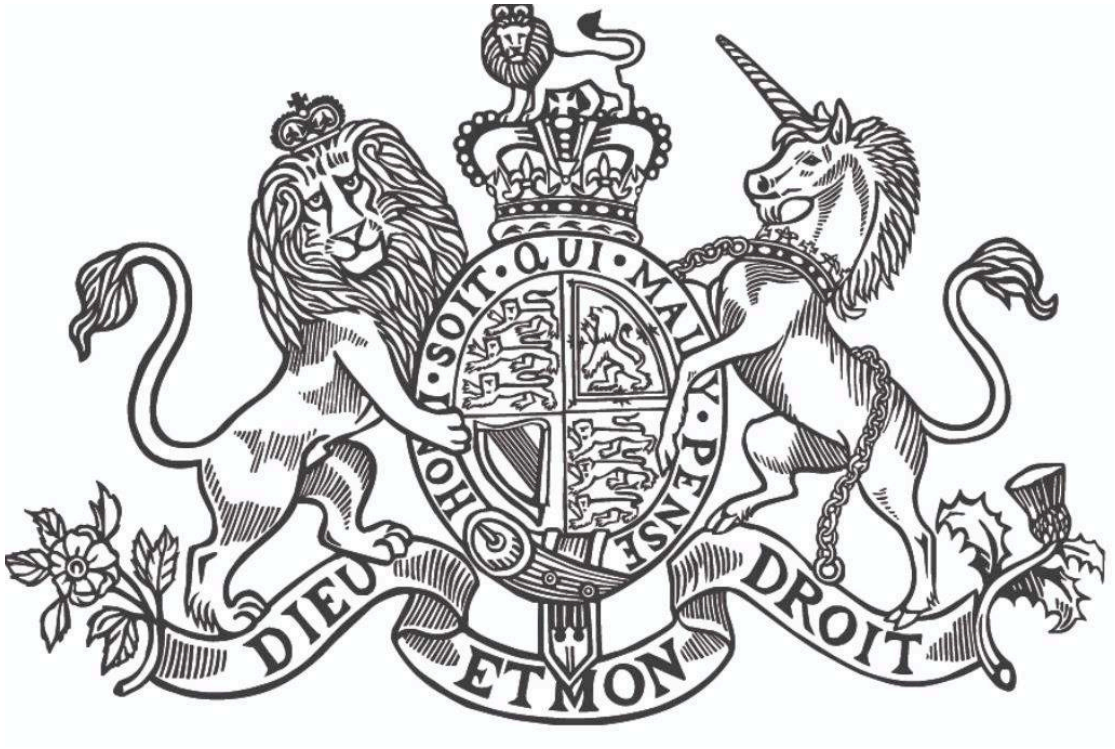

Integrating design literacy within Chinese Health Promoting Hospitals

Submitted for the Degree of
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Wenbo Ai

“This thesis represents partial submission for the degree of Doctor of Philosophy at the Royal College of Art. I confirm that the work presented here is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis. During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.”

Wenbo Ai

December 2023

Acknowledgements

This thesis is a final gift in memory of my dearest grandmother (1941-2022)

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Thanks finally to my parents, family, partner and those close friends, who always believed in me, and were by my side. I hope my life will reflect and deserve your love.

Abstract

The World Health Organization (WHO) established the concept of Health Promoting Hospitals (HPH) in 1986, with the main aim to expand the role of hospitals from treatment-centred to health promotion-centred cultures and by doing so, empowering and facilitating deeper community context. Design research and social healthcare have permeated western studies. However, when it comes to design practice in Chinese HPH, research suggests hospital managements still tend to believe design is only a last-minute intervention rather than drawing comprehensively and synthetically from a design research perspective. This is the gap my PhD practice-led research aims to fill, by employing *designerly* research, Chinese HPH practitioners may access and apply a systematic, comprehensive understanding of what design thinking means for HPH implementation.

The research asks: Can design thinking create a supportive, sustained and creative community setting for Chinese HPH? Can the WHO philosophy of HPH and design epistemology be adapted and situated in Chinese hospitals through design research?

The practice in this research is reflected in field trips, two case studies and design frameworks. First, the research examines Chinese hospitals in Central and East China, looking at the role of design in HPH and investigating the level of design penetration within that context between 2017 and 2019 using field trips and action research. Second, two case studies were conducted with two focus groups through participatory communication design (PCD) research: (1) participatory action research into a low-literate group targeting medical consumption issues in Hantun village; (2) a participatory dental health promotion course for children aged 4-8 in Wuhan. Both case studies propose a change from “top-down”

policymaking to adopting a “bottom-up” strategy; from expert-dominated to participatory and democratic approaches. The core of HPH activities is enabling people – patients, professionals and communities – to design their own experiences, services, tools and artefacts. Finally, the design frameworks offer a pluralistic, situated, nuanced and inclusive process for Chinese HPHs.

My main contribution to knowledge is within the Chinese HPH field, developing and proposing comprehensive design-thinking frameworks – *designerly* ways of knowing, thinking, and doing – increasing accessibility to the inclusivity of design ontology, epistemology and methodology, within Chinese HPH context. A secondary contribution to knowledge is situated in the design fields. It defines PCD through participatory design, communication design and communication theory as a blended theoretical construction, developing novel PCD methods and transitional communication methods as extensive methodology. These design contributions address gaps in current design research.

Contents

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Glossary: Key phrases and their meanings as used in the thesis.

- **Communication design**

This combines methods and approaches from design with communication theory, expanding from graphic and visual communication design. It not only focuses on communicating messages, information, knowledge and emotions using media and objects through design, but emphasises design appropriate communication channels or platforms, aiming to encourage natural communication.

- **Five actions of health promotion**

1. Building public health policy;
2. Creating supportive environments for health;
3. Strengthening community action for health;
4. Developing personal skills and
5. Reorienting health services. (WHO, 1986)

- **Health communication**

The way to disseminate health information, increasing awareness of specific health issues. Health literacy, health education and health promotion are different approaches to health communication.

- **Health literacy**

Disseminating health-related information and knowledge in the Chinese context between 1949 and the 1980s. *Health literacy* focuses primarily on the specifics of hygiene.

- **Health education**

Beyond health literacy aiming to educate about disease risk factors and change health-specific behaviour.

- **Health Promotion (HP)**

World Health Organization (WHO) definition: “HP is the process of enabling people to increase control over, and to improve, their health.” (WHO 1986:1). A more diverse approach, moving beyond health literacy and health education, focuses on social participation and intervention.

- **Health promoting hospital (HPH)**

Based on HP, HPH aims to reorient from traditional treatment-centred to a more dynamic and socially-oriented, health-centred approach. For example, integrating HP with education, disease prevention and rehabilitation. One definition is taking “action to promote the *health* of their patients, their staff, and the population in the community they are located in. Health promoting hospitals are actively attempting to become ‘healthy organizations’” (WHO 2009).

- **HP setting**

WHO describes this as “the place or social context in which people engage in daily activities in which environmental, organizational, and personal factors interact to affect health and wellbeing” (WHO 2022).

- **Participatory communication design (PCD)**

Based on communication design, I define PCD as implying a more active and interactive design approach, one based on earlier community-partnered participatory research (Jones, Koegel and Wells 2008: 67). PCD addresses stakeholder engagement to complete communication, while also considering interaction between people, objects and materials.

Abbreviations:

CD / Communication design

CHEC / Chinese Health Education Centre

DT/ Design Thinking

GD / Graphic design

HP / Health promotion

HPH / Health Promoting Hospital

JPCDP / Jiangsu Provincial Centre for Disease and Prevention

JPH / Jiangsu People's Hospital

JPMCHH / Jiangsu Provincial Maternal and Child Health Hospital

NHCC / National Health Commission of China

PCD / Participatory communication design

VCD / visual communication design

WMU / Wenzhou Medical University

WHO / World Health Organization

WUSH / Wuhan University Stomatological Hospital

UNESCO / The United Nations Educational, Scientific and Cultural Organization

Chapter 1: Overview

1.1 Context

Social healthcare services are shifting from curative treatment to more dynamic social Health Promotion (HP). In 1986, the World Health Organization (WHO) first proposed the concept of HP in its *Ottawa Charter*, defining the term as "the process of enabling people to increase control over, and to improve, their health" (WHO 1986:1). Health Promoting Hospital (HPH) – synthesising these initial promotion settings – ideally will expand hospital roles from curative to disease prevention, and from dealing with chronic sickness to maintaining health and wellbeing for local residents inside and outside the hospital. Traditional medicinal healthcare does not, however, easily fit this new and dynamic social HP model. HP has been integrated with the humanities and social sciences, outside the disciplines of medical science. Gradually, the social sciences – including design – are penetrating the study and provision of healthcare. Design is an expanding, adaptive discipline: design exploring its role in healthcare has spawned a new hybrid subject – health design (Noël and Frascara 2016) – using design thinking to produce innovative healthcare solutions.

In China, the concept of HPH was first launched and given a status in official policy by the National Health Commission of China (NHCC) in 2013. Following the NHCC's guidelines, there are – as of June 2017 – 3014 hospitals implementing HPH policy. Simultaneously, design in China has shifted to focus on non-commercial areas: design research on social

innovation is emerging. Service design and strategic design are recognised by senior Chinese design academics (Wang, Liu and Liu 2016).

Since COVID-19, the increased importance of HP in public health education, health management and communication has become clear. China put in place a strict health management policy (Liang 2019; Wu, et al 2021). The NHCC re-emphasised the importance of HPH at a press conference in November 2020 (Sohu, 2020) claiming that HP is a process, empowering people to control and improve their own and others' wellbeing. At the conference the NHCC promoted HPH, encouraging hospitals and the wider public to understand better what HPH is and how it may be rolled out (ibid 2020).

The last four decades have seen various HP developments not only in the EU and China but internationally. Nevertheless, doubts remain because "there is a dearth of high-level research on HPH and there is limited evidence on the efficacy of HPH" (McHugh et al 2010: 230). Most HPH literature focuses on management, capacity building and evaluation (Yeatman and Nove 2002; Yaghoubi, Karamali and Bahadori 2018). Though research suggests the effectiveness of evidence-based design (Mills et al 2015), user-experience design (Bate and Robert 2007), service design, architecture design and participatory design in healthcare services (Langley, et al 2018). As one of my gatekeepers He (2018) explained in an interview, "hardly any non-systematic design research has explored HPH in the Chinese context". Health professionals often have limited knowledge about what design can contribute to HP, and often misunderstand the use of it (Nakarada-Kordic et al 2021). Clearly, design researchers need to promote concepts to health professionals such that the potential of design is recognised. This PhD research aims to fill that gap and accelerate the process of engaging design with the Chinese HPH system.

1.2 Research motivations and purposes

My original motivation for undertaking this research was a personal concern about my grandmother. She was illiterate and couldn't read her prescriptions. My grandfather had helped her with her medicines for decades. When I studied as a graphic design student in China, I was aware of these issues, imagining a user-friendly medicine box for my grandmother as a final project for my degree. After I moved to London to study service design for my Master's degree, I considered my grandmother's needs could encourage a major service design project. Unfortunately, this project never materialised. Maybe my awareness of design in social innovation and of the potential of the original project was less visible at that time, so the medicine box and any linked service design projects were abandoned at a conceptual stage. Regretting this, when I considered the possibility of a PhD, I decided to use my concerns about low-literacy and healthcare in my research proposal. If design is problem-solving (Boradkar 2010), I should seek to address the problems my grandmother faces. After a case study of low-literate patients' prescription problems and conversations with members of the NHCC, I realised this was a small part of issues surrounding wider healthcare services in China. Designing a medicine box as a product or user-centred service is not enough. Those with challenged literacy – like my grandmother – are one of the marginalised, vulnerable groups using Chinese HPHs. Low-literate patients' prescription problems are among other complicated healthcare issues ignored by mainstream HP. Therefore, my objectives for the research shifted to a wider, socially systemic investigation.

Compared with the UK – where service design and design thinking deeply penetrate healthcare organisations – China has a long way to go in this process. What Chinese healthcare and hospitals need is the establishment of fertile design soil: such fertility could, potentially, allow the Chinese system to grow design thinking, change rigid mindsets and strategically innovate. In terms of systemic change, a first step would be establishing a paradigm that defines *ontologically* – what is the concept of design-led HPH? – as well as *epistemologically* – how do we understand the ways design-led HPH works? As soon as Chinese healthcare organisations understand the paradigm, they can use it to explore, discover and develop a variety of appropriate research and healthcare practices. Given sufficient encouragement and space for innovative practice, HPH services and products should appear spontaneously. The purpose of this research is not, therefore, changing health-related behaviour – though this may be considered essential to HPH. Based on the current Chinese context in terms of the degree of penetration of design and of HPH, the research priority must be empowerment: encouraging design ideas and delivering comprehensive practice in Chinese HPH.

The objective of this research has expanded from a micro level – my grandmother's prescription box – to a macro level – addressing wider HPH needs in terms of design, knowledge transference, establishment of finer mechanisms and a communication strategy which allow design practices, tools and methods to emerge spontaneously (Dong et al 2015). The aim of innovation in this research is not to improve a product or service, but to be part of creating a sustainable platform for Chinese HPH through design engagement. Consequently, design intervention is more about facilitating people and systems than inventing products and artefacts (Casaca-Lemos 2017). HPH and design in China are facing a transformation and

that, in itself, represents an ambitious achievement. My PhD research becomes a single step on a transformative journey.

1.3 Research puzzle, questions and hypothesis

The research puzzle asks: how it is that design literacy has not been functionally absorbed into Chinese HPH? All the parts are there, available, but changes have not been made despite obvious advantages. Following this puzzle, two research questions present themselves:

1. Can design thinking create a supportive, sustained, and creative community setting for the development/consideration/implementation of Chinese HPH?
2. Can the WHO philosophy of HPH and design epistemology be adapted and situated in Chinese hospitals through design research? In other words, how can design literacy offer a more pragmatic framework extending from the WHO's theoretical guidance – its five HP actions (see glossary)?

Before answering these, there are ancillary questions:

3. What is HPH?
4. How do Chinese healthcare professionals view the role of design? Why is design literacy neglected by some Chinese health professionals and managers?
5. What is the current Chinese HPH policy?
6. What kinds of design theories and methods fit Chinese HPH?

The broadness of design breeds abundant theorising and attendant methodologies through integration across disciplines, producing new interdisciplinary hybrid design methodologies. It goes without saying that design methods should be well selected and synthesised to fit into

any application. Choosing carefully from among design theories and methodologies means selecting elements then integrating these into Chinese HPH as research process.

1.4 Methods and methodology

This research is practice-led, using enquiry through design; it uses flexible design that is research-oriented – based on participatory communication design (PCD), selecting and integrating a variety of design and other multi-disciplinary methods to suit research purposes at different stages. Grounded theory, action research, focus groups, field trips, ethnographic research, co-creation activities and participatory pedagogical design methods have each been used along the research journey to answer the first research question. Design thinking frameworks offer significant guidance as tools for self-evaluation to answer the second research question. A framework is defined as visual scaffolding that helps HPHs navigate design practice when it comes to the stage of knowledge dissemination.

1.5 Direction of research contribution

This design-oriented research mainly contributes to HPH knowledge and practice in the Chinese context. It considers the current Chinese HPH approach and the situated penetration of design theory. The case studies offer findings which lead to a new design paradigm, with design frameworks shifting Chinese HPH stakeholders' design understanding from the tangible to the intangible, from small to larger scales, from partial to the more comprehensive. This addresses the absence of design-based research in Chinese HPH

offering an example of how such research may link with other disciplinary methodologies, integrating into HPH, wider healthcare and other social regimens in China.

In terms of contributions to design, this study has synthesised PCD from participatory communication, participatory design and communication design. In a similar way, it has blended theory and methodology from ethnographic design anthropology, inclusive design, service design, visual communication design, and transition design. In addition, transitional communication methods developed from this study expand design conceptualisation.

1.6 Philosophical foundation

The philosophical foundation guiding this research has been drawn from transformative, pragmatic and constructivism research. "Transformative research developed in transdisciplinary contexts … [is] an engaged, politically and socially responsible enterprise with the power to transform and emancipate. The approach should be inclusive, participatory, and democratic, involving non-academic stakeholders during all parts of the process." (Leavy 2017:13) Since the concept of HPH aims to shift hospital roles from traditional treatment centred to a dynamic social HP, the research should be seen as part of a transformative process, targeting and contributing to HPH through design research: communicative action (Habermas 1987) is a guiding rule.

Pragmatic research uses different tools for different contexts rather than relying on one alone. Unlike traditional pathogenetic models or the health literacy approach – one size fitting all (Vargo-Gogola and Rosen, 2007) – this research pragmatically offers a dynamic, inclusive, and situated perspective through design practice. Experimental inquiry as pragmatic

knowledge production (Dewey, 1986) empathises innate creative skills. Accordingly, the *designerly way of HPH* nurtures design skills for HPH users through pragmatic experimentation.

Constructivism requires learners build new understanding by integrating experiences rather than passively receiving information: each learning act is both active and distinct (Piaget 1971) meaning learning is an engaged fabrication rather than purely the transmission of conventional knowledge. Theories of progressivism (Dewey 1986) and instructional scaffolding (Vygotsky 1978) suggest project-based, practice-related making (Brian 2021), as well as experiential and active learning by doing, has profoundly guided my PhD's case studies and action research.

1.7 Chapter structure

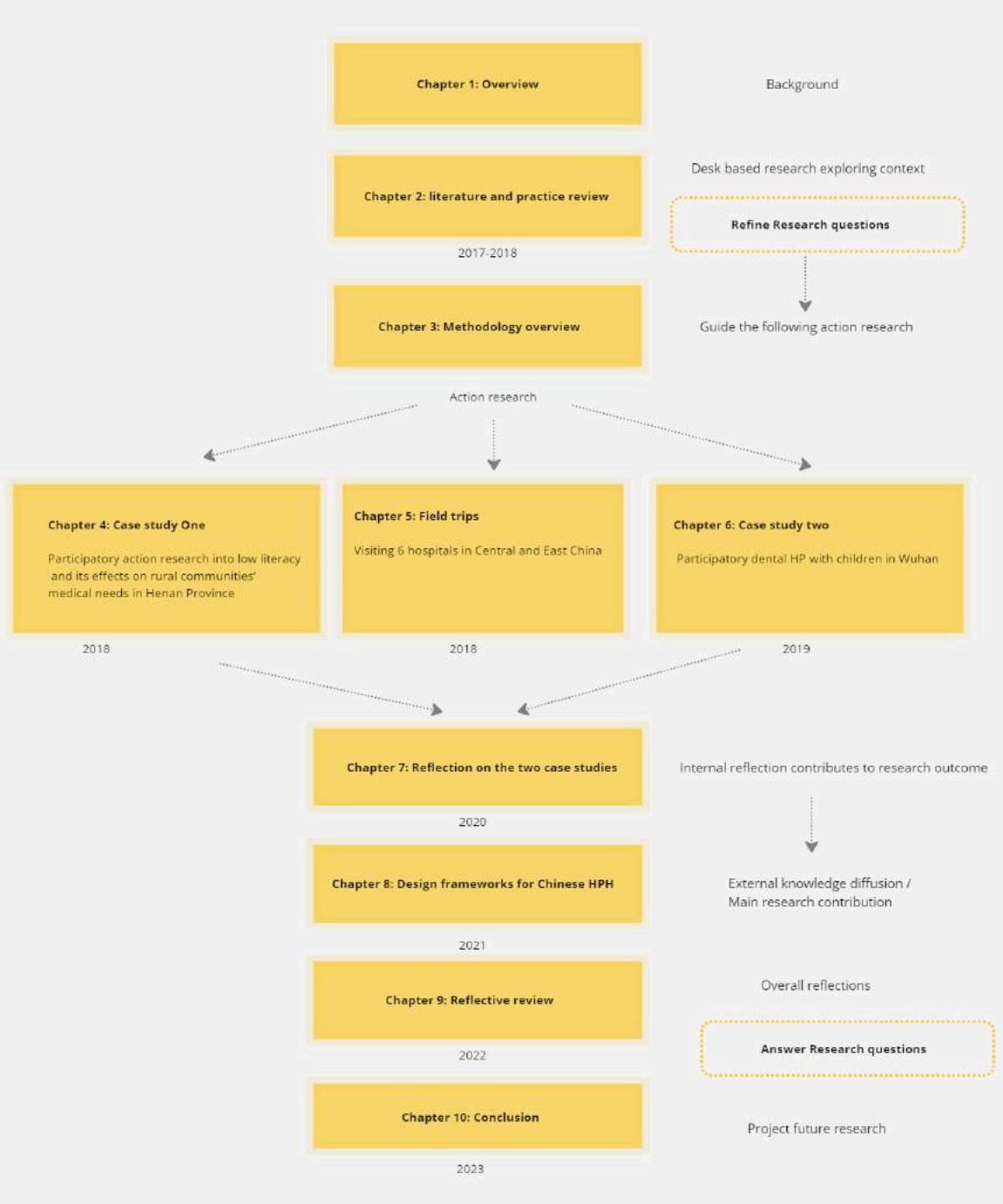

Figure 1: Chapter structure

This thesis has ten chapters*:* figure 1 describes the overall chapter structure. Following the introduction in chapter 1, the literature and practice review in chapter 2 provides further conceptual background, exploring what HPH means according to WHO (1986) and in the Chinese context from historical and political perspectives – identifying what HPH is and how it develops. It explores the reason why HPH slowed in Europe, offering proactive experience and sustained insights for Chinese HPH. Following the Chinese HPH review – specifically four pioneer Chinese HPH practice reviews examining different HPH models and communication approaches in real contexts. 2.3 considers how the theoretical framework and design methodologies have been deployed so far both in HPH literature and healthcare service literature. Comparing different community and design-based approaches – service and inclusive design, design ethnography/anthropology, social and transition design – one commonality is participatory co–creation engagement: allowing the definition of PCD across three disciplines. Chapter 2 refines research questions through the synthesis of the literature review in the HPH, healthcare and design fields, and identifies the gap: the absence of design research in Chinese HPH. Through the comparison of health communication, communication modelling and communication design, it indicates that PCD can be a potential methodology for Chinese HPH.

Chapter 3 introduces overall methodology, combining design with social science methodologies applied to HPH: a nest of flexible design research methods – a case study and field trip, PCD methods integrated from other design methods, and a communication-specific approach. Chapter 4 presents the first case study, a preliminary action research – testing how low literacy interacts with medical needs within the context of rural communities' HP – and an initial examination of PCD in a grassroots environment. This allows me to build connections with NHCC and the Chinese Health Education Centre (CHEC). CHEC

introduced me to those hospitals I visited for my pilot studies. Chapter 5 records the field trip and site visits to five recommended Chinese hospitals and two healthcare organisations, where I gained a deeper understanding of individualised HPH approaches and design awareness, which in turn helped the development of my communication ladder. During this journey, one hospital appeared to select itself – Wuhan University Stomatological Hospital (WUSH) – as my research partner, where I conducted my second case study. In chapter 6, I explain my participatory dental HP with children, forming an interdisciplinary course with Timi Art School.

Chapter 7 reflects on the two case studies and shapes patterns through transitional pathways, from *visual materials* and *learning through doing* to *participation and empowerment in active citizens,* to *grassroots innovation and creative community.* This internal comparative reflection contributes to the external knowledge diffusion of Chapter 8, generating design frameworks: the designerly way of knowing HPH benefits design thinking (DT) epistemology; practice process maps and a designerly way of conducting HPH framework structures DT process; the core ingredients of a designerly conceptualisation of HPH then informs DT mindsets and principles. These frameworks aim to promote DT within Chinese HPH.

Chapter 9 uses reflective methods to review practice, field trips, case studies and as a reflection on the WHO (1986) guidelines as well as my PhD journey. It also considers changes to my PhD, the evolution of social innovation design in Chinese public sectors, and design permeation into non-design disciplines. Chapter 10 concludes with an assessment of the overall contribution to knowledge my research represents, whether and how the research questions are answered, how far the research puzzle is solved, with the original hypothesis as

a measure. Limitations to the research – personal as well as unavoidable and systemic – lead naturally to an assessment of possible future directions.

1.8 Research ethics

The research ethics follow RCA policy (training complete 2018). Each specific research element was submitted and approved by the RCA Research Committee before embarking on the field trips and case studies. The European Commission (2007) suggests that research ethics involve applying substantial principles to any investigation. This should protect human and other subjects, as well as promote scientific integrity and transparency. Overall, any PhD should be seen as an ethical enquiry both in approach and meaning (Haan and Bellah 1983).

The fundamental research ethics principle in my action research was to build mutual trust and respect between researchers and participants as well as creating pleasurably engaging experiences. Gatekeepers played essential roles in this mutual process, adopting research activities into their local cultures to suit participants. As for the different groups, ethical strategies should be deployed with flexibly, Table 1 lists the key distinctions. More details will be discussed in sections 4.2, 5.3 and 6.3.1.

	Ethical challenge	*Gatekeepers*	*Ethical strategies*	*Ethical principles*
Field trip	Each hospital has different rules and policies.	Mr He from CHEC, introduced key managers from each hospital and health centre.	Follow the rules from key managers from each hospital and health centre.	Ethical principles in action research
Case study one	Participants were low literate, could not read and sign the consent form.	Researcher's grandfather and aunt	Gatekeepers informed participants of the purpose and procedure of each activity in local dialect and asked permission.	Ethical principles in Indigenous research
Case study two	Participants were children, had no legal recourse / status.	Head of TIMI Art school	Provide clear course introduction: containing course aims and curriculum, parents signed consent forms, but children had the right to choose or pull out of any module.	Ethical principles in participatory design

Table 1 : Research ethics involved in action research

Chapter 2: Literature and practice review

2.1 Introduction

This chapter provides a three-part literature review – HPH (see 2.2), theoretical framework and methodologies (see 2.3) and PCD (see 2.4) – plus a summarising overview of literature review (see 2.5). Section 2.2 systematically reviews HPH using balanced conceptual, theoretical, historical and practical perspectives, both in the European and Chinese contexts, providing as comprehensive an understanding as possible – given research constraints – of HPH, investigating how regional hospitals conduct HPH based on their understandings. Section 2.3 discusses both community-based and design-based approaches in the healthcare literature while 2.4 defines PCD through the lenses of participatory communication, and participatory and communication design. The summary (section 2.5) suggests trajectories – that PCD might be a promising approach for Chinese HPHs based on the literature and how any weaknesses may be addressed.

2.2: HPH reviews

It is contextually important to understand HPH from political-historical perspectives (Mickler 1989; Green and Kreuter 1991), then within a systematically reviewed theoretical frame, examining methods from HPH literature – specifically WHO policy papers – online papers and academic literature. This background to HPH suggests how it is conducted both in a global and specifically Chinese context.

2.2.1 HPH historical-political review

- ***Phase 1: Preparations for initiating HPH by WHO-EURO (1986 – 1989)***

The concept of HPH developed out of HP philosophy (Buchanan 2000; 2006.) HP philosophy suggests hospitals are expected to expand their roles beyond curative services to more dynamic social HP, shifting their cultures from treatment-centred to health-centred, creating empowering community settings such that the community determines relevant structures in a bottom-up not top-down authority.

In 1986, WHO published its *Ottawa Charter* after the First International Conference on HP in Ottawa. The Charter presents a series of initiatives based on settings in schools, villages, cities, workplaces and hospitals and identifies 5 priority action areas (see glossary for HP). In 1988, hospitals were singled out as one of the influential HP strategies.

- ***Phase 2: Development of concepts and the initiation of network structures (1989 – 1992)***

During this period, the International Network of HPH was initiated by WHO-Europe. Its purpose is to facilitate healthcare organisations' improvement of healthcare quality, enhance the relationship between hospitals and health services, the community and its environment, and strengthen the health and wellbeing of patients, staff and relatives through collaboration.

The first policy document – the *Budapest Declaration on Health Promoting Hospitals* – describes the aims for participation in HPH, emphasising the importance of participatory, health-orientated procedures involving *patients, staff and community* (WHO 1991).

- ***Phase 3: Testing the concept, further developing network structures (1993 – 1997)***

The first systematic, comparative HPH implementation was the *European Pilot Hospital Project* (1993 – 1997), involving 20 hospitals from 11 European countries (Pelikan et al 1998). It focusses on hygiene and safety, control of hospital-acquired infections, health education programmes training young mothers on perinatal care, studies of patient satisfaction, quality assurance of surgical services, early diagnosis of neonatal hearing loss and the prevention of mutism. It concludes with four HPH programmes aimed at:

1. Hospital patients;
2. Hospital staff;
3. The local community, and
4. Developing the hospital into a healthy organisation

(Pelikan et al 1998).

Further to this, the *Vienna Recommendations on Health Promoting Hospitals* (WHO 1997) provides fundamental principles and strategies for implementation and specifics on how to foster participatory work and generate commitment, improve communication and education within hospital cultures and hospital communities, using methods and techniques from organisational development and project management.

- ***Phase 4: Restructuring and globalising for the twenty-first century***

In this period, the HPH network and WHO were developing a standard strategy. The WHO regional office for Europe published criteria for HP evaluation, specifically 7 guiding implementation strategies (see Figure 2).

Figure 2: Seven criteria for HP evaluation (Rootman et al 2001: 3-4)

In 2004, five HPH standards were proposed:

1. Management policy;
2. Patient assessment;
3. Patient information and intervention;

4. Promoting a healthy workplace, and
5. Continuity and cooperation.

(WHO European Office 2004: 11 – 13)

18 HPH core strategies and 7 implementation strategies (WHO 2005: 59 – 60) were published simultaneously (see Appendix A) offering clarity from WHO HP experts. The principles help organisations run HP but are they practicable enough for regional organisations? Can such organisations understand how to run and evaluate HPH by following these strategies? From theoretical knowledge to practical conduct (Polyani 1966), design practice-based research can offer pragmatic and empirical guidance. In terms of the seven principles and five standards, design literacy (Lutnæs 2021) can target each criterion, offering a more feasibly practical heuristic. (See 2.3.2 and 2.4 for the design approach matching these HP criteria.)

The concept of HPH should be "understood as an organisation that aims to improve health gain for its stakeholders by developing structures, cultures, decisions and processes" (WHO 2007: 6). HPH development then focuses on four areas: "promoting the health of patients, promoting the health of staff, changing the organisation to a health promoting setting, and promoting the health of the community in the catchment area of the hospital" (WHO 2005: 8). Here is the origin of dynamic roles for both staff and patients, of building interactive organisational structures and cultures, developing environments connected with communities.

HPH ideology has spread and the first formal HPH network in Asia was established in Taiwan in 2006 and the first non-European international HPH conference held in Taipei in 2012. The international HPH network now consists of more than 700 member hospitals and

health services globally. Memberships range from district hospitals, primary care clinics, university hospitals to health centres and nursing homes (HPH Network, 2019). The geographic spread indicates HPH's global development: this Chinese HPH study accelerates the internationalism, if only incrementally.

2.2.2 Why HPH slowed in Europe after 2000

The HPH concept spreads globally, but Nutbeam and Muscat (2021) argue progress has been slow. From the quality and quantity of academic literature surveyed, there is a clear chronological divide: most HPH academic papers in Europe were written between 1990 and 2006, very few are found thereafter. Whitehead (2004) identifies this dearth, relating it either to the stalled progress of the European HPH programme or reporting problems among European HPH network members (see Figure 3).

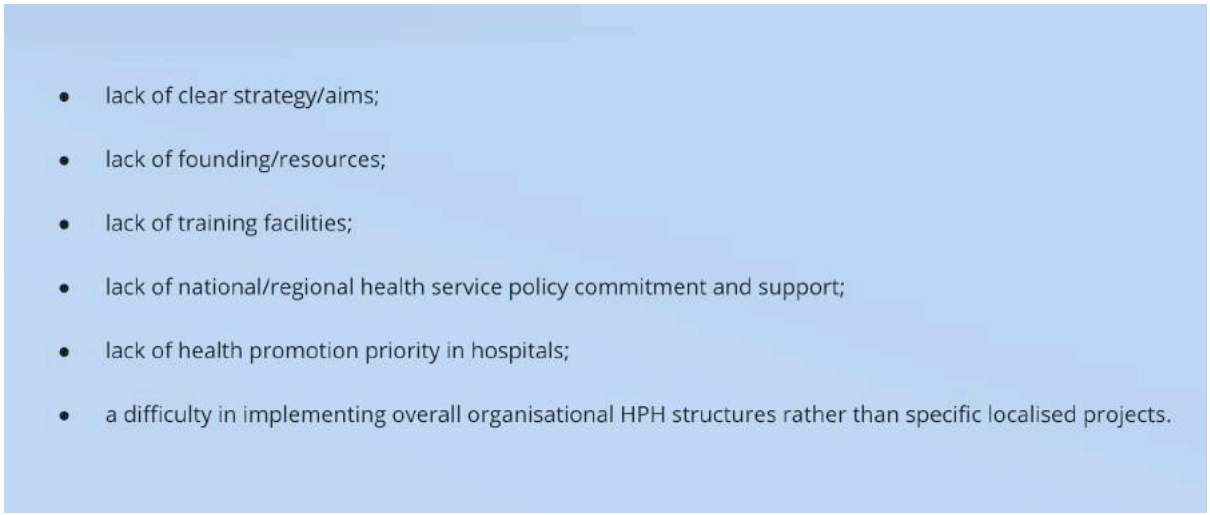

Figure 3: Why HPH has slowed in Europe (Whitehead, 2004: 261)

Deccache and van Ballekom (2001) discuss a lack of government policy support, individual organisational management commitment or adequate resources for HP in hospitals. One four-year case study evaluates HP capacity building, identifying weak partnership, leadership and commitment as key to poor organisational change or effective long-term HP (Yeatman 2002). Sitanshu, Gautan and Subitha (2012) suggest one reason for this decline is lack of clear implementary strategies and tools. Blinkhorn (2002) claims most HPH projects have only been conducted as pilots and faded as initial funding dried up. HPH literature focuses on disease management and outcomes alongside partial programmes (Whitehead 2004; Huang et al 2016).

How HPH is understood affects how it is practically interpreted, reflecting a variety of approaches and theoretical structures (Johnson and Baum 2001). Epistemology is key to implementation of comprehensive HPH and while organisations understand HPH differently, there is one question consistently put throughout European HPH literature: whether HPH is or is not achievable. Some see HPH as an added burden, impossible to achieve, conceptualising hospitals as traditional treatment centres not part of a more holistic structure. Nevertheless, community hospitals serve communities, taking care of local residents' health (Heaney et al 2006). If locals have a place to access proper HP knowledge this could, potentially, lighten treatment expenses and demand on healthcare organisations. Hospitals staffed by professionals with HP knowledge, have an added potentiality of delivering health information to communities. A hospital should not only be seen, therefore, as a physical treatment space, but also – and equally importantly – as a social space providing health services and education (Berkman and Kawachi 2003). Though, services should be delivered across the spectrum (Wilkinson 1996), something Berkman and Kawachi (2003) miss. With improved living conditions, the roles of hospitals inevitably must change from the traditional

biomedical to a perspective focussed on social health. For this reason, hospitals see as advocates of change: HP is thus a strategy for the development of "healthy hospital organisations" (Pelikan, Krajic and Dietscher, 2001). In countries such as China where healthcare is not free at the point of need, HPH could provide both a better hospital service and environment, contributing to their image and benefiting patients, staff and the surrounding institutional structures.

Since the 2019 COVID pandemic, there has been a clear return to an emphasis on HPH in Europe (Van den Brouke 2020; Miedema, Lindahl and Elf 2022). Analysis of why implementation of HPH slowed over the prior two decades may provide valuable lessons for Chinese HPH, avoiding those drawbacks faced in Europe and offering insights for a sustained approach.

2.2.3 Chinese HPH review

Chinese national health communication has experienced three stages (see Figure 4), developing from initial health literacy to wider education which expanded towards more dynamic HP.

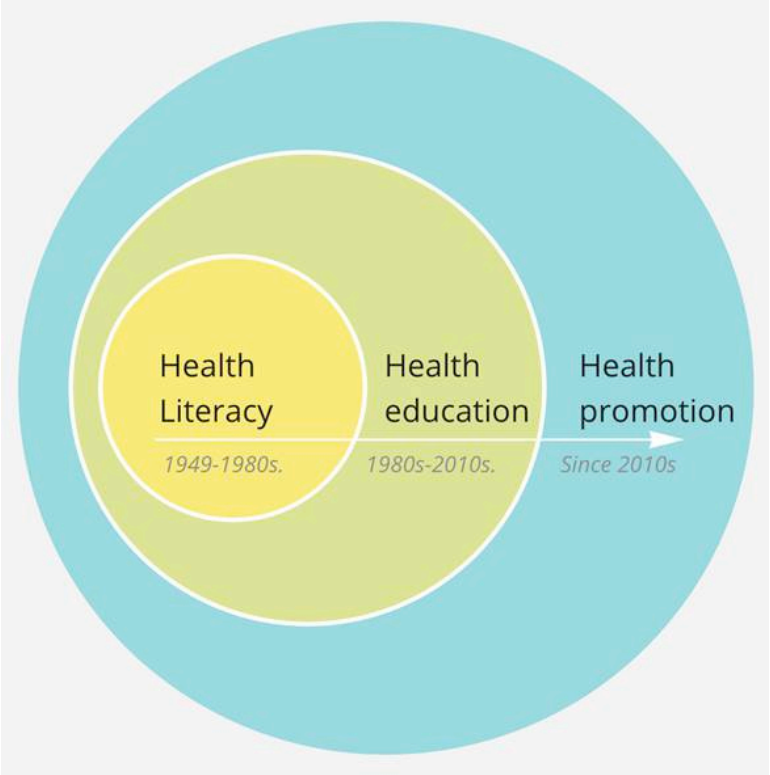

Figure 4: Development of health communication: literacy / education / promotion

Gu (1999) compares three different definitions (see Table 2) in his examination of the theory and strategic application of HP before official implementation. This shows HP as an advanced approach covering both health education and literacy, suggesting the strategic trend of HP generally.

