymore Never

0Hari

0Beberapa kali dalam seminggu

0Beberapa kali dalam sebulan

0Beberapa kali dalam setahun

0Pernah bekerja dengan HONF, namun tidak lagi

0Tidak pernah

Understandings of Science

Pemahaman akan Sains

Science is important for making people's lives easier and more comfortable. *

Sains memiliki peran penting dalam membuat kehidupan lebih mudah dan nyaman

Strongly Agree Agree Neutral Disagree Strongly Disagree

Science has one definition. *

Sains hanya memiliki satu definisi

Strongly Agree Agree Neutral Disagree Strongly Disagree

Science is objective, unbiased, and non-political. *

Sains itu objektif, tidak memihak, dan non-politik

Strongly Agree Agree Neutral Disagree Strongly Disagree

Understandings of Community Development

Pemahaman akan Pemberdayaan Komunitas

I did not initially work with HONF to make things to improve my community. *

Saya bekerja bersama HONF pada dasarnya tidak bertujuan untuk memajukan komunitas saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

I work with HONF on projects to solve problems in my community. *

Saya bekerja bersama HONF untuk memecahkan persoalan di dalam komunitas saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do not have the skills to make a difference in the problems that affect my community. *

Saya tidak memiliki kemampuan untuk membuat perbaikan dalam permasalahan-permasalahan yang terjadi di komunitas saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

Free Response Questions

Pertanyaan bebas

How would you describe the House of Natural Fiber? *

Bagaimana anda mendeskripsikan House of Natural Fiber

How do you define community development? *

Bagaimana anda mendeskripsikan pemberdayaan komunitas?

This is the end of the survey. Thank you for completing it. Results will be analyzed and published over the course of the next few months! If you would like to learn more about the long-term project, please check out the following website!

Ini adalah akhir dari survei. Terima kasih atas kesediaannya dalam melengkapi. Hasil dari ini akan dianalisa dan dipublikasikan dalam beberapa bulan kedepan! Jika anda ingin mengetahui lebih lanjut tentang proyek jangka panjang ini, silahkan kunjungi website ini!

A2. Science, Openness, Community Development B

This survey should take approximately 10 minutes to complete.

Sains, Keterbukaan, Pemberdayaan Komunitas B

Dibutuhkan kurang lebih 10 menit untuk melengkapi survei ini.

You were individually selected to complete this survey because you have previously attended a House of Natural Fiber event or worked with people associated with the House of Natural Fiber sometime in the last 15 years.

Anda dipilih secara individu untuk melengkapi survei ini, atas dasar partisipasi anda dalam acara atau proyek yang diselenggarakan House of Natural Fiber, baik sebagai partisipan kolaborasi ataupun sebagai pengunjung dalam kurun waktu 15 tahun terakhir.

About this Survey and Privacy Notice

This survey is being distributed as part of master's thesis research conducted by Hermes Huang in Yogyakarta, Indonesia regarding networks around the House of Natural Fiber over the last 15 years. This research will also contribute to a 2-year study on open science networks in Indonesia, Nepal and the Philippines.

The first section of this survey collects demographic data, including your name. For your privacy, your name, in association with responses provided here, WILL NOT BE

RELEASED TO ANYONE, and will ONLY be seen by the researcher, Hermes Huang, and his research assistant, Kiki Rizqiana.

Mengenai Survei Ini dan Nota Kerahasiaan

Survei ini didistribusikan sebagai bagian dari penelitian tesis yang dilakukan oleh Hermes Huang bertempat di Yogyakarta, Indonesia, perihal jaringan yang dimiliki oleh House of Natural Fiber dalam kurun waktu 15 tahun terakhir. Penelitian ini juga akan diikuti sertakan dalam penelitian tentang jaringan sains terbuka (open science) di Indonesia, Nepal dan Filipina.

Bagian pertama dari survei ini mencari tahu tentang data demografi, termasuk juga nama anda. Untuk kerahasiaan identitas, segala respon yang dinyatakan disini, **TIDAK AKAN DIBERITAHUKAN KEPADA SIAPAPUN**, dan **HANYA** dapat diakses oleh peneliti, Hermes Huang dan asisten penelitiannya, Atinna Rizqiana

I have read "About this Survey and Privacy Notice" *

Yes, I have read and understood that my name, in association with the responses provided here, will only be seen by Hermes Huang and Kiki Rizqiana.
Saya telah membaca "Mengenai Survei ini dan Nota Kerahasiaannya" *

Ya, saya telah membaca dan paham bahwa nama saya, berikut respon yang saya nyatakan disini, hanya dapat diakses oleh Hermes Huang dan Atinna Rizqiana.

Email

Phone

Nomer Telepon

Demographic Data

Data Demografi

(Name) Nama (first) Awal second) Keluarga

(Age) Usia *

(Gender) Jenis kelamin *

(male) Laki-laki (I prefer not to answer) Tidak dijawab (others) Lainnya

(female) Perempuan

(Ethnicity) Etnisitas

(Nationality) Kebangsaan *

(Associated Institution) Institusi *

(Profession) Profesi *

(Religion) Agama *

1st language spoken

Bahasa yang digunakan pertama *

Bahasa Indonesia Jawa Inggris Lainnya

2nd language spoken

Bahasa yang digunakan kedua

Bahasa Indonesia Jawa Inggris Lainnya

3rd language spoken

Bahasa yang digunakan ketiga

Bahasa Indonesia
 Jawa
 Inggris
 Lainnya

1st Person, Event, OR Object that introduced you to the House of Natural Fiber
Orang pertama, Acara ATAU Obyek yang memperkenalkan anda pada House of Natural Fiber *