Terminology	*Health literacy*	*Health education*	*Health promotion*
Essence	Disseminating literacy → knowledge communication	Education → Participation → Behavioural change	Behavioural change → sustainably supportive infrastructure
Main methods	Monological knowledge dissemination	Combination of dissemination and education, stress on education	More multifactorial, comprehensive. Emphasis on organisational behaviour / building a supportive environment
Character	One-way communication	Behavioural change at its core – limited by the risk factors / pathology of the illnesses	Multiple intervention through social engagement and organisational collaboration
Effects	Purely hygienic knowledge accumulation	Leads to a change in knowledge / attitude / practice. Improves individuals' healthcare abilities, but unsustainable	Can improve both individual and group healthcare – long-term effects

Table 2: Comparison of health literacy / education / promotion (translated by author from Gu 1999)

Since the PRC was founded in 1949, Chinese hospitals have run health literacy and hygiene promoting programmes. This focus was on these areas to help address the challenges with a high proportion of Chinese still living in poverty (Gu 1999), since the 1980s a variety of health education activities have been developed. With the development of the Chinese economy, people demanded a new healthcare environment, to encourage both HP and wellbeing. To adjust to social and economic developments, the NHCC started HPH projects from 2013: the first time the HPH concept was launched and implemented officially through

policy formulation, pilot projects, training, annual progress reports and specific projects. In 2016, China hosted the Ninth WHO Global Conference on HP, in Shanghai. Two outcome documents, *the Shanghai Declaration on Promoting Health in the 2030 Agenda for Sustainable Development* and *the Shanghai Consensus on Healthy Cities* provide more guidance in and experience of the terms of HP. The official government document *Healthy China 2030 Programme Outline* (2016)[1] was launched, offering relevant policy guidance based on the WHO HPH philosophy.

With support from NHCC, there are 3,014 hospitals implementing HPH projects in China (Chinese Health Education Centre, 2018). The NHCC organised the HPH Press Conference (2018) inviting 4 hospitals to showcase HPH projects as good examples to other HPHs. These illustrate pioneer examples of HPH in China with novel, distinct patterns of practice offering models for other Chinese hospitals.

A. Jiangsu People's Hospital (JPH)

This hospital has relocated clinical departments rather than following traditional divisions of internal medicine and surgery. Patients do not need to walk long distances through reception, diagnosis and treatment stations during visits. Doctors come to the hospital half-an-hour before the diagnostic period, giving health literacy advice to patients in reception, extending doctors' responsibilities from treatment to prevention. Also, doctors may use cartoons and animations – when appropriate – for health literacy videos, using a special health programme broadcast on a TV channel.

[1] 《"健康中国 2030"规划纲要》

[2] (医养结合模式)

[3] "PRECEDE stands for Predisposing, Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation. PROCEED stands

B. Shandong Jining No.1 Hospital

This hospital's volunteer team calls itself the "clown doctor". Starting in 2015 it has 136 members. They use clowning as well as magic and dance to comfort young patients, encouraging laughter and reducing levels of discomfort or fear. The hospital also provides wider psychological support for the family. It has built a mutual connection with a health promoting school. The "clown doctors" have developed a variety of health promoting programmes in schools depending on seasons, age and needs of children, using drama to promote health education. Together with this, a Youth Health Education Centre in the hospital operates as a separate department, inviting children to the hospital to learn health prevention, thus reducing fear of the hospital environment and increasing understanding of the work of medical staff.

C. Lishui Central Hospital

This hospital has built an HPH database, containing 658 health promoting knowledge updates on the hospital information system, using their dedicated online platform to share HP knowledge with patients and families.

D. Southwest University Hospital

The hospital built a community health service centre in cooperation with a medical university, enhancing collaboration between medical and technical staff and volunteer students. It has created a new service model by connecting the college student volunteer HPH team with elder care community service. This cooperation is part of a key Chinese HP policy, the "Medical and Aged Care Integrated Model"[2].

[2] (医养结合模式)

These four projects show how HPH has been understood and put into action in China. Though few understood what service or communication design were, such practice could nevertheless be examples of effective service and communication design:

- Hospital A considers and redesigns service flow processes and communication media;
- Hospital B pays attention to young patients' experiences at hospital through a creative communication approach;
- Hospital C uses high-tech service / communication platforms to promote health knowledge;
- Hospital D is a co-production practice, connecting the hospital with its community through a health service centre.

Technically, organisations can use alternatives to improve their service models and communication approaches without precise knowledge of service or communication design. This can only change one element at a time, however, while design offers a complex research system consisting of diverse points of contact and a systematic methodology to change organisations and actions comprehensively rather than piecemeal. The overall conclusion to the development of HPH research in Europe – from the early stages of conceptualisation to pilot experiments – focuses on patient-oriented HP and organisational development. In China – with strong government support, the promotion of the HPH concept together with experience based on HPH research in Europe – hospital leadership has begun to understand the importance of HP. There remain issues regarding how to conduct HPH within their own organisations with unique social and cultural norms. These for examples provide illustrations of how to develop HPH in specific organisational and institutional environments.

CHEC published a report – the *HP Hospital Project Proposal Scheme* (2017) – encouraging the building of national and regional HPH networks and leadership platforms, setting up regular meetings and enhancing communication and cooperation within and through hospitals. CHEC (2017) suggests central government should build a national, comprehensive HPH evaluation system, encouraging hospitals and medical staff to develop health science and education programmes and setting up health promoting education centres inside hospitals. Health education promotion projects need to reflect regional features and cultural norms. The report does not mention the role of design and therefore its potential is not understood. How, therefore, do Chinese healthcare professionals see the role of design? The case studies in chapters 4 and 6 and field trip in chapter 5 explore this and answer the question.

Chinese academic HPH literature mainly focuses on introducing HPH policy, theories and frameworks based on WHO guidelines and Western studies (Xiong *et al* 2017), organisational management (Zhao 2017), case study reviews taken from within local hospitals and communities (Chen 22015) and infrastructure capabilities more generally (Shen 2018). Using WHO frameworks to implement practices as an effective deductive method has proven essential in terms of knowledge exchange. Tian (2013) mentions there is an absence of any Chinese context-based theoretical framework or evidence-based research studies. Those theoretical frameworks and evaluation tools mentioned in Chinese HPH literature are based mainly on Western studies (see 2.2.4 and 2.3) and their perspectives are mainly from healthcare not design. Encouragingly, recent Chinese HPH research has started to examine patient-centred communication (Chen 2015; Tang 2020; Wang *et a.* 2020; Jiang and Hong

2021). Since design is accepted as a human-centred approach, this might provide one good way to introduce practice to Chinese HPH.

Another discovery from my Chinese HPH literature review is that writers value the connection with community, specifically diverse community-orientated activities organised by hospitals: for example, building health community clubs with different groups (Ji 2015), opening hospital library access to its community (Zhai 2021), local hospitals setting up health education "cabins" within their communities (Gao et al 2013). During COVID (2020 – 2023) community authority managements played essential roles in pandemic prevention and HP (Zhang 2022), though very much in a double-edged way. While these studies consider levels of community engagement, hospitals' implementations remain a top-down process, lacking depth in research before implementation. Dong et al (2007: 146) arrange designer-orientated user research methods into three types: *forum* – asking – *representation* – observing – *co-design* – participating. Current Chinese HPH do not consider the first two types. This has guided my two case studies to cover each of these three stages, suggesting what Chinese HPH may be missing in practice, methodology and process.

2.2.4 HPH theoretical framework and methods review

The section covers both HPH and healthcare research literature, conveying "the notions of capacity building into a structured process for HP action in specific settings" (Whitehead 2004: 259). After the initiatives from the WHO and HPH networks, there remains a spectrum of understanding of the concept and HPH has interpretations and practices expressed differently in different locations. Figure 5 lists three frameworks as a typology can summarise

different HPH interpretations. Both first two approaches from Johnson and Baum (2001) and Kar Roy and Lakshminaryanan (2012) can be classified as aimed at reforming the healthcare institution – specifically articulated as the first category of Vang (1995)'s framework. Their last two approaches see reform of surrounding community – specified in Vang's (1995) second category – as important. However, they all mentioned HPH connect with communities is a more advanced approach.

Figure 5: Comparing three HPH frameworks

Conducting a health promotion project can provide health information and education to patients and might help prevent certain illnesses initially. But previous experience shows how funding can dry up once specific projects finish, preventing the transformative processes that allow a reforming hospital to evolve sustainably.

Delegating HP to the role of any specific division, department or member of staff is organisationally inevitable but cannot be restrictive. Should it be then these marginal activities won't reorient the hospital's community role: health professionals are already overworked and don't have either the time or energy to think about HP activities. This might also explain why HPH projects in Europe have wound down. In the UK, for example, the NHS is facing a severe shortage of staff (Johnson 2018; Deakin 2022) and has neither resources nor funding to run HP projects. Both Vang's (1995) two categories – focussed on reforming institutions as well as surrounding communities – suggest a more holistic, co-setting approach might generate cooperation with other organisations and communities (this is addressed later, see 6.4.2 and 6.5).

Another most usual approach is a setting approach, focusing on the hospital.

> A setting is where people actively use and shape the environment; thus, it is also where people create or solve problems relating to health. Settings can normally be identified as having physical boundaries, a range of people with defined roles, and an organisational structure. Healthy settings' key principles include community participation, partnership, empowerment and equity. (WHO 2022)

Original healthy settings begin in sensitised schools, work sites, villages and cities, then expand to homes, prisons, universities and, logically, hospitals (WHO 2022). Hospitals generally lag behind other social care settings (Nagle et al 1999; Aujoulat et al 2001) but by comparing HPH theoretical frameworks, it seems that a hospital connected to a community can be the most dynamic and generative setting, leading to sustainable development. *The Vienna Recommendations* (WHO 1997) are generalised into four categories – patients, healthcare staff, organisations, and environments and communities – and HPH expresses all

four yet cannot be separated into discrete settings since each is connected to another. Hancock (1999) suggests the hospital setting needs to embrace at least two others, for example the workplace and community. “Health services must go beyond an emphasis on the hospital ... towards a more coordinated approach that embraces primary and community care-led strategies” (WHO 2015:12). This fits well with actor-network theory and participatory design methods (Schuler and Namioka 1993) (see 2.2. and 4.2).

2.2.5: Discussion

The first main finding in the HPH literature review and analysis – asking why HPH has slowed in the EU – considers that a hospital setting connected to a community approach can best contribute to the sustainable development of HPH. Non-systemic, unilateral understandings and implementations of HPH could be another reason why it fails to gain traction. HPH hasn’t entirely integrated with other HP settings – specifically communities – and this could be a reason it has slowed in some EU countries. If there is no fertile setting which can sustain HPH growth, HPH projects will wither.

HPH needs to connect, engage and effect collaborations in non-hospital settings – schools, villages, cities and workplaces – which, in turn, need to be interconnected at some point (WHO, 2007). How these different settings can work together and create new frameworks is worth further exploration. These initial findings shed light on my two case studies connecting hospital settings to communities. Case study one (see chapter 4) was carried out in a village, case study two (see chapter 6) within a school. Building on the understanding that HPH needs to connect to its community, the following section reviews how various theoretical

frameworks and social healthcare research methodologies develop based on community connections.

2.3: Theoretical frameworks and methods review from social healthcare literature

Although EU-related HPH literature appears to have declined over the last decade, healthcare research never stops. Moving out of specifically HPH literature and into a wider healthcare literature review, I now explore theories and methodologies used in social healthcare which may help form a practical theoretical framework for HPH studies.

A reason to expand the methodological scope for identifying needs within social healthcare is because both HPH and health communication and literacy demand equally complex explanatory perspectives. Health literacy is affected by an individual's articulateness, background and education as well as the varieties of encompassing social environments and the effectiveness of healthcare organisations' communication patterns (Allen et al 2011). It can – to an extent – be classified according to internal and external elements: *internal* implies personal knowledge, literacy, numeracy, cognitive skills and social connectedness (Volandes and Paasche-Orlow 2007); *external* implies competence of health communication provided through healthcare systems across wider society (Makoul 2001). If 89% of health factors depend on a mix of genetics, behaviour, lived environment and social circumstances (GOIVO 2017), these fall outside clinical and hospital settings: interrelated social determinants of health are themselves affected by multiple factors. They may express a range of health variables (see Appendix B) with 5 key determinants: behavioural (36%) social (24%) genetic (22%) medical care (11%) and environment (7%). Each determinant also has intricate derivative sub-branches. Appendix B illustrates these determinants and shows how health

communication – literacy, education and promotion – can become a “wicked” problem (Rittel 1972; Buchanan 1992).

While it is impossible to precisely predict any individual’s health behaviour better solutions are not guided by a design cut-off rule. After all, individuals tend to categorise themselves as part of social groups based on shared and similar interests, characteristics, cognitive elements generated by and through behaviour and sociocultural environment (Tajfel and Turner 2004). Emotional attachments and senses of belonging allow individuals to perceive similarities between and within groups. Connectedness within groups can influence an individual’s health choices and well-being and partially depends on the setting within which they are comfortable and sustained (Lee, Buchanan and Yu, 2020). People naturally seek social support – including health advice – from like minds with whom they identify (Jin, Phua and Lee 2015).

Should HPH define a target of social groups before implementing appropriate health communication strategies? When it comes to engaging and diagnosing within different groups, a community-based, social network approach – a design anthropology linked with ethnography and inclusive design – can be potentially generative, to understand and work with group health behaviour and engage with group activity while acting with an awareness of fit. This will be explained as the selective community-based and social network approach (see 2.3.1) and the design-based approach (see 2.3.2). Selection criteria depend on the potential trajectory of HPH development.

2.3.1 Community-based, social network approach in healthcare

Community-centred approaches (Meroni 2008) shift focus from individual to community scales; a community-based solution (Department of Health 2008) addresses health intervention at that scale. Theories of community mobilisation (Obregón and Waisbord, 2010), organisation (Ross,1967) as well as design approach (European Council, 2001) emphasise the power that community can contribute to healthcare services. These theories fit the findings from the HPH literature review mentioned earlier (see 2.2.5). As public health moves from a biomedical to a wider social approach, researchers have embraced theories from social science such as actor-network theory (Callon and Latour 1980s; Bilodeau and Potvin 2018), social ecology theory (Bukatko and Daehler1998), social learning / cognitive theory (Bandura 1986), reasoned action / planned behaviour theory (Ajzen 1985), and evidence-based practice theory (Cochrane 1972). These approaches suggest that hospitals can no longer concentrate on treatment exclusively. *Salutogenesis* (Bhattacharya et al 2020) becomes a new study of health, targeting factors that contribute to human health and well-being, rather than causes of disease (Mittelmark et al 2022). Among these, actor-network theory (Latour 2005) is an interesting example, a useful conceptual tool, deploying network connections to deal with complex systems of change such as healthcare (Bilodeau and Potvin 2018). It emphasises the importance of connections between heterogeneous entities, between humans and non-humans. What I learnt from this theoretical framework cluster is the importance of network to build connections: this is used in my case study two (chapter 5) and is analogous to the assertions implicit in design language, such as co-design and participatory design – building connections and networks through design perspective – (see 2.3.2).

One popular framework – *PRECEDE-PROCEED*[3] (Green 1974; Lawrence and Kreuter 2005) – has been used as a comprehensive structure in public health research. PRECEDE provides the structure for planning focused public health needs; PROCEED provides the structure for implementing and evaluating that plan. The framework provides three different processes: planning, implementing, evaluating. Similarly, Bate and Robert (2007: 83) divide tools between diagnostic and intervention across sixty different methods. Diagnostic tools fit the planning process while intervention tools fit implementation. Porter (2016) re-examines the *PRECEDE–PROCEED* model, concluding it assists HP by being more population-centred, participatory and better grounded in practice. This model shares similarities with design approaches (see 2.3.2) as does *RE-AIM* – Reach, Effectiveness, Adoption, Implementation, and Maintenance (Glasgow, Vogt and Boles 1999) – used in health behaviour interventions (McGoey et al 2016).

Having acknowledged complex frameworks, theories based on behavioural change and organisational management need acknowledging: the Health Belief Model (Rosenstock 2000), the Theory of Trying (Bagozzi and Warshaw 1990), Trans-theoretical / Stages of Change Model (Prochaska and DiClemente 1983), the Diffusion of Innovation (Rogers 1962;2003) and the Burke-Litwin Model of Organisational Change (Burke and Litwin 1960; 1992). Each emphasise organisational capacities as important contributions to processes of change, while leadership may encourage capacity building in the co-production process. Hartley and Benington (2010) mention both informal and transformational leadership – either inside or outside a healthcare organisation – influencing others without formal authorisation. Further, they assert leadership has the potential to influence four processes:

[3] "PRECEDE stands for Predisposing, Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation. PROCEED stands for Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development." (Green 1974: 34-58)

- Clarifying objectives;
- Encouraging participation;
- Enhancing commitment to quality, and
- Supporting innovation.

These frameworks are based on innovative change through the involvement of external entities.[4]

2.3.2 Design-based approach from healthcare service literature review

When it comes to innovative organisational change, design science emerges both in research theory and practice. Initially, design elements in healthcare only covered architecture, interior and visual communication. Later, the spread of the concept of user experience – including user-centred, universal and inclusive design, as well as design for all, co-design, participatory and service design – has permeated healthcare research and practice in both patient experience and hospital service (Ku and Lupton 2020). The common proposition is not only consideration of customer experience, but also designing personalised participation, co-creating unique value.

Health design researchers (Noël and Frascara 2016; Chamberlain and Partridge 2017; Ku and Lupton 2020) claim the paradigm in healthcare has shifted from centralised, sequential models to distributed value-creation with patients as co-creators of their own wellbeing. The healthcare delivery model has changed, therefore, from a personalised to a participatory

[4] In 2017, Taiwan organised an HPH leadership workshop to guide health service delivery. The workshop revealed certain healthcare organisations focussed on leadership and service in HPH development (Chiou 2017).

model; from *mass-production* and *mass-customisation* to *mass-collaboration* (Freire and Sangiorgi 2010). Different approaches – *co-design, co-production, co-creation* – conclude that co-creation could be more effective because it allows users to be central not only to the design of services but also to service production and development (Sanders and Stappers 2008). I will discuss the five design subject areas – service and inclusive design, design ethnography and anthropology, social and transition design – as uniquely conceptually and methodologically positioned in healthcare and have considerable potential for HPH studies.

A. Service design

Service design is a well-established hybrid of product service and business marketing, systematically iterating user experiences and providing a holistic, user-centred, co-creative service to public and private sector organisations (Stickdorn et al 2011). Service design methodologies include user scenarios, customer journey and stakeholder maps, experience and blueprint service models (Kimbell 2014; Service Design Tools 2017) allowing a systematic perspective at each stage of design: observation, engagement, ideation, visualisation, evaluation and structuring (Sangiorigi 2011) working across design fields – for example, design anthropology and communication design – and may be applied at different stages of HPH. Service design has, after all, been widely employed in hospital services and healthcare fields (Freire and Sangiorgi 2010; Pfannstiel and Rasche 2019) and in NHS research for decades. The NHS Institute for Innovation and Improvement developed (Department of Health 2005) a pilot project with service designers to see how design practice and research could contribute to a shift of healthcare innovation. Three main approaches were generalised through paradigmatic projects (see Figure 6).

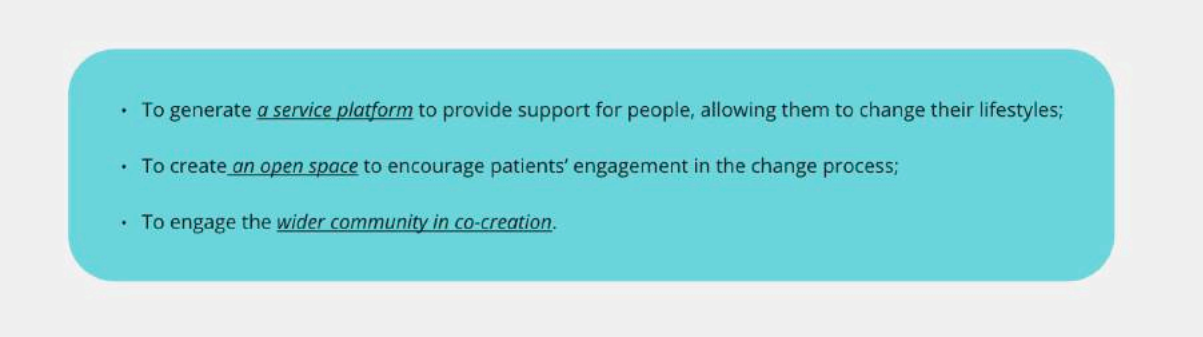

Figure 6: Three aims of service design in healthcare (Freire and Sangiorgi 2010)

Freire and Sangiorgi (2010) discuss the aim of experience innovation, suggesting it doesn't seek to improve a product or service, but to enable the co-creation of an environment populated by organisations and consumers and their networks. In this case, personalised, evolvable experiences are the goal – products and services evolve as a means to that end. A user-centred approach is not sufficient in this model: healthcare service design practice needs to be centred on the community of co-creation: this agrees with the overall findings of the HPH literature review.

B. Inclusive design

The term is first used by Coleman (1994), is called "design for all" in the EU and "universal design" in the US (Clarkson and Coleman 2015). The British Standards Institute defines inclusive design as accessible to and usable by as many people as possible (Keates 2005) but does not suggest designing one approach to fit an entire population. On the contrary, the British Standards Institution advocates appropriate design targets for a diverse population, minimising design exclusion (Clarkson 2016), developing a family of derivative products to fit the widest possible needs. Inclusive design identifies each design with a clear user group (Dong et al 2015) developing appropriate population sub-sets (Clarkson and Coleman 2015).

Through this nuanced understanding of user diversity and of different capabilities, needs and aspirations (Clarkson et al. 2007), inclusive design empowers marginalised groups (Coleman et al 2003; Ventura and Bichard 2017), "extreme users" (Coleman et al 2003:13) and vulnerable groups (Kenning 2018) often ignored by mainstream provision. The focus of inclusive design has shifted from original ergonomic product engineering to a wider design environment in disciplines including healthcare and hospital organisation (Dong et al 2015) and healthcare education (Levey and Montenegro 2018). Inclusive design may be applied to HP and support settings to develop the capacities of those with different intellectual abilities (Vlot-van et al 2020). Research suggests inclusive design as a method to target health inequalities and marginalisations, which Chinese HPH frequently ignores.

C. Design ethnography / anthropology

Design ethnography is qualitative research that collects data which may lead to useful, innovative design processes (Müller 2021) entailing a significant period of research-based participation in people's daily lives to collect data through observation, listening and interaction (Atkinson 2007). An ethnographic approach emphasises the local, establishing a holistic understanding of natural settings (Blomberg et al 2017). Design ethnography doesn't only help address design problems, but identifies community problems needing solutions which may gain from a designerly approach. There is also a benefit for designers who can build a more accurate and responsive map of people's needs (Bichard and Gheerawo 2010). Ethnographic qualitative research methods involve fieldwork, participatory observation, narrative interviews, photography and cultural probes (Müller 2021). These methods offer a hermeneutic approach allowing designers the chance to understand specific local circumstances where design will take place, and to recognise how individual groups'

behaviour is related to and generated by sociocultural contexts. Health organisations – especially hospitals – do not always fully understand the social determinants of different groups' wellbeing and behaviour. Design ethnography provides detective and diagnostic methodologies to gain insights into specific groups' health (Zaman 2008) and understand groups' health behaviour as well as a community's wider health conditions and problems (Savage 2000; 2006; Malagon-Maldonado 2014). Ethnographic probes have been used to improve healthcare services (Elg et al 2011) and may effectively lead to a next design stage: choosing corresponding artefacts, prototypes and toolkits (Sanders and Stappers 2014) as appropriate platforms for further participation and communication.

Design anthropology applies these ethnographic methods in developing new products, services and practices. Figure 7 lists three types.

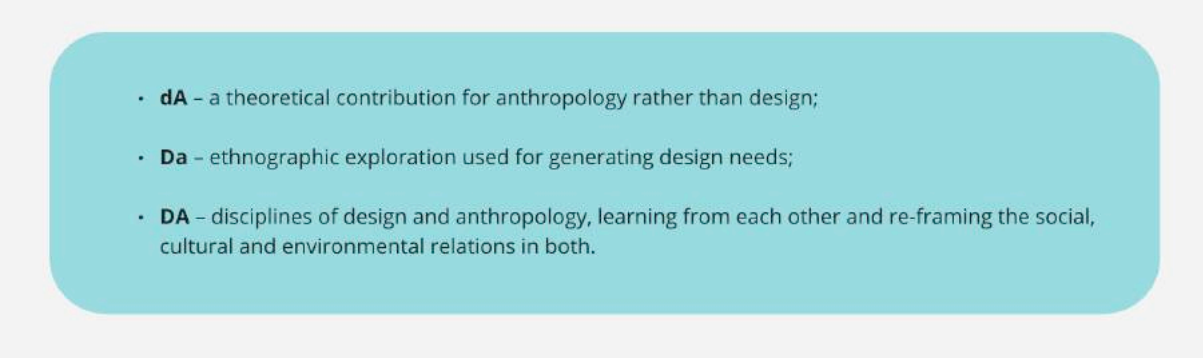

Figure 7: Typology of design anthropology (Gunn and Donovan 2012: 9)

These types provide different degrees of design with ethnographic integration, exampling interdisciplinary research based on research purpose and contribution. Traditional ethnography needs long-term immersion in social settings allowing participatory observation and documentation detailed in everyday practice (Gunn, Otto and Smith 2013). In contrast, design anthropology does not require long-term immersive fieldwork but rather "short-term

ethnography" (Pink and Morgan 2013) across different cultural settings, described as "quick and dirty ethnography" (Plowman 2003), "rapid ethnography" (Norman 1999) and merely "design ethnography" (Nova 2014). Pink (2015) proposes "sensory ethnography", which suggests a researcher use a multisensory approach in participatory observation, interviewing and visual ethnography. This shifts both the definition and approach of data collection.

Design anthropology could be part of an alliance with design thinking: inclusive, empathic, social as well as participatory and co-design, each contributing to social innovation (Ventura and Bichard 2017). Design anthropology in healthcare studies has been applied in psychiatric contexts for building comforting hospital environments (Duque *et al* 2021) and improving health informatics (Novak and Harris 2020). There is, finally, an interdisciplinary research area – medical anthropology – exploring how equitable healthcare may be achieved (Witeska-Mlynarczyk 2015).

D. Social design

Social design is design practice aiming for innovative social change (Resnick 2019) rather than commercial benefit. A shift from centralised to distributed systems can motivate grassroot initiatives and autonomy, seeking the sharing and exchanging of resources and values (Manzini 2015). Social design recommends that corporations from different public sectors target complex social issues together: to some extent, co-value creation can save social budgets through resource exchange. This identifies one reason why HPH has slowed in the EU – budgetary constraints especially following COVID (Thomson et al 2022; Godziewski 2022: 101) where the aim of Health in All Policies was seriously threatened. The

concepts of HPH and WHO's five priority action areas can be seen, in combination, as a social design project congruent with Health in All Policies creating supportive environments and strengthening community action for health, developing personal health skills, ideally leading to personal health autonomy and social innovation in public health.

E. Transition design

Transition Design acknowledges we live in a transitional period, one in which design plays a vital role in social transitions leading to more sustainable practices. Irwin established Transition Design, emphasising the "interconnectedness of social, economic, political and natural systems to address problems" (Irwin et al 2015: 1) and draws on theories such as those explaining change within living systems (Capra and Luisi 2014; Wheatley 2006). The *Transition Design Framework* (Irwin et al 2015) illustrates the process of achieving transitional design through four co-evolving areas: Vision ⟷ Theories of Change ⟷ Mindset and Posture ⟷ New Ways of Designing (see Figure 8).

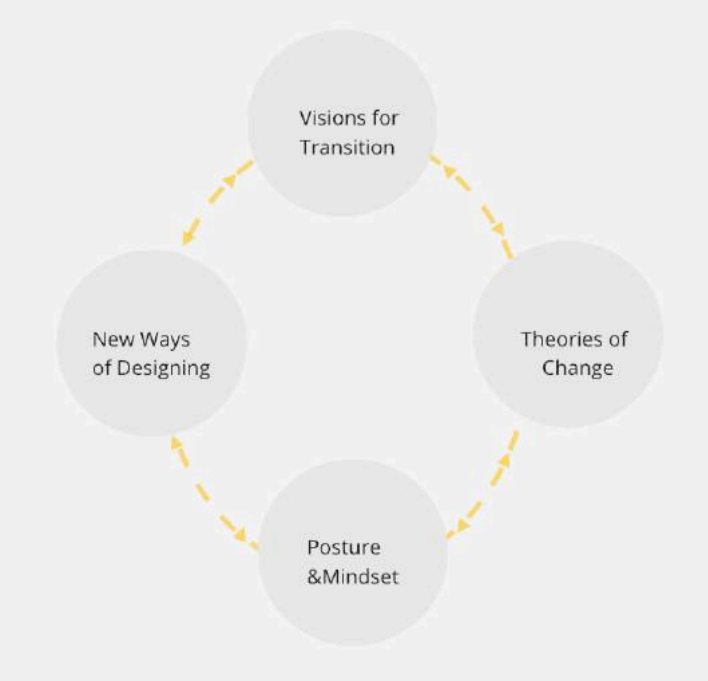

Figure 8: The Transition Design Framework (Irwin et al 2015)

This illustrates how transition design "challenges existing paradigms, envisions new ones, and leads to radical, positive social and environmental change" (Irwin *et al* 2015: 7). HPH picks up the transitional design heuristic to suggest hospitals shift from treatment-centred to a more health-promotion-centred approach. This process of transition challenges traditional orthodoxies – specifically those in hospitals – expanding their roles beyond curative service towards social HP (McAlister 1982: 43 – 44). Irwin, Tonkinwise and Kossoff (2022) subtly distinguish between *service* design as a mature discipline, *social* design as a developing discipline, and *transition* design as an emergent discipline. Unlike other design disciplines, social design and transition design do not have systemic mature methodologies which can broadly be applied to areas such as healthcare: this needs to be explored further. The transitional communication methods I developed through this research have to some extent filled this gap (see 7.3 and 10.2.2). The concepts of social design and transition design can inevitably bring a fresh mindset to HPH, addressing social change and associated transitional

processes, while it should be remembered that “rapid, pervasive change coupled with the increasing demand for design-led approaches to problem solving both afford and obstruct transition solutions” (ibid 2022: 33).

Design is a broad concept with many different branches: even though some theories and methodologies overlap or even obstruct, different design disciplines emphasise contrastingly divergent areas and mindsets. Ventura and Bichard (2017) show how inclusive, empathic, participatory and social co-design focus on different sub-areas, list various advantages, disadvantages and the extent of user involvement in each design (see Appendix C). Understanding subtle differences mean design researchers can re-apply them to distinct contexts (Jones 2014), even inventing new hybrid methodologies, combining a variety of components (Sangiorgi 2011; Manzini 2015). These various design disciplines and methodologies are reincorporated as hybrid design-based approaches (Bernet, Willens and Bauer 2013) targeting healthcare research across projects – a guide in terms of the integration and interaction at different stages of my Chinese HPH research.

2.3.3 **Discussion**

Different theoretical frameworks and methodologies uniquely connect healthcare communities. There is a clear trend of healthcare research moving from purely medical treatment to wider social co-creation research, which involves a range of external resources and disciplines. The same trend is evident in HPH development. If there is one commonality among these different frameworks and methodologies across both the community-based, social network (see 2.3.1) and design-based approaches (see 2.3.2), it may be participatory,

co-creation engagement. This is the key finding of this section. Selective design-based approaches in healthcare, when compared, provide divergent approaches communicating a panorama of information and perspectives, hard to communicate through words alone (Akoglu, Dankl and Dahl 2019). This prepares for the slightly cryptic observation that " if one idea could be found central in design studies, it most likely would be communication." (Buchanan 1985:4) Based on corrective explorations, reflections on and through intangible connections, participatory co-creation engagement and communication design emerge as key initiators of a snowball development, catalysing the exploration of PCD.

2.4: Participatory Communication Design (PCD) review

Based on the previous literature review, PCD seems an essential clarifying approach. A review of PCD literature should offer clarity, exploring whether PCD can be an effective approach for HPH. Figure 9 defines PCD as the synthesis of three fields: (1) participatory communication (2) participatory design, and (3) communication design. This chapter examines these fields from reviewing the development of communication models in communication theory (see 2.4.2), to the development of participatory design (2.4.2) and communication design using design theory (2.4.3).

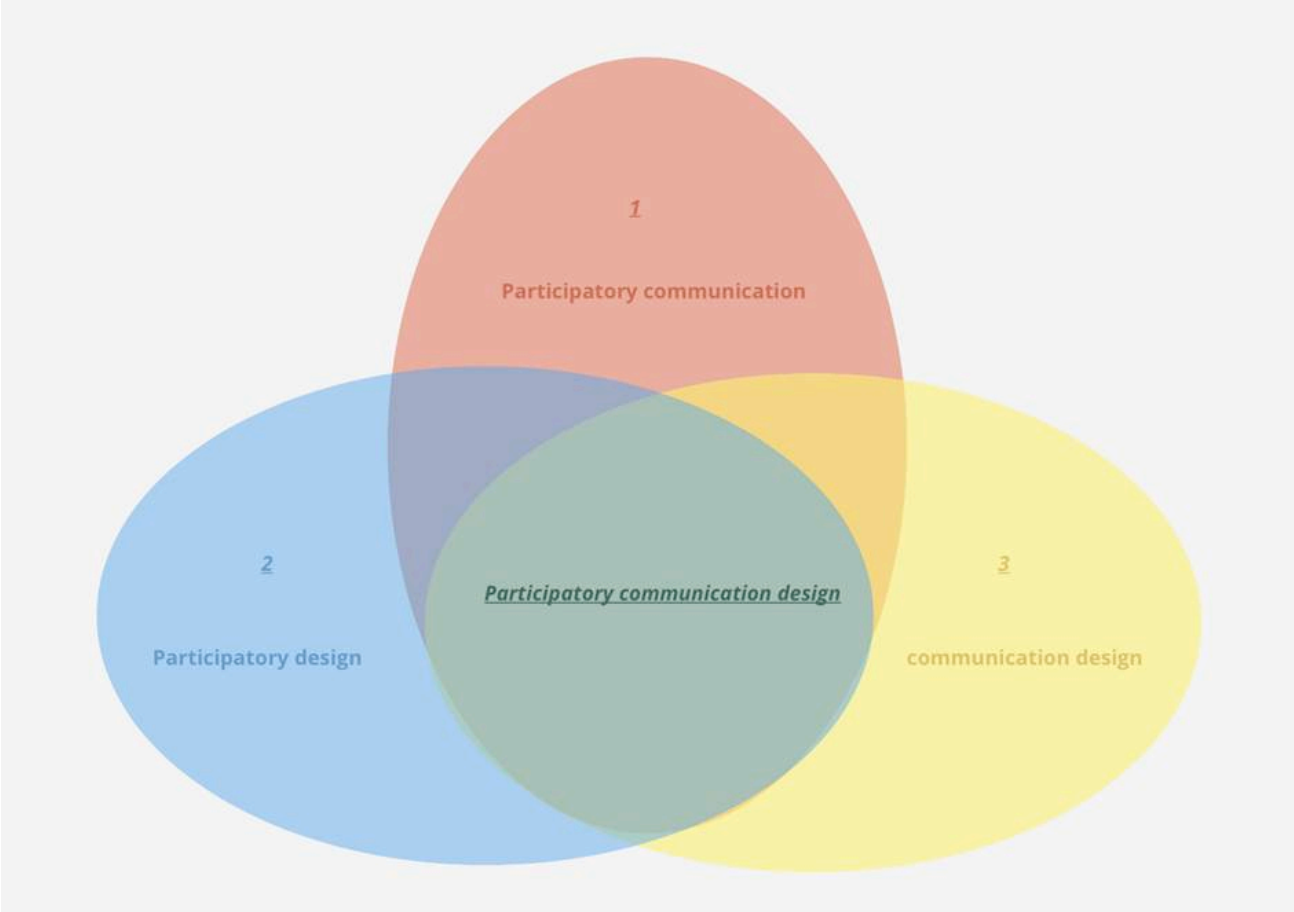

Figure 9: PCD fields

2.4.1 Review of communication models: from diffusion – one-way/monological – to participatory models – two-way/dialogical

Since one of the tasks for HPH is disseminating HP knowledge, it is worth reviewing communication models.

A. One-way / monological communication models

Early communication theory is expressed by Laswell's linear model (1948): *who* says *what* / through which *channel* / to *whom* / with what *effect*? A process-based, telephonic model of

transmission.[5] Mass communication theories (Lerner 1958; McQuail 2011), persuasion or social judgement and aesthetic theories (Hovland and Muzafer 1980; Berger [1972] 2008; Griffen 2012) examine the effects of persuasive narrow or broadcast communication strategies (Tufte and Mefalopulos 2009) and focus on how perspectives are altered. Health literacy in its earliest stages uses this model to map the dissemination of health information. Rogers' (1962) diffusion of innovation theory examines how new concepts are adopted by a group or a social system which consumes a novel idea, behaviour, or product as a one-way experience (LaMorte 2019).

Between 1970 and 1980, communication and behavioural change theory (Schwartz 2000) examines social marketing strategies used in health communication: for example, anti-smoking and HIV prevention campaigns. Overall, these one-way, single perspective communication models are orientated as linear, top-down systems of persuasion where an audience – or receiver – is more or less passive. Reception could be said to be an act of obedience rather than of comprehension. Early models of strategic communication describe no participatory involvement, mainly focusing on information dissemination through audio-visual and print media (Tufte and Mefalopulos, 2009). This is similar to the health literacy approach at the early stage of HP.

B. Two-way / dialogical participatory communication models

Participatory communication is first given an affective presence in Berger ([1972] 2008) and Frieire (1973; 1985). Freire's anthropologically based concept of dialogical pedagogy implies communication based on group discussion and participation rather than simplistically through standard media channels. Specifically, it addresses cultural identity, reciprocal cooperation

[5] Which is fair enough, given Lasswell's work on propaganda and telecommunication (1943).

and mutual trust among equals, sharing information during communication (Servaes 1996: 4). Participatory communication theory may be extrapolated from The United Nations Educational, Scientific and Cultural Organization (UNESCO) debates concerning access, participation and self-management (Berrigan 1977; 1979). Access not only refers to media, but also to those places, spaces and platforms providing opportunities for participation in public involvement and decision-making. The life skills communication model – developed in the 1980s – examines how citizens are encouraged through a didactic yet intercommunicative, face to face approach (Hendricks 1988), a transitional stage between one-way and two-way communication models. Similarly, health education is a transitional stage from health literacy to HP: health education mainly uses the methodology of behavioural change, communicating life skills development. Participatory communication stresses public engagement which usually involves a community-oriented approach, not only allowing for the sharing of information and experience with group decision-making, but also exploring and generating new knowledge aiming to improve current practice (Tufte and Mefalopulos 2009). This approach addresses structural social change through participation (Rockefeller Foundation 1999), a feedback loop unavailable in Lasswell's one-way model.

2.4.2 Review of Participatory Design (PD) development: from workplace democracy into wider design disciplines

Contemporary PD has its theoretical origins in 1970s Scandinavia: the social and political civil rights movements of the 1960s created the prerequisites. The Norwegian Metal Workers' Union encouraged work-place democracy, shifted power from the traditional top-down policy to bottom-up strategies, allowing workers to determine the resources they

needed (Sandberg 1983). The UTOPIA project developed hands-on experience, emphasising the need for organisational alternatives (Bødker et al 1987). The Scandinavian workplace democracy movement certainly enlightened the birth of PD, which adapted and expanded into other design fields. For example, user-centred design (Norman and Draper 1986) – stresses both the user's needs as well as product function. Another typically American brand of pragmatic system design (Greenbaum 1991) emerged simultaneously.

PD is a paradigm shift from designing *for* users to designing *with* users, now a well-established research area across design disciplines (Robertson and Simonsen 2012), such as product design (Demirbilek and Demirkan 2004), architecture (Schuler and Namioka1993), graphic (Taffe 2012), service (Holmlid 2012) and social innovation design (Björgvinsson and Hillgren 2010). PD has been practised in hospital studies, informing the decision-making of hospital environmental design (Eriksen 2000; Kristensen et al 2006); as a probability-based decision support tool to improve nurses' cognitive workflows (Jeffery et al 2017) and to improve health education experience with clinicians and patients (Paulovich 2015). Visual health education materials designed with/by health experts, mean designers can be more effective and engaging. Projects apply PD into HP (Berg and Gulden 2012; Hagen et al 2012; Navarro et al 2013; Neuhauser 2017;) emphasising a patient centred approach.

2.4.3 Review of communication design (CD) development– from graphic design (GD) through visual communication design (VCD)

CD is a swiftly developing subject (Lemos 2017), a synthesis of diverse disciplines and theories (Marsh1983) offering a constructive, multi-modal approach (Yates and Price 2015).

Defining CD is challenging, since the terminology is used interchangeably with VCD and GD (Lemos 2017; Walker 2017). It is widely identified as *graphic design* in the twentieth century, specifically as *visual communication* in the 1960s and *communication design* in the twenty-first century (Triggs 2019:10). As a term, CD originally may be partnered with graphic design as "the production of the texts, imagery and information that are communicated by the media and those texts, images and information graphics are undoubtedly both ideological and political" (Barnard 2013:154). When GD began to morph into VCD, it appropriated "a diversity of visual forms and languages so as to convey information, ideas and beliefs" (Triggs 1995: 5). Yet, VCD tends to consider actions of "conceiving, programming and projecting", more potently than objects or products (Frascara 2006). In terms of CD precisely, recent discourse has evolved communication systems (Davis 2012) to designing *for* and *with* (Lemos 2017). CD fractured and redrew its discursive boundaries drawing in the social sciences, business and medicine (Triggs 2019:11) necessitating knowledge gained from communication theory. Perhaps because of this, communication designers are utilising the possibilities of communication theory (Frascara 2006).

Traditional communication theory focuses more on information transmission in ways similar to traditional GD. CD has followed theoretical developments and moved from modelling a one-way transmission of messages to more interactive scenarios (Sanders 2006) despite challenges to this theoretical interactivity. Frascara (2006: xiv) claims that "there is no single way to make communication clear for everybody everywhere" due to the variables affecting information transmission. This is particularly problematic when considering "cultural backgrounds, emotional states, personal interests, intellectual development and value systems" (ibid 2006): any CD strategy needs to be defined and tailored specifically within

and to the context in which any communication takes place. This allows CD links with other design approaches – participatory design, design ethnography and anthropology, inclusive design. This hybrid communication approach may nuance communication effectively for those groups involved.

2.4.4 A definition of Participatory Communication Design

While there are no clear definitions of PCD in the literature, Mefalopulos and Kamlongera (2004) refer to participatory communication *strategy* design as one developmental approach for designing, implementing and managing field project communication. I seek to develop this conceptualisation further, defining PCD as an interdisciplinary field based on a synthesis of three fields: participatory communication, participatory and communication design (see Figure 9) implying a more active and interactive CD approach, addressing stakeholder engagement to complete or fold the communication process, while also considering engagement between people, objects and materials.

My research considers design as not only about physical products. Design is, more precisely and importantly, about the processes of conceiving, planning, scaffolding, coordinating, programming and achieving HPH: a process of *folding* communication as more participatory, active and interactive CD.

2.4.5 Comparing health communication, communication models and communication design

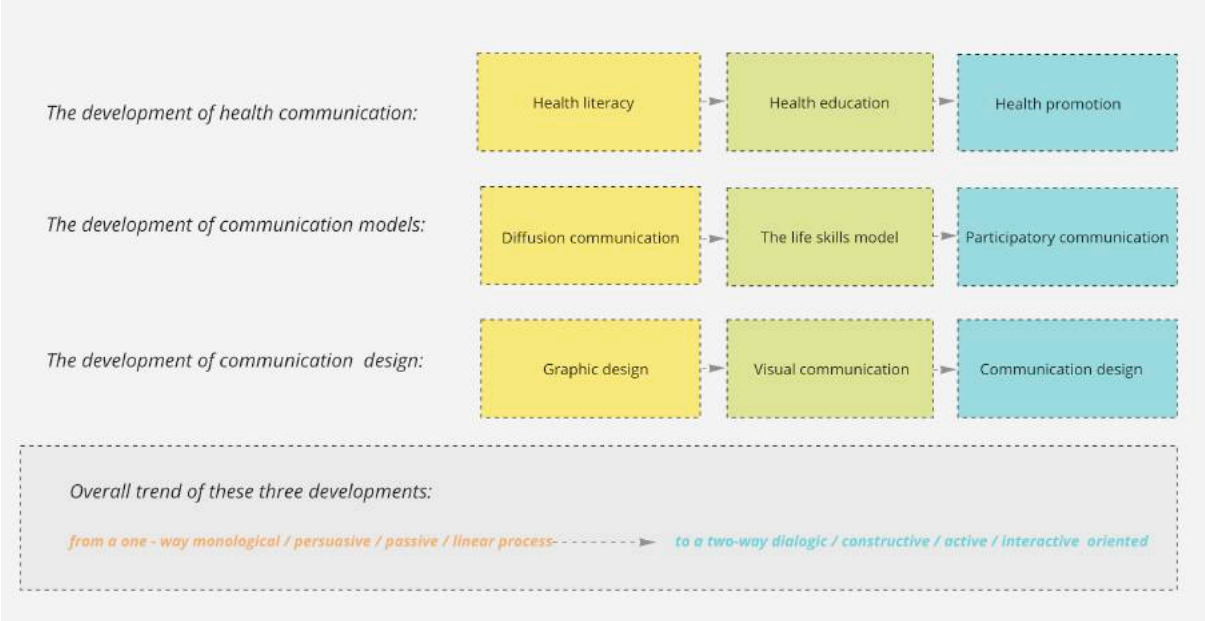

Figure 10: Overall trend of three developments: health communication, communication models and communication design

The development of health communication appears to share a trend with the development of communication models and CD (see Figure 10). Health literacy mainly focuses on passively learning HP knowledge: a one-way communication in which learning methods are usually didactically persuasive and visual implementation materials are drawn from traditional GD methodology: books, leaflets, posters, videos, traditional and internet media broadcasts. Holmes (2008) argues traditional HP by its nature focuses more on message development and dissemination. Lacking dialogue and feedback, it easily ignores problems and possibilities, leading to ineffective communication. Health education is, however, geared crucially towards a life skills model, involving a range of pedagogic methodologies to teach precisely targeted, health-enhancing skills. Visual implementation materials facilitate teaching using visual

communication. Finally, HP is more dynamic, interactive and participatory, much the same as PC and CD. The overall directionality of these three trends (Figure 9) to some extent indicates that PCD may be an excellent fit to HP generally.

2.5 Summary

This chapter's first finding (see 2.2) is that advanced HPH needs to connect to a community, eliciting community-based, social network methodologies. A comparison of different theoretical frameworks and methods used in HPH and in wider healthcare research (see 2.3) identify those selective design-based approaches which could contribute to Chinese HPH research. Section 2.3 suggests that participatory co-creation engagement is the key asset connecting communities among different frameworks and across methodologies. Comparing these helps generalise my own research narrative, helping to fill a gap in the literature and reframe my research questions. This allows a synthesis of PCD (see 2.4). Comparing three developments – *health communication, communication models and design* – leads to the finding that PCD may be an appropriate methodology for HPH. The literature review's "snowball" reflection hinted at this, and each subchapter's findings guides the content and scope of this review, until the "secret weapon" – the folded methodological essence – PCD emerged.

While projects with single design perspectives have been discussed (see 2.3.2), there is no comprehensive design research synthesised from all design genres and nested in HPH research – whether theoretically or in practice – and this is even more the case for Chinese HPH research. Here is the gap in the literature: if design can help organisations create a sustainable environment and contribute to organisational capacity-building through

co-creation in healthcare research, why can't it be used in the HPH? Researchers identify HPH as a novel strategy contributing to healthcare development (Pelikan et al 2001).

Based on this review, six "ifs" (see Figure 11) summarise that design-based research can be an effective approach for HPH studies.

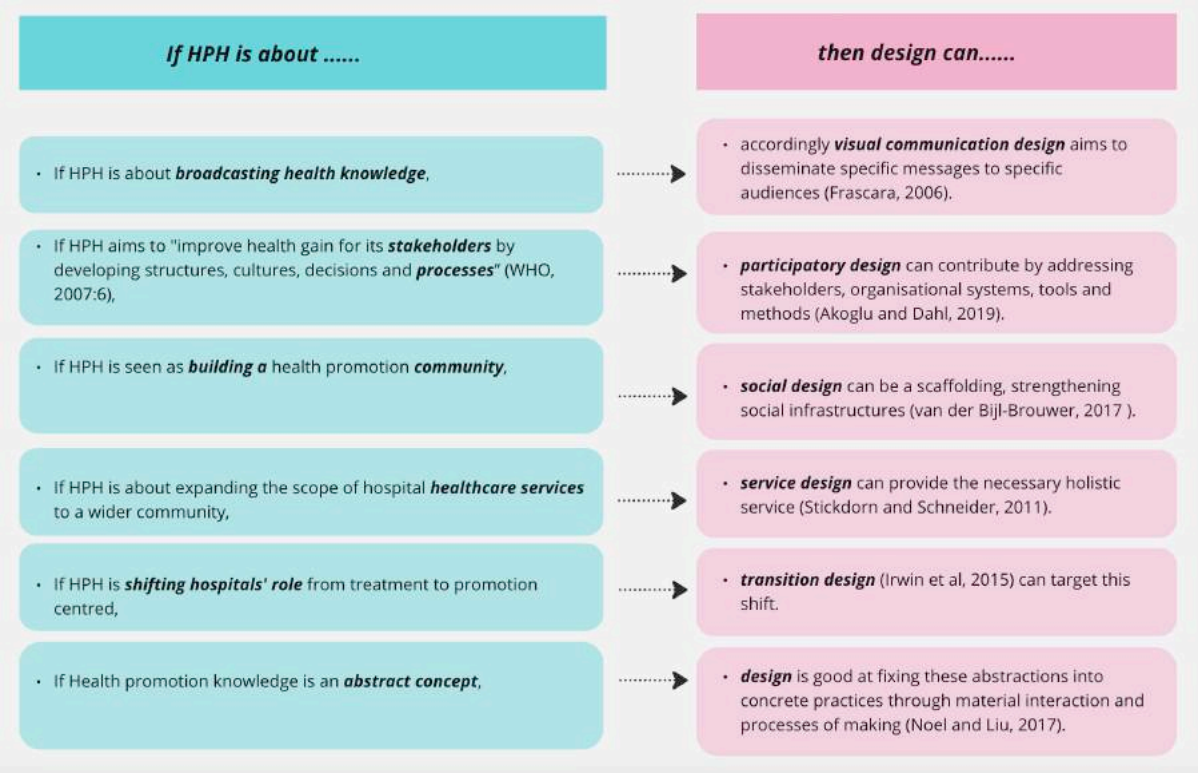

Figure 11: Six "ifs" connecting HPH and design

Clearly, design research has a potential role in HPH through a purposive methodology. Design is a broad discipline and its methodologies are separate tools: conducting specific design projects, a designer needs to select and combine these into "an overall design process" (Cross and Roy 1975: 4), understood as forming a design methodology. Design researchers' work is to select and integrate an adoptive design methodology effectively from relevant areas, adapting it to the uniqueness of each project. Where HPH has multiple interpretations,

design has corresponding fits. This refines one research question: what kind of hybrid design methodology can be synthesised and applied into the Chinese HPH context? The answer is explored practically in the following chapters. Cross (1990) understands the exploratory nature of design such that design methodology allows the exploration of a topology that is unknown. The aim is to discover something new, or let it reveal itself through practice. “The emergence of a paradigm affects the structure of the group that practices the field” (Kuhn [1962] 2012: 99) meaning design cannot be a systematic, dull repetition of what the researcher has explored before.

Chapter 3: Methodology overview

3.1 Introduction

My research is empirically based and practice-led, developing processes of enquiry *through* design in Chinese HPH. The methodology involves ethnographic fieldwork to provide rich qualitative data (Cresswell and Cresswell 2018) and hopes to test whether a design approach – as an alternative to traditional healthcare approaches – may contribute to Chinese HPH development.

A dialogue with the literature is vital to provide a framing context, testing "fitness to survive" (Popper [1959] 2005: 248) for Chinese HPH. Part one – the HPH review (see 2.2) – allows me to understand more fully the conceptual, theoretical, and historical identities of HPH, testing both what I need and expect from experiencing the literature. Part two (see 2.3) reviews community and design-based approaches in healthcare literature. This leads to the definition of PCD (see 2.4), consolidating or folding ideas from traditional design and communication fields: participatory communication, participatory design and communication design. This combination helps reformulate potential answers to the key research question: how can design-based research provide a supportive, sustained and creative framework for HPH in China?

3.2 Flexible design research methods

The next stage uses flexible design research methods (Robson and McCartan 2016), action research (Lewin 1946) and field trips (Foote Whyte 1993) to collect further qualitative data

thus seeking better and more challenging empirical evidence to help answer the primary research question. Flexible design research requires a nuanced, multi-level approach. Flexibility allows practice-led processes to speak so that both policymaking and decision taking can be fluently based on empirical observations and hermeneutically accessible phenomena. To reach reliable, testable and verifiable developments – avoiding becoming so flexible research control is lost – continual "reflection-in-action" and "reflection-on-action" (Schön 1983) evaluates data during each stage (Kolb 1984), connecting intermediate findings with research questions and estimated development, keeping research on track. Grounded theory, ethnographic research and case studies are the three traditionally appropriately adaptable design methods (Robson and McCartan 2016) allowing effective and clear answers to the research questions and a testing of the research hypothesis (see 1.3).

In my research (see chapters 4/5/6), interviews act as the main ingredient of grounded theory (Glaser and Strauss 1967), participatory observation (Foote Whyte 1994) as key to ethnographic research in field trips and case studies. My two case studies are based within community and social groupings (Robson and McCartan 2016): one focuses on an elderly (60 years plus), low-literate group in Hantun Village; another on children (from 4 to 8 years) in Wuhan. Both are marginalised groups, naturally and systematically excluded from benefiting from traditional HPH implementation methods – text-based promotion materials such as printed books, leaflets or digital articles accessed through social media. Focus group methodology – while being "deceptively simple" yet allowing informality to generate rich data (Wilkinson 2006:177) – may offer Chinese HPH a chance to avoid standardising methodologies that are, by their natures, exclusive. Decolonising and Indigenous examination of environment (Louis 2007), while not an exact fit to the conditions in the field I experienced, nevertheless have sensitised me to the nature of marginality. Decolonising

methodology is not just undoing colonialism and making political resolution, but also provokes the production of Indigenous knowledge, breaking knowledge hierarchies and encouraging social transformation (Smith 2012). It emphasises using Indigenous ontological and epistemological perspectives to "re-cover, recognise, re-create, re-present and re-search" the story (Archibald et al 2019: 4). Additionally, "for Indigenous people, decolonising research isn't about the total rejection of Western theory, research, or knowledge. It's about changing focus" (Louis 2007:132). Focus group research is important in such change and while the research data sets with whom I engaged are "Indigenous" they are not excluded on racial grounds. Nonetheless, standard socio-political, medicalised focus on the literate and trained creates marginalised individuals in all societies. It may be useful to "reframe, reclaim and rename" (Steinhauer 2002:70) as part of the reflection generated by focus group interaction. While there have been national and local policies in China to decentralise and avoid standardisation, inclusive design and design anthropology can help recognise marginalised groups and reframe or refocus. PCD in group study may uncover difficulties uniquely related to focus groups, seeking corresponding approaches and methods to address what too often are designated "problems", producing tailored solutions that embrace but don't problematise or exclude. This lies at the political-theoretical heart of my action research.

Community-based participatory action research is another method particular to case studies. Unlike traditional desk-based or laboratory-based healthcare research, community participation involves local people in social development (Sanoff 2000) requiring researchers actively to collaborate with non-academic stakeholders and communities among all the processes of research, from problem finding to research outcomes (Leavy 2017). Community is not just a lived ontology, it can be defined "as physical, political, psychological, historical,

linguistic, economic, cultural and spiritual spaces" (Smith 2012:128). Having a broad understanding of the concept of community and defining it differently allows marginalised focus groups to emerge during research.

Health problems within a population subgroup are associated with social environment and personal factors (WHO 2015): certain groups share health problems as well as behaviour. Focus groups can, therefore, be a valid method to detect commonality of health issues from the same subgroup. That is the reason I linked focus groups with community-based participatory action research in my case studies. Table 3 lists specific action research and flexible design research methods involved in these two case studies.

Table 3: Flexible design research methodology

3.3: Participatory Communication Design methods

PCD as a core method is widely used in all my participatory interviews, meetings, presentations, network building, field trips and case studies. I define the relevant PCD methods during the research process, folding them with other subject methods from across the three main stages of diagnosis, priming and implementation (see Figure 12).

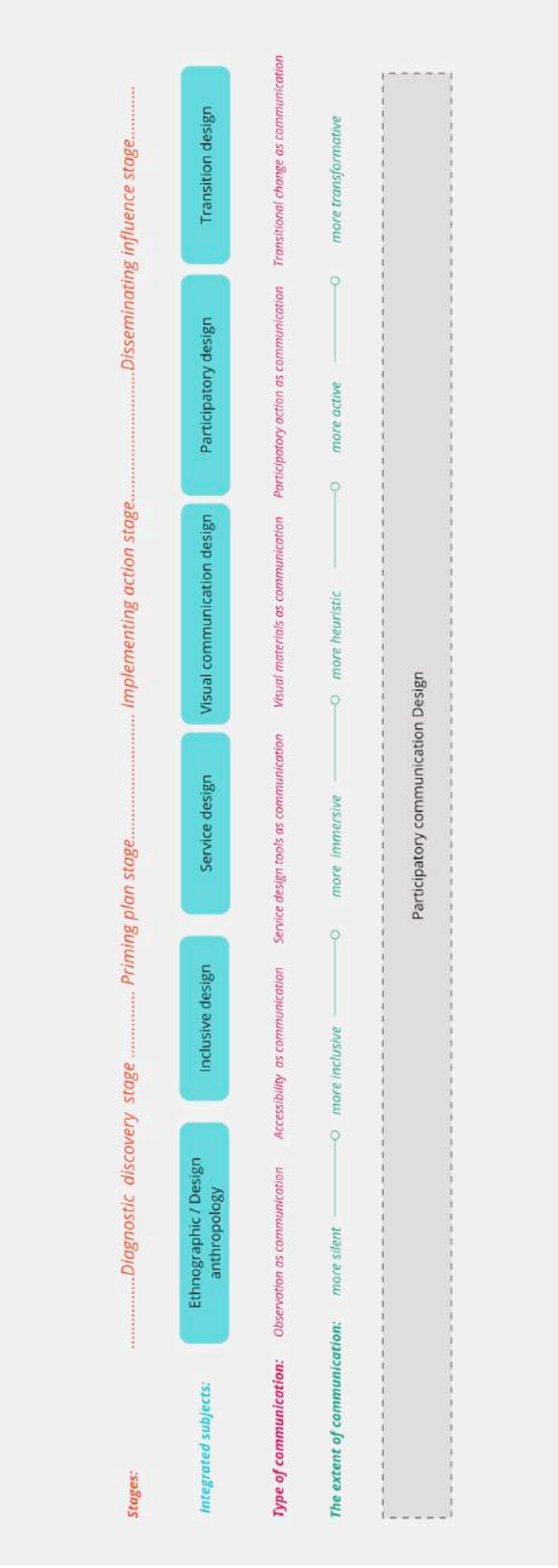

Figure 12: PCD methods

During the diagnostic stage, ethnographic and design anthropology methods dominated communication. I only asked questions when individuals had finished their stories and at an appropriate moment. In some environments, I could only access and talk with the gatekeeper: I wasn't allowed access to patients due to ethical issues. At this stage, communication could sometimes be silent or one-way: for example, observing, sensing and simply listening. Inclusive design creates an accessible mindset that encourages holistic communication.

Service design methods sit between the first stage of diagnostic discovery and the second stage of priming. Some service design tools were used in diagnostic discovery, such as the customer journey map and personas as models of typical users. Certain tools were used for priming, for example, co-design and service mind map and brainstorming. At this stage, the extent of communication is more immersive, seeking to sense each key aspect using service design toolkits and touchpoints.

Visual communication design methods fit between the priming / planning stage and the implementation / action stage. Visual materials can be either formal or informal communication tools and communication at this stage is more heuristic. The next stage is action implementation, involving PD methods: participatory action is a more interactive communication. The last stage is disseminating and influencing, it uses transitional communication as a gentle push to achieve transformation.

The extent of the communication was not the same at each stage. As a design-oriented communicator, I needed to know when my communication approach should be more silent, more immersive, more heuristic, more active or a mixture at different stages and then

visualise the process. It goes without saying that communication approaches should be determined before communication starts.

Based on PCD methods during three stages, a communication approach staircase was designed with five main steps (see Figure 13). The steps follow a logical progression and guided my research journey.

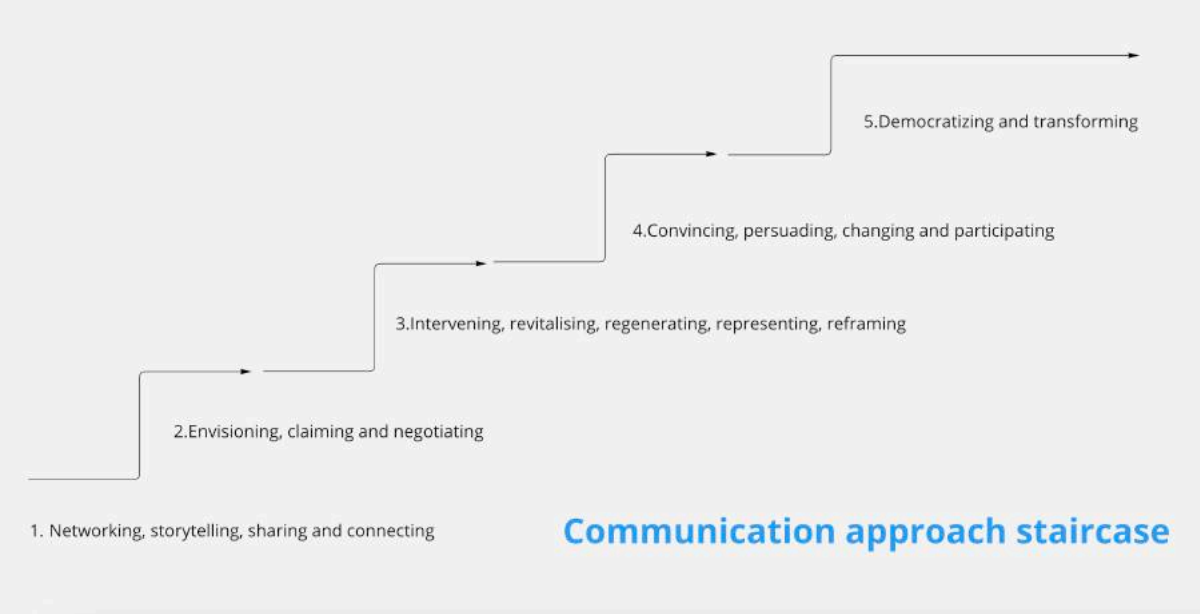

Figure 13: Communication approach staircase

3.4 Summary

Sennett (2014: 177) offers a clear methodology of **See – Plan – Act – Refine – Communicate** that accurately fits my research trajectory:

- **See** – ethnographic research (see 4.3.1 / 4.3.2) and field trip (see chapter 5);
- **Plan** – literature review (see chapter 2 and 6.2.2), contextual background research (see 4.2 and 6.2), reflection in action (see 4.5, 5.4, 5.5 and 6.4);

- **Act** – participatory action (see 4.3 and 6.3);
- **Refine** – reflection on case studies (see chapter 7), and
- **Communicate** – the design framework (see chapter 8).

The methods of logical reasoning during my research journey – methods that interrogate what is taken for granted – suggest a process that is appropriately demarcated as deductive or inductive (Popper [1959] 2002: 13; 55) or simple and abductive (Popper [1959] 2002: 536), each adapting the stages of PhD research as learning progresses.[6]

- Deductive reasoning (see chapter 2) is used through the literature review – specifically reviewing theories and other research frameworks – and examines the research question, building an appropriate design methodology.
- Inductive practice – observing specific experiences in case study one (see chapter 4) and field trips (see chapter 5) – draws broader general intermediate conclusions after practice: clarifying PCD is an appropriate methodology for this study.
- Abductive practice (see the case study, chapter 6) involves creative even imaginative leaps towards greater simplicity. It proceeds through co-design of dental educational courses, setting up a structure in which the dental hospital can operate as a health education community or leisure centre. This suggests that design practice can help Chinese HPH create a supportive, sustained, creative environment.
- Inductive reflection (see practices, chapter 7) gathers evidence and seeks emerging patterns from comparative reflections.

[6] The logic that feeds these progresses are data-based generalisations or higher levels of certainty or probability; abduction, like Okham's razor, seeks simplicity.

- Abductive conclusion (see the design frameworks, chapter 8) from incomplete observations to best prediction, acknowledges my awareness of the limitations of the research.
- Deductive envisioning (see future research and practice, chapter 9) tests these frameworks in new practices, transferring general to specific understanding.

Overall, the relationships of theory and practice in research can be imagined as an infinite loop: from specific contexts to general knowledge, then testing before returning to specific contexts in a generation of new knowledge. In this sense the relationship isn't a true loop, not an event cycling and repeating. It is a three-dimensional, Archimedean spiral where new knowledge moves practice into an arc length of continuously adaptive design.

Chapter 4: Case study one – participatory action research into low literacy and its effect on rural communities and their medical needs in in Hantun village

4.1 Case study aims and purposes

Following my initial research motivation – my grandmother's concerns over her medication – my original design outlook only acted as an interpretation, as a product or service solution. PhD research has allowed me to move beyond these germinal perspectives, to reflect on problems systematically. I began to wonder how other illiterate or semi-literate patients negotiated their needs, identifying this as an issue particularly affecting that social group, asking how they receive HP knowledge, how HP is run by local hospitals in a rural environment dominated by agriculture where high tech has – as yet – little if any effect. Driven by this curiosity, I conducted my first case study at Hantun village in Henan Province in April, 2018. It focuses on the medical issues of those who are illiterate or weakly-literate – with issues of presenting of prescriptions, understanding and taking prescribed medicines – and proposes an example of how grassroots health organisations could run an HPH. The first aim of this research journey was to understand low-literate groups' needs, desires, habits, perceptions and individual cognitive strategies in terms of medicine consumption. The second aim is to understand the system of public HP in the village setting, how public and private health sectors run an HPH in a Henan village. The third aim is the initial examination of PCD methods in HPH practice while partially answering my research questions and setting up my design-based HPH research in the grassroots, rural Chinese environment.

4.2 Contextual background and ethical issues

China's regional development is unequal. Democratic, economic, cultural and health developments are absent in some rural areas – but the Chinese countryside is not homogenous. Hantun is a small, semi-isolated agricultural village with roughly 300 permanent residents. Han is a common surname and nearly 70% of the population share it, belonging to the Han ethnic grouping. This strengthens community cohesion, though socio-economic change means that adults often work in major cities leaving the retired or elderly to look after grandchildren. This is an established pattern across modern rural China (Xu and Xia 2014; Wang 2022). Due to their predominantly agricultural background and for a range of complex historical reasons (Spence 1983; 1999), seniors are mainly poorly literate or illiterate[7]. For common demographic reasons – women live longer than men – the illiterate elderly in this village are predominantly females struggling with dosages and usages of medicines once prescribed.

The focus group of this case study is Hantun's low-literate villagers, aged over 60. Since participants lack literacy skills, asking them to sign a consent form they cannot read is impossible and unethical and family members who can read are often absent. Consent is, therefore, a constant negotiation, building trust in a dynamic set of relationships; it isn't just ticking boxes and getting signatures (Smith 2012). In Indigenous research, older people and researchers who share socio-cultural backgrounds can build relationships of trust more easily, allowing the collection of more dependable feedback: "Trust is embedded in cultures. From an institutional perspective, trust plays a role as a sanctioning mechanism, thus acting as an

[7] UNESCO (2006) defines illiteracy according to three typologies: (1) those people who cannot read and write; (2) those who cannot recognise modern social symbols in everyday use; (3) those who cannot manipulate technological tools such as smartphones or computers. The Chinese government defines an illiterate as someone who can read fewer than 1500 Chinese characters (ChongQing Education Council 2009). My observations suggest the majority of inhabitants in Hantun cannot read 1500 words; few use smart phones.

informal institution." (Welter and Alex 2012: 52). The elderly often has a wealth of knowledge and experience, a reputation deeply rooted in local communities: they can be invaluable resources for younger generations and, of course, for the researcher (Gaver, Dunne and Pacenti 1999). For this case study, two family members are my gatekeepers (Corra and Willer 2002): my aunt – a deputy at the clinic who introduced me to all local clinics and hospitals – and my grandfather – a respected village elder who guided me towards interviewees and whose influence helped me gather workshop participants. These two gatekeepers made me known, explained the purpose of my research, informed participants what the activity was and its implications, and asked permission orally of every case study participant. In some Indigenous communities, such an informal approach can be effective, participants being more willing to open up and share experiences in a relationship of trust (Bijlsma-Frankema and Rousseau 2012: 259). I spent every holiday in this village before I moved to the UK, and some villagers know me well. The close relationship I managed to sustain is rooted in shared ethnicity which can more easily build trust. Doing ethnographic research in ethnographers' own cultures has special positionality (Wilson 2020); having family members involved in the research can provide deep understanding and acceptance of familiar circumstances and community, reduce prejudice, and deal with potential conflicts (Stephenson and Greer 1981; Uslaner 2012).[8]

[8] "There is a clear differentiation between trust in people you know (experience-based trust) and faith in strangers (moralistic trust). … Trust is not a one-dimensional phenomenon based exclusively upon experience." (Uslaner 2012: 73)

4.3 Participatory action research involving medical needs of low-literate adults

This action research has three stages (see Figure 14) at each of which mutual trust was initiated, built and sustained.

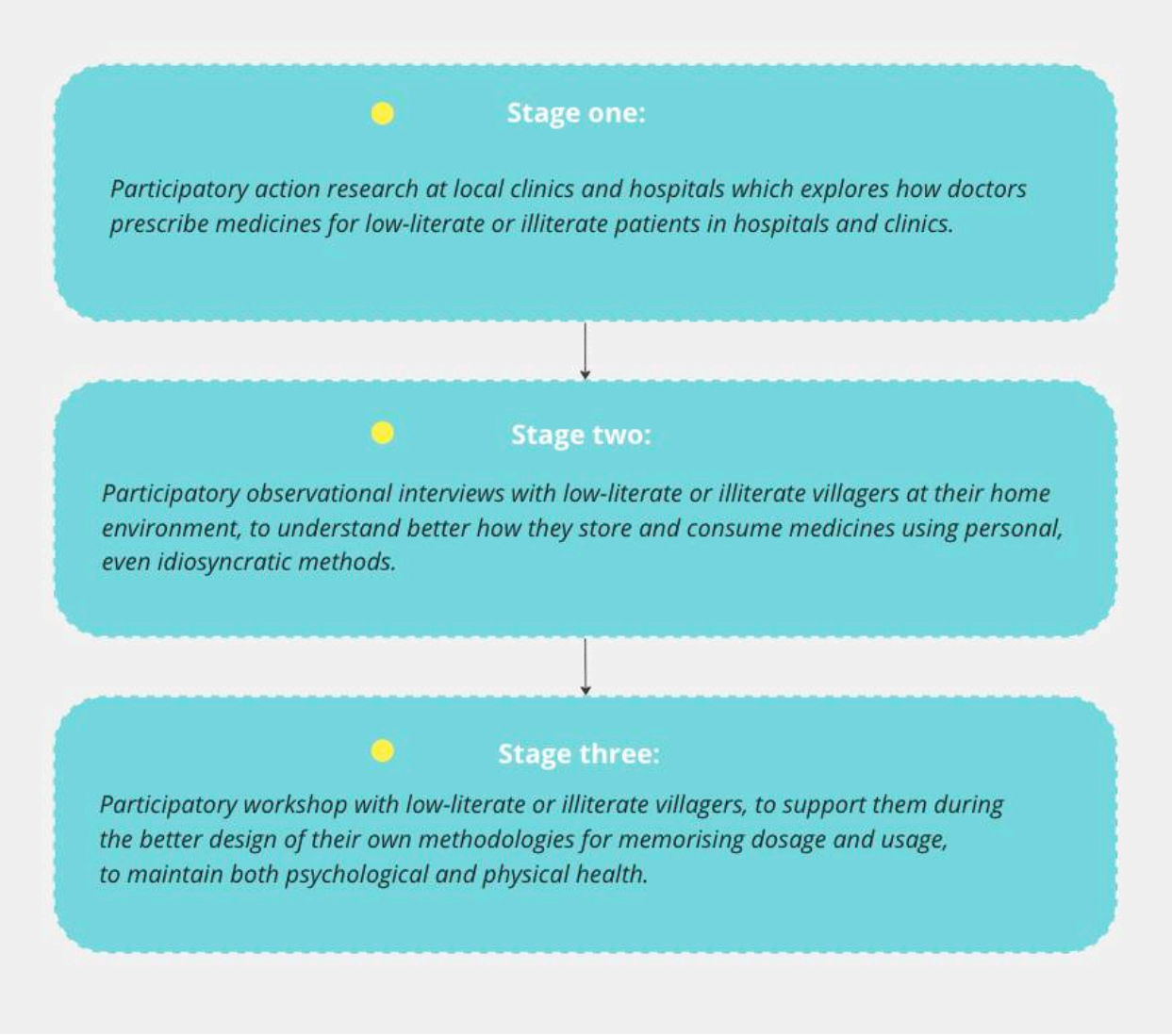

Figure 14: Three stages of case study one

4.3.1 Participatory action research at local clinics and hospitals

a. At a local private clinic in Hantun village

Figure 15: The environment of a local private clinic in Hantun village: entrance, common / waiting area; clinic surgery

This private clinic (see Figure 15) is neighbourhood-based: the doctor runs the surgery – separate rooms for examinations and diagnosis plus a pharmacy – in one of his domestic rooms. In a small village like Hantun, everyone knows each other well and due to close ethnic relationships, patients walk into the doctor's house without an appointment – common practice in rural settings. My aunt introduced me and the reason for my visit, and my observer status was agreed by both doctor and patient – coded as **doctor A** and **patient A**. Patient A was treated for a cold. Since we're well acquainted, conversation followed naturally. Figure 16 illustrates the action journey, common in village clinics like this: diagnosis, prescription,

packing and dispensing of medicine, the patient's discharge.