The main survey will now begin
Survei utama akan dimulai sekarang

Motivations for working with other people

Motivasi dalam bekerja sama dengan orang lain

I work with other people to learn new skills. *

Saya bekerja bersama orang lain untuk mempelajari keahlian baru

Strongly Agree
 Agree
 Neutral
 Disagree
 Strongly Disagree

OSangat setuju

OSetuju

ONetral

OTidak setuju

OSangat tidak setuju

I work with other people to meet and work with people who share similar interests. *

Saya bekerja bersama orang lain untuk bertemu dan bekerja dengan mereka yang memiliki ketertarikan yang sama

Strongly Agree
 Agree
 Neutral
 Disagree
 Strongly Disagree

I work with other people to build networks that I can use in the future. *

Saya bekerja dengan bersama orang lain untuk membangun jaringan yang dapat saya gunakan di masa depan

Strongly Agree
 Agree
 Neutral
 Disagree
 Strongly Disagree

I work with other people to improve my reputation. *

Saya bekerja bersama orang lain untuk meningkatkan reputasi saya

Strongly Agree
 Agree
 Neutral
 Disagree
 Strongly Disagree

I work with other people to find employment opportunities. *

Saya bekerja bersama orang lain untuk mendapatkan kesempatan bekerja

Strongly Agree
 Agree
 Neutral
 Disagree
 Strongly Disagree

I prefer to work with people using... *

Saya lebih banyak bekerja bersama orang lain lewat..

Facebook
 Twitter
 Email
 Line
 Whatsapp
 Blackberry Messenger

Path
 In-person Meeting
 Other

Deterrents for working with other people

Yang memberatkan dalam bekerja bersama orang lain

I do NOT like to work with other people because I don't have enough time. *

Saya TIDAK suka bekerja bersama orang lain karena saya tidak memiliki cukup waktu

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do NOT like to work with other people because my projects are too easy or simple. *

Saya TIDAK suka bekerja bersama orang lain karena proyek saya terlalu mudah dan sederhana

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do NOT like to work with other people because I don't want my work to be critiqued. *

Saya TIDAK suka bekerja bersama orang lain karena saya tidak mau karya saya dikritik

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do NOT like to work with other people because I want to avoid misunderstanding and miscommunication. *

Saya TIDAK suka bekerja bersama dengan orang lain karena saya menghindari kesalahpahaman dan miskomunikasi

Strongly Agree Agree Neutral Disagree Strongly Disagree

Understandings and methods about sharing and documentation

Pemahaman dan metode tentang berbagi dan pendokumentasian

I fully understand what Creative Commons licenses are. *

Saya sepenuhnya paham akan lisensi Creative Commons

Strongly Agree Agree Neutral Disagree Strongly Disagree

I offer professional (paid) services in my area of expertise. *

Saya menawarkan layanan profesional (berbayar) dalam bidang keahlian saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

I share my work because it is expected of me. *

Saya membagi pekerjaan/karya saya karena itu yang diharapkan dari saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

Deterrents for sharing and documentation

Yang memberatkan dalam berbagi dan pendokumentasian

I do not share my work (projects and processes) because I don't have time. *

Saya tidak membagi pekerjaan/karya saya (proyek maupun proses) karena saya tidak memiliki cukup waktu

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do not share my work (projects and processes) because my projects are not creative. *

Saya tidak membagi pekerjaan/karya saya (proyek maupun proses) karena pekerjaan/karya saya tidak cukup kreatif

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do not share my work (projects and processes) because I don't want people to steal my ideas. *

Saya tidak membagi pekerjaan/karya saya (proyek maupun proses) karena saya tidak mau orang lain mencuri ide saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

I do not share my work (projects and processes) because my projects are too complex. *

Saya tidak membagi pekerjaan/karya saya (proyek maupun proses) karena terlalu rumit

Strongly Agree Agree Neutral Disagree Strongly Disagree

Attitudes and Understandings about the House of Natural Fiber

Sikap dan Pemahaman tentang House of Natural Fiber

The House of Natural Fiber (HONF) is a community I feel a part of. *

House of Natural Fiber merupakan komunitas dimana saya merasa menjadi bagian darinya

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) positively affects Yogyakarta and surrounding communities. *

House of Natural Fiber (HONF) memberikan pengaruh positif bagi Yogyakarta dan komunitas di sekitarnya

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) is one place where I get inspiration for my personal work. *

House of Natural Fiber (HONF) merupakan tempat dimana saya bisa mendapat inspirasi bagi pekerjaan/karya pribadi saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) shares their work openly for others to critique and utilize. *

House of Natural Fiber (HONF) membagi kegiatan dan karya mereka secara terbuka dan dapat digunakan maupun dikritik oleh orang lain

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) is made up of people who have diverse ways of thinking. *

House of Natural Fiber (HONF) terdiri dari orang-orang yang memiliki cara pikir yang beragam

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) has introduced me to new people that I have subsequently worked with on projects or events. *

House of Natural Fiber (HONF) telah memperkenalkan saya pada orang-orang baru yang kemudian hari bekerja sama dalam satu proyek atau acara

Strongly Agree Agree Neutral Disagree Strongly Disagree

The House of Natural Fiber (HONF) does not have the resources that I need. *

House of Natural Fiber (HONF) tidak memiliki sumber daya yang saya butuhkan

Strongly Agree Agree Neutral Disagree Strongly Disagree

I would work with HONF to learn about science. *

Saya bersedia bekerja dengan HONF untuk mempelajari sains

Strongly Agree Agree Neutral Disagree Strongly Disagree

I would work with HONF to learn new skills. *

Saya bersedia bekerja dengan HONF untuk mempelajari keahlian baru

Strongly Agree Agree Neutral Disagree Strongly Disagree

I would work with HONF to hang out and have fun. *

Saya bersedia bekerja dengan HONF untuk bergaul dan bersenang-senang

Strongly Agree Agree Neutral Disagree Strongly Disagree

I would work with HONF to access their facilities. *

Saya bersedia bekerja dengan HONF untuk mengakses fasilitas mereka

Strongly Agree Agree Neutral Disagree Strongly Disagree

Understandings of Science

Pemahaman akan sains

I can see my work as a form of science. *

Saya menganggap pekerjaan/karya saya sebagai bentuk sains

Strongly Agree Agree Neutral Disagree Strongly Disagree

Science is something only done in formal institutions. *

Sains adalah sesuatu yang hanya dilakukan dalam institusi formal

Strongly Agree Agree Neutral Disagree Strongly Disagree

Science is too complicated to use in my work. *

Sains adalah hal yang terlalu rumit untuk digunakan dalam pekerjaan/karya saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