Figure 16: Patient A's treatment journey at the Hantun private clinic

After diagnosis, doctor A explained – while he was preparing the medicine – how to package it in a way to negotiate issues associated with low-literacy or illiteracy: "This traditional packing method is called *pentagon packing,* practiced for hundreds of years in China and still widely used in rural clinics". Doctors use recycled paper cut beforehand into a square. Whenever a medicine is dispensed, the doctor takes a number of papers based on times of dosage, puts different quantities of pills on each paper according to the prescription. In this case, he packed two day's medicine – to be taken three times daily – six packages in total. Each package was a single dose containing four different pills of different dosages. Finally, those papers were folded five times and sealed in a pentagon. Normally patients do not bother to ask the names of the pills each pentagon contains, nor do they need to remember the dosage, just consume the pills in each package once it's open in turn. The advantage of this

packing method is its simplicity: it is convenient and easy to use regardless of whether patients are literate or illiterate. I experienced this method when I lived there as a child.[9]

b. Participatory action research at a local government authorised hospital in Huji town centre

Huji is the political municipality that manages 28 villages including Hantun and is fewer than 10 kilometres away. Each municipality has one government authorised hospital, not only for more complex treatments but, more importantly, for public health services and advocacy – in effect, managing the social health welfare system. Huji hospital has the responsibility of an HPH within its jurisdiction. Generally, villagers come to this hospital when their needs are more serious than the everyday treatments available at the doctor's house. Though this hospital has a large campus, there is no reception area: patients go directly to the specialist department since they usually know the place well. Each department is a single space: the doctors' surgery and patients' waiting areas are within the same room. There are chairs for patients if they need to wait while doctors diagnose other patients (see Figure 17).

Figure 17: The environment of government authorised hospital in Huji: entrance and cardiovascular department

[9] Because of its comfortable familiarity, getting a consultation and prescription from a doctor is locally called "going to pack some pills".

Unlike most Western clinical systems, patients can turn up without an appointment here also, walking in and waiting in the common surgery. The researcher's aunt – the deputy of this clinic – suggested the cardiovascular department as the best place to conduct action research because patients were more often older, low-literate or illiterate. Since cardiovascular disease is common amongst older people in this area patients rarely worry about privacy during a visit. The guidance of a local gatekeeper – who intuited an appropriate approach to negotiate research ethics and who had a profound contextual understanding – proved invaluable (Corra and Wiler 2002).

After receiving an agreement from both doctors and patients under my aunt's guidance, I sat in the waiting area of the cardiovascular department's single room and observed. Unlike the local village clinic, where everyone knows each other well, sharing expectations based on shared ethnicity, the public hospital is more formal. Direct conversation might not be such an effective approach. While the patients sat waiting, I didn't ask about diagnostic conversations. I tried, rather, to engage in direct observation as a "fly on the wall" (Calås 2021; Moelker 2014) with every action witnessed occurring as naturally as possible.[10] I observed and recorded data without obstruction during consultations. I used the service design method-customer journey map to follow an elderly patient's visit (see Figure 18), coding **doctor B** / **patient B**.

[10] There are, however, reasons to tread carefully during direct observation and interaction may be broader than an invisible insect suggests (Rietmeijer et al 2021: 1204): participant direct observation may better reflect the encounter. This suggests similar HPH research methodology should be situationally responsive enough to allow for appropriate adaptations.

Figure 18: Patient B's journey at Huji public hospital

During diagnosis, doctor B checked the patient's condition and medical history including any prescriptions from other doctors; then he ordered a new prescription, printed it and asked patient B to pay and collect the medicine from the pharmacy next door. Patient B could not read the prescription so was told to go back to the doctor for usage instructions. When patient B returned, doctor B was with another patient but stopped to advise patient B regarding the prescription, explaining the precautions for consumption and how to adjust dosage after a specific period. Importantly, he used a ballpoint pen to write two Arabic numerals on the medicine package, making the dosage instructions clearer: the first represents the number of pills to be taken, the second represents the times at which the medicine should be consumed.

Most low-literate or even illiterate patients recognise Arabic numerals better than Chinese characters.

Respectfully, I asked questions once the patients were gone. Doctor B said “I write dosage instructions to all patients because most are elderly, have poor eyesight, and live independently with no one to help them.” When we discussed the pentagon packaging, he agreed on its advantages for low-literate or illiterate patients. “Large hospitals have, however, stopped using it, not because it is out of date or too informal but mainly because if a patient moves to a new clinic, new clinicians might not recognise the prescription from the pentagon method alone.” This could risk medical negligence. Doctor B also mentioned that “patients follow their instructions not entirely depending on level of literacy, but on their personalities: confidence is key to overcoming obstacles represented by linguistic codes”. Those who took only two or three different pills could easily navigate the process by the appearance of each, but this means functional illiteracy (UNESCO 2006). Based on doctor B’s experience, patients who struggle to follow instructions are not only low-literate or illiterate but also may be those who have functional cognitive defects. Most patients in this town have chronic diseases, need various medications and adjust dosages depending on their condition. This leads to confusion in terms of memorising usage and dosage. Doctor B’s feedback provided the criteria of selecting interviewees – older villagers suffering from chronic disease (see 4.3.2) – reminding me to consider their lack of confidence might increase their inability to negotiate problems: his feedback indicated how I incentivised them in the participatory workshop.

4.3.2 Participatory observational interviews with low literate villagers in their home environments

Based on doctor B's feedback, these interviews focus on senior villagers who suffer from chronic illness. My grandfather knew and selected potential patients, informing them of my research and the procedure needing their agreement. We achieved a total of 10 interviewees – not counting invalid or repeated cases – and I selected four different yet typical common cases, coded **interviewees A, B, C, D**.[11]

Interviewee A:

Figure 19: Interviewee A – keeping a pentagonal package in her pocket

Interviewee A is a widow of 78 who worked as an agricultural labourer (see Figure 19). She has very basic literacy and lives with her daughter-in-law who is also a low-literate; her son works in Shanghai. She bought a mobile phone designed for the elderly, but only receives

[11] This I have already published (Ai 2019: 180-182). Due to the importance of objective descriptions from interviewees this text is drawn from that paper with only minor changes.

calls from her son, never calls him because she doesn't know how to use the keypad beyond opening and closing a call. She uses the *pentagonal packing method* to pack her own medicine from boxes and puts one package in her pocket to carry all day. Interviewee A said that, for lack of heating in winter, "I'm in the habit of putting my hands into my pockets and this reminds her to take my medicine during the day, no matter where I am." This suggests local meteorological conditions may be one variable for taking medicines.

Interviewee B:

Figure 20: Interviewee B – remembering two different medicine dosages from colour

Interviewee B is a 62-year-old who prides herself on her memory (see Figure 20). She is low-literate but can remember her medicine dosage clearly from its appearance on both the packages and the colours and textures of pills. Having observed the power of colour for this interviewee, I saw a TV remote control on a table, with different coloured buttons. Nevertheless, the interviewee expressed a similar disconnection from technology as had interviewee A: she said "I would never turn the TV on when I'm alone."

Interviewee C:

Figure 21: Interviewee C – medicine storage / expiry date on container

Interviewee C is a 75-year-old single man with low literacy. Once an agricultural worker he now lives a simple life helped by those of his extended family remaining in the village. He can remember dosage because the number of medicines is few and easily manageable. I noticed, however, that one of his prescriptions would expire in five months (see Figure 21): calculating dosage, the interviewee would still be taking these pills after expiration. This might pose a serious problem with certain medications.

Interviewee D:

Figure 22: Interviewee D – personalised medicine distribution method

Interviewee D's wife is in her 70s – her age couldn't be ascertained exactly – is totally illiterate and always forgetful: possibly experiencing early stages of dementia. Her husband – older and literate – said "I put her medicine into six boxes, marked 1,2 and 3 representing morning, noon and evening and containing two days' dosage. When she picks one box, she takes all the contents at once." The number written on the outside is important because dosages and types of medicine vary (see Figure 22). This method was created by her husband and has been used for 20 years. It is a similar logic to the pentagonal packing method, only the materials have changed from paper to a plastic container. Observation suggested the interviewee was now so used to the process it had almost become automatic. Nevertheless, should her forgetfulness increase – perhaps with the advance of dementia – then this system would become useless or worse than useless.

Figure 23: Examples of personalised usage markings and medicine storage methods

Apart from these four cases – interviewees A, B, C and D – other villagers display similar conditions and strategies. The common methods are marking the function, variable dosage

and use of medicine either by the doctor or the patient's family (see Figure 23). The common problem for patients taking multiple pills is chaotic storage methods causing or deepening confusion. Some patients make their personal medicine storage box (see Figure 24) suggesting individualised methods could be the best fit for each patient: how to encourage them to design their own methods is a key issue for the next research stage.

Figure 24: DIY medicine storage box

4.3.3 Participatory workshop for villagers with low-literacy

Based on these observational findings, I organised a workshop helping villagers identify their personal approach to remembering prescription dosage and use. Three main strategies were

used to encourage participation in the workshop, especially among those who felt frustrated and were less confident. First, before the workshop, I carefully planned who should participate, as well as where and at which times. This was essential. These choices not only affect data collection, but also the engagement of those involved. Secondary, well-prepared materials and suitably designed toolkits motivate participation. Thirdly, design methods need to be flexible and responsive during the workshop: if the prepared material did not encourage a good process of engagement, alternative solutions were immediately needed to adapt the methodology and address the problem.

Figure 25: Social activity at a neighbourhood shop in Hantun

Finally, we chose a small commercial location in the village centre as the workshop site (see Figure 25), a social space where villagers often come for informal activities after lunch such as chatting, knitting or playing poker. These spontaneous activities are a fluid and flexible environment where people come and go at will. In terms of villagers' daily routines, my aunt said "they normally farm or shop in the mornings, then arrive at this location for social activities after lunch. The afternoons, traditionally, are a period in which to socialise and relax – many will have been working hard in the fields since sunrise." It seemed, therefore, expedient to conduct the workshop in the afternoon, allowing people to drop in naturally and

join the group: spontaneity is valuable since we could not be certain how many illiterates or low literates would have been willing to participate in a more formal, intimidating setting. In this location, we hoped those who walked in naturally – as they do most days – might feel our workshop was an organic not artificial extension of the time they usually spent at the shop. Establishing a natural, flexible sense of informality, the participants would be more relaxed and less pressured to take part.

Burns (1979) describes participation falling into four categories: awareness, perception, decision-making and implementation. I adopted these as a broad strategy for this workshop to obviate potential unwillingness to participate among those arriving in the shop. I built awareness with a simple, straightforward and easy-to-understand introduction using colourful materials – memos, string, tape, plastic stickers and pens – on a low table. My grandfather introduced the workshop purpose, then I encouraged those present to take time to see what the workshop was about before making a decision to get involved or not without undue pressure (see Figure 26). Finally, the workshop occurred spontaneously, without any pressure, with group learning as individuals helped each other.

Figure 26: Preparation for the workshop

Materials and presentations created awareness and participants showed interest by touching materials though nobody attempted to go further. One participant was worried about making mistakes, but my aunt and grandfather set an example by selecting colourful materials and sticking them onto the medicine package, saying there was no right or wrong way. However, only two participants tried to symbolise their dosages, others stood around and observed. This indicated interest in the workshop, and they asked questions and touched materials but they either did not know how to do it or dared not to do it. Based on this dilemma, I needed to find alternative motivational strategies.

I quickly designed encouraging prompts, putting three A1 sheets on the table. Those gathered around the table were asked what they did morning, noon and night and what kind of visual image could represent these times. This evoked unique memory links, associations of visual elements with medicine consumption, allowing participants to see the activity holistically. Then verbal and visual activities occurred spontaneously. Some people drew icons of suns and moons in different colours with light rays, clouds and emojis (see Figure 27).

Figure 27: Five participants' drawings of suns and moons

A few were unwilling to draw but expressed ideas orally which I then sketched. After this, four participants drew new ideas on the paper, others shared in detail stories of the ways they took their medicine and stored it, according to their daily routines. For instance, one participant said "I check my grandson is in bed normally to remind me to take my evening pills". Figure 28 shows overall results of activities connected to or prompted by the daily periodicity. Some data linked to local contexts: a cock crowing in the morning, farm work occurring regularly in the fields before noon, noodles handmade at lunchtime – such noodles are a regional delicacy – soaking or washing feet every evening rather than showing – especially in winter – and watching over grandchildren as they do their homework after dinner. These routine activities are rooted in traditional culture and contemporary lifestyles and vary regionally.[12]

Figure 28: Iconic representations of key moments in daily activity

After group discussion and story sharing, totally fourteen participants chose materials and designed their own "reminders" for time and dosage. Figure 29 shows this participation

[12] These present valuable data for local HPH research in terms of detecting and contextualising habits and lifestyles, then link these to health-related behaviour.

process and figure 30 illustrates the results. Some used colours, lines and dots; others drew specific icons meaningful for themselves.

Figure 29: The participation process

Figure 30: Results of participation

Brainstorming encouraged participation and reduced apprehension, allowing participants to build from their own memories selections to represent complex information. Some imitated others: some took the initiative to guide their friends. All this is acceptable even if someone copies another's ideas, as long as they choose the simplest and easiest method for themselves to remember and use: the workshop created a mutual learning platform on which participants mutually benefitted. These responses feed into two priority action areas of HPH (WHO 1986): creating supportive environments for HP and developing skills allowing people to manage their health conditions better.

Participants reported this workshop encouraged them to design their own methods and understand medicinal information. My aunt said "these experiences enriched grassroots medical services for these people, especially the most vulnerable and poorest, empowering their medical knowledge through community participation." It gave the local public health clinic a new, more positive approach to HPH, with participants feeling for the first time engaged in finding solutions to their needs. It redefined participatory roles for patients and members of staff within their communities.

4.4: Grassroots HPH inquiry

The second part of this case study examines how local public health sectors understand and conduct HPH, inside and outside hospitals. This inquiry took place at two urban hospitals, one clinic and a shared public space in Hantun village.

Figure 31: Interview with deputy head of hospital about HPH implementation with information board

At Huji public hospital, my aunt – as deputy head – introduced me to how HP for local residents is run (see Figure 31). Her and her team's job is following NHCC guidelines, implementing HPH based on the provincial or county-wide policy. One of the most common communication approaches for every Chinese hospital running HPH is putting up and maintaining a health education advocacy board. My aunt said "the public government health committee allocates funds so that these boards effectively promote health in every hospital and village. The layout of the information board is standard, but the format of posters varies between hospitals depending on their management team's design perceptions and abilities." (see Figures 32 and 33)

Figure 32: Hospital health education advocacy board

Figure 33: Village health education advocacy board

Inside her hospital, four main health advocacy boards are located at the hospital entrance. Figure 32 shows information on the prevention of winter / spring epidemics. These posters are from the "health literacy promotion campaign" designed by CHEC (He, 2018). I have seen the same posters in a community area in Beijing and my aunt said they have no resources nor ability to redesign the posters: it is easier to use the originals from CHEC. Though it is known many locals cannot read the texts, there are no alternatives. The design isn't professional: a simple layout more like an insignificant, even superfluous decoration. Some images and design elements are clearly downloaded from the internet, one even shows Western children (see Figure 31) hardly connected to a local audience. Figure 32 shows other printed information stuck on the glass of the board, partially obscuring the information beneath. This is worse in the case of the health advocacy board in Hantun, now completely blocked by bricks (see Figure 34). It appears these hoardings are barely noticed, rarely read, and not valued by their public (Figures 32 – 34).

Figure 34: Hantun HHP clinic and blocked health information board

I visited Jiahui hospital – a private hospital in a neighbouring town – which chose different posters from the "National Public Health Service Campaign" organised by CNHC and CHEC. Their visual designs (see Figure 35) used a popular comic-book style to promote disease prevention and hospital services. In these cartoons, however, some traditional costumes are from other ethnic minority groups rather than those present locally. Again, the social context appears disconnected from the message on the board.

Figure 35: Jiahui hospital's health education advocacy board

According to my aunt, “another common HPH practice is public hospitals running regular physical and medical examinations for both children and the elderly”. Figure 36 shows her hospital running its service for children, to detect abnormalities. As an urban government authorised hospital, it also supervises clinics in villages. My aunt added “every village has an authorised HPH clinic which receives funding from the public government hospital to run HP.”

Figure 36: Physical examination service for children inside Huji public hospital

With my aunt introducing me, I visited the delegated HPH clinic in Hantun to understand how HP works for local villagers. With a chronic illness health managing service as one of the national health services initiated by CNHC, chronic patients can have regular check-ups at this local HPH clinic. Figure 37 shows a villager having his blood pressure taken. Apart from offering basic treatment – as is the case with private clinics – this HPH clinic maintains a health archive of vulnerable residents (see figure 38). With the agreement of each patient, the doctor showed me his health management service record. It is more like a questionnaire in terms of different health conditions and symptoms, listed ranging from 1 (no symptoms) to 5 (frequent symptoms) (see Appendix E). These records are evidence-based and quantitative.

The doctor said “they were used by the county public health committee, being convenient for senior managers’ regular inspections”. How useful these records are for health maintenance remains to be explored.

Figure 37: Medical examinations for chronic illness among older patients at Hantun HPH clinic

Figure 38: Health management archive of vulnerable residents at Hantun HPH clinic

This clinic also distributes HP booklets designed by the county Public Health Committee and Centre for Disease and Prevention. Local residents collect these from the clinic. Figure 39 shows three HP booklets: one promotes a healthy lifestyle, one concerns illness prevention and health education, a third is specifically on tuberculosis. Although there are a few cartoons,

most information is text-based. The illustration – bottom right in this figure – shows a modern urban lifestyle, irrelevant to both the topic and its local context. Considering most residents are low-literate or illiterate, hardly any of this information is accessible and they must ask the doctor directly if they have a question. HP group activity might be organised to involve and communicate intimately rather than rely on printed materials.

Figure 39: Three HP booklets from the clinic

Local HPH executives don't offer design solutions that meet the needs or allow for the perspectives of their beneficiaries. These printed materials (Figures 32, 33, 35, 39) are not effective channels of communication. First, they did not choose the appropriate medium, material or platform for villagers. Mass media communication – radio or TV – or tailored communication – such as performance or workshops – may be more suitable than booklets

and posters for low-literate or illiterate villagers. Secondly, they do not pre-test these media with local people. Pre-testing communication materials may help an audience understand information more easily (US Department of Health and Human Services 2005) and implement what they have understood more effectively. The efficiency of health intervention depends on who has the power to choose materials and make decisions (Holmes, 2008).

4.5 Summary

This case study examines low-literate and illiterate villagers' medical issues and needs and investigates their local HP implementation. It also tests and validates the PCD methods through action research. This practice offers an alternative bottom-up exploration of HPH, from HPH research *for* the people to HPH research *with* the people. As a paradigm, it suggests local HPH authorities shift HP services from the hospital into the local community (Vang 1995; Johnson and Baum 2001; Kar, Roy and Lakshminaryanan 2012), consider organisational and community structures and cultures – areas of concern to low literate individuals – and redefine participatory roles for patients and members of staff within their communities. All in all, this practice proves PCD could develop personalised and personally relevant methods and skills, empowering communities and democracy (DiSalvo 2022), strengthening and reorienting local health services in terms of HPH. At this stage, it may be possible to indicate that PCD is a valid approach to HPH. Further research and practice are needed for the next stage.

After the field trip, I went to Beijing where I interviewed Mr Jianzhang He, who is in charge of Chinese HPH implementation from CHEC. He agreed with my assessment of the problems of local HPHs which I illustrate in this case study. Local medical professionals are better situated to understand and conduct HPH as illness prevention working from predictive

examinations, maintenance of chronic illness and distributing – appropriately – HP materials such as posters and booklets. Mr He added "local authorities have few if any HP research or design applicability skills and limited design resources. Therefore, CHEC aims to provide standardised design materials. Local authorities can change the size of the materials to suit the places they are posted, printing them locally. Some hospitals have designed individual posters, but these are still text-based, not recognising the needs of low-literate or illiterate patients. Overall, local HPH runs passively, implementing policy top-down." This obedience to central policy blocks initiatives and innovative local methods and pathways of discovery. This is a common policy problem in the public sector in China and probably globally. However, the CHEC has seen the potential of my research, offering a new perspective on using design strategy to lead a project, still a rare approach in Chinese organisations. The research also encouraged the CNEC to think which designs could provide a more innovative, heuristic framework, allowing a transformative process and contributing to capacity building within organisational structures and cultures, and within institutional decision-making processes. To this end, Mr He – my next gatekeeper – agreed to provide pilot hospitals from different cities for my research. This should make my field trip (see chapter 5) more excitingly creative, helping me understand how comprehensive HPH practice in different provinces might work.

Chapter 5: Field trip

5.1 Introduction

Following case study one, I further explore HPH in the Chinese context on my field trip in 2019. First, I attended the 27th HHP Conference run by WHO in Warsaw in May 2019. The Conference helped me build an appropriate communication approach for non-designers, suggesting how I might introduce the idea of design linked to HPH. The Conference increased clarity, making concepts more comprehensive and a better fit for healthcare. Following this, and using skills gained, I visited five hospitals and two healthcare organisations in four different provinces in China (see Figure 40). This extended comparative exercise helped me understand current HPH practices at different hospitals, their different areas of need across separate Chinese regions. There were three aims for this field trip:

1. Seeking advanced evidence and embedded examples of Chinese HPH practice, helping clarification of current Chinese HPH approaches in a wider context.
2. Identifying a hospital as my partner for the second case study.
3. Reflecting on communication skills and the designer's role in the field trip. This latter is essential for network building and co-creation planning as a communication designer.

Figure 40: Field trip map

This journey to build mutual understanding allows me to acknowledge more precisely how healthcare and design fit together, offering indications of how design-based research may contribute to HPH.

5.2 Attending the 27th International Conference on HPH and Health Services, Warsaw, Poland

Following case study one, I presented my paper "HP practice for a low-literate community in Hantun village, China" at the 27th HPH Conference. My presentation was scheduled for oral session 4.3, "Community HP". I was the only researcher with a design background in attendance and this was the first time I represented my research in front of culturally diverse HP researchers. This helped me practise how to present design concepts to non-designers: in this context, they were all healthcare professionals. I learnt how to build an appropriate

communication approach, delivering and promoting the concept of design for Chinese hospitals as my next steps. Also, I attended the linked HPH summer school and HPH Newcomers Workshop, experiencing hands-on implementation of HP in healthcare. I learned HPH knowledge first-hand as well as from a theoretical, political WHO perspective. This has helped me understand the wider theoretical framework – and its practical implications – more deeply, supplementing and updating my literature review. There was no mainland Chinese HPH experts at the Conference, but a few from Hong Kong and many from Taiwan as well as experts from South Korea and Japan. The Conference exhibition and presentation showed how HPH in Taiwan has developed comprehensively and with sophistication. The Taiwanese have built a strong HPH network, with capacity and leadership, conducting HPH practice variously with different focus groups connected to local communities. Participatory communication is widely used. This further demonstrates how participatory communication can lead to a variety of HPH, generating diverse, unique learning approaches within groups and communities. Taiwanese practice sets a good example for mainland Chinese healthcare organisations wishing to run HPH. Subsequently, based on my presentation and learning experience from the 2019 Conference, I tailored the content of my presentation to the Chinese healthcare context and used it to initiate an exchange of knowledge benefitting my field trip to Chinese hospitals.

5.3 Site visit to Chinese hospitals and healthcare organisations

The journey from my HPH and healthcare literature review, my first case study and the HPH conference have proved extremely useful, but I had to translate research findings into tangible results that could be understood and accepted by Chinese healthcare experts. I prepared a

presentation containing comparative Western project cases, showing how design is used by hospitals. I explained design involvement as a continuum from architecture and interior design – the requirement to build a space – through visual communication, graphic design and any public art involved to "decorate" such a space. Later, service design, interaction design and community design were described as management elements to improve patients' experiences and hospital services within respective communities. I also used the *Design Ladder* (Danish Design Centre 2001) as a communication model to represent the positions of design. This has four steps: non-design; design as form-giving; design as process and design as strategy (see Figure 41). This allows hospitals visually and intuitively to reflect on which stage they are at, suggesting possible future trends for Chinese hospital-based healthcare.

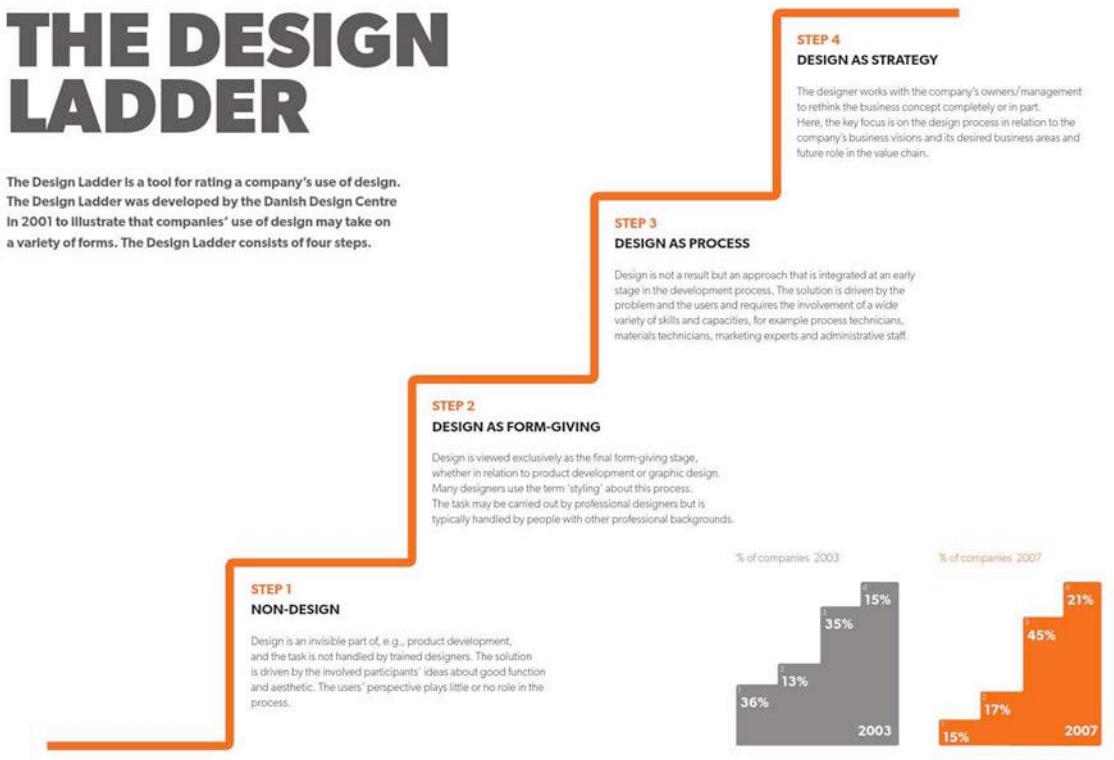

Figure 41: The Design Ladder (Danish Design Centre 2001)

After case study one, I'd five meetings – online and face-to-face – with Mr He. He gave suggestions for my presentations and selected pilot hospitals for me, introducing me to the key HPH networkers at each hospital. We had a three-way, initial online meeting with each new gatekeeper separately. These network communications and research preparations proceeded for nearly a year before I embarked on my field trip to China.

5.3.1 Henan People's Hospital

In March-April 2019, I conducted my field trip. The first site visit was to the Henan People's Hospital: they have no design involvement either in the hospital environment or as part of HPH implementation. When I had a meeting with the head of the Paediatric Cardiology Department, I shared Western HPH projects. He told me he'd refused design concepts proposed by members of staff, adding instead some colourful child-oriented decoration. He said: "patients need to rest. *Colourful decorations* will distract them while a *clean white colour* is simple and suits our hospital's style. A hospital should be like a hospital, not a nursery or playground." This reflects the importance of understanding design among team leaders. Without an established understanding and an open-mind, hospitals still run as traditional treatment organisations.

5.3.2 Wuhan University Stomatology Hospital (WUSH)

At WUSH I was guided by Mr Jiang, Head of Health Education. After my presentation, he agreed on the design development process for those hospitals I identified. Then, as my

gatekeeper, he took me to visit the hospital and explained which oral health education projects are complete. They'd designed a cartoon mascot based on the image of a tooth and developed a series of animations promoting tooth and mouth protection knowledge (see Figure 42) which encourage children to be better aware of dental care while becoming popular on social media.

Figure 42: Cartoon animation and souvenirs designed by WUSH

There is a sculpture based on the cartoon in the garden near the hospital entrance, an information board with descriptions, QR-linked with their cartoon on social media. There aren't, however, other child-oriented elements at this time (see Figure 43). Outside hospital grounds, there were two window displays facing the public street on dental HP (see Figure 44). Like other commercial displays, while still non-interactive it seemed to attract attention.

Figure 43: Mascot statues designed by WUSH

Figure 44: Window displays on dental HP

In the waiting area of paediatric outpatients are two TV screens: one announces patient appointment numbers, the other plays cartoons to entertain and comfort children. Some children were watching either on the public screen or via their own phones. Some were scared and crying, nevertheless, and comforted by their parents (see Figure 45): their feelings of insecurity, fear and uncertainty are often stronger than adults (Vavili-Tsubuja and Jyrkou 2015). Inside the clinic were cartoon-themed decorations to relax young patients; dentists wore cartoon decorated headscarves to generate a more relaxed ambience (see Figure 46).

Figure 45: Waiting area at WUSH Children's Department

Figure 46: Clinic at WUSH Children's Department

There are leaflets in the waiting area (see Figure 47), but information provided in this form is not much different from other hospital departments: it is not specifically designed for children. Perhaps for this reason few leaflets are taken. The departmental team does try to create a relaxing atmosphere: dentists wear colourful scarves rather than the usual white cap; contemporary paintings hang in the corridor. This suggests the hospital management attach importance to art and design as a method to improve the ambience – and perhaps are willing to go further – but there is still considerable room for improvement.

Figure 47: Current HPH practice – cartoon posters / dental health leaflets at WUSH

Though this mascot has become popular through social media, a problem – identified in an interview with the Head of HP, Mr Jiang – is WUSH have not fully understood the power of design, despite Wuhan being nominated "Creative City of Design" by UNESCO, and despite greater sensitivity to design aesthetics in the city compared with other "Key National Cities". Most health professionals still see design outcomes in terms of tangibles reflected in WUSH's designed HP outputs of mascots, cartoons and leaflets.

WUSH also runs a public engagement programme through regular lectures and workshops. As these activities are professionally-led the approach is, however, more medical, theoretical and content-based rather than creative and interactivity-based. It was clear the hospitals often didn't know design could be used by and absorbed into interactive learning processes through participatory design education. After the first meeting with Mr Jiang, he agreed there is a lack of interactive space where children could play while waiting. One of the main conceptual outcomes from our conversation was the creation of fertile interactive space in the children's

department, where young patients could divert themselves, release their fears and learn dental health knowledge through play. Staff showed their interest in this claiming they'd consider these activities and the spaces generated at the new hospital campus. This might comprise an interactive installation and even hands-on experiments; activities could contain oral health information so children might learn through participation while reducing fear.

I felt my practice approach was congruent with WUSH's, reflecting its organisational point of view. I therefore decided to conduct my next case study: developing an interactive learning approach for children's dental HP. This site visit provided background and ideas for my case study two (chapter 6). Mr Jiang eagerly supported me, agreed to provide human resources and theoretical dental health data for this next stage, and said he looked forward to seeing my novel, design-led approach to dental HP.

5.3.3 The Eye Hospital of Wenzhou Medical University (WMU)

The third trip was to The Eye Hospital of WMU which has a popular ophthalmological museum within the hospital complex. The museum is open to the public, and visitors include a range from individuals, families to school parties. Although the museum mainly focuses on and is aimed at children, there are opportunities for adults to learn ophthalmological knowledge – scientific concepts as well as practices to prevent ocular disease and damage – through various interactive exhibits, as well as games (see Figure 48). This interactive learning inspired me and informed my practice at WUSH, providing a generative case study. The combination of art, technology and HP education can – in such a context – create and sustain the circumstances for children's healing and promote their wellbeing (Fancourt 2017).

Figure 48: Ophthalmological museum inside The Eye Hospital (WMU)

5.3.4 Jiangsu Provincial Centre for Disease Prevention (JPCDP)

The first trip in Nanjing was to visit JPCDP, an organisation focussed on following the NHCC and CHEC guidelines, setting standards for linked sub-provincial hospitals, then maintaining and evaluating HP and disease prevention. Introduced by Mr He from CHEC, Ms Ji working at JPCDP was my gatekeeper in Nanjing. She invited me to their HPH training meeting where staff gave a presentation to their manager in a mock lecture. This prepared staff to propagate their disease prevention knowledge and methods to other hospitals, which in turn could spread ideas to patients and the wider community. This dissemination methodology is, however, a standard top-down approach: health communication is lecture-based and while it is more interactive than text-based programmes it remains passive and lacks participation. Afterwards, I shared my presentation exampling Western HPH projects and design orientation where reciprocal rather than one-way knowledge exchange is key. Subsequently, Ms Ji introduced me to two hospitals, prominent in the province. One is JPH the other is Jiangsu Provincial Maternal and Child Health Hospital (JPMCHH).

5.3.5 Jiangsu People's Hospital (JPH)

JPH has been mentioned as a practice review in the literature review chapter (see 2.2.3 A). This site visit offered an intuitive experience, signage design depending on different hospital departments (see Figure 49). In the lobby a piano is played by volunteers, creating a peaceful even enjoyable atmosphere not the usual anxious and impatient feeling in a large waiting area. I had a meeting with the HPH department and exchanged research data. They showed practical HPH projects, for example where nurses and doctors orally communicate health

information using visual material in an inclusive, corroborative approach spanning literacy barriers (Pratt and Searles 2017). Certain medical professionals run departments together with patients; others are community-based.