Understandings of Community Development

Pemahaman akan Pemberdayaan Komunitas

My work contributes to alleviating specific problems in my community. *

Pekerjaan/karya saya berkontribusi dalam mengurasi permasalahan tertentu dalam komunitas saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

I see HONF as a resource that I can use to make things to improve my community *

Saya memandang HONF sebagai sumber daya yang dapat saya gunakan dalam memajukan komunitas saya

Strongly Agree Agree Neutral Disagree Strongly Disagree

Development is something that only the government or large organizations should work on. *

Pembangunan merupakan sesuatu yang harus dilakukan oleh pemerintah dan organisasi besar saja

Strongly Agree Agree Neutral Disagree Strongly Disagree

Free Response Questions

Pertanyaan bebas

What is your inspiration or motivation behind the kind of work that you do? *

Apa yang menginspirasi atau memotivasi anda dalam berkarya atau melakukan pekerjaan?

How do you define science? *

Bagaimana anda mendefinisikan sains?

This is the end of the survey. Thank you for completing it. Results will be analyzed and published over the course of the next few months! If you would like to learn more about the long-term project, please check out the following website!

Ini adalah akhir dari survei. Terima kasih atas kesediaannya dalam melengkapi. Hasil dari ini akan dianalisa dan dipublikasikan dalam beberapa bulan kedepan! Jika anda ingin mengetahui lebih lanjut tentang proyek jangka panjang ini, silahkan kunjungi website ini!


A3. Survey Questionnaire Free Responses

A3.1 Survey A

Entry Id	Date Created	How would you describe the House of Natural Fiber? Bagaimana anda mendeskripsikan House of Natural Fiber?	Translation of BQ	How do you define community development? Bagaimana anda mendeskri	Translation of BS

				ipsikan pemberda yaan komunitas?	
1	2015-05-27	Open lab.		Continuity .	
2	2015-05-27	community engaged, generous, international, outgoing, experimental, open, critical, playful, well organised		active involvement between those with knowledge and skills and those who benefit from the transfer of knowledge. an active exchange in giving and learning from all participants. the open flow of information, of the strengthening of all involved.	
3	2015-05-27	One of the most progressive art+science community in Asia.		Bringing more people together to get involved in the topic.	


4	2015-05-27	Komunitas yang multi disiplin	A multi discipline community	Bersama sama saling belajar antar anggota untuk menyelesaikan persoalan-persoalan di dalam komunitas .	To learn together among members to solve different kinds of problems that happens in the community
5	2015-05-27	I have not enough place to write my answer.		Same as above.	
6	2015-05-27	important / penting :p		very important / sangat penting :p	
7	2015-05-28	They are a bridge between science, art and community development. They encourage young people and non-specialists to try to develop solutions for their community.		This is a very wide and varied question. It can be a lot of different things.	
8	2015-05-28	For me HONF is not anymore the organisation it used to be. Most of the friends working there have left HONF and have found new and more opened organisation called Lifepatch based in south Jogja, with no hierarchy in their positions as it used to be in the House of natural fiber. That is why I prefer to communicate and to		I am sure that HONF has done lots of very positive things for the local communities. But in Jogjakarta there are far more organisations such as Kunci, ICAN,	

		cooperate with the ex-honf, now Lifepatch members.		Lifepatch, Survive garage, Save the dunes, Performance club and many others. They all are trying to improve the society, the country, the earth, by organising many interesting, useful and educative events, workshops etc.	
9	2015-05-30	sound efect	 <p>จุฬาลงกรณ์มหาวิทยาลัย CHULALONGKORN UNIVERSITY</p>	don't forget for regeneration and inovatif or keep spirit	

10	2015-05-30	Exclusive Closed group	<p>Berdiri sama ditengah mereka, ada saatnya didepan memberi contoh, ditengah memberi semangat, dibelakan g memberi dorongan</p>	<p>To stand equal in the middle of them, there's a moment to be in front of them to gave examples, in the middle give them spirits, and to be in the back and give them a push</p>
11	2015-05-30	<p>One of the most interesting collectives that work between arts, research and communities. I have been in particular interested in their environmentally driven work. It should also be said, that they are a lovely group of people, with whom dialogue, sharing a meal and cooking together are as important as the work done. On another note; some questions above did not have suitable answers so i marked them neutral, towards the end of the survey.</p>	<p>I prefer to talk about collaborati on with local groups, as often communit y denotes too strong degrees of belonging. Developm ent is a tricky one, as it also has geopolitic al histories as a term. Often enhancing means of self expression and ways of</p>	

				developin g practices and skills together, or simply moderated dialogue are those things that mark positive aspects of communit y developm ent.	
12	2015- 05-31	Cool kids		Building bridges between different people	
13	2015- 05-31	A laid back institution with highly intelligent and thoughtful people who are engaged in their communities and focused on experimenting with education as a focus.		Uniting people with a vision on improving their local communit y	
14	2015- 05-31	A very interesting collective that bridges the digital, material and social.		Finding ways to support members of a communit y to advance projects they have defined and are engaged in and committed to.	
15	2015- 06-01	x		x	