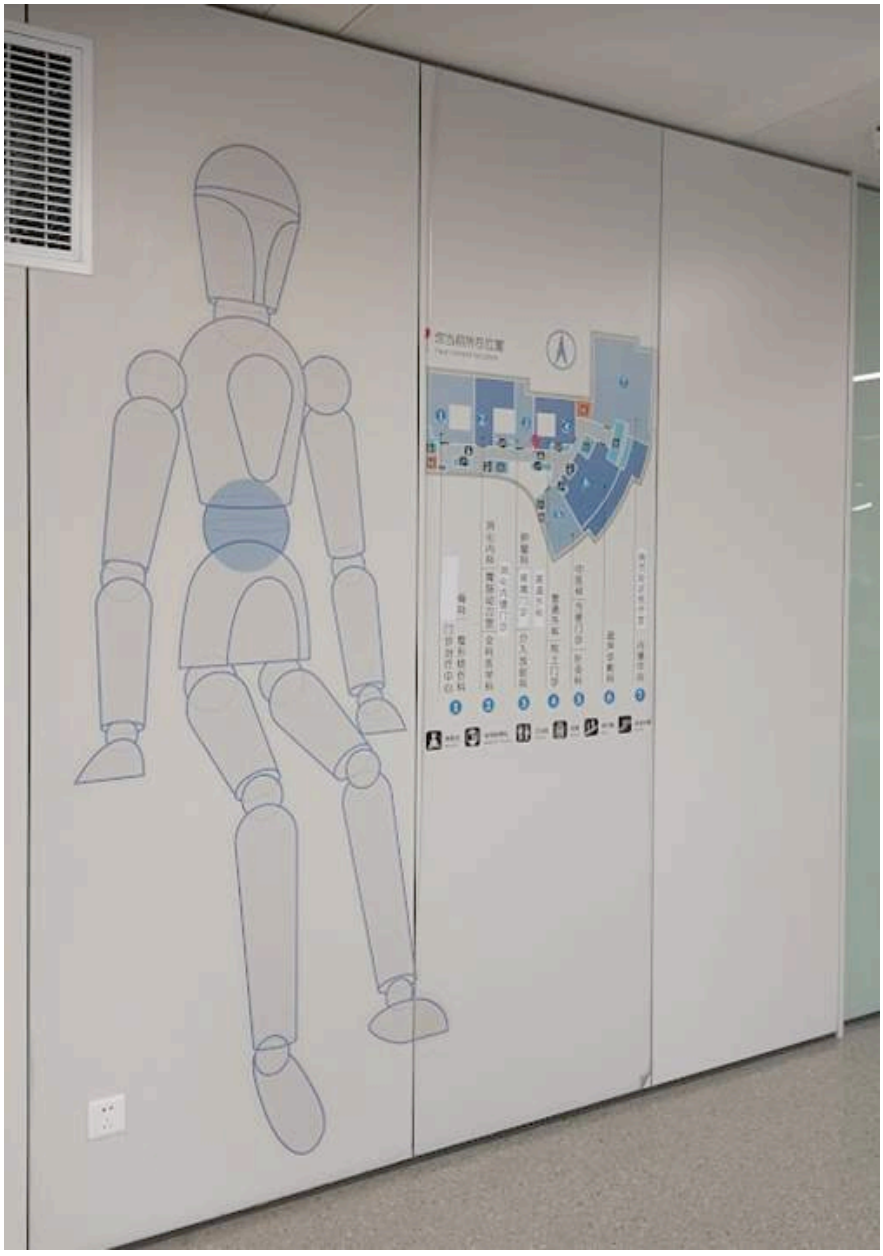

Figure 49: Visual signage design at JPH

5.3.6 Jiangsu Provincial Maternal and Child Health Hospital (JPMCHH)

Figure 50: Visual environment in JPMCHH

The next site visit was to JPMCHH. Their inpatient department is like a fairy-tale castle, a design clearly predicated on its special patients; almost every square centimetre is covered with colourful designs. These begin in the reception and waiting areas (see Figure 50) and continue through to treatment rooms via connecting corridors, with a multi-sensory training room (see Figure 51). Even washrooms and lavatories are similarly decorated. There are also playgrounds and play-oriented rehabilitation training centres, designed specifically for and around children. In all these locations, colourful graphics and playful designs are displayed to encourage children to feel welcome, offering positive and educative interactions. Parents'

feedback in an interview by China Central Television (Xinhua News Agency 2019) strongly suggests the children feel more comfortable seeing health professionals in these locations: the children – and perhaps their parents, forming a positive feedback loop – are more relaxed. There was a general sense among the young patients of wanting to engage in activities which foster discovery and exploration: curiosity displaced the fear they feel when visiting a hospital (Fani and Artemis 2014) and children were offered "power in a powerless environment" (Lerwick 2016: 143).[13]

Figure 51: Multi-sensory training room in JPMCHH

5.4 Reflection on the field trip

These specific experiences from my field trip reflect how certain Chinese hospitals are beginning to understand the positive influence of creating an ecology with a sustaining model for all concerned: patients, their families and even health workers. There is emphasis on the importance of art and design in the creative HPH practice. Comparing all my site visits, I

[13] This is similar to the choice, agenda, resilience and emotion (CARE) treatment principles for paediatric patients (Lerwick 2016: 144) avoiding "white coat syndrome".

realised there is a clear link between HPH creative development and the deeper acceptance of art and design in these Chinese hospitals. The more art and design are developed in the universities of a region, the deeper hospitals and HPH leaders respond to my design-based proposals, the more easily they accept new ideas from outside their usual trajectories.

This field trip wasn't without problems. First, HPH teams still saw design as a final output: after all, they were used to hiring an external design team to deliver products based on their requirements rather than after consultation with hospital users. This may be because managers do not see the full design vision – as He (2018) suggested – and because engaging patients in the design process is time consuming and costly (Dong et al 2005). Co-design research, pursuing the goal of shared value, is one solution. I'll discuss in greater detail (see 7.2.2 and 7.2.3). Second, current designers working for HP delivery don't do so comprehensively or systematically: they still separate into graphic, interior and product designers. Managers hire the appropriate designer depending on outcome: a simplistic HPH approach. More responsive and diverse approaches – interdisciplinary design backgrounds rather than a single design subject – should help design researchers gain a wider view of appropriate design methodologies. This is why a comprehensive design literature review – covering design with anthropology and communication as well as participatory, service, inclusive, social and transition design – was essential before I embarked further into my research (see 2.3.2). When it comes to long-term solutions for health design education, training students across a multiple design methodology is desirable, logical and inevitable. Poor preparation and training mean a lack of comprehensive design understanding from both HPH managers and designers, indicating the importance of clearly communicating design epistemology.

The challenge for my research is to break through the established idea held by most Chinese health professionals that design outcomes should be tangibles ranging from graphic design and architecture to interior and product design. Intangibles such as design for service, strategy and even new ecological systems may not be fully understood outside design disciplines, especially for Chinese healthcare which may inhibit cooperation and engagement with health professionals (Black et al 2019). Aside from the need to promote design thinking in healthcare, design research should also communicate the reason design thinking needs to be integral to HPH. Certainly, much in design education has changed, especially in Western universities, adapting management and social innovative theory, as well as responding to wider trends within the contemporary global economy (Resnick 2019).

To help Chinese hospitals gain a better understanding of the gap with Western design in healthcare – and for them to see how design intervention changes from traditional to new fields – there's a need to see where they fit design and what could encourage the next steps. A design ladder developed by the Danish Design Centre (2001) (figure 41) provides a useful model. I adapted the Ladder to indicate where Chinese hospitals may align with the categories.

Figure 52: HPH design checklists – reflection on field trip using Danish design ladder

In the context of disciplinary development – and in terms of how design is involved specifically in Chinese hospitals – there's a clear step-by-step development visible. Based on my experiences and conversations with Mr He from CHEC– as well as with healthcare staff at the hospitals I visited – it seems that most Chinese hospitals have passed step 1 where design is absent and moved to step 2 where design is just passing out HPH material. Figure 52 demonstrates that the majority of HPH design remains at step 2, mainly using a range of traditional print media – books, posters, leaflets – through to digital media – the internet and social media. The advantage of media appropriateness is that healthcare messages can be broadcast to a wider audience. McQuail (2010) believes mass communication's traditional unidirectional flow should not be applied to modern media: it certainly doesn't hold for social media. The disadvantage of mass media HP communication is, however, that it cannot benefit marginalised groups. This is where step 3 – design as co-creation – can improve message targeting and reading, an area where current Chinese HPH practice may be weak.

5.5 Reflection on communication skills and role of design in field trip

Through my practical experience on the field trip, I communicated more effectively with other healthcare researchers. The experience has made me think that design acts as a sense-making process (Hummels and Dijk 2015), the designer acting as a sense-making communicator. The field trip helped me understand the relationship between insider and outsider research (Smith 2012): I built a range of communication skills. At this stage, being both researcher and professional stranger (Agar 1980; Granosik 2011), I introduced "nudge" theory (Thaler and Sunstein 2008) into my practice to facilitate the negotiation of entry to

partner communities and build a sense-making process. Three realisations were needed to plan and follow practice through the whole communication process:

- What is “common sense” in this context; how is it possible to consolidate trust between insider research partners?
- What potential value can partners achieve?
- How to build reciprocal relationships between partners?

Cooperation can be understood as a mutual pleasure rather than merely action together (Sennett 2014) yet there are conflicts between insider and outsider researchers. Most change-making initiatives are accompanied by uncertainty and risk (Akama 2019) and insiders must live with the consequences, good or – potentially – bad. Therefore, building evidence, being open to the unexpected but also being prepared enough to avoid uncontrolled drift is essential at the first stage of communication. I developed the method – communication approach staircase (see Figure 13) to illustrate evidentially through sharing case studies and design narratives from my perspective, building visual prototypes, imagining, and dispelling the uncertainty and subjectivity experienced by insider researchers. Building visual prototypes may be the distinctively adaptive skill a design researcher brings to co-projects (see Figure 53).

	Design's role	Purpose	Delivery
Stage 1	A visitor/ learner/observer An adapter / consultant A presenter/ interpreter An imaginative actor	Build connections	Interaction
Stage 2	A scaffold maker/ co-creator A facilitator/ supporter/ participant	Promote self-reliance empower participants	Intervention
Stage 3	A friendly challenger A framework maker	Build design capacity	Transformation

Figure 53: Role of design researcher (2019 field trip)

Figure 53 shows my role changed significantly at different stages of the research journey depending on purpose and delivery at each stage. The purpose of stage one was mainly for building understanding between me and hospital management and staff. My role started as a visitor, observer and learner without interaction; then I became an adaptive consultant, asking more questions of staff when they had time and patience. After briefly understanding their HPH approach, I proposed showing them selected case studies from Western HPH which I presented and interpreted. When they refused, my communication stopped, and my visit ended (see 5.3.1). If they said yes, I – as an imaginative actor – presented the case studies and nudged their approach using the Danish Design Ladder, allowing them to see where their current design approach fits and what they might consider developing. The first stage happened at all site visits; the second only with WUSH during my second case study when I acted as a scaffolder to empower participants. Stage three is ongoing even beyond the formal

parameters of the PhD, with research outcomes as framework to build design capacity and transform practice.

5.6 Summary

If design and health are still separate fields, this field trip provided a mutual learning opportunity – to understand each other's perspectives, methods, practices and expectations. As a design researcher, I've learned more comprehensive knowledge of Chinese HPH, and this helps me understand how each hospital and HPH leader or manager sees design differently. My presentations and meetings with HPH professionals offered them a chance – however brief – to understand design in the healthcare context. This stage of my research also helped me plan case study two (see chapter 6) using new research knowledge and better cultural understanding, as a design student hoping to span Western and Chinese practice, filling those gaps that present themselves.

Chapter 6: Case study two - "Participatory dental Health promotion with children in Wuhan"

6.1 Introduction

This chapter describes my second case study – participatory dental HP with children – undertaken in August 2019 at Timi Art School in Wuhan. It covers three typologies of encounter: firstly, me as a design researcher; secondly, design education at Timi – an elementary level art school in Wuhan – and, lastly, HP in WUSH. This co-creation practice aims to throw new light on dental HP, drawing on lessons from these three encounters, providing a new effective approach for HP projects using design.

Based on the findings from the site visit at WUSH and conversation with the head of HPH (see 5.3.2), I decided to attempt the PCD approach to promote children's dental health education. Also, following findings from the literature review (see 2.2.5), it is reasonable that HPH should not be separate from other HP environments, including HP schools (Vang1995; Johnson and Baum 2001; Kar et al 2012). Five children's healthcare case studies from the *Children's Environments of Care Report* (Department of Health 2015) show participatory art improves both children's learning and health. These leads suggested that working with an art school in Wuhan, designing an art and design-based dental health curriculum, would be useful for my second practice. I'd a meeting at Timi where the headteacher, Mr Shi, was pleased with the concept of cooperation, believing it could benefit both his school and its students by adding health education practice to their curriculum.

6.2 Contextual background and secondary literature review

WUSH HP review (see 5.3.2) from the field trip provided a contextual background in terms of current children's dental HP. WUSH, the Timi school and I were hoping to design a new teaching method to benefit both art education in schools and HP in hospitals. Therefore, primary research includes reviews of current art design educational approaches – examining and comparing both in the Chinese context in Wuhan and in the Western context. This expands conceptually away from HPH research (see chapter 2.2) and healthcare design studies into design education. This expansion is not only because HP has an educational purpose delivering health welfare knowledge to a range of clients, but also because the essence of HP is to some extent a foundational and essential educational activity: particularly important since, in my second case study, my role with children was primarily coaching and guiding creativity through a participatory art and design approach. Apart from the "Current HP at WUSH" (see 5.3.2), the research expanded conceptually into design education and elementary art education.

6.2.1 Design education review

The educational approach has become more interactive. At higher education, Noel (2018) applies an emancipatory research paradigm in design education and practice. This includes critical theory based on ethnically specific, participatory and transformative research (Groat and Wang 2001), emphasising openness, participation, accountability, empowerment and reciprocity (Danieli and Woodham 2007). These principles particularly have been widely discussed and applied in design research education.

In terms of teaching strategies in general education, van Onselen and Valkenburg (2013) describe three strategies based on Vermunt and Verloop's (1999) model:

1. **Strong teacher control**: teacher takes over students' cognitive, affective and regulative learning activities;
2. **Loose teacher control**: giving all learning responsibilities to students, and
3. **Shared control**: teachers continually motivate students to learn.

The model of art design education in Wuhan appears to be shifting from strategies (1) to (3) (Shi, 2019). Participatory design could contribute to managing this transformation in a way that might be applicable to the Chinese context. Dewey ([1916] 2016) points out that participation is a fundamental and active learning tool so students might, through participation (Reijo 2000) change from passive learners – waiting for instructions – to active learners – democratically decentralised (Aksit et al 2016).

For an elementary educational level, Norway offers an alternative paradigm, where art, design and crafts were merged into one subject in the 1960 National Curriculum for primary and lower secondary schools: until now this has included art, architecture, design and visual communication. No European country has a similar model or sees the benefit of this merger in which design is a core subject for children (Nielsen 2013). Though these subjects can be found widely in universities in China, only one arts subject is understood as purely practical, without design elements: drawing lessons in Chinese state schools.

6.2.2 Review of elementary art design education in Wuhan

In Wuhan – a "Key National City" in China[14] – primary art education has been dramatically improved since 2000 due to greater public awareness of the need for quality. The Chinese pedagogical context attempts to offer students moral/political, psychological and physiological awareness as well as an appreciation of aesthetics. This stress on aesthetics encourages and sustains a flourishing arts education. The system is still, however, experiencing the transition from passive to active learning: hardly any design education is involved in state schools and there are only a handful of frontier private art schools – where teachers studied art and design abroad – using design methodologies in teaching. In these schools, through higher education-based design paradigms – involving fashion, graphic and 3D design – there has been a degree of integration. Courses conducted purely in art and design have never integrated with other subjects or become multi-disciplinary.

Participatory observations of students' art lessons at Timi art school and in children's dental hospital outpatient departments, were conducted under supervision before we designed the curriculum. Observations helped me gain a clearer understanding of current approaches in context and identified gaps my research could fill.

Following my two key findings from the literature review – that hospital settings need to connect with communities and that co-creating through experiential interaction contributes to capacity building and organisational change – this case study aimed to use PCD to connect hospitals with school settings. I had hoped to test one of my research hypotheses – suggesting

[14] A Key National City [重点国家级城市] is a government designation. Such cities are strategically important and play significant roles in economic development, regional influence and national policies. The criteria for designating a city a Key National City may vary.

hospitals could serve as leisure centres – by answering in part my research question: how can design practice create a supportive, sustained and creative community setting for HPH in China? To explore this research element, a three-week curriculum was set running at Timi art school.

6.3 Case study process and methods

6.3.1 The overall methodology of designing curricula and creative activities

After the first meeting with Mr Jiang during my field trip in April 2019, we had two online meetings to discuss theoretical concepts, sharing ideas concerning creative activities and dental HP. Both research proposal and ethics were approved by the RCA Research Committee and were shared with Mr Jiang to gain an alternative perspective. In August, he introduced me to the heads of the dental and nursing paediatric departments. We had further discussions about curriculum/activity development. The department heads recommended a recent publication *Children's Dental Care* (Tai 2019), by the Chinese Stomatological Association and China Oral Health Foundation as part of a series on scientific HP and disease prevention. Tai has become part of theoretical guidance material for designing curriculum content: key staff, teachers from Timi school and I, who involved in this course studied this book before we prepared the curriculum.

The next core group meeting was at Timi art school. Taking up suggestion from staff, the entire course was designed within 12 days: each module lasted 3 hours involving up to 8 students on the same day. We sent our consent form, curriculum and course introduction for

each module to parents. Based on a principle of voluntary involvement, parents and children could select any module depending on their interests and timetable and they could pull out at any point. There were in total 12 students – 6 boys, 6 girls – signed up for the course with ages ranging from 4 to 8 years. Numbers for each module ranged from 5 to 7 students, and the teaching team consisted of a course leader and 2 teaching assistants as well as myself. The aim would be to offer PCD integrated with artistic practice, helping children engage theoretically through creative making rather than passive listening and reading.

The first hurdle was to design developmental and stimulatory materials as the primary aim of this practice. It was decided to use Tai's (2019) insightful professional medical opinions as a theoretical base for art teachers and me to prepare lessons. The topic of each lesson was originally from this source or based on a dental protection concept. Lessons were designed to encourage positive behavioural change: they would improve children's dental regimes, involving aspects of local diet and micro-cultural family upbringing habits. After selecting topics, the researcher worked with art teachers to determine which art design practice would suit certain knowledge points focussed on dental protection: a process of co-designing a curriculum. Table 4 itemises overall course structure designed in cooperation with teachers, showing each day's topic and aim and the corresponding teaching methods and making materials. The content theory is based on Tai (2019) and the animation. Participant numbers are in the final column.

Day/ Date	Participant numbers	Content / theme	Aim / purpose	Teaching Methods	Making materials	Reference to theory
Day 1: (6 Aug 2019)	• 7	• Course introduction • Knowing different teeth	• Encouraging students to understand the course and get to know one another. • Recognising different shapes / structures / functions of teeth	• Ice breaking drawing game • Flashcard • Drawing circles – finding the right teeth	• Sketch drawing • Collage	• Tai (2019) chapter 2.2 (p38) • Animation season 1 episode 01
Day 2 (7 Aug 2019)	• 6	• Introducing common dental diseases: perio-dontitis, tartar, bleeding gum	• Understanding how bacteria damage teeth • Symptoms of each disease • Causes, factors and preventions	• Flashcard • Showing scientific bacteria image	• Sketching • 3D drawing	• Tai (2019) chapter 2.3-2.5(pp 40 – 43) • Animation season 1 episode 06
Day 3 (8 Aug 2019)	• 5	• How to brush/clean teeth	• Teaching the right way to brush teeth • Introducing different types of dental floss	• Dental floss performance	• 3D drawing	• Tai (2019) chapter 2.11 (pp 55 – 56) • Animation season 1 episode 02
Day 4 (9 Aug 2019)	• 5	• Dental treatment	• Knowing how dental tools protect teeth and keep them healthy • Understanding general treatment processes and tools • Reducing fears • Preventing broken teeth from accident;	• Storytelling	• Mixed materials	• Tai (2019) chapter 2.12-2.18 (pp 57 – 73) • Animation season 1 episode 07
Day 5 (13 Aug 2019)	• 4	• Tooth exfoliation • Review different functions of teeth	• Understanding why children lose their milk teeth • What should children do during this period?	• Role-play	• Sketching • Drawing • Doll making	• Tai (2019) chapter 2.2 (pp 37 – 39) • Animation season 1 episode 03
Day 6 (14 Aug 2019)	• 5	• Animal teeth	• Learning how to maintain strong teeth • Allowing students to choose an animal which they believe has strong teeth, being their iconic hero	• Empathy creation	• Sketching • 3D clay modelling	• Tai (2019) chapter 2.6-2.7 (pp 44 – 46) • Animation season 1 episode 05

Day 7 (15 Aug 2019)	• 5	• Chess / game design	• Good and bad behaviour • Tooth maintenance	• Role-play • Narrative design	• Sketching • Drawing • Collage	• Tai (2019) chapter 2.6-2.7 (pp 44 – 46) • Animation season 1 episode 04 09
Day 8 (16 Aug 2019)	• 5	• Preparing chess pieces, getting ready to play	• Interactive learning • Play between peers	• Loose control	• Colouring the model	• N/A
Day 9 (8 Aug 2019)	• 6	• Fashion bag	• Reviewing previous knowledge	• Free selection: allowing pupils to pick any topic from previous themes	• Collage and textile	• N/A
Day 10 (21 Aug 2019)	• 6	• 3D mouth castle	• Understanding the mouth as a closed space • Why bad breath? Treatment and prevention	• Storytelling	• 3D paper modelling	• Animation season 1 episodes 16 / 19
Day 11 (22 Aug 2019)	• 5	• Healthy / unhealthy teeth	• Reviewing previous knowledge	• Recalling learning outcomes • Asking pupils to draw what they remember best	• Acrylic painting on canvas	• N/A
Day 12 (23 Aug 2019)	• 6 pupils • 6 parents	• Exhibition and show	• Evaluating the course • Feedback from parents and hospitals	• Presentation • Designing group activities • Displaying all the artwork created in the course • Informal talk	• Quiz • Playing games with parents • Receiving rewards	• N/A

Table 4: Course structures

This course preparation suggests a specific HPH programme needs to be well conceived with inter-cooperative teams, defining and carefully selecting suitable methods and materials before HPH implementation. Among those methods, the following I consider worth discussing in greater detail.

6.3.2 Preliminary incentives

Figure 54: Preliminary incentives – cartoon and teaching materials

First, to attract the children's attention, at the beginning of each lesson we showed the cartoon – *The Tooth Elves Team*[15] – designed by the hospital (see Figure 54). The stories were mainly about how teeth battle with different oral bacteria and linked stomatopathies: the cartoon figures symbolised each variety of stomatopathy. Stories introduced the function of different teeth, beneficial and detrimental foods, diets and behaviour. We selected episodes corresponding to the content of each lesson – an introduction viewed as both intriguing and entertaining by pupils, who were then encouraged to design their own stories and cartoon figures. After each episode, an art teacher explained the dental healthcare point and suggested students to design appropriate for the lesson should they feel so moved. We used brief presentations if the information or the task were complex and tailored the language specifically to engage with children (see Figure 55). Scientifically accurate pictures, flash cards and other materials were prepared in advance and used to stimulate children to build connections between their behaviour and more theoretical medical knowledge.

[15] *The Tooth Elves Team* at https://www.youtube.com/watch?v=smL2WrrYBHc&list=PLpGWsup0yt_4nmBNqRRKxF-0vWwJcwgZT

Figure 55: Preliminary incentives – presentation and course introduction

6.3.3 Ice-breaking games as an incentivising warm-up

Like any workshop, if participants do not know each other, there should be initial team-building or incentive generation. Having fun using ice-breaking games helps children lower their sense of unfamiliarly and enhances the following cooperative experience. Since the theme was dental health, we asked them to draw their partner's smiling face, particularly observing the shapes of their teeth. Following the discovery that each tooth has a different shape, the teacher named each with its function, using flashcards to show where the tooth being described is located and asking pupils to find the relevant tooth either in the picture or their own mouth if they preferred. Such an ice-breaking game should match both the content of the workshop and the characteristics of participants: a good fit of content to participants encouraged drawing activities (see Figure 56).

Figure 56: Observational drawing as ice-breaking game

The second session invited pupils to design an image of teeth based on their shape and function (see Figure 57). This encouraged them to memorise the importance of each tooth's function through a re-creation process – an alternative learning approach for HP through direct participation.

Figure 57: Pupils' drawing practice after teacher explained teeth structures and functions

6.3.4 Empathy through role exchange

During each stage of each course, empathy as a guiding principle was engaged by both teachers and students. Empathy is recognised as vital in design (McGinley and Dong 2011; Devecchi and Guerrini 2017), especially in higher education. User-centred design, human-centred design, participatory design and co-design all to some extent rely on empathy: assuming another's perspective, imagining their emotions, thoughts and feelings (Devecchi and Guerrini 2017). Psychologists have long addressed the importance of empathy, a skill usefully encouraged in children (Levine 2012). Teachers need to engage imaginatively with the emotions of students while communicating content, changing tone appropriately as they communicate. When the pupils were designing their cartoon characters, they needed role play, to create stories and images of their own. If some students were stuck with an idea, their teachers would use shared control methods and ask "what would you look like or do if you were an incisor tooth suffering from decay because of too much sweetness?" They would give intriguing answers and the teacher would respond by encouraging them to project these into sketches or prototyping, developing their final art design work afterwards. The empathy skills they developed through the course not only helped pupils design their own stories from theory into practice, but also considerably enhanced imaginative abilities. Empathy in participatory design can enhance an individual's knowledge and experience through a reciprocal reflection between participants and others (Ho and Lee 2012).

6.3.5 Participatory prototyping cycle

During making, we used a co-design action framework called the participatory prototyping cycle (Sanders 2014) as a framework method. It is a looped iterative process of making, telling and enacting (see Figure 58).

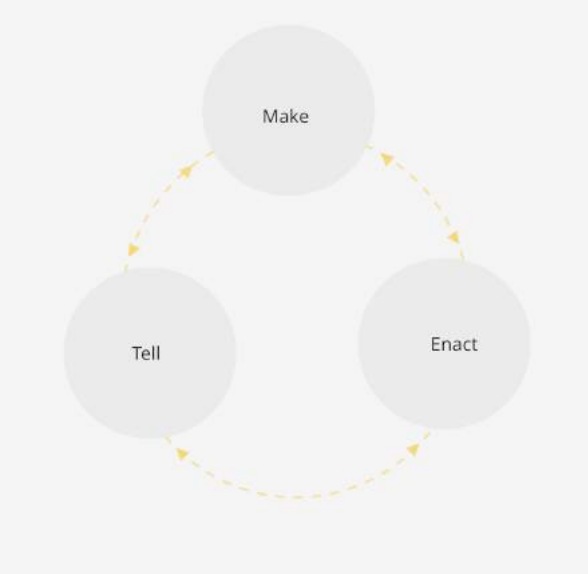

Figure 58: Participatory prototyping cycle (Sanders 2014: 7)

The pupils continuously responded in this iterative loop:

- **Telling –** storytelling about dental health from the cartoons or created by themselves.
- **Making –** creating the objects linked with their stories and dental health knowledge.
- **Enacting –** putting their ideas into practice, playing games and engaging in activities.

During these 12 days, they fully immersed themselves in this loop, enhancing and transforming abstract health knowledge into daily experience through re-organising and re-framing the information. It is reasonable to conclude that his framework could be used as a

HPH participatory methodology, encouraging participants to use tools, materials and artefacts to interact within the loop, absorbing health awareness actively.

In terms of promotion processing, their chess game on day 8 acted as a material iterative technology for learning. Students invited their mates to play and learn with them, using the HP material, circulating their understanding of dental health behaviour more widely. This suggests HPH should inform and guide groups to design their own materials creating a sustained loop as was experienced by the pupils at Timi. Spontaneous circulation from their own designed materials can have a more powerful influence and generate a more memorable pedagogic experience than a top-down circulation of standard texts which pupils recognise as stock products for school and from which it is easy to disengage (Krajcik and Blumenfeld 2014: 317).

6.3.6 Narrative drawing as a way of reprocessing information

Narrative drawing is not only a research methodological tool – for example in visual arts, communication studies or even for some aspects of management studies – but also works at the elementary educational level, at least in the Western context (Duncum 1993). The major difference in narrative drawing for design research is that it has become oriented more towards problem solving. Pupils at Timi used narrative drawing as a storytelling approach to express the HP knowledge they'd learnt and then personally re-created. Creative activities across different sessions ranged from drawing through crafting, gaming, making sculptures, imaginative narration, toys, even using dolls and shopping bags (see Figure 59). If the concept of the Ebbinghaus forgetting curve ([1885] 1913) in educational contexts (Plaskura

2019) encourages a pedagogic methodology that reviews information several times as a mnemonic, then these materials and making processes represent a similar process to enhance memory without boredom or loss of interest and – most importantly – allowing retention of key concepts and patterns.

Figure 59: The children's creative activities

Teaching methods behind narrative drawing are flexible and free, in a context of loose control (Vermunt and Verloop 1999). Imagination can be any and everywhere; sketches can be chaotic and need not be logical, fostering self-esteem and enthusiasm. After the pupils decided on a design based on their drawing, they moved on to the model-making or prototyping phase. The next teaching practice is within a more shared, control-dominant environment as some of the making processes were necessarily teacher guided, to achieve initial ideas. Each child's design idea, process and outcome were different, and art teachers guided them responsively. Overall, teaching activities were semi-structured, abductive sensemaking processes (Popper [1959] 2002), involving coaching rather than teaching. Sometimes, my role as a researcher in the context of each lesson evolved into being a playmate rather than a teacher.

6.3.7 Dental performance and behavioural change

The Report of the *Fourth National Oral Health Epidemiological Survey* (CNHC 2017) records the rate of children brushing teeth twice daily as 24.1% (5 years-old) and 31.9% (12 years-old). Traditionally, Chinese parents believe children don't need to brush their teeth due to the natural process of tooth exfoliation. This opinion is changing, prompted by deciduous tooth decay rates at 70.9% (5 years-old) and 34.5% (12 years-old), an increase of 7.8% and 5.8% respectively from the previous decade. From dentists' feedback, this may partly be the result of the dramatic increase in sugary snacks in children's diets coupled with the – now – inappropriate cleaning methods. Based on this development, on day 3 we used a toothbrush and tooth model, and also played a video (Chinese Stomatological Association 2017)[16] to show the "circular brushing" cleaning method. Students saw and tested this method and designed a 3D picture of brushing teeth illustrating enhanced circular action.

Another major behaviour that needs to be promoted is flossing. Dental floss is still rare in China – adults using floss is fewer than 5% (CNHC 2017). Children have no opportunity to experience the importance of floss from family influence, nor do public schools normally have a dental education course to promote its use. With this background, we brought different flosses, tapes, sticks, and interdental brushes and showed the pupils how to use them, allowing them to gain a feeling for these tools and take them home (see Figure 60). Next, we encouraged them to create narrative drawings about how dental floss and similar dental aids can clean teeth properly and help protect them. This hands-on experience of both touching real floss and linked materials as well as creating stories using various media, encouraged knowledge transfer with the aim of changing dental behaviour.

[16] CSA (2017) http://www.cndent.com/archives/53063 [accessed 04/12/18]

Figure 60: Dental floss learning process – from experience to story creation

6.3.8 Interactive exhibition as practice evaluation

A concluding exhibition (see Figure 61)– to present all work pupils designed across the course – gave an opportunity to evaluate whether they'd negotiated and internalised complex dental health literacy. It was not only a chance to demonstrate results, but created an opportunity to bring all the partners, stakeholders and participants together to exchange ideas as spontaneously as possible and to achieve feedback from Timi parents and WUSH healthcare professionals.

Figure 61: Final exhibition including the fashion parade with bags

A series of activities were designed for the exhibition. Parent feedback forms were distributed as well as questionnaires for the children. The questionnaires – framed as a competition to encourage responsiveness – were completed to test learning results. Feedback from six questionnaires shows evidence of incremental changes to the children's dental care behaviour following the course. We then invited parents and children to play a board game which the children had designed. After this, we gave a presentation, illustrating the whole development process, from initial idea to prototype to outcome in terms of dental health behavioural change. Finally, an award ceremony and a "fashion parade" were held to commend and celebrate achievements. These activities were designed for the sake of positive reinforcement and a feel-good factor to strengthen memories of the learning experience. From the perspective of participatory design, sharing achievements at the end of participation not only

reveals the values created but also boosts participants' self-esteem and stimulates long-term cooperative relationships with partners (Kelley 2013; Sennett 2014; Belinda 2015).

The exhibition room transformed into a live interaction space full of artworks, activities, presentations and discussion. This multidimensional approach redefining a "space" occurs frequently in the art design exhibition field, but is still rare in HPH. Considering WUSH is planning to design a children's centre on its new campus, this participatory exhibition offers a scenario for the future of their paediatric department. This case study further indicates that a design-based approach offers a creative community setting for HPH, changing the hospital environment into community, health education and leisure centres, even playgrounds.

6.4 Reflection on the case study

Based on feedback from and evaluation of the final exhibition, it was demonstrated that this co-design practice brought together shared "co-values" in four categories.

6.4.1 Empowerment

Children as participants could reorganise dental health knowledge, enhance and transform their own health paradigms, changing behaviour however incrementally. This research might contribute to reducing "white coat syndrome" (Lerwick 2016) suggesting that – through the processes of making – pupils developed an awareness of protecting teeth, enhancing empowerment through participatory design making. Dewey ([1916] 2016) was to some extent vindicated.

6.4.2 Co-creation

The Timi Art School as a practice partner gained a new multidisciplinary art and design curriculum, co-created with other subjects such as dental health education. Shor (1992) proposes a critical pedagogic approach that is profoundly participatory: affective, problem-posing and solving *in-situ*, multicultural, dialogic, democratic, interdisciplinary and – for the learner – active not passive. To foster these abilities among students, it may be time to consider bringing such design methods into mainstream education, with design teachers working alongside colleagues and through other organisations, running a co-creation curriculum, allowing the cultivation of a more innovative, creative citizenship (Stern and Seifert 2008; Zamenopoulos et al 2016) with skills to solve a range of problems.

6.4.3 Recreating

WUSH learnt a novel creative HP approach, led by design research. The whole learning process of this practice is from content theory-based to making-based approaches. This has been both a reframing and recreative process, from passive acceptance to initiative building. According to the feedback from my gatekeeper Mr Jiang, the exercise provided a referential experience for HPH, to be accessed when future HP projects are developed and run. Traditional HPH approaches are geared more towards the sciences and humanities, but now they have witnessed a “third HP” approach. This designerly way of knowing emphasises how design can be another way of learning, in addition to the sciences and humanities (Cross

1982), coaching children to learn dental health knowledge using cooperative design techniques, developing abilities to switch between thinking and doing (Cross 2011). All the methods conducted in this practice – building connections between making, thinking, learning, visualisation, and model making – have been broadly used in design education (Noel 2016) but rarely in HPH practice in China.

While the animated cartoon as an approach of HP is an appropriate medium, WUSH's current HPH doesn't engage children nor encourage active participation, either in the design of characters or in the deeper content design of HPH materials. Guided by feedback in terms of the heterogeneity of students' displayed artworks, WUSH now realises there are significant differences in terms of visual presentation and preferences for disseminated materials across children's age ranges, ignored before this practice.

6.4.4 Reflexive practice

As a design researcher, I have learnt how to liaise with partners to achieve shared value. This is essential in getting people onboard, building connections, working together and even generating long-term professional relationships. This cooperation needs careful planning from the start. Reflection-in-action and reflection-on-action (Schön 1983) were continuously conducted before, during and after each session. One example would be parents' feedback during the session, reporting that sketching for a few days did not motivate children, though the themes of dental health knowledge were different. Reflecting on this deficit, we modified it to other handmade creations at the next session and changed making materials regularly. This better motivated participants and partners, allowing for consistent and shared enjoyment.

When it comes to co-design projects, cooperation is not just about shared activities but – perhaps more importantly – about the experience of mutual pleasure, understood as an exchange from which participants benefit (Sennett 2014). Conceiving, developing, achieving and sharing the *co-values* are great incentives to achieving such mutual pleasure and allowing an effectively remembered learning experience which may encourage behavioural adaptation. Design researchers need to think and plan strategically: what is the *co-value* at each stage and how can this build mutual enjoyment through the entire process of cooperation and learning?

6.5 Summary

This co-design practice benefits all stakeholders and participants, hinting at how Chinese HPH may develop cooperative HP programmes with local partners and communities through network building and value sharing (Zhai 2021). Co-designing helps build financial effectiveness and responsibility, allowing local HP actions to grow spontaneously and leading to a sustained HPH environment. This co-design approach also helps connect HPH settings with other public sectors, shifting HPH from *inside* hospitals to *outside*, into the wider public community. This should expand HP coverage through partnerships, which often hospitals have difficulty achieving or sustaining. This dental health case study suggests that design research methods can be integrated into HPH activities. Design researchers can play a role in organising HPH by helping make abstract HP knowledge more concrete through making, thinking and learning, and improving HP literacy.

Chapter 7: Reflection on two case studies

7.1 Introduction

This chapter introduces some common ground from the comparison of two specific case studies (see Figure 62) through *reflection-on-action* (Schön 1983). Common ground (see 7.2) evolved general principles and can potentially be applied more widely. The findings of this comparison as an intermediate transitional reflection (see 7.3) extracted explicit knowledge from tacit phenomenon, prospected answers for research questions (see 7.4), contributing to the design frameworks in chapter 8. The method of reasoning in this chapter is inductive, moving from the specific cases to general knowledge. Shifting from "knowledge building" to "knowledge using" moves from an "inquiry paradigm" to an "application paradigm" (Owen 1998:12). The journey map of two case studies can be found in Appendix D.