16	2015-06-01	Fresh people		not something that is done but something that happens.	
17	2015-06-01	I do not have the experience in partnering with HONF, therefore I cannot describe it.		When people in the community collaborate to generate solutions to common problems	
18	2015-06-01	house of natural fiber is a good place for a good people		a people with a different characteristics in one project	
19	2015-06-01	Artists at heart, a dynamic group of excellent, creative people with good ideas and a very positive, hand-on attitude to problem solving.		Shaped by the challenges and problems faced by the community as a whole.	
20	2015-06-01	no experience with it		common issue sharing within by communication platforms [events, via web etc]	
21	2015-06-01	HNF is a great online/offline		During years of	

		community with a lot of interests and strongly dedicated in community collaboration.		observation I think that they became a catalyser of ideas and growing number of participants that make community stronger.	
22	2015-06-02	 <p>HONF merupakan suatu lembaga nirlaba yang bergerak pada kegiatan pemberdayaan masyarakat...pelatihan yang dilakukan memberikan pencerahan untuk memperlengkapi peserta lebih baik.</p>	<p>HONF is a non-profit organization that moves in a community empowerment activity. The workshop that they conduct,</p>	<p>pemberdayaan komunitas merupakan cara atau strategi pelibatan masyarakat untuk berdaya dalam menghadapi persoalan dan menggerakkan kerjasama satu dengan lainnya.</p>	<p>community development is a way or strategy to involving community in order for them to become empowered to face problems and stimulate teamworks among one another</p>

			brings enlightenment to be able to make the participant 'well equipped'	
23	2015-06-02	<p>When I was a student HONF was known as party brats. However once I got to know them a little better their individual interests are quite diverse. I didn't get that impression from it as an organization, though. HONF produces sleek publications which in return has made it easier for me to describe their activities to curious agents ~mostly foreigners. I would now define it as a media art community, one that is still hard to find in Indonesia art scene.</p>		<p>The idea still needs to be figured out within different circumstances. For example when one tries to engage with individuals from a variety of backgrounds (education, economy, practices, etc.) one should be wary of using the</p>

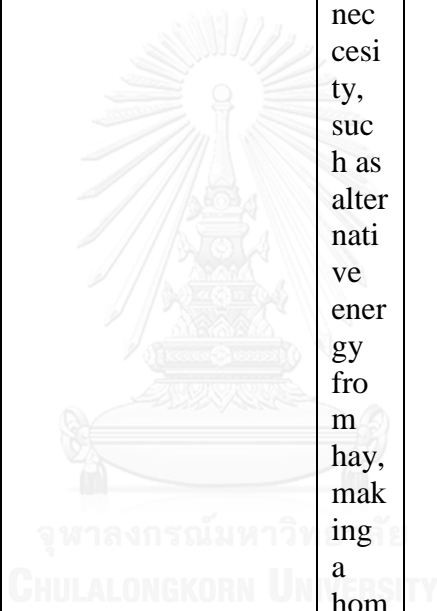
			<p>term community for it is potentially misunderstood as attempts of doing social work. Community empowerment is however, another creature.</p>	
24	2015-06-02	<p>During my first stay in Indonesia I met Venzha Christ and later Ira Agrivine, the co-founders of HONF. Ira invited me to give a noise workshop at HONF and I took an interview with her and Venzha Christ. Ira Agrivine strongly supported me in my feminist approach and helped to organize a 'Mz Baltazar's Laboratory' workshop on Open Hardware at Sewon Art Space, the Artist Residency I was based in. What made it a 'Mz Baltazar's Laboratory' workshop was the fact that it was exclusively for people who identify as female. Ira continued the group after my first visit and developed it into the</p>	<p>It is important to encourage kampung life and sharing systems on a local level, take responsibility for global issues and react to them on a local level, network with neighbors, but as well like minded activists on a global level. Community</p>	

		women artist collective XXLab. In 2014 I have collaborated on a project with XXLab, for an exhibition in Jakarta.		development means raising awareness on the interdependencies of people living close to each other, encouraging gift economy and informal markets, at the same time understanding the consequences and bigger picture through relating to other groups and international initiatives.	
25	2015-06-03	Great place great people in a great place in Indonesia inspiration for other location in the world how it can be done		Creating a better community using the talents, inspiration and entrepreneurial drive of people. Using what there is already	

				to create food, water and energy for all to use so that basic needs are met. Make a person proud where you come from and what can be done to make it greater	
26	2015-06-03	HONF awalnya adalah sekelompok orang dengan latar belakang pendidikan desain grafis. Mereka erat dengan musik elektronik dan party. Mereka kemudian memilih media art sebagai bidang utamanya. Sebagai komunitas mereka membuat karya2 seni dan event-event. Pada perkembangannya media art kemudian mereka hubungkan dengan kebutuhan hidup manusia, seperti energi alternatif dari jerami, pembuatan alkohol, bengkel craft dengan peralatan mutakhir.	In the beginning, HONF is consist by a bunch of people with a graphic design background. They are	ketika sebuah komunitas berhasil menanggulangi sebuah permasalahan yang umum dan mendasar yang dialami oleh anggota komunitas tersebut. komunitas menjadi lebih maju dan kuat.	When a community successfully solving common and basic problems, that's been faced by their members, the community itself will grew stronger