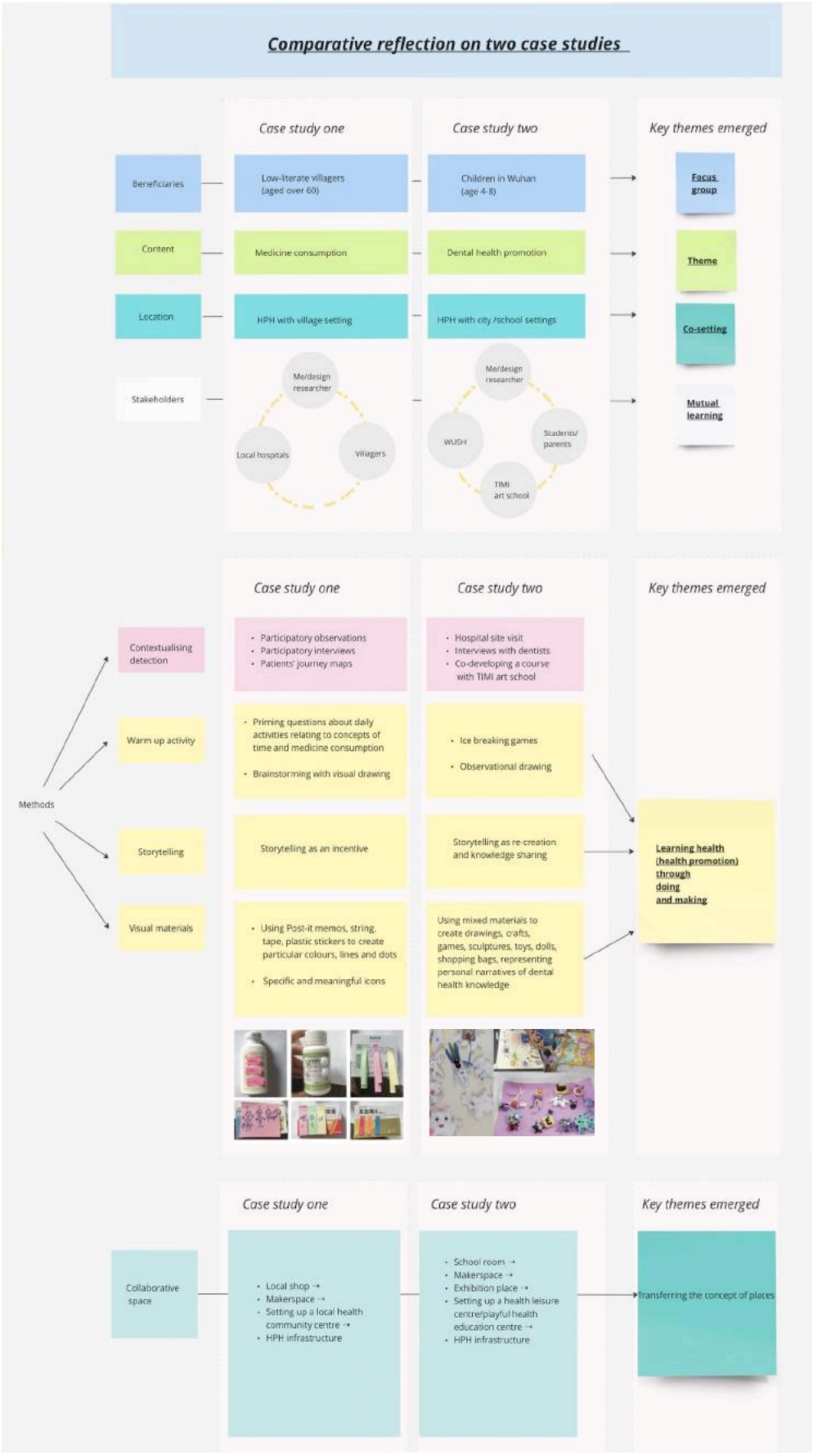

Figure 62: Comparative reflection on two case studies

7.2 key themes from comparative reflections on case studies

Based on figure 62, four themes emerge from comparative reflections on the two case studies: focus group (7.2.1), co-settings (7.2.2), mutual learning (7.2.3) and visual materials and prototypes enhancing learning experiences (7.2.4).

7.2.1 Focus group

The first focus group from case study one comprises low-literate villagers – aged more than 60 – the second comprises urban middle-class children aged 4– 8. These can be considered minorities, marginalised from mainstream channels of HPH. These two cases at demographic extremes encourage Chinese HPH to consider dynamic groups using multiple promotional approaches, selecting appropriate communication channels. In fact, each HP project should have a spectrum of focus groups, some of which may not be fully acknowledged in earlier HPH discourse. Such “invisible” groups may only appear after initial cultural detective research. Design ethnography and inclusive design can be appropriate methods of detecting hidden focus groups (see 2.3). To reduce health inequality, Chinese HPH could enlarge coverage of different communities and focus groups. After selecting focus groups, an appropriate methodology can be determined.

7.2.2 Co-settings

Based on the setting approach identified in my literature and practice review (see 2.2.4), the list of health settings has expanded since previous advocates of the exclusive hospital setting

now embrace alternative sites. My first case study integrated HPH within the village healthcare setting; my second connected HPH with urban and school healthcare. The validity of these two practices proves and formulates a single strategy which employs *co-settings for HPH.*

Public settings outside hospitals provide alternative approaches which hospitals may never have considered, yet which are more suitable for these linked groups. Normally local organisations are embedded within communities, enjoying transparent mechanisms (Manzini 2015). Case study two demonstrates the art school as a local organisation non-hospital setting can understand children better in terms of learning through making, allowing the building of a novel HP approach from co-settings with partners outside hospitals.

When itemising collaborative settings WHO (2022) proposes options, though these are not exhaustive. Settings can also be understood as conceptual touchpoints in which people benefit from HPH, further expanding WHO's concept of a setting to a public space as a location for co-creation to promote health (see Figure 63). For example, health information boards shown in case study one can be upgraded to a makerspace- as a setting.

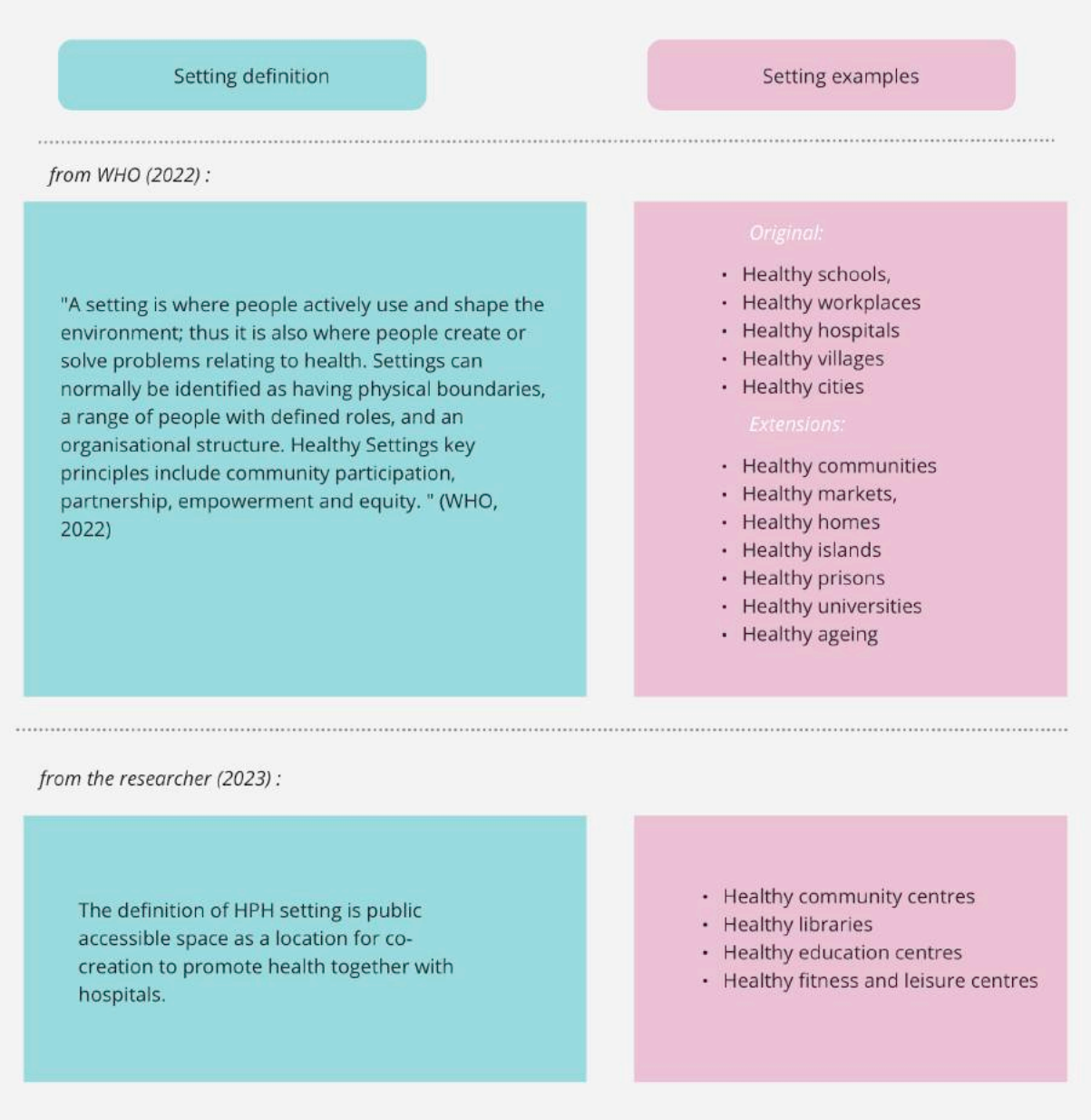

Figure 63: Setting definitions and examples

7.2.3 Mutual learning

To achieve such co-settings, co-created values and key mutual learning goals between actors must be recognised. In case study one, I gained valuable contextual knowledge from villagers and their doctors before the workshop began, then low-literate villagers benefited from and

contributed to group learning in that participation. Finally, this action research offers an alternative in terms of establishing grassroots HP for local hospitals.

In case study two, WUSH provided theoretical background support and gained new methods of dental HP. Timi school provided teaching resources and benefited from co-curricular development; students benefited from courses through their contributory efforts. When it comes to any co-setting developments for HPH, the mutual learning and shared values must be made explicit before cooperation. Researchers who build scaffoldings need to conceive how reciprocal-learning processes should be woven through participation, and how co-value should be created and transformed for people, organisations and specific environments (Ai 2019). Most importantly, researchers need to communicate these co-values intelligibly and transparently between actors, otherwise cooperative work becomes problematic. This clarity of communication also helps clear ethical issues in participatory projects.

7.2.4 Visual materials and prototypes enhancing learning experiences

In the methods section (see Figure 62), apart from contextualising detection and warm up activity before main implementation, one essential piece of the toolkit – using visual materials and prototypes – was widely used in both case studies. Deploying visual representation methods to communicate information in health education and improve basic health literacy has been noted (Haragi, Ishikawa and Kiuchi 2019) though earlier focus is still about visual illustration as a final delivery. In design education and especially visual communication and service design, however, visual representation methods can be far richer and more diversified. Manzini (2015) claims visual tools can trigger and support social

conversations in three categories according to different functions: “conversation subjects, conversation prompts and experience enablers” (ibid 2015: 133).

“Conversation subjects” interconnect and attract different actors. For example, the health information board (see Figures 31-35) in case study one acts as a touchpoint; visual representations from the interactive exhibition (see Figure 61) in case study two act as media for group conversations between myself, the school, the hospital and parents.

“Conversation prompts” are visual artefacts and methods – signals – enhancing communication during co-design stages. For example, the scientifically accurate flashcards and cartoon animations (see Figure 54) in case study two.

“Experience enablers” can be prototypes, small-scale experiments or informal sketches created by participants. Sketching as an action of thinking by drawing provokes initialising ideas linking problems with possible solutions (Cross 2011). This intermediate discovery process should be considered a creative learning tool rather than functioning as a finished solution. In case study one, participants used drawings as a brainstorming initialisation (see Figures 27 and 28), then visual materials – *post-it* notes or stickers – representing use of medicines (see Figure 30), possibly as prototypes. In case study two, visual materials – artistically creative media – were incentives helping children towards awareness and greater dental health care (see Figure 57). In this context, prototyping wasn’t a tool to test ideas for eliciting final products; rather the prototype itself became a new learning tool (Glen et al 2015) and the process of making became a new way to understand and promote health. Though prototypes are still not taken seriously in the Chinese context, the approach is used in design education but as yet not in HPH. Research findings from field trips indicate the

reasons are that the final purpose of design is seen as delivering a finished product regardless of process: HPH still believes publishing textual materials is acceptable as final assessments. Valuing prototyping and informal visual materials suggest adaptive approaches so that understanding of learning can be accepted as a valid project outcome. Designers and HPH organisers need to elaborate, select and prepare visual materials in advance as part of project planning and realisation.

7.3 Transactional reflection on case studies

7.3.1 **Learning through doing and making – from formal / passive to informal / active learning**

The core methodology from figure 62 has formulated is to promote health through doing and making. The benefits of learning through doing are well recognised by design education, but still not extensively practised in healthcare **(**Taffe, Pedell and Wilkinson 2018) and are even rarer in Chinese HPH. According to Dewey (1986), learning by doing through participation can move students away from passive reception of instruction, participation being fundamental to active learning (Shor 1992). To help unpack the active learning process, Kolb's experiential learning cycle (1984) describes how abstract conceptualisation can shift to concrete experience through active experimentation; concrete experience then builds abstract conceptualisation through reflective observation (see Figure 64).

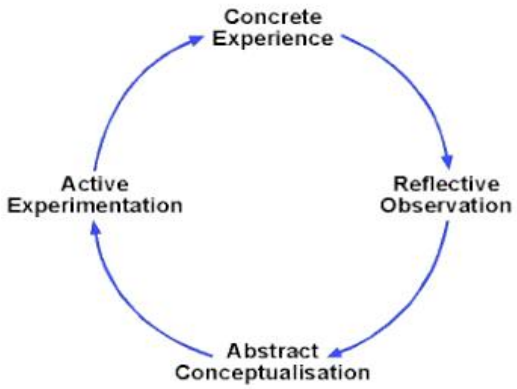

Figure 64: Kolb's experiential learning cycle (1984)

Birk (2017) states any of the four stages can be a first step in entering the learning cycle. My two case studies embody Kolb's learning cycle, starting from active experimentation as a first step. Case study one (see Figure 65) used priming methods, asking participants what they do morning, noon and night to build connections between visual images and temporal concepts. Active experimentation helped participants embody abstract concepts as familiar, concrete experiences. They then used personal experiences to represent complex abstractions – medicine dosages and usages – through reflective observation of personal methods.

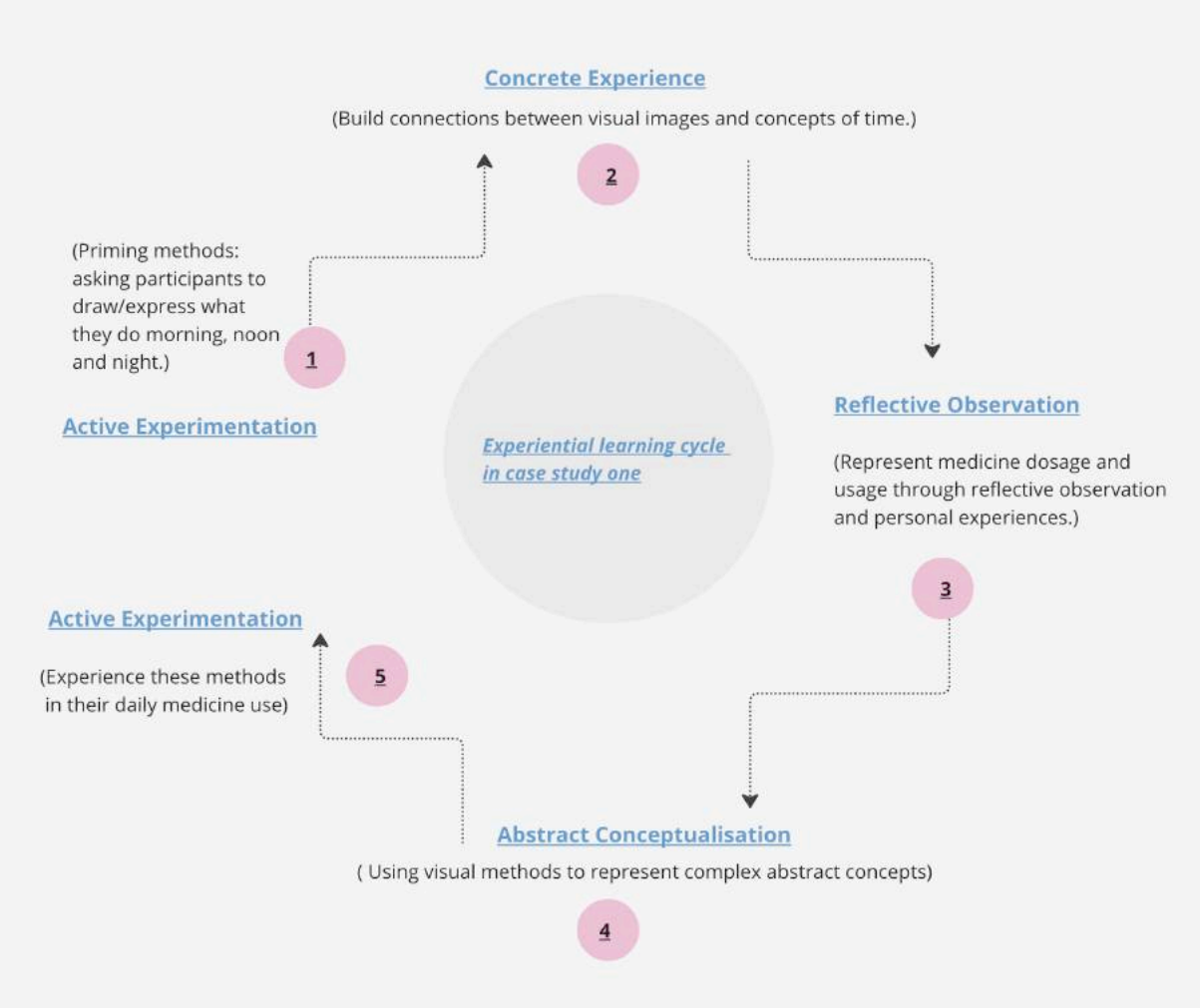

Figure 65: Experiential learning cycle in case study one, after Kolb (1984)

Case study two (see Figure 66) used model making, role play and gaming as active experimentation to shift abstract dental health information into more concrete and personal experience. Their learning experiences enhanced abstract theoretical knowledge of HP through reflective observation**.**

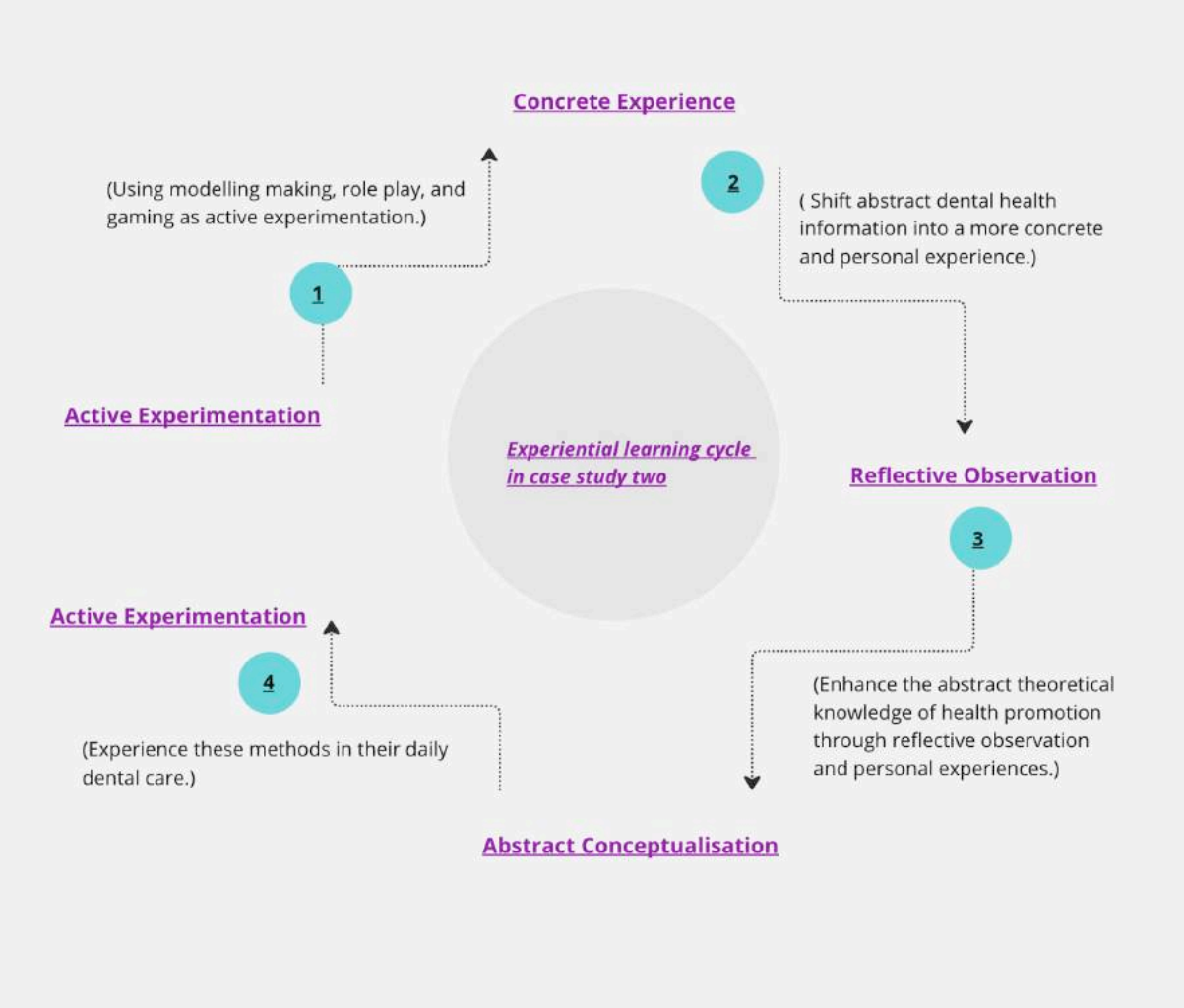

Figure 66: Experiential learning cycle in case study two, after Kolb (1984)

Both these practices offer an informal learning approach, emphasising the learning experience rather than mere dissemination of information (for example, using health information boards and/or textbooks). Shifting from formal to informal learning is moving from passive to a more active, initiative-based understanding of health. Absorbing knowledge through this cyclical reprocessing consolidates what is learnt. In health education, educational tools can support learning, providing an inclusive experience between patients and professionals, reducing inequity in reception of public health messages (WHO 2006), allowing practice to evolve more effectively.

7.3.2 From active learning in shared space to collaborative makerspace

As the result of group learning activities through making in a public space, the concept of a place devoted to physical display – a collaborative makerspace – is central. Such collaborative space is more than a physical location where work can be done face-to-face: it is where social interaction is facilitated through knowledge exchange and co-creation between internal and external actors (Montanari et al 2020). A makerspace defines where people co-produce, sharing tools, skills and knowledge (Gershenfeld 2005).

For HPH, collaborative makerspaces act as a communication channel or HP setting. It can be permanent in or outside hospitals, or a temporary publicly accessible space. How to identify suitably flexible public spaces depends on community practices and needs. In case study one, thinking of inhabitants' leisure activities and where they normally engaged in these helped me locate a space. In one sense, the space found me rather than the other way round. Finally identifying a local shop – where the community already chose to gather for social activities – as a makerspace was more my response to accepted local practice. This discovery – the location's identifying of itself – serves as a model of setting up local health community centres as collaborative makerspaces for HP. In case study two, an external partner offered a classroom in a school as a makerspace, then upgrading this as an interactive exhibition space: another model for playful learning spaces in hospitals or communities.

Choosing the most accessible and flexible spaces for specific HP needs depends on a responsive appropriateness between focus groups, external partners and the promotion

themes themselves. If the location is a permanent hospital space, this can act as a magnet for external partners and other social and material resources. This should be the embodiment of any co-setting strategy. The wider possibility of allowing flexible places for HPH could be applied to other publicly accessible spaces such as libraries, community service centres, playgrounds, sports centres and shopping centres. A makerspace should, after all, support diverse HP activities, from still displays – HP exhibitions – to social activities promoting health – workshops, lectures, performances, hands on experiences, films, concerts, even food festivals. A place allows multiple sensory communication channels to open – visual, verbal, sonic or various physical contacts – offering a synthesis of informal and formal health learning opportunities.

7.3.3: From collaborative makerspace to HPH infrastructure

Figure 67: Shifting public access to HPH infrastructure (two case studies)

Figure 67 shows both case studies transferring the concept of place from one that is collaborative to one that is infrastructural. Case study one used a local shop as a makerspace,

then projected a set up in a permanent local health community centre as HPH infrastructure. Case study two used a school room as a makerspace; this then became an exhibition place, which suggested building a long-term health leisure centre or play-oriented health education centre, acting as HPH infrastructure.

Utilising a collaborative space to fertilise the local health ecosystem, as a seedbed for health innovation, can promote a sustainable, diverse and open community (Merkel 2015). In this way, collaborative makerspaces offer a new infrastructure for HPH. The current and frequent understanding of infrastructural needs – keeping the environment clean and neat, improving brand image – needs to adjust such that HPH offers a more organic and responsive environment, shifting the concept of built infrastructure by adding collaborative makerspace. This might not only aesthetically improve the environment, it also functions as a place where social HP naturally occurs, encouraging a healthy community based on a community's own terms.

Seravalli and Eriksen (2017) define "infrastructuring" as a continuous interaction between human and non-human actors, allowing spaces to develop. Infrastructuring elements can be "digital platforms, physical spaces, logistic services, information services, communication services and design expert services" (Manzini 2015: 151) indicators of how Chinese HPH might grow multiple promotion channels and an HPH infrastructure. When it comes to transformation from a single project to wider social change, creating a democratic infrastructure is essential (Ehn and Ullark 2007): without deep, community-based responsiveness HPH cannot hope to be as robust as it needs.

7.3.4 From participation and empowerment in health to active citizens

Confucius and Plato believed artisanship – creativity within community – cultivates good citizens (Sennett 2014). This implies learning through making fosters citizens whose attitude to health is creative and proactive, not merely obedient. Through turning places into collaborative makerspaces, changing passive health learning to active making, participants improve their health through methods they themselves design. This transformative process leads organically and almost automatically to the change of *isolated individuals* into *active citizens* in HP, allowing citizens to see value created by themselves rather than delivered by others (Bentley and Wilsdon 2003). Recognising people not merely as patients but as agents of change, activates their roles in wellbeing creation and reduces health inequalities (Abel and Frohlich 2012: 237). This is no simple transformation: it requires a power shift using a bottom-up strategy. Public health organisations need to create conditions that allow people agency, to take control of their health with local communities beating paths towards each solution (Sangiorgi 2011: 34). Compared with the traditional patient information consultation approach, a more inclusive participation may lead to better health outcomes overall (Shimmin et al 2017: 8) achieved without excessive budgetary strain. Participatory engagement should be integrated into HPH implementation, allowing hospitals to cultivate patients as active citizens with awareness and agency – an approach which allows two-way communication and recognises the creativity made available.

7.3.5 From active citizens to grassroots innovation and creative community

Community engagement of active citizens – once accepted and socially scaled – should generate enabling ecosystems (Manzini 2015) and grassroots innovation (Seyfang and Smith 2007). Creative communities are people who – at least in part – define their ways of life through finding innovative solutions to specific social issues themselves (Resnick 2019: 194). In community action research, citizenship is defined as a right to participation that questions existing power structures, awakening a self-reflexive process (Ozanne and Saatcioglu 2008). This sets a high bar for Chinese HPH: how hospitals' roles become creative hubs encouraging active citizens' innovation needs to build on research insights offered here.

7.4 Summary

Comparing themes from the two case studies, two transition threads appear (see Figures 68 and 72). Figure 68 illustrates how the first thread – mutual learning through visual materials (micro) – encourages grassroots innovation and creative communities (macro). Figure 72 shows the second thread of design focus and changing of designers' roles.

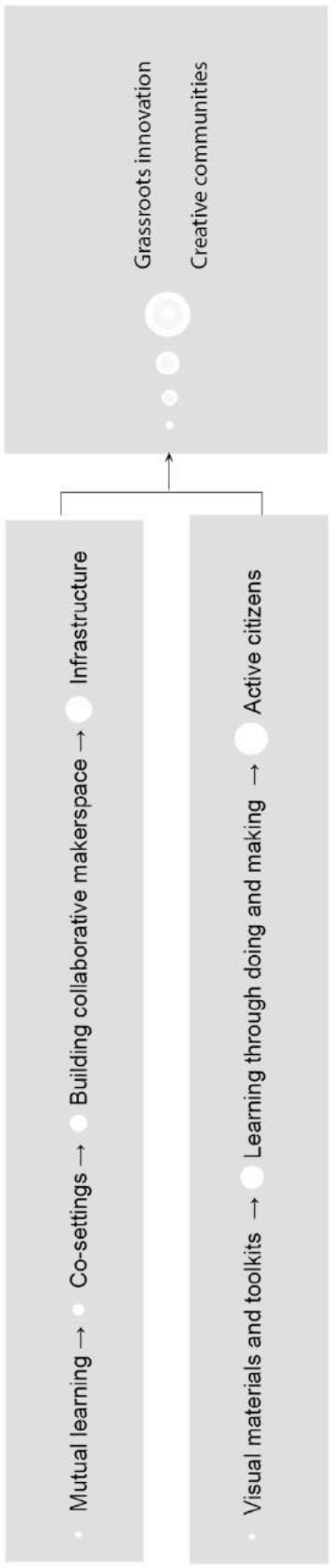

Figure 68: The transition threads from micro to macro in case studies

Mutual learning as an initial co-value concept encourages the adoption of co-settings, building effective, collaborative and organically responsive makerspaces. These become imaginative infrastructures, cultivated mechanisms allowing dynamic minds to seed creative methods. Figure 69 illustrates this, reflecting how macro mechanisms allow micro elements – mindsets, methods, materials – to grow while micro elements contribute to building infrastructures.

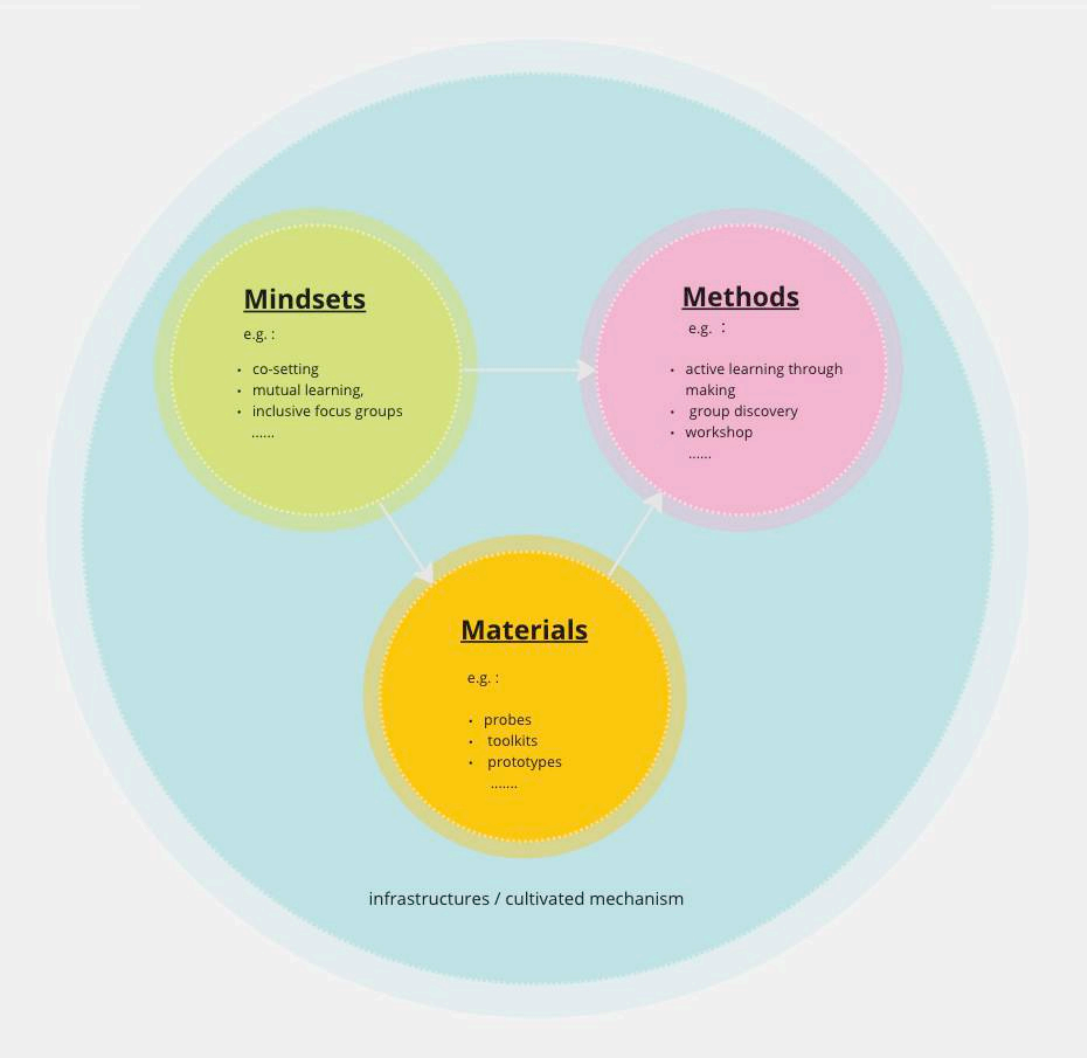

Figure 69: Mindsets, methods and materials within infrastructures

Through the incorporation of these elements – from the open mindset, through accessible visual materials to inclusive toolkits supporting learning activities using methodologies that encourage – this infrastructure patterns participants into active citizens and contributes to and scales up grassroots innovation and creative communities. This process of knowledge accumulation – followed by the case studies – builds evidence to answer research question one: how can design practice help Chinese HPH create a supportive, sustained and creative environment? WHO's (1986) five actions are policy-driven, politically deterministic, top-down iterations (Figure 70).

Figure 70: Five actions of HP from WHO (1986)

I reorder this sequence based on the research findings, shifting the passage of power to bottom-up (see Figure 71).

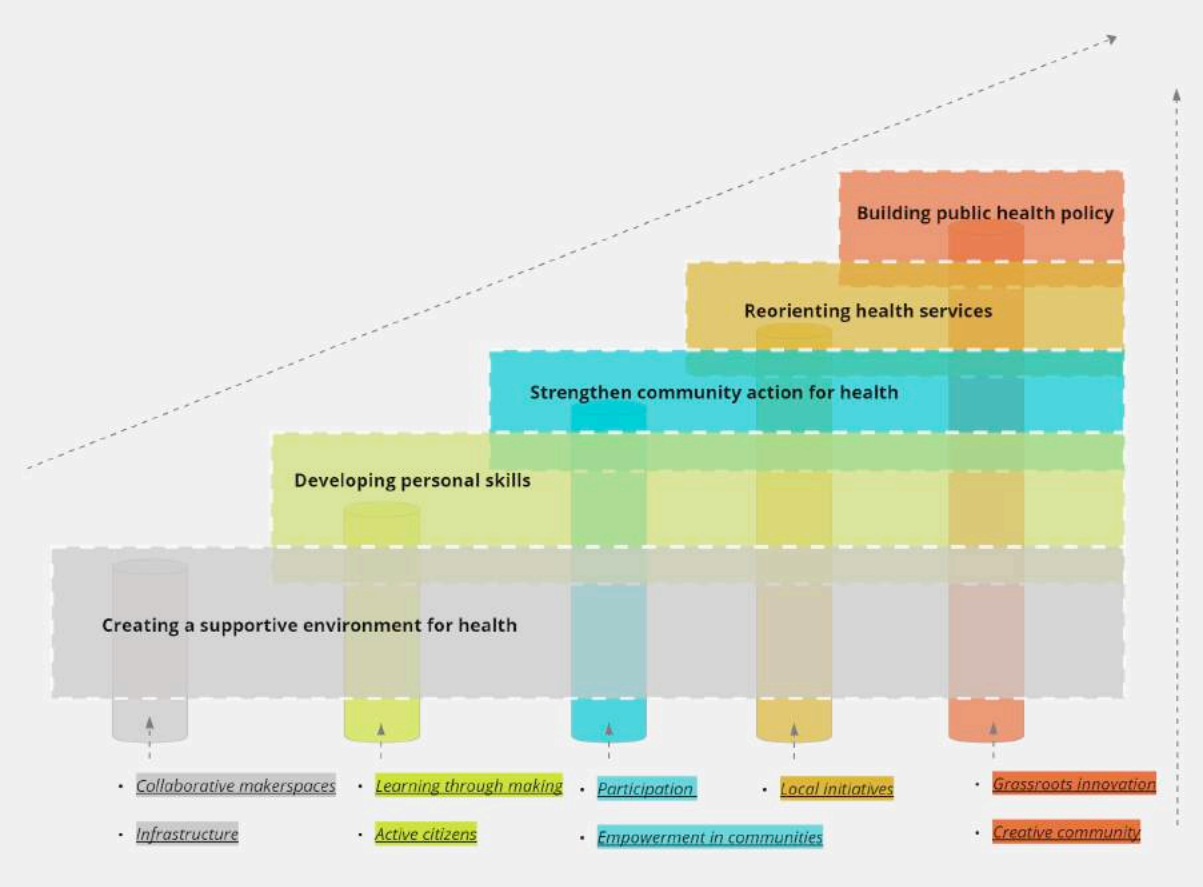

Figure 71: Reordering five actions of HP through design scaffoldings

- Creating a supportive environment for health through *collaborative makerspaces and infrastructure*.
- Through this infrastructure, developing personal skills and reorienting health services by *learning through making*, enabling *active citizens* in makerspaces.
- Enabling can strengthen community action for health as *participation and empowerment in communities*.
- This process, ideally, rebuilds public health policy by *grassroots innovation and creative community.*

This sequence goes some way to answering the second research question: How can design literacy contribute to the WHO guidelines of five HP actions?