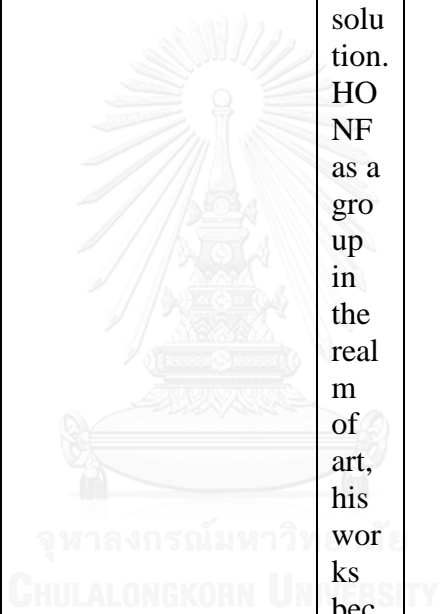
			usually linked with electronic music and party. They then chose media art as their main field. As a community they made lots of artworks and events. Later on, as their expl	
--	--	--	--	--

			oration on media art, they join art with human basic necessity, such as alternative energy from hay, making a home made alcohol, crafting workshop with state of the art equipment		
--	--	--	---	--	--



			<p>nt</p> <p>I do not understand the purpose of HO NF. If the development is now ongoing on they use science to facilitate the lives of many people, it seems there is no project HO</p>	
--	--	--	--	--

			<p>NF I hear succ eed ed in pro vidi ng an effe ctiv e solu tion. HO NF as a gro up in the real m of art, his wor ks bec ame a sort of a poli she d pres enta tion of the proj ect to mak</p>		
--	--	--	---	--	--



			e it mor e artis tic (but still not able to mov e the feeli ngs sho uld see artw ork) . Glo ss was sole ly mad e into an obje ct pres ente d proj ect it as very sop histi cate d, com plex , and		
--	--	--	--	--	--




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จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY


27	2015-06-05	too much party, hahahahaha...	 <p>setiap elemen dengan kemampuannya ikut bersumbangsih terhadap komunitas tsb, sederhana apaun. dan komunitas tsb diharapkan mempunyai impact terhadap society, yg lebih luas. memang mungkin tidak bisa instant, tetapi itu adalah harga yang harus dibayar.</p>	Every elements with its ability, together having useful role to their community, even as simple as possible. And hopefully the community itself have an impact to the wider and bigger scope of society. Its definitely not an instant process, but its there's a price to pay
----	------------	----------------------------------	---	--


			Generally: One art and technology-based independent collective. Personally: co-worker, sharing friend and brother on celebrating life.		Crucial, but must not neglect the existence of personal values in a community.
28	2015-06-06	secara umum; satu kolektif mandiri berbasis seni dan teknologi. secara khusus (pribadi); rekan dalam bekerja, teman dalam berbagi, dan saudara dalam merayakan hidup.		penting. namun, tetap tanpa mengabaikan keberadaan 'nilai' personal dalam sebuah komunitas.	
29	2015-06-06	energetic		indispensible	
30	2015-06-06	as sharing space		(-)	
31	2015-06-06	It's difficult to describe, cos i know how it has constantly changed and evolved throughout the years. having had a very pioneering and socially responsible		the definition of community has a very different connotat	

		role in the earlier times 2007-2011, i am not so sure how to describe them now.		ion in indonesia..	
32	2015-06-06	Organisasi yang memiliki taste seni yang bagus	Organization that have a good taste on art	Semangat kemandirian yang tinggi	A high spirit of independency
33	2015-06-09	a workshop of poetry, culture and making. A house for imagination, love and action.		Like an autonomous primitive cell with inputs, sensors / brain / outputs, action. This unique cell can divide, react and create networks of other autonomous cells.	
34	2015-06-09	Art & science for change		Engagement within & understanding not exploiting	

35	2015-06-09	<p>Saya mengetahui dari beberapa pameran dan sempat mampir ke studio kita sewaktu di Bandung. Proyek yg dikerjakan sangat menarik, terutama yang dilakukan di FabLab-nya. Dengan potensi memiliki workshop seperti itu, Bandung, kota tempat tinggal saya, akan dibanjiri banyak mahasiswa arsitektur/desain/seni untuk melakukan eksperimentasi dan berbagi lewat pameran. Saya kira proses yang mereka lakukan sangatlah penting.</p>	<p>I know them from some exhibition, and they had a chance to stop by to our studio in Bandung. Their projects are very interesting, especially some that' been don</p>	<p>Megembangkan potensi yang dimiliki komunitas sehingga dapat memiliki kemandirian</p>	<p>Developing potencial own by community, in order to they own their independencies.</p>
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			e in thei r fabl ab. Wit h the kind of pote ntial to hav e that kind of wor ksh op, Ban dun g - the plac e whe re I live d, will be ovef low ed by man y arch itect ure/ desi gn/ art stud ent,		
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			 <p>doing experi men tatio ns and shar ing thro ugh exhi biti on. I thin k the proc ess they hav e alre ady don e is very imp orta nt.</p>	
36	2015-06-09	edgy and fun.		to wake people up and aware about their environme nt, their surroundin gs, to list problems then choose the easiest method first to solve

				them.	
37	2015-06-09	Tempat berbagi ide dan berkolaborasi	A place to share ideas and to collaborate	Ketika komunitas mendapatkan manfaat dari kegiatan tertentu	when communities are getting benefits from certain activities
38	2015-06-09	Their achievement of the projects both in community scene and in the international scene, I have full of respect for them.	 Their achievement of the projects both in community scene and in the international scene, I have full of respect for them.	If the community is alive, it's been always updated and maintained the structure of the community. Not only becoming bigger, alternation of the generation in the community is also development.	