The second transition thread generated by this reflective chapter and role as a design research in this study. It concerns how designers' roles shift from providing solutions to improving design capacities and capabilities (see Figure 72).

Figure 72: The second transition thread of design focus and designers' roles

Designers working as facilitators for and in collaboration with multidisciplinary processes, projects and organisations are becoming more common (Minder and Heidemann Lassen 2018). My role in both case studies was one of facilitator. However, once designers leave a project, people may have little or no design knowledge forcing them to hire designers for any new projects or as the original project adapts. Sangiorgi and Eun (2014) suggest building users' learning, ownership and capabilities in open design strategies. This chapter is therefore an examination of transition, a reflection on my two case studies, generalising using general principles to elicit a framework (see chapter 8) for spreading design knowledge and increasing design capacity in Chinese HPH, to empowering design capabilities (Manzini 2015) and widening the theoretical scope in the context of a macro-HP system.

Chapter 8: Design frameworks for Chinese HPH

8.1 Introduction

This chapter generates an alternative perception – knowing *what* – and the logically linked implementation – knowing *how* – of HPH from a design perspective, based on theoretical and practical literature review findings (chapter 2), field trips (chapter 5), two pertinent case study discoveries (chapters 4 and 6) plus case study reflections (chapter 7). Here, I explore what design thinking means for HPH, how it can provide an open-ended, inductive and heuristic semi-structured framework specifically for the Chinese HPH context.

8.2 Why a comprehensive scaffolding design framework for Chinese HPH

The challenge for design practitioners is providing training and tools to clients, embedding design skills and approaches within organisations (Sangiorgi and Prendiville 2017). The paradox of design is its simplicity nested in profoundly complex practice. To use this paradox, Conley proposes visual simplicity as a step to success.

> A design framework is a simple visual structure that helps organise the information and ideas of a problem so you can work on it more effectively. A framework is often composed of a relevant list of categories. These categories are developed from initial research that should be a part of every new project (Conley 2016).

Simple in structure, then, but this is only half the story. Following discoveries from field trips, site visits and case studies, it is clear the ways local hospitals understand the concept of HPH and design will affect how they conduct HPH practice. Even if they know the initial HPH concept from WHO and NHCC, when it comes to practical actions in different hospital departments, some still do not understand how to run HPH projects. As for the cognitive principles of design intervention in hospitals, there is a gap between awareness and deeper conceptualisation.

One gap I found is that systemic design research is rarely explicit in Chinese HPH literature. Again – based on my field trip, case studies, interviews and the Chinese HPH practice review – practitioners and patients have different attitudes towards design intervention in hospitals. Some doctors and healthcare experts reject design involvement, believing healthcare is treatment centred; others acknowledge the importance of design, while nevertheless saying they don't know how to deploy design in HPH environments. Certain hospitals (see 2.2.3) use design intervention, but poor understanding of concepts means design is only a last-minute implementation. Professionals don't know that – ironically perhaps – some of their decisions, actions and results are already design-based: Gorb and Dumas (1987) call this "silent design". Design research makes tacit knowledge explicit and partial understanding more comprehensive. Bridging the divide involves a leap of imagination: the puzzle of design is "how to make communication possible that was once difficult, impossible or unimagined" (Aakhus 2007: 112). Through a design framework as visual structure (Conley 2016) and effective communication, Chinese HPH practitioners may have a systematic, indeed comprehensive understanding – a deeper imagining – of what design thinking means in HPH

implementation. Specifically, they may construct a more sustained, creative and supportive HPH environment and infrastructure.

8.3 A brief review of "wicked problems" and design thinking

To deliver an appropriate design theoretical framework for Chinese HPH, a brief review explores what design thinking is generally and within healthcare specifically.

Regarding a theory of knowledge inquiry, Dewey addresses the processes of institutional problematisation that determine the solutions chosen (Dewey 1938). The difficulty is addressing problems that are ill defined and need to be "wickedly" solved for a dynamic general planning theory. Rittel (1972: 392) defines wicked problems, borrowing the use from Popper (Buchanan,1992). Wicked problems[17] are a class of social systemic dilemmas which are ill-formulated, where information is confusing (Churchman 1967; Buchanan 1992): they are never solved and can only be repeatedly resolved (Rittel and Webber1973; Boradkar 2017).

Selecting principles to find then understand appropriate solutions is a dilemma generated by wicked problems. Among these different approaches of knowledge inquiry and solutions, design thinking is one potential pathway. In architectural design and urban planning, Rowe (1991) describes design thinking as a decision-making aiming to solve problems – but this merely states the obvious. Design thinking needs to be defined more as a process generated

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[17] Ten distinguishing properties of wicked problems (Rittel 1972: 392): "(1) Wicked problems have no definitive formulation. (2) Wicked problems have no stopping rules. (3) Solutions to wicked problems are not true or false, but good or bad. (4) There is no immediate and no ultimate test of a solution to a wicked problem. (5) Every solution to a wicked problem is a "one-shot operation". (6) Wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan. (7) Every wicked problem is essentially unique. (8) Every wicked problem can be considered to be a symptom of another problem. (9) The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution. (10) The planner has no right to be wrong."

by and sustained within a design paradigm: in this case design that is specific to healthcare and the HPH: a latitude of conceptualisation is useful. The origin of design thinking as a methodology is often credited to Simon (1969) who defines design as devising courses of action aimed at changing existing situations into preferred ones. More precisely, design thinking is often traced to an articulation of "Design with a capital D"[18], addressing design as a third culture with a distinctive "designerly way of thinking and communicating" (Archer 1979: X). Cross further explores the phenomenon, the methods and values of "designerly ways of knowing"[19] comparing thought processes across the sciences and humanities, claiming designers tackle problems that are "ill-defined" (Cross 1982: X). Definitions of wicked problems in design thinking (Buchanan1992) are extended by Brown (2008) who proposes such thinking should lead to innovation, particularly in industry. Kimbell (2011: 285) puts design thinking into three categories: (1) a cognitive style related to design thinking, knowing and acting; (2) a general theory and (3) as a resource for organisations with the designer leading.

Though healthcare design experts understand and articulate design thinking differently – in research, practice or education – their work draws on pioneering explorations and references earlier approaches. There is a shared feeling that design thinking – as methodology, mindset, tool, process, strategy – effectively addresses those wicked problems in healthcare (Roberts et

[18] Cross (1982:221) concludes "Design with a capital D": "The central concern of Design is 'the conception and realisation of new things'; It encompasses the appreciation of 'material culture' and the application of 'the arts of planning, inventing, making and doing'; At its core is the 'language' of 'modelling'; it is possible to develop students' aptitudes in this 'language', equivalent to aptitudes in the 'language' of the sciences (numeracy) and the 'language' of humanities (literacy); Design has its own distinct 'things to know, ways of knowing them, and ways of finding out about them'."

[19] Designerly ways of knowing describe the phenomena of study in each culture as:

- in the sciences / the natural world
- in the humanities / human experience
- in design / the artificial world

The appropriate methods for each culture are:

- in the sciences / controlled experiment, classification, analysis
- in the humanities / analogy, metaphor, evaluation
- in design / modelling, pattern-formation, synthesis

The values of each culture are:

- in the sciences / objectivity, rationality, neutrality, and a concern for 'truth'
- in the humanities / subjectivity, imagination, commitment, and a concern for 'justice'
- in design / practicality, ingenuity, empathy, and a concern for 'appropriateness'

al 2016; Anderson, Calahan and Gooding 2017; Valentine et al 2017; McLaughlin et al 2019; Ku and Lupton 2020; Sandars and Goh 2020; Thakur et al 2020).

When design researchers apply design thinking to different problems and subjects, Buchanan (1992) claims the challenge is attaining a deeper understanding so that cooperation and mutual benefits can be achieved. One outstanding design theorist in China defines design thinking as "a reflective and adaptive approach to problem solving in contexts that are open to interpretation, for goals that are open to negotiation, and with principles that are open to selection " Xin (2020). With his precise identification of interpretation / negotiation / selection, Xin offers one of the clearest conceptualisations of Chinese design thinking.

Clearly, there is no single definition. Sennett (2014) sees design as a capacity of integrative thought such that each researcher need refine a conceptualisation for their own field to target new, hitherto unconsidered wicked problems. HPH is clearly one such wicked problem (see chapter 2.3). The understanding of HP and illness prevention varies from people to people, region to region, culture to culture and across history. Geography, genetic-familial patterns, education, ethnicity, age, sex, class and occupation are not exhaustive social determinants, making HPH ill-defined and, as yet, wickedly imprecise. HPH as part of wider healthcare issues, shares the same complex socially determined ecosystem. Due to its complexity, it cannot but be embedded in different contexts, situations and communities or guided through appropriate frameworks of design thought. When researchers promote design thinking into new subject areas, they must define precisely what design theory is. To develop an appropriate framework for Chinese HPH, I conducted a visual summary for design thinking, to refine what it could and should cover.

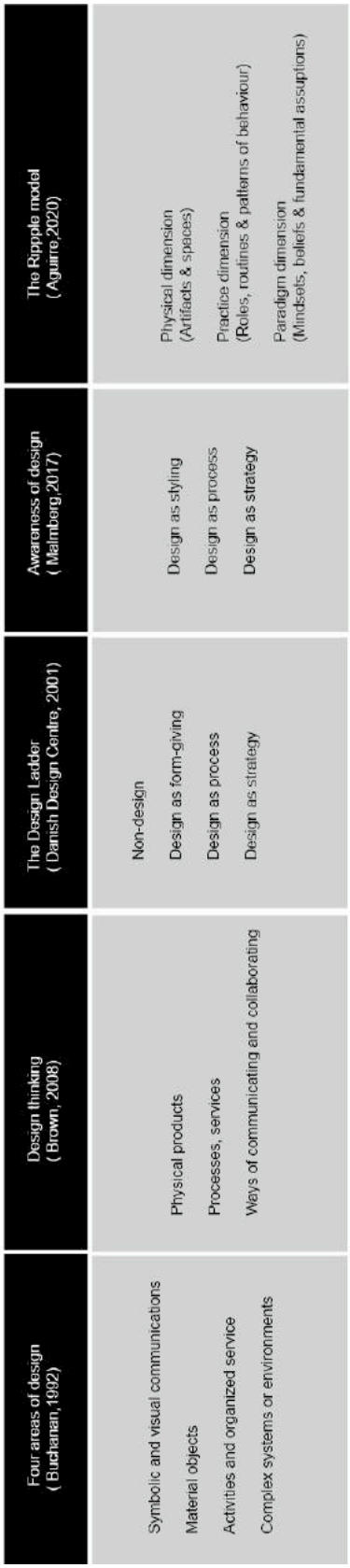
8.4 Visual summary for design thinking / literature review

Because there are many definitions, I synthesised a review of design theory to clarify a complex paradigm and project a conceptual simplicity rather than add layers of obscurity. This review is divided into three: design thinking epistemology (see 8.4.1), design thinking as process (see 8.4.2) and design thinking mindsets / methods and principles (see 8.4.3). First, I describe what design thinking epistemology may be, then ask what leads to theoretical development in projects or organisations – the design thinking process – finally considering mindsets, methods and principles guiding design implementation.

8.4.1 Design thinking epistemology

I selected two design theoreticians: Buchanan (1992; 2019) – who identifies four areas of design – and Brown (2008) on design thinking, as well as one national design communication model, the "Design Ladder" (Danish Design Centre 2001). Design models from doctoral research, the "Awareness of Design" (Malmberg 2017) and "The Ripple Model" (Aguirre 2020) identify areas of thinking, expanding the epistemology using different terminologies related to research specifics.

Following observations made during my field trip, I used the Design Ladder to help articulate an aspect of nudge theory (Thaler and Sunstein 2008) projecting Chinese hospitals' levels of design cognition responding to national political implementation. The four design steps from the Ladder are hierarchically related. Buchanan (1992) claims these areas are interconnected rather than having interleaving prioritisation. Figure 73 suggests what design can offer in different situations.



Four areas of design (Buchanan,1992)	Design thinking (Brown, 2008)	The Design Ladder (Danish Design Centre, 2001)	Awareness of design (Malmberg,2017)	The Rippple model (Aguirre,2020)
Symbolic and visual communications		Non-design		
Material objects	Physical products	Design as form-giving	Design as styling	Physical dimension (Artifacts & spaces)
Activities and organized service	Processes, services	Design as process	Design as process	Practice dimension (Roles, routines & patterns of behaviour)
Complex systems or environments	Ways of communicating and collaborating	Design as strategy	Design as strategy	Paradigm dimension (Mindsets, beliefs & fundamental assuptions)

Figure 73: Design thinking epistemology

8.4.2: Design thinking process

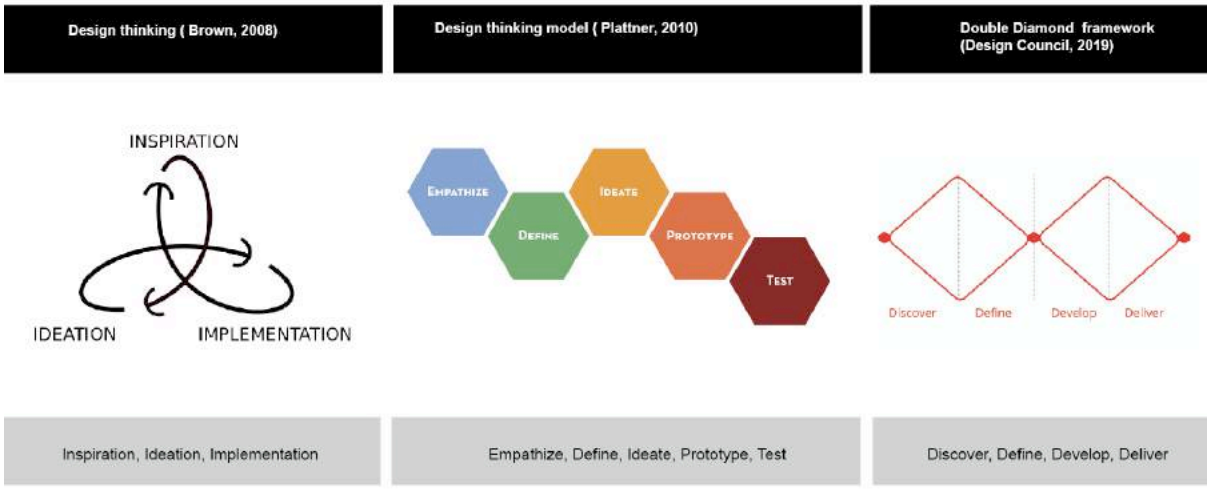


Figure 74: Design thinking as process

Once design thinking is identified, it is wise to explore how the process works. I selected three design thinking process models (see Figure 74) – models mentioned frequently in Chinese design symposia because these suit the conceptualisation of design in the Chinese HPH context.

- Inspiration, ideation, implementation (Brown 2008);
- Empathise, define, ideate, prototype, test (Plattner 2010), and
- Discover, define, develop, deliver (Design Council 2019).

Because design processes are complex and intangible – especially for non-design experts – visual diagrams are useful as methods to depict the processes (Kimbell 2014; Täuscher and Abdelkafi 2017) communicating design thinking effectively to a wider audience (Noble and Bestley 2016). These three models (see Figure 74) each visualise design thinking processes.

8.4.3: Design thinking mindsets / methods / principles

If the design thinking epistemology and process is known and a designerly way of guiding projects followed, design characteristics act as supplements, generating mindsets, methods and principles. From among design principles, I selected six examples: three from outstanding design theorists (see Figure 75), one from the UK Design Council (see Figure 76) and two from the health design field (see Figure 77).

Three design theorists:

- 10 core design elements from the "systematic method for designers" (Archer 1965);
- Methods and values in design from the "Designerly Way of Knowing" (Cross1979);
- A design thinker's personality profile from "Design Thinking" (Brown 2008).

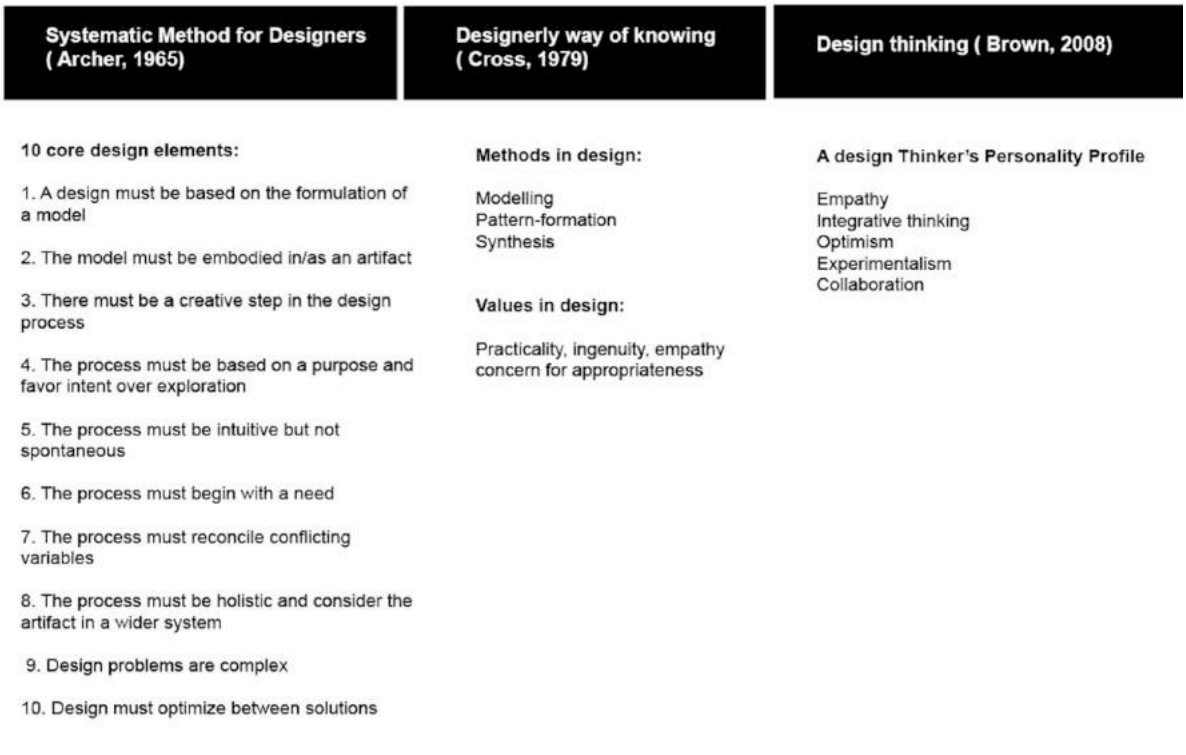


Figure 75: Design thinking principles from three theorists

The "Double Diamond Framework" (Bánáthy 1996; Design Council 2019) (see figure 76), has been promoted in healthcare research (Xin 2020) but professionals have neither noticed nor adopted the latest add-ons (Design Council 2019): the methods bank and design principles create a culture of success recognising the importance of leadership and engagement. According to research findings from my field trips and case studies, these add-ons are partly what Chinese HPH lacks in terms of design understanding. There may be a need to follow up the process of percolation to assess its extent and effectiveness.

Figure 76: Design thinking methods / principles / culture from Design Council

Healthcare experts offer two additional design frameworks (see Figure 77).

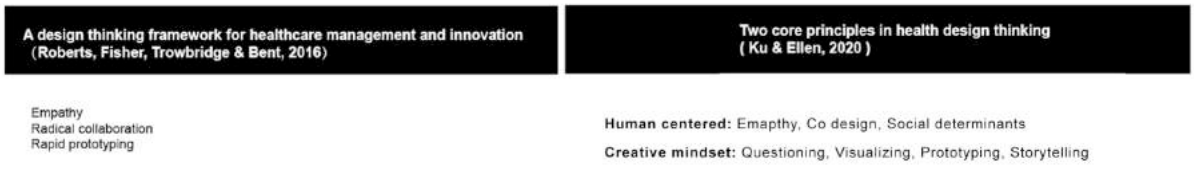


Figure 77: Two frameworks from healthcare design

These two are considered part of the wider healthcare field incorporating design thinking and evidence, suggesting that medical educators are integrating design thinking into their curricula (van de Grift and Kroeze 2016; McLaughlin et al 2019). Such frameworks in practice are evidence that experts from healthcare have started to factor design thinking into medical research, practice, training and education. The visual summary of my literature review in design theory covering epistemology (see Figure 73), process (see Figure 74) and mindsets, methods and principles (see Figure 76), is an overview of my design framework for Chinese HPH.

8.5 A designerly way of knowing HPH

Based on design thinking epistemology (see 8.4.1) and the transitional reflection on my case studies within field trips (chapter 7), I generated a "designerly way of knowing HPH" (see Figure 78). This heuristic articulates my position as a design researcher, as well as anchoring my research within a Chinese HPH environment. The designerly way of knowing, doing and thinking, is just one approach among patterns of knowledge inquiry (Dewey 1938); as such, it doesn't assert any superior approach as a way forward for Chinese HPH.

The optimal chance for success is if clarity when generated is maintained. When design thinking intrudes into the practice of non-design partners, a radical design approach is needed to connect their previous approach to novel conceptual patterns. This helps partners decide which elements must be sacrificed, which remain and which should be enhanced or created anew (Thakur et al 2020).

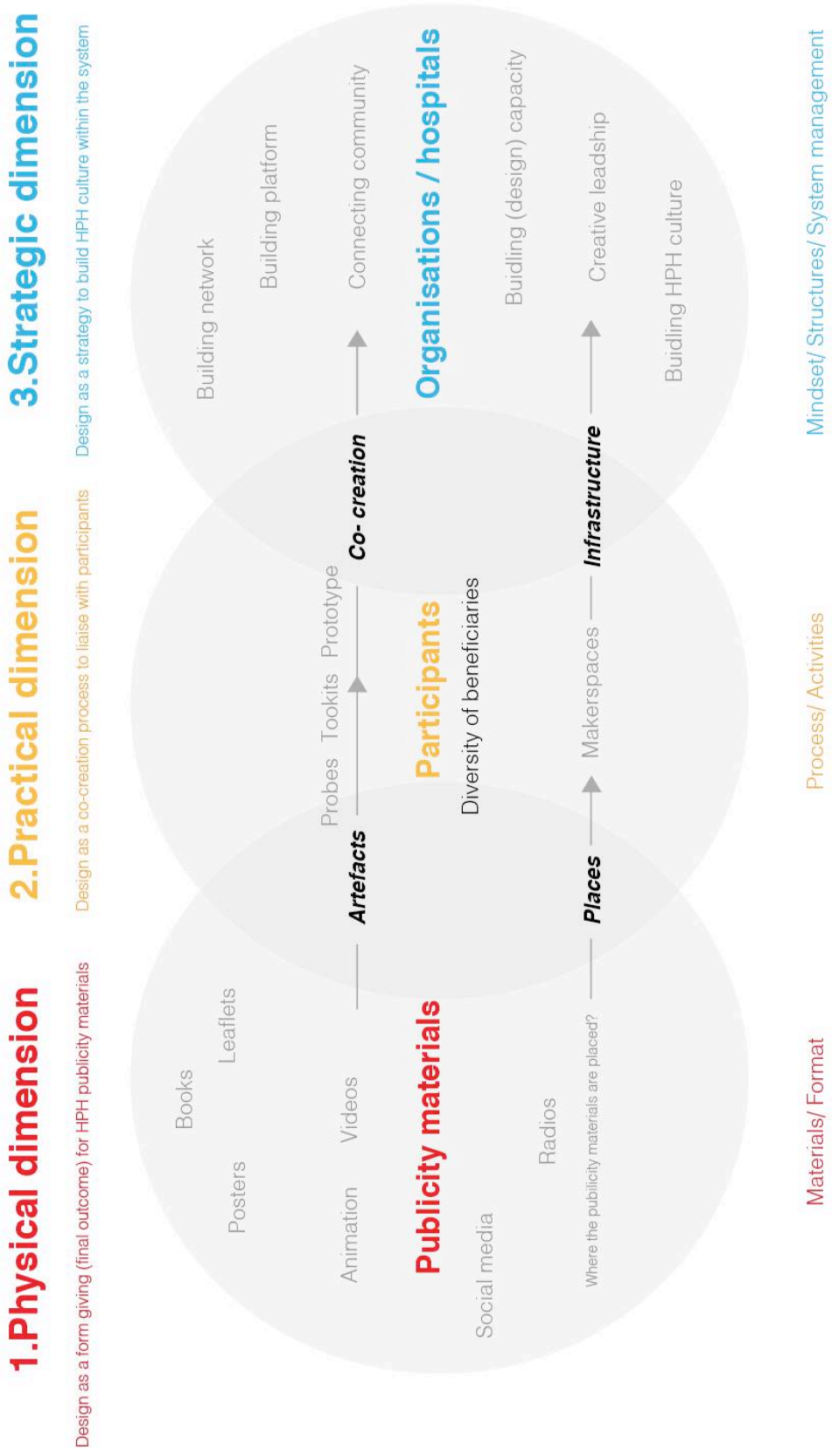


Figure 78: Designerly way of knowing HPH

These three Venns are not hierarchical but are important for my research, reflecting the fragmented Chinese HPH understanding of design. This comprehensive design framework acts is one integrated model, connecting segment areas where thinking involves a physical (see 8.5.1), practical (see 8.5.2) and strategic (see 8.5.3) dimensions.

8.5.1 Physical dimensions – design as form-giving (final outcome) for HPH publicity materials

The physical dimension connecting the current approach of Chinese HPH with patterns of design thinking is realised in HPH publicity materials: among the Chinese hospitals I have contacted it is apparent that many see design as a final outcome rather than integral to a holistic healthcare approach. The hospitals choose designers through agents whose roles are only to deliver publicity material to express ideas a hospital management seeks to promote: designers and design are refining tools, implementing what is required. No research or design partners are involved early on. Patients receive HP passively through traditional communication channels and media such as posters, books, leaflets, videos, animation, radio and TV and across virtual communities. I'm not criticising these media as insufficient or counterproductive: they are essential, enjoying widespread social diffusion; however, they demonstrate a passive, linear learning approach rather than active engagement. Such an approach cannot consider the variety of individuals expressing different learning behaviour dependent on such variables as – for example – age, sex, regionality, culture and educational levels. It easily disregards peripheral groups such as the elderly and children, people special needs, ethnic minorities whose first language isn't Mandarin, people in rural areas with poor

media access, and people with limited literacy. Such groups have been excluded from health-related research coverage, leading to health inequalities (WHO 2005). A diverse approach to communication and its potential channels would tailor communication: a subtle targeting of design thinking as a systematic synthesis would expand conventional articulation, becoming more user-centred, more empathetic (Devecchi and Guerrini 2017) and more inclusive. Inclusive design, ethnographic and design anthropology offer effective methodologies (see 2.3.2) diversifying HPH design, which is where the second practical dimension intervenes (see Figure 78).

8.5.2 Practical dimension – design as a co-creation process, liaising with participants

Clearly "there is a big difference between placing a story in front of people and positioning people as active participants in a story" (Baerten 2020). Co-design bridges this difference from a passive and necessarily partial acceptance of messages to reflexive, energetic engagement; moving from the first to the second dimensions, transitional terminologies need to connect a current familiar approach with an unfamiliar environment. Artefacts are not only publicity materials promoting health education but can also be co-creative materials such as probes, toolkits and prototypes to communicate through processes and activities. Chinese HPH implementers have already considered the format of publicity materials should be linked with the places where materials are positioned. The format can be a pointcut[20] to introduce the significance of makerspaces where users engage in various co-production practices by sharing tools, knowledge and skills (Gershenfeld 2005; Gauntlett 2010; Seravalli and Eriksen 2017). The second dimensions improve participation across HPH users, leading

[20] A set of join-points in logic.

to nuanced, heterogeneous approaches tailored to diversity – a change from standard implementation (Valentine et al 2017).

8.5.3 Strategic dimension – design as a strategy to build HPH culture systemically

The third dimensions encapsulate design as strategy, building HPH culture into systems. Co-creation and infrastructure connect the second practical with the third strategic dimension. Co-creation doesn't only build connections with a diversity of beneficiaries (Robert et al 2021), but, importantly, builds networks connecting communities which together tackle the wicked problem of disengagement. Community is as slippery a concept as culture, defined variously as physical, political, psychological, historical, linguistic, economic, cultural, and spiritual spaces (Sangiorgi 2011), yet individuals' HP behaviour and lifestyle and illness prevention are rooted in community and meaningful healthcare requires community participation (Blumenthal and Yancey 2004). Community scale intervention and community co-creation education (Heimburg et al 2021) are now well-targeted practices: healthcare services in the UK / EU have shifted towards community-based solutions (Design Council 2021). If HPH can be defined as a wicked problem because of the diversity and complexity of social determinants, community co-creation might effectively generate inclusive, sustainably situated solutions, tackling wickedness.

One literature review finding suggests that HPH cannot be separated from its variety of settings[21]. The co-settings strategy (see 7.2) means HPH as it connects across settings seeks collaborative space within communities. This is where people actively use and shape their environment, creating or solving health problems. Settings normally are identified as having

[21] Healthy settings (WHO, 2022) include cities, villages, municipalities and communities, health promoting schools, workplaces, markets, homes, islands, hospitals, prisons, universities and healthy ageing.

physical boundaries but can also be people with defined roles, existing within organisational structures (WHO 2021). Therefore infrastructure (Bjögvinsson, Ehn and Hillgren 2012) isn't limited to the physical but also can be virtual (Scapolan and Mattarelli 2020; Toivonen, Idoko and Sørensen 2020): institutional and organisational settings (North 2012) are complementary to an extent.

To run HPH practice sustainably, hospitals need this complementarity such that a supportive environment of space, infrastructure, organisational culture (Cornwall 2008), creative leadership (Mainemeliset et al 2015) and capacity building (van der Bijl-Brouwer 2017) can be sustained. The concept seems widely accepted.

> Health is about creating healthy and environmentally sustainable environments where people feel included and which promote activity and connection. It is about supporting communities and social networks to come together to help each other. It is about dealing with increased demand with fewer public sector resources in an entirely different way. (The Design Council 2021)

This corresponds with my third strategic dimension. The designerly way of knowing the HPH framework provides a comprehensive conceptual epistemology.

8.5.4: Transitional strategy in this framework

Clearly there are two transitional threads (see Figure 78: specifically the directional arrows): the first is *artefacts*, traditional publicity materials at layer one, then *probes, toolkits, prototypes* in layer two. These artefacts and learning materials enhance *co-creation activity*, which contribute to building a creative community in layer three.

Within the second thread are *places* where HPH may be launched in layer one allowing them to imagine where *makerspaces* can be built in layer two. This sustains the *infrastructure* in layer three, a long-term foundation of HPH cultural capacity and leadership. These two threads are derived from transitional thinking (see Figure 68). The difference is the first internal reflection process (Figure 68) triggers the second (Figure 78) as external clarification for knowledge diffusion.

In terms of transition design communication strategy, clear keywords would help Chinese HPH organisations to understand progressively, moving from layer one to two, ending at the strategic dimension of layer three based in evolved understandings, achieving an effective transition. When designers enter a non-design field, transition must enhance mutual understanding. Therefore, it is important to choose applicable terminologies fitting an audience's understanding, transmitting understandings into those imaginative layers where designers' work can be effective. Figures 68 and 78 illustrate the transitional design method I developed. Since transitional design is an emergent field, it is hoped this strategy can fill the gap in design methodology, helping designers communicate transformation more effectively.

8.6 Practice process map – a designerly way of conducting HPH

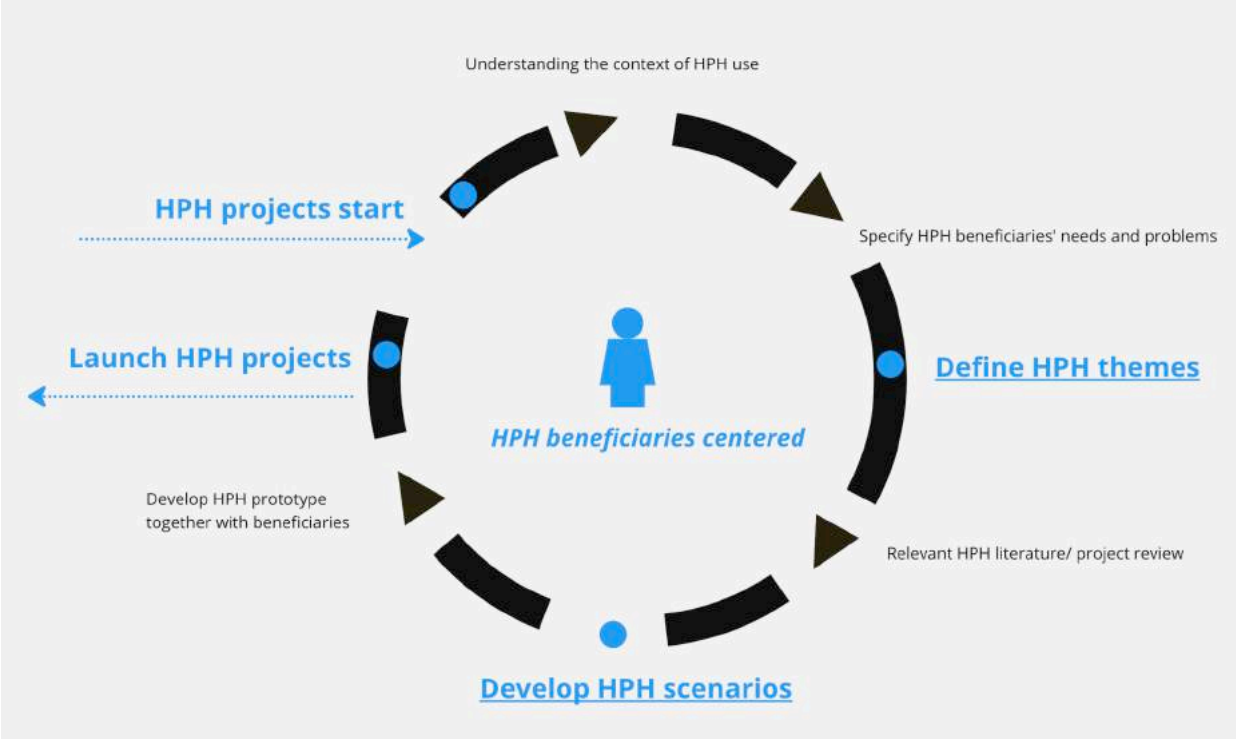


Figure 79: Practice process map – designerly way of conducting HPH

The designerly way of *conducting* HPH (see Figure 79) changes from a top-down, linear process – focussed on themes / solutions – into an interactive, organic approach centred on HPH beneficiaries. Research is needed to understand the contexts of specific HPH uses, specifying beneficiaries' needs and problems before going on to design. The traditional Chinese HPH approach defines ideas and implements policies without initial exploration (Tian 2013). Identifying ideas organically may address deeper problems (van der Bihjl-Brouwer 2016): initial identification can be both uncertain and turbulent yet also creative, allowing HPH teams to explore themes unknown at a project's inception. A rolling HPH literature review is therefore vital to the process of assessing scenarios and solutions. For instance, to improve local interaction – citizen engagement – before building creative

HPH autonomy. Enabling people to design and navigate their own experiences, services, tools and artefacts lies at the core of HP activity: HPH beneficiaries seek the most appropriate self-propelled learning approaches. Finally, the development of HPH prototypes hand-in-hand with beneficiaries is necessary before the HPH projects launch into wider communities. Such prototyping is invaluable to test whether duplication in other similar contexts or communities is feasible.

8.7 The main ingredients for a designerly way of conceptualising HPH

Figure 80: Main ingredients of a designerly way to conceptualise HPH

I have characterised Chinese HPH design thinking (see 8.4.3), particularly identifying how Chinese HPH organisations may easily find themselves neglected because of their current approach: Figure 80 suggests recipe whose ingredients may be broken down as:

- *Who* are key HPH beneficiaries (用户);
- *How* the pathways for engagement with the learning process (参与) way include more diverse groups as HPH participants;
- *What* are beneficiaries' behaviour, problems and needs (主题), and
- *Where* HPH approaches and methods of implementation may be situated (方针).

The four characters (用，参，主，方) signify the main ingredients of a recipe and are effective homophones making them more easily disseminated (see Figure 8.9).

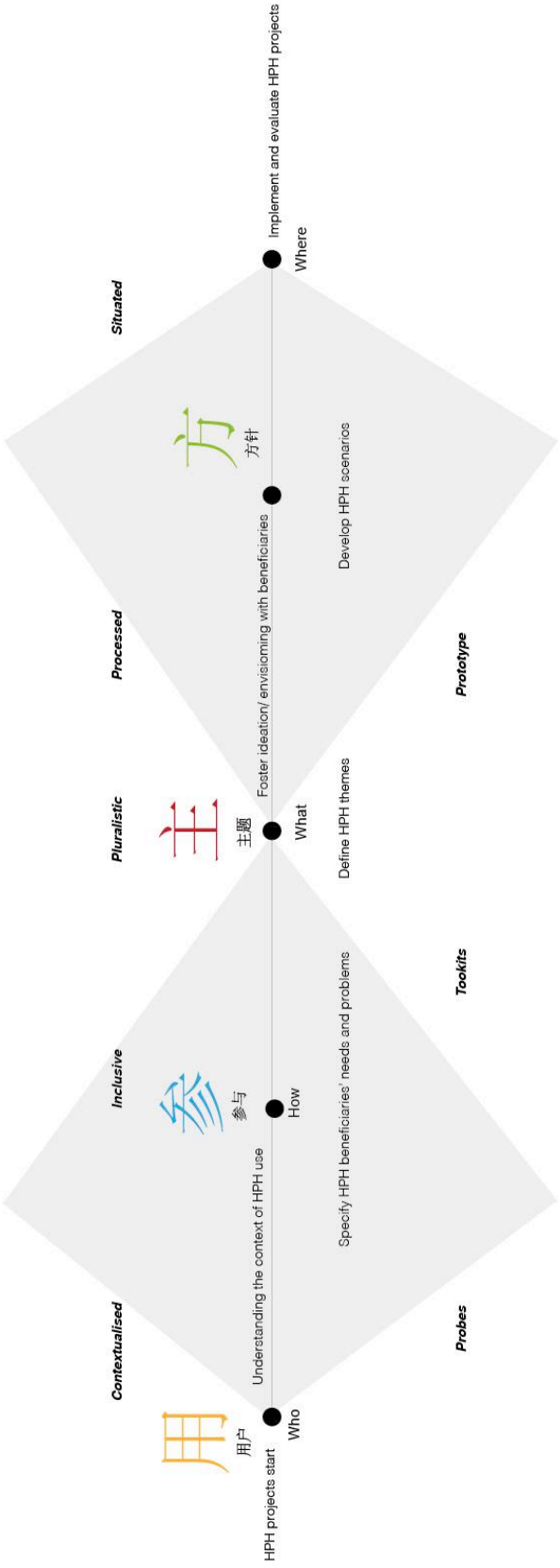


Figure 81: Research process map – designerly way of conducting HPH

Figure 81 (drawing on Figures 78, 79 and 80) projects the key ingredients of Figure 80 back into Figure 79, while displaying different stage probes, toolkits and prototypes. Methodology using probes (Gaver, Dunne and Pacenti 1999) helps specify the social and cultural contexts where HPH projects can start, producing multiple, rich, engaging and inspirational responses (Gaver et al 2004). Toolkits – setting up self-learning materials during co-creation – encourage local interaction and citizen engagement. Repeated prototypes test and improve usability after developing HPH scenarios (Sanders and Stappers 2014).

8.8 Summary

This chapter has examined the literature on design thinking linked to so-called "wicked" problems, visually summarised in three dimensions:

- Design thinking *epistemology* (see 8.4.1);
- Design thinking *process* (see 8.4.2), and
- Design thinking *mindsets* / *methods* / *principles* (see 8.4.3).

A comprehensive scaffolding design framework for Chinese HPH has been developed drawing on non-Chinese experiences while, nevertheless, remaining relevant. These designerly ways of *knowing* (see 8.5.1), *doing* (see 8.5.2) and *thinking* (see 8.5.3) generate heuristics helping formulate my design frameworks.

As for to solving wicked problems, there are paths of enquiry and possible solutions. Wickedness being what it is, there are no optimal solutions. There need to be specific determinations that unpick wicked problems and offer solutions without reductionist thinking.

There must be consideration of the unique HPH / designerly interface in context, scope, perspective and latitude (Xin 2020).

These semi-structured, open-ended design frameworks encourage an exploration of the potential of Chinese HPH in more contextualised, inclusive, pluralistic, processed and situated ways. Referring to the second transition (see Figure 72) there is a focus shift in organisational design away from designers towards designing (Junginger and Bailey 2017), from hiring designers to training everyone into a design mindset. This is a crucial shift from designing *for* them, to designing *with* them so they may *design themselves*, in both senses. Manzini (2015) believes the design mode can be stimulated and cultivated like any other talent. In other words, design can be used by non-designers if they can understand the nature of design and be encouraged to nurture design capability (Cross 1990). These frameworks hopefully project an appropriate conceptualisation of design thinking into the Chinese HPH field.

Chapter 9 Reflective review

9.1 Introduction

This chapter uses my designed HPH frameworks to reflect on my previous action research: the practice review (see 2.2.3), field trip (see chapter 5) and case studies (see chapters 4 and 6). It also considers the WHO Guidelines (1986), which help explain my second research question: how design as a practice may cover all aspects of structured recommendations and provide corresponding implementations. The chapter evokes my entire PhD journey and projects future work through reflections. In terms of the relationship between such critical reflections and action, there are three types of reflective theory:

- Reflection-in-action;
- Reflection-on-action (Schön 1983), and
- Reflection-for-action (Cowan 1998).

Based on Kolb's experiential learning cycle (see Figure 82), King (2002) combines this with another cycle of "Reflection-in-action – Reflection-on-action – Reflection-for-action" (see Figure 83).

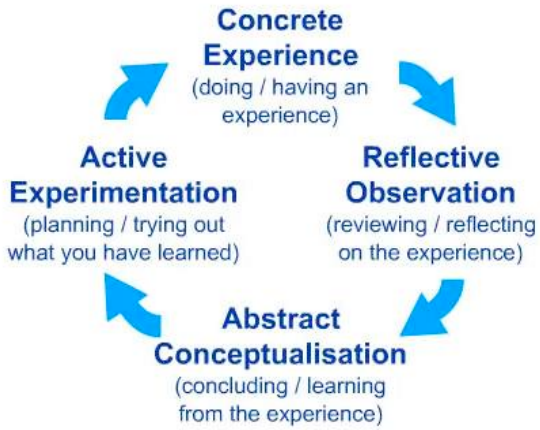


Figure 82: The Experiential Learning Cycle (Kolb 1984)

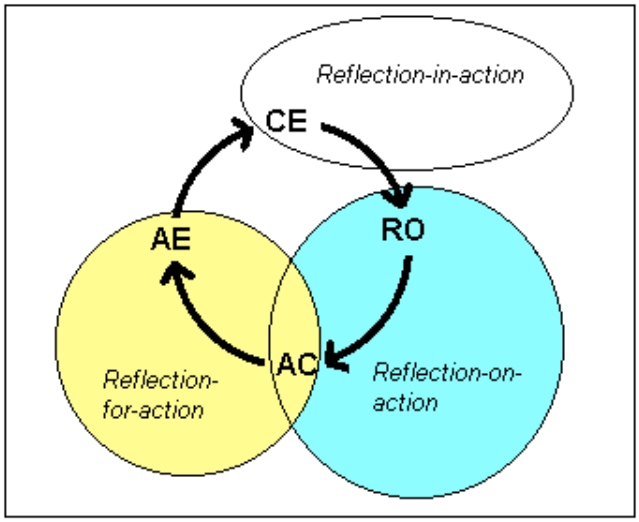


Figure 83: Assigning types of reflection to Kolb's Learning Cycle (King 2002)

Using the insights these theoretical models help build, I can effectively explore the extent and directionality of my research journey's reflections and reviews. These practice reviews fit King's (2002) reflection model at key process moments (see Figure 84).

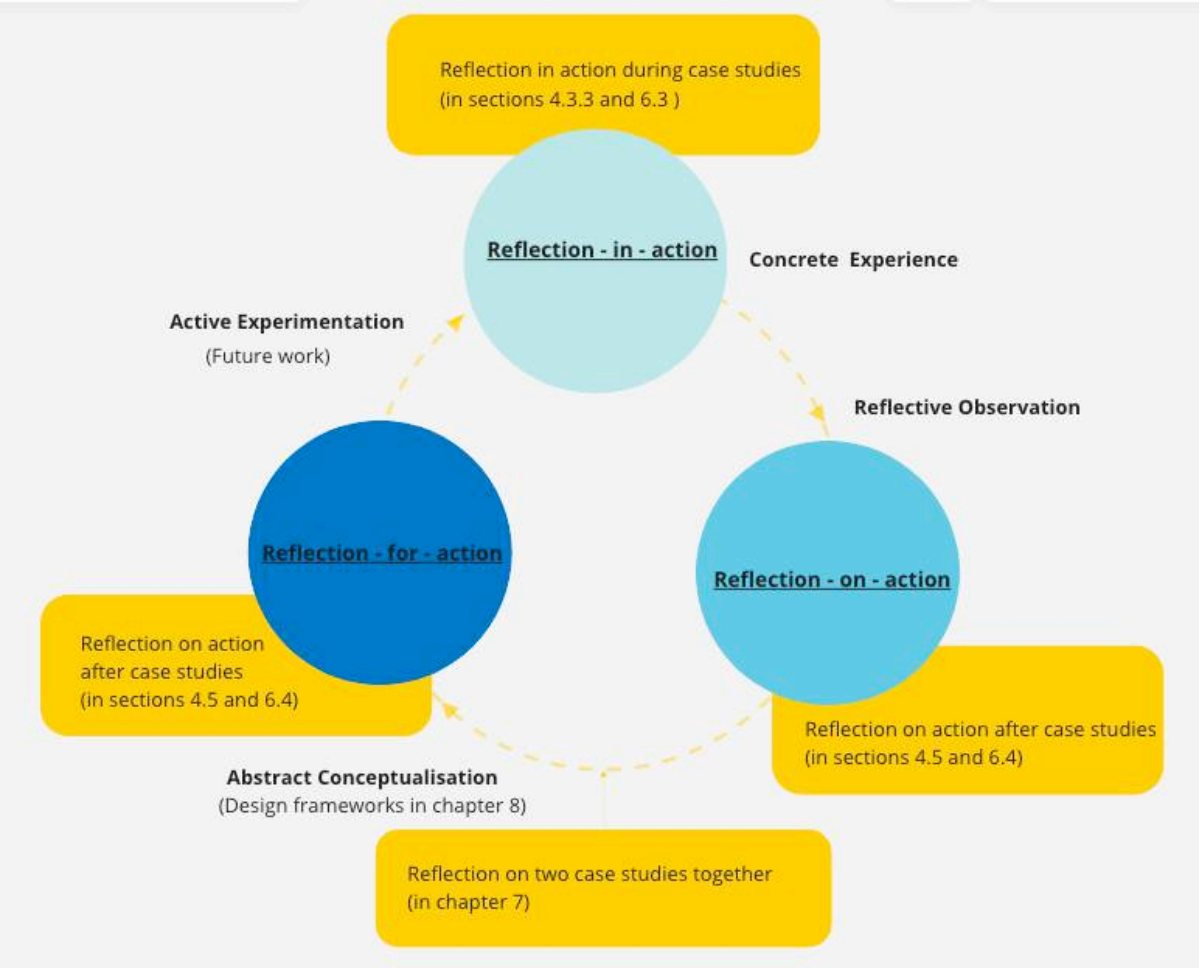


Figure 84: Review of my Practice Reviews (2021) based on King's Assigning Types of Reflection model (2002) and Kolb's Experiential Learning Cycle model (1984)

Reflection-in-action is essential, especially for flexible design research, determining and influencing stages of the research process and methodology. In case study one (see 4.3.3), reflecting low literates' behaviour helped shift the priming methods when no participation at the beginning of the workshop, asking their daily activities relating the time concept motivated their participation and proceeded the workshop. In case study two, parents' feedback and reflecting students' previous performance after each session allowed us to prepare various materials for the following sections.

Reflection-on-action reflects better initial levels of design, immediately after the case studies were finished. Reflection after case study one (see 4.5) addressed bottom-up strategy, building the network with CNEC. Reflection after case study two (see 6.4) reviewed the development of co-creation, emphasised the "co-values" of co-design practice. Due to the short period of reflection, these practice reviews were mainly given over to recording, then writing-up process and methodology, adding quick reflective notes based on previous knowledge and experience that helped recall the memories of the practice itself.

The process appears to prove what Dewey (1933) insists, that reflection is both complex and takes time to do well. The second reflection-on-action is comparative reflection on both case studies (see chapter 7), which accelerated the emergence of the design frameworks for Chinese HPH. These can be seen as synthesised "abstract conceptualisation" (Kolb 1984), and offer evaluation criteria reflecting on my case studies, field trips and even my whole PhD journey. Therefore, this chapter fits "reflection-for-action".

9.2 Reflection on practice review, field trip and case studies

Based on one of my design frameworks – the designerly way of knowing HPH (see Figure 78) – my self-reflection operates across three dimensions: the physical, the practical and the strategic. After my "designerly way of knowing HPH" framework was delivered, I used it as a checklist to consider to what extent those Chinese hospitals delivered on each dimension (see Figure 85). These lists are from my practice literature review – completed in 2018 – the field trip and site visit – experienced in 2019 – and my case studies – completed between 2018 and 2019.

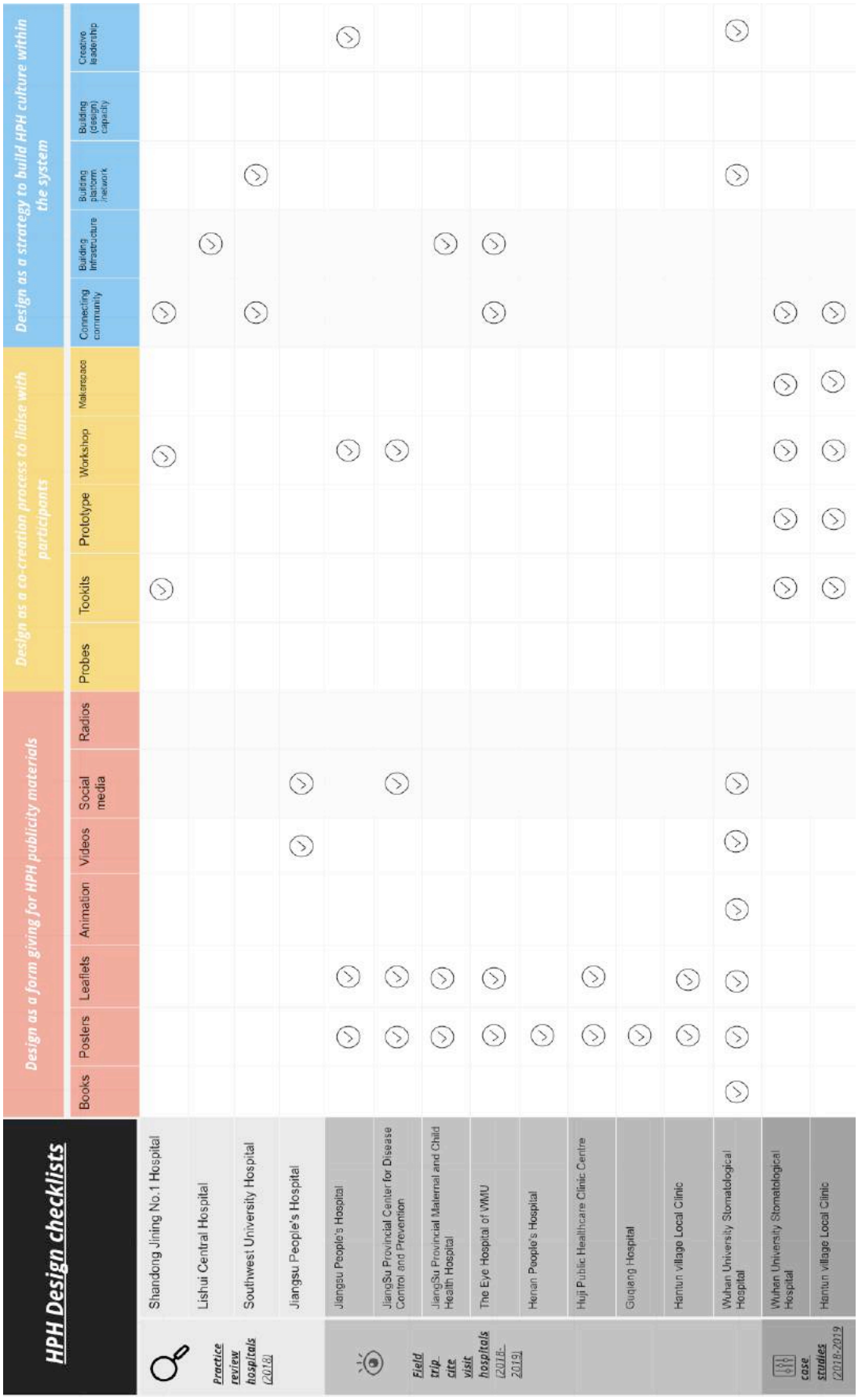
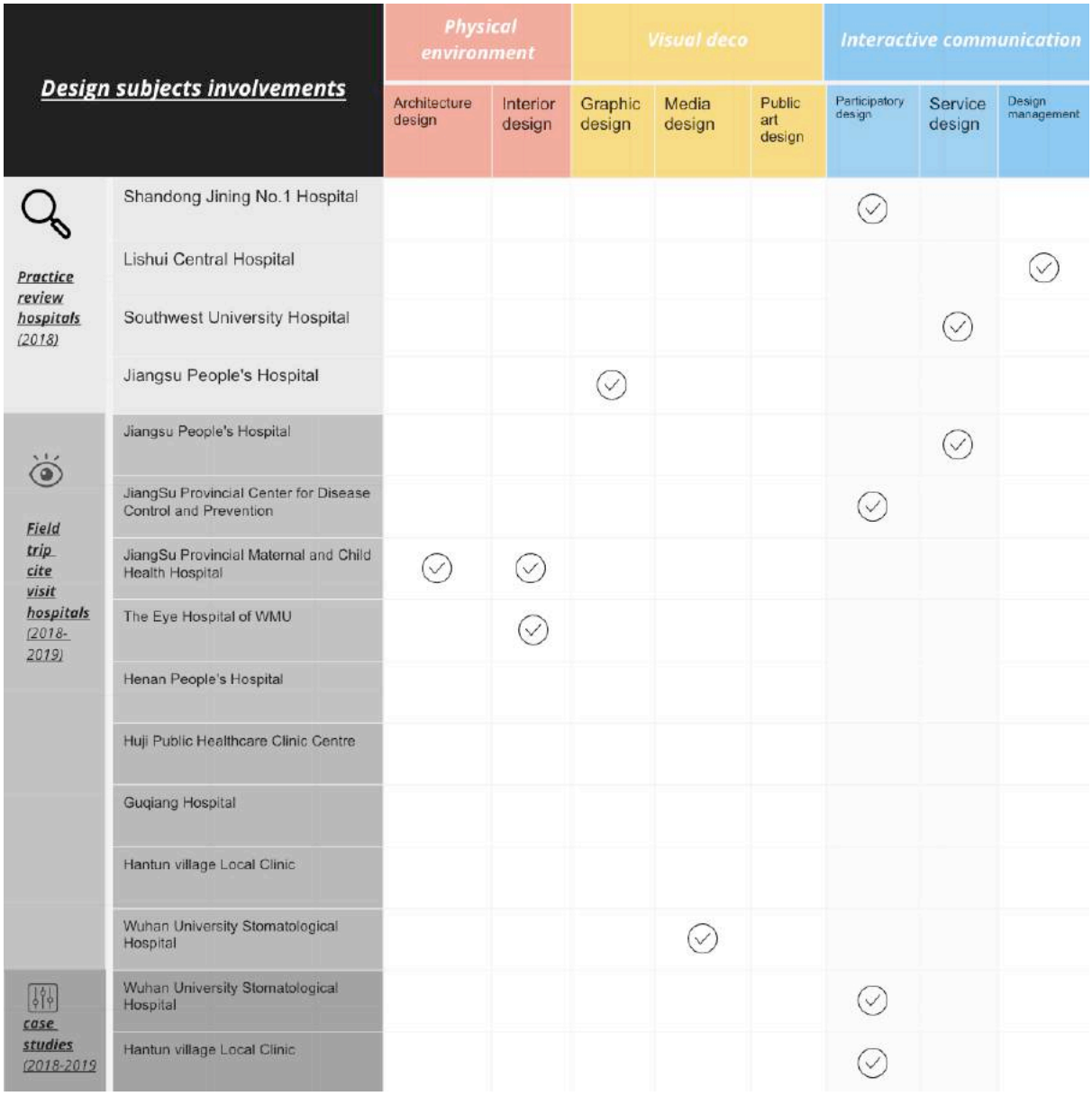


Figure 85: Self-reflection based on the "designerly way of knowing HPH" framework

Generally, hospitals from the practice review cover the second practical and third strategic dimensions, while those hospitals from my field and site visits remain primarily within the first practical dimension. My case studies were more precisely focused within the second practical dimension. This process of self-reflection might not be immediately understood, partly because of differing attributes, focal points and contexts between the literature review – reading, site visit – *seeing*, and case studies – *doing*. Specifically, what I analysed in the practice literature review was the report of the NHCC (2020): the perspective of this government organisation focuses on an overarching strategy to promote good practice. Secondly, when I visited hospitals during my field trip – though practical and strategic levels can be sensed from my interviews, informal-seminars and exhibitions – generally the physical dimension was still easier to detect: physical products are more analytically accessible compared with the abstract second and third dimensions. Thirdly, my case studies place greater emphasis on the co-creation process with participants, which with its attribute of practice easily fits the second dimension. These three dimensions are complementary: one is not given a greater priority. The resulting design framework acts as a comprehensive checklist to reflect HPH practices and actions, based on my understanding – which, I admit, might mean a level of personal bias. Nevertheless, Chinese HPH could use this to avoid partial understanding and poor implementation.



Design subjects involvements		Physical environment		Visual deco			Interactive communication		
		Architecture design	Interior design	Graphic design	Media design	Public art design	Participatory design	Service design	Design management
Practice review hospitals (2018)	Shandong Jining No.1 Hospital						✓		
	Lishui Central Hospital								✓
	Southwest University Hospital							✓	
	Jiangsu People's Hospital			✓					
Field trip cite visit hospitals (2018-2019)	Jiangsu People's Hospital							✓	
	JiangSu Provincial Center for Disease Control and Prevention						✓		
	JiangSu Provincial Maternal and Child Health Hospital	✓	✓						
	The Eye Hospital of WMU		✓						
	Henan People's Hospital								
	Huji Public Healthcare Clinic Centre								
	Guqiang Hospital								
	Hantun village Local Clinic								
	Wuhan University Stomatological Hospital				✓				
case studies (2018-2019	Wuhan University Stomatological Hospital						✓		
	Hantun village Local Clinic						✓		

Figure 86: Design subjects involvement checklist

Figure 86 displays a checklist of design / subject involvements, reflecting on hospitals through the lenses of my literature review, field trip and case studies. Compared with the data in figure 85, the involvement of design subjects is easier to track and understand from reading, seeing, hearing and doing as I progressed through the literature review, field trip and case studies. Having design subjects directly involved does not, however, mean hospital professionals understand design as do design experts. Design activity can happen without full

understanding or design cognition but with the lead of a comprehensive design epistemology, design activity and implementation can be thoughtful, diversified and pluralistic.

9.3 Reflection on the WHO (1986) guidelines

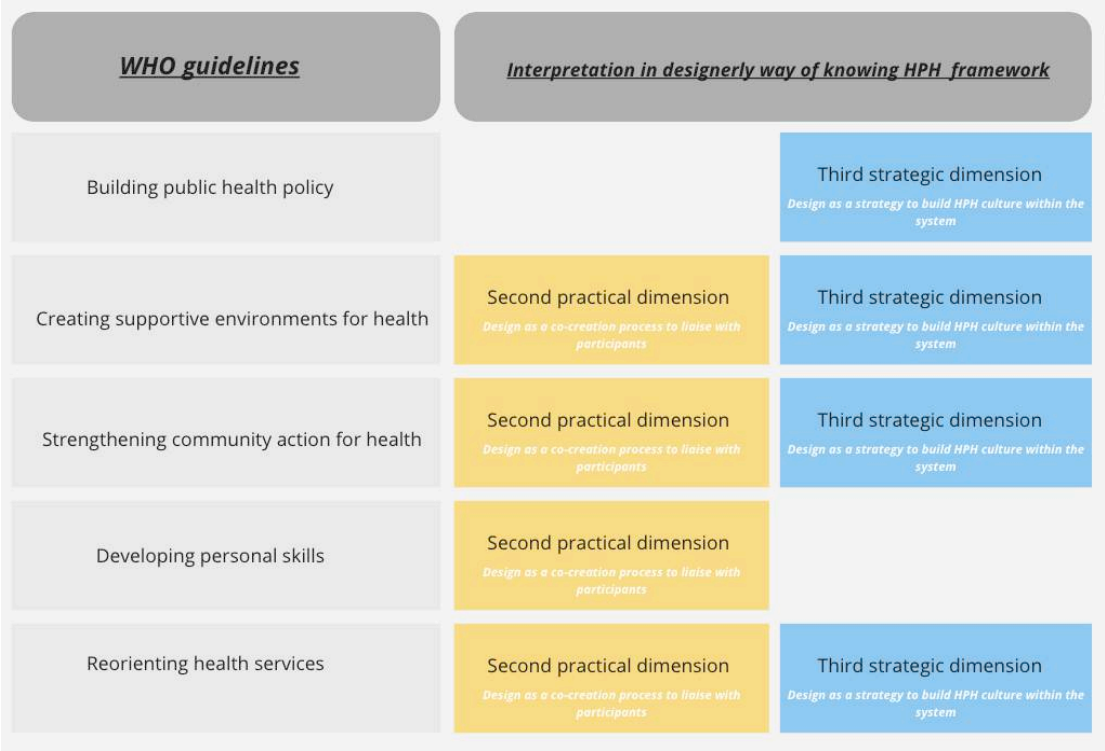


Figure 87: WHO guidelines interpreting in designerly way of knowing HPH framework

The WHO guidelines in the context of my design framework (see Figure 87) help identify how action areas interpret my "designerly way of knowing HPH" (Figure 73). Building public health policy occupies a strategic dimension. Creating supportive environments for health, strengthening community action for health and reorienting health services should be interpreted as occupying both practical and strategic dimensions. Developing personal skills can be addressed within the practical dimension.

Looking back at interviews with HPH staff in Chinese hospitals during my field trip, some professionals complained they still didn't have any clear understanding of what HPH was or how it might be implemented. The reason for this lack of clarity may be that HPH policy guidelines are abstract while professionals are still trained in traditional treatment-centred healthcare. Figure 87 shows how a design framework expands the WHO concept of HPH from an abstract to a concrete implementation using research tools, suggesting how design might interface with a hospital culture, shifting it from a treatment-centred to a more dynamic social health-centred approach.

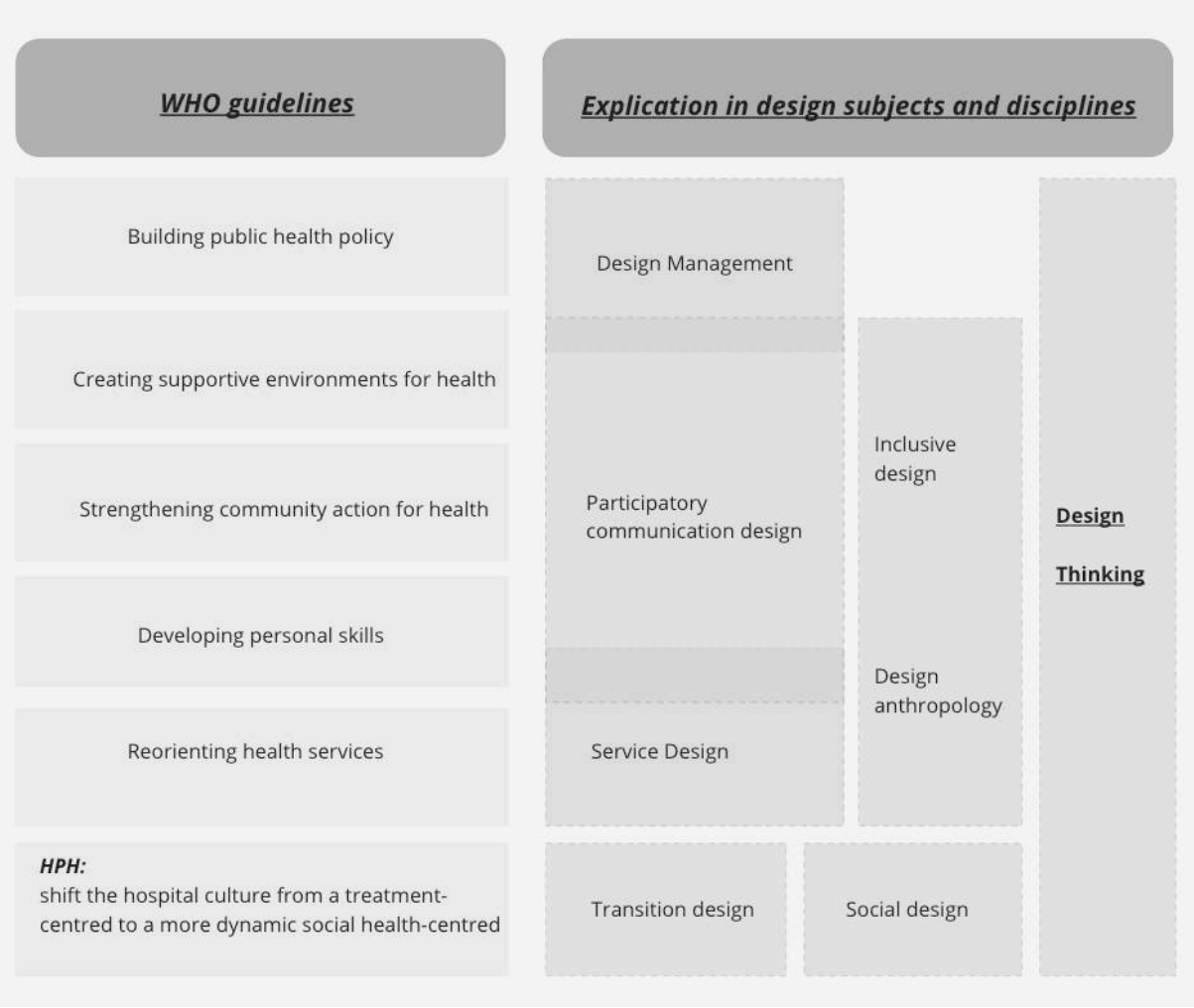


Figure 88: Design subjects and disciplines and the WHO (1986) guidelines

Figure 88 illustrates how each WHO guideline can be interpreted across different design disciplines. Participatory communication design with inclusive design and design anthropology can, in all likelihood, create supportive health environments, strengthen community health action, help to develop personal skills and reorient health services. Design management together with creative leadership can contribute to building public health policy and creating supportive environments for health. Service design can address developing personal skills and reorienting health services. Considering the motivation of HPH is shifting hospital culture towards a more dynamic social health-centred approach, transitional and social design can target and inform this metamorphosis. Clearly, these design disciplines are intertwined at different levels and stages. Design thinking can be an overarching structure across all five actions of the WHO guidelines. This reflection indicates that a "designerly" approach can deliver HPH and while it is not the only solution it does answer research question two: providing evidence that design methodology can support those actions proposed by WHO.

9.4 Reflection on the processes of systemic change promoted by my PhD

In terms of systemic changes, Body and Terrey (2019: 54) define three types through co-design:

- *Developmental change* – improving performance of an existing system;
- *Transitional change* – transitioning to new processes or technological platforms while maintaining the inherent structure of an existing system, and
- *Transformational change* – a change to the underlying strategic intent of a system.

I propose my PhD journey reflects systemic change as a researcher, and mapped onto each of the three types as follows.

1. Two case studies (chapters 4 and 6) act as developmental changes with PCD underpinned by materials and tools. Design activities lead to participants' health behavioural changes accomplished through practice.
2. Design frameworks (chapter 8) encourage transitional change, from previous to new organisational and community behaviour through diffusion. One PhD research aim was to facilitate such change.
3. My PhD recognises that incremental transformational change is ideal, from group – organisational and community – to wider social change. Socially innovative initiatives through creative autonomy may still face considerable challenges within the Chinese healthcare system and, while social innovation conditions may not yet be ripe, there is one advantage I discovered from my first case study: the harmonious connections of local communities especially at their grassroots. Whether this is what remains of Mao's ideology from 1958 to 1983 (Spence 1983), connectedness of the local community may well be why social innovation through participatory design as process is possible.

These three changes indicate how my research journey target widens, from the micro to the macro. In terms of social innovation design, this research is not social design and doesn't achieve social innovation through design. Case studies in redistribution of local resources may lead to localised changes, then fan out on a larger scale of metamorphoses in different environments. Design research can accelerate and direct such processes (Manazini 2015) and, though this is not a social design PhD, my personal theoretical construction process illustrates

how to connect local initiatives and encourage participatory conversation: a direct contribution to the PCD field I developed.

9.5 Reflections on social innovation and design in the public sector

Though this research is not mainly focused on social innovation design, this section briefly explains my ideas concerning how to improve design thinking in the Chinese public sector in the context of social innovation. If social innovation can be defined as "the process of developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress" (Soule, Malhotra and Clavier 2023), then HPH can be seen as one example of attempting to achieve such progress in terms of health innovation. Social health innovation needs group collaboration, requiring awareness of responsibility and corresponding to a deepening of civil society. Chinese politics has frequently emphasised transformation from material civilisation (物质文明) to intellectual civilisation (精神文明): an advantage for social design in China. Reflecting on my research journey, three suggestions are proposed to boost design engagement and social health innovation in China.

1. Design thinking should be circulated in different sectors through a more transferable and applicable grassroots approach. This might allow social innovation to emerge in a bottom-up strategy. It is worth noting that design thinking should respond contextually – the design researcher's job is to select the strategy corresponding to overall philosophy: the appropriate can only be ascertained after field experiments.

2. Design education in China needs to encourage more social designers. Ideally, every design subject can add a social design and design thinking methodology, sensitising more graduates to social health issues.
3. Public leaders, civil servants and their teams need design backgrounds to inform a wider engagement. This can be achieved by hiring designers or providing training.

9.6 Reflections on future challenges and opportunities in health design

There is still a way to go until HP penetrates hospital organisational culture (Johnson and Baum 2001). Jones (2014) underlines the values of both design and designer in healthcare, as communicators and connectors, detectives, and problem solvers: yet he sees the challenges facing design in the healthcare field. In fact, design challenges are universal and need to be identified project by project (ku and Luoton, 2022). By positioning this research as *design* to *healthcare* research, it can build awareness of design in Chinese healthcare. The knowledge I developed in terms of the design thinking strategy, PCD and transitional communication skills, will contribute to new approaches to tackle future challenges, enhancing the academic and practical disciplines in synergy.

Considering the long-term challenges facing HPH, health design as a transdisciplinary course between design and public health education could offer one solution. Health design thinking can be built through a studio-based curriculum (ibid 2022) and has been taught in both undergraduate and graduate programmes (Noël and Frascara 2016: 34 – 38).[22] China only has a few centres offering health design research, such as the Healthcare Service Innovation Design Research Centre at Tsinghua University and the Inclusive Design Research Centre at

[22] One example is the Master of Research Healthcare and Design at the RCA.

Tongji University: there is no dedicated course yet. The development of health design education would create common ground, break down barriers, improve mutual communication between disciplines and target complex issues in healthcare (ibid 2016). A transdisciplinary course would diffuse design thinking into healthcare.

9.7 Reflections on design permeation into non-design disciplines

This PhD is focussed on design in the HPH field. It heartens me to imagine the integration of design thinking into other disciplines and, though not the purpose of my research, this transdisciplinary reflection offers benefits to be utilised in future work, both my own and other researchers'. Tonkinwise (2015: 5) describes three approaches where designers work with other disciplines on corporate projects:

1. The designer works as a team member offering suggestions, while the project and wider team are still dominated by non-design experts.
2. The designer works as a "process enabler". Though the project itself is not considered a design project, design is a coordinating point for the team leading to innovation.
3. The project runs in designerly ways with or without designers on the team. This allows leadership to understand and harness design thinking. Based on the field trip, my finding is that Chinese healthcare organisations use design mainly at early stages.

My two case studies suggest a designer works as a "process enabler" facilitating the project. However, my framework works towards stage three: running HPH in a *designerly way of doing,* with or without designers.

Apart from the main design permutation – *design in the HPH field* – another permutation was projected from my case study 2: might art design combine subjects in a trans- or interdisciplinary way, becoming a new alternative curriculum in Chinese elementary school education? Design being a part of everyone's foundational education – as a third academic discourse apart from the sciences and humanities – is already a reality in some countries. The 1960 National Curriculum for primary and lower secondary schools in Norway included art, architecture, design and visual communication, training students to become creative problem solvers and critical consumers (Nielsen 2013). In North America, research studies have applied design thinking at primary (Noel and Liu 2017) and secondary schools (Aflatoony and Wakkary 2015), exploring how design education can be transferred to other courses and mainstream education helping meet the challenges of twenty-first century pedagogy.

When it comes to design permeating other disciplines, design thinking can be an essential communication strategy (Plattnner et al 2010). Clearly, design thinking has different connotations for different disciplines, and designers are well-positioned to build comprehensive, heuristic methodologies. Working across disciplines as communication designers means understanding where such junctions may lie. Investigating how other fields of research understand then implement design is as important as understanding how designers work across disciplines. Relationships can change over time as designers involve themselves, discover the extent