			An open organization whom always give contribution to the their community and society, through their workshops, works, performance, collaboration, etc	community is a foundation that needs to make some change and improvement
39	2015-06-09	Sebuah organisasi terbuka yg selalu memberikan kontribusi ke komunitas dan masyarakat sekitarnya, entah itu lewat karya, workshop, pertunjukan, kolaborasi dll.		Komunitas adalah pondasi yg diperlukan untuk melakukan perubahan dan perbaikan.
40	2015-06-09	An idea that should exist elsewhere in the world too. I wish we have a HONF in		Encouraging the community to be a

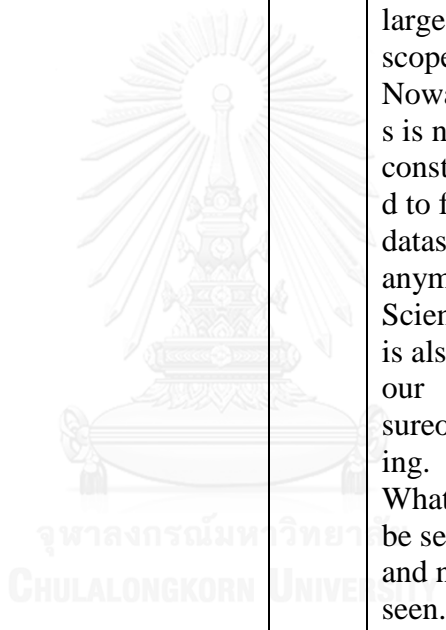
		Europe.		part of its own development.	
41	2015-06-09	Awesome!		Inspiring always — looking for innovation for the better!	
42	2015-06-09	A community of specialists hosting projects and sharing knowledge globally.		Helping all community members access their rights, feel like they belong, and achieve a quality of life that is acceptable to them.	
43	2015-06-10	HONF yang sekarang adalah sebuah institusi yang banyak bekerja layaknya sebuah institusi pada umumnya, mengerjakan proposal dan menjalankannya.	Right now HONF is an institution that do a lot of works, just like any other	pemberdayaan komunitas adalah memberikan ruang dalam arti yang luas kepada setiap komunitas untuk menjadi inkubator ide-ide, wacana, dan pikiran di dalamnya.	Community development is a way to give space is a wider meanings to every community, as an incubator of ideas, platforms, and their inside thought

			com mon insti tuti on, wor king on pro pos al and run it	
44	2015- 06-12	a strong community/ org, different, easy access, innovative, art, familiar..		should be a co- working for developm ent for communiti es.
45	2015- 06-12	HONF is a great collaborative effort to make tools and ideas accessible for artistic and community projects and education.		Communit y developm ent is increasing interaction , communic ation, and education.
46	2015- 06-15	...		Working in collaborati on with people that share a context in order to improve their conditions
47	2015- 06-23	An inspiration from afar.		Engaging diverse people

				with common goals, be them explicit or otherwise.	
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A3.2 Survey B

Entry Id	Date Created	What is your inspiration or motivation behind the kind of work that you do? Apa yang menginspirasi atau memotivasi anda dalam berkarya atau melakukan pekerjaan?	Translation of BJ	How do you define science? Bagaimana anda mendefinisikan sains?	Translation of BL
1	2015-05-20	Cognitive justice and knowledge democratization for people who are recognized for their contributions to knowledge		Science is a process that has been politicized and used in a global hierarchy of knowledge production	
2	2015-05-30	melakukan riset terutama pada sejarah	Doing research especially on history	saya tidak tahu karena saya bukan ahli dalam sains	I dont know, because I'm not a scientist
3	2015-05-30	Our main goal at Olabi is to bring diversity to the production of new technologies, bringing		Science is the day by day discovery	

		access to people.		!	
4	2015-05-30	My big family		Sesuatu yang baru yang tdk pernah dipikirkan dan dibuat orang sebelum saya	Something new, something that never been thought or done by people before me
5	2015-05-30	My passion for art and to develop, promote. Support the very existence of Indonesian contemporary art		Science is such a large scope. Nowadays is not constricted to fixed data anymore. Science is also our surrounding. What can be seen and not seen. It is more and more easily connected with arts. Especially in the scope of focus that I do. Culture. Arts, technology. Then of	

				course, science.	
6	2015-05-31	I don't believe that anti capitalist revolution is possible in my lifetime so I have chosen to focus on individual moments of creative expression as the closest thing to freedom I have encountered in this life		rigorous, organized research and pursuit of information	
7	2015-05-31	Great work from other people, like music, film, photography.		A method, knowledge to solve problems .	
8	2015-05-31	Pematangan diri dan Peningkatan Kualitas Hidup. baik secara materil maupun secara non-materil	As a grown up process and to improving my quality of life, in term of materially and non-materially	ilmu pengetahuan yang mampu membantu dan memudahkan manusia dalam menjalankan kehidupannya. science adalah alat atau metode, bukan tujuan.	knowledge that are able to help and make life easier for people. Science is a tool or method, not a purpose
9	2015-06-02	Make better life		ilmu pasti!	defined knowledge!
10	2015-06-02	As an artist and a researcher I aim to look for and discover things		Knowledge of any kind.	

		that were previously unknown to me, which often leads to new insights and creative work that can also benefit others in a broader context.			
11	2015-06-03	Contribute to better world, transformation to better world		Gathering new knowledge and apply this knowledge in contemporary society	
12	2015-06-03	complexity level		science is the way to search the truth, the road to find the things that you really want to understand	
13	2015-06-03	criticism		umm... it's a form of organised knowledge production whose outcomes are (at least putatively) taken to have universal applicability	

				lity. (sorry, i'm not a scientist, or a philosop her.)	
14	2015-06-03	dapat memberikan manfaat buat orang lain akan selalu menjadi inspirasi buat saya dalam berkarya.	"Able to give benefits for others" will always be my platform of inspiration on my work	Sains merupakan an pengembangan kemampuan oleh manusia yang sejatinya akan membawa manfaat dan kebaikan untuk semua.	Science is an expanding developed knowledge that was done by human, in order to bring benefits and good will to all mankind
15	2015-06-05	- The long-time failure of the state to provide integrated knowledge and information system and infrastructures in Indonesia. We have no libraries with active programming, school libraries are filled with outdated textbooks or religious books. Formal institutions like libraries and schools are almost wilfully, systematically designed to alienate people from learning about themselves, their surrounding environment, their		A method of pursuing, building, organising and presenting knowledge, that should be rigorously tested and contested.	

		<p>histories. The most disparaging of all is when these failures of formal educational and information institutions are then taken as a representative of the state of literacy in Indonesia. At the same time, civil society and home industries seem to have always had created their own tactics, usually working together to create a shared space of shared facilities where people can access information, network, and create, thus encouraging shared production and consumption rather than relying on the state. This can be in the form of libraries, bookstores, rental comics, internet cafe, etc. So I see the labels of makerspaces, hackerspaces, coworking spaces, as basically a shared space, of which in Indonesia we can find a long history of existence.</p>		
16	2015-06-06	to make my part of humanity		science is the a part of the big mystery of Universe
17	2015-06-08	The spirit of sharing my knowledge and experience.		Science and art can complement each


				other to create the circumstances around us becomes more pleasant.	
18	2015-06-08	<p>My creative endeavors (such as my art-based projects, informal research) often include the tenets of do-it-yourself Biology and a focus on non-human, human symbiosis. A motivation behind what I do is lesser about community development but in elucidating particular modes of empathy for a non-human being or other less highlighted figures and cultivating a certain kind of worldliness. Thus, my creative projects are not initiated to solve problems within particular communities but rather a process of learning and sharing through a productive platform of making, and transforming. If community development emerges, it does. but it is not a primary goal in the kind of work that I do.</p>		<p>IMO, Science is epistemological (if one may say) and not completely absolute and objective in nature when describing a particular phenomenon. The constructing and becoming of knowledge requires a prior understanding of how knowledge is produced and transferred. Once recognisi</p>	


				<p>ng that, science, like other knowled ges, can find easy overlaps and similariti es with other discipline s. To be more specific, science to me is a study and investigat ion of micro- and macro- human and non- humans in particular ecologica l settings, both urban and rural.</p>	
19	2015-06-08	Mostly my surroundings, nature, social phenomena and my self contemplation		<p>Science is a tool for us to understand more about ourselves , nature and our surroundi ngs with a testable physical methods.</p>	

				It is suppose to be free and accessible for anyone anywhere	
20	2015-06-08	Using though provoking technology to create novel, fun designs and interactions with a purpose.		Hard to tell these days, after having had a (rather ignorant) paper reviewer saying that my work is not scientific enough because its goal is to promote 'awareness'.	
21	2015-06-09	memory.		seseatu yang observasi onal dan tidak harus sistematis.	Something observational and it doesn't have to be systematically
22	2015-06-09	Deal with the tensions of ephemeral collaboration and physical separation as we negotiate relationships of presence filtered through networked objects via computer		I see science as alchemy - in fact alchemy wasn't considered occult	


		software and digital networks.		until religion and later science and technology rivalled and marginalized it. The technical principle of alchemy, controlling matter through manipulation of symbols, is the technical principle of materials and modern day computer software as well...	
23	2015-06-09	my work can make other smile		science is opinion based on empiric fact	


24	2015-06-09	Ketertarikan pribadi pada bidang tersebut, posibilitas di masa depan dan kemungkinan dampak baiknya dalam skala yang lebih besar di Indonesia dan dunia.	Personal interest on it certain discipline, its possibilities in the future and its potential to bring good effect on a bigger scale in Indonesia and the world	Ilmu pengetahuan	Science (*'Ilmu Pengetahuan' is literally means 'science' in bahasa)
25	2015-06-10	mengingat manusia akan kebutuhan dasar (less consume)	To bring awareness on a basic need for human (less	Sains yang berguna untuk beterbeker world and environment	A useful science for a better world and environment

			consume)		
26	2015-06-11	people, nature, sounds, streets etc		knowledge or a system of knowledge covering general truths.	
27	2015-06-11	 <p>I use puppets as a way to convey a message (usually in favour of change in this world towards more sustainability and more fairness, in line with human rights). I deliver training for educators on participatory education and Human Rights Education. So, contributing to a better world, is part of my motivation in what I do.</p>		I had never thought about this before. As my background is not closely related to science, I see science as something big I can't reach. When I met HONF and they told me their way to think about it I was inspired to see how much	

				close the work between their way of understanding science and what I do with puppets can be related.		
28	2015-06-11	<p>Saya percaya sepenuhnya bahwa masing-masing dari kita dihadirkan di dunia untuk menjadi manusia yang bermanfaat, bukan semata untuk diri kita sendiri, tetapi untuk lingkup yang lebih luas. Prinsip saya: integrity, positivity, fun.</p>	 <p>จุฬาลงกรณ์มหาวิทยาลัย CHULALONGKORN UNIVERSITY</p>	<p>I believe that each of us are exist in this world to become a useful mankind, not only for ourselves, but also for a wider scope. My fundamentals</p>	<p>Bagi saya, sains adalah rahasia yang disediakan Sang Pencipta di alam semesta yang perlu selalu dieksplorasi oleh umat manusia, lebih utama untuk mewujudkan kehidupan yang harmonis, lestari, manusiawi, dan bermartabat.</p>	<p>For me, science is a secret that's been provide by the Almighty in the universe. It is need to be explore by mankind, even more to bring a harmonious, sustainable, humane and dignified life.</p>

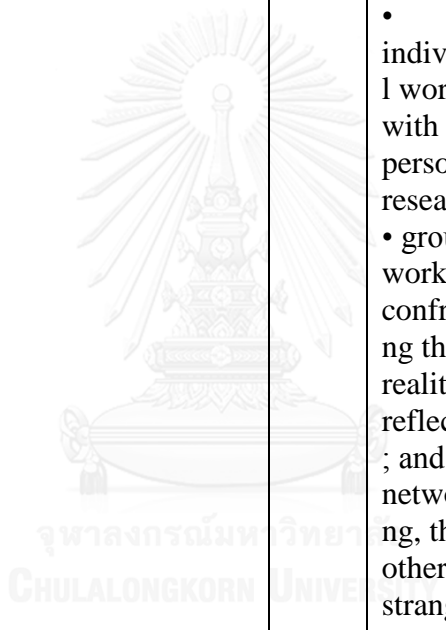
			are: Integ rity, posit ivity, fun		
29	2015- 06-12	lingkungan sekitar	surro undi ngs	the way of life	

30	2015-06-14	 <p>Saya terinspirasi oleh beberapa hal menarik yang saya lihat sehari-hari berupa objek visual maupun audio, baik objek nyata atau maya, maupun ide yang datang dari diskusi. Beberapa hal menarik tersebut kemudian saya coba mengerti bagaimana cara kerja secara teknis, fungsi dan manfaatnya untuk pribadi maupun sosial, hingga kemungkinan untuk membuat maupun mengembangkannya,</p>	<p>I am inspired by mundane object that I found interesting, whether it's a visual object or audio, real or unreal. Also certain ideas that came from a discussion process. From there I then try to understand</p> <p>Sains adalah ilmu pengetahuan, segala ilmu yang bisa dipelajari dan dibedah secara teknis, dengan teori modern maupun tradisional untuk digunakan sebagaimana mestinya.</p>	<p>Science is science, it's any kind of discipline that can be learned and technically explored, by modern or traditional theory, in order to be used as it is supposed to be</p>
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		 <p>d how it could be creat e tech nical ly also what its purp ose pers onall y or socia lly. Then I could foun d its possi biliti es to be mad e and to deve lop it.</p>	
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31	2015-06-14	Saya menganggap pekerjaan saya bisa membangun imajinasi dan refleksi kritis untuk memulai perubahan sosial.	I consider my work as a medium to build imagination and critical reflection to start a social change	Bekerja menggunakan akal-budi, subjek yang jelas, cara yang tepat, dan hasil yang bisa dipertanggungjawabkan dan digunakan untuk memperbaiki keadaan.	work using ingenuity, clear subject, right way and results that can be use and responsible to fix the situations
32	2015-06-15	To change perceptions and therefore affect change		I do not define science as purely academic as by the same token I do not define art as purely artistic.	
33	2015-06-15	everyday objects, science fiction and pop culture		something that works well with fiction (read as : art, function, etc)	
34	2015-	I am dedicated to		Science	

06-15	<p>promoting new insights in contemporary instrument building and technology within the Arts. To do this I see the importance of promoting and educating artists and creative thinkers about the role of technology in creative practice. A key feature of my work is play, engagement and community. Through my exploration of contemporary musical instrument building techniques, such as engagement with materials, sonic potential, participatory engagement and performance, I seeks to expand the role of the musical instrument. It is here that I wish to highlight our symbiotic ontological relationship with sonic apparatus as a site where the human and the non-human meet. From this I see that all reality is a dance between object, action, communication and materiality. I strongly believe we all make and share our realities together and places like HONF allow this to happen.</p>	<p>is both materialistic and agential. A great book to read on this is "Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning Book by Karen Barad". It looks at the role agency and materialism play in scientific analysis and how we determine reality from them. Science is a process and a way of thinking, much like philosop</p>	
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				hy, but instead of analysing a priori thinking it is dedicated to a posteriori thinking around empirical evidence.	
35	2015-06-18	Being a full-time "artist", living and working in the same place, little or no difference between the private and the public		<ul style="list-style-type: none"> • individual work, with personal research; • group work, confronting the reality of reflection ; and • networking, the other, the strange stranger with his other culture and his bizarre way of thinking. 	
36	2015-06-23	This is a mission statement my collective SEAD (Space Ecologies Art and Design) is working on: "SEAD is an interplanetary network of multidisciplinary		Induction , deduction, observation and experimentation.	

	<p>individuals working in art, science, engineering and advocacy. We aim at reshaping the future through hands-on experimentation and critical reflection. To achieve this we develop paradigm-shifting projects in which ecology, technology and community are integrated in synergistic ways."</p>		<p>All carried out within the same shared statistical framework.</p>	
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A3.3 Key Informant Interviews

Date	Organization	Representative
April 20, 2015	House of Natural Fiber Foundation	Irene Agrivine
April 22, 2015	House of Natural Fiber Foundation	Tommy Surya
May 11, 2015	House of Natural Fiber Foundation	Venzha Christ
June 10, 2015	House of Natural Fiber Foundation	Irene Agrivine
June 10, 2015	House of Natural Fiber Foundation	Venzha Christ
June 18, 2015	Hackteria Lab	Marc Dusseiller

VITA

Hermes Huang was born and raised in Cupertino, California, in the San Francisco Bay Area. He graduated from the University of California, Davis with Bachelors of Science in Neurobiology, Physiology and Behavior with a minor in Comparative Literature. His passion for applied work led him to Nepal, where he volunteered as an assistant physiotherapist, and learned about an entire world beyond California. This trip inspired him to pursue international work and he studied Hindi, Nepali, comparative literature, and plant and agricultural sciences to round off his undergraduate experience.

He started his career in Thailand as a Princeton in Asia Fellow teaching English at Khon Kaen University, where he began learning more about Southeast Asia and its importance on the global stage. He continued his tenure as a Princeton in Asia Fellow in Nepal working at the International Union for Conservation of Nature, and fulfilled a long-term goal of living and working in Nepal full-time.

Hermes was awarded a Rotary Global Grant Scholarship in 2014, and began his time with the MAIDS Program soon after at Chulalongkorn University. During his time in the MAIDS program, he was able to embark on a new journey of research and community-building under the topic of Open Science and the making of open source hardware for science. He will continue engaging with open science communities in Asia after his time in the MAIDS program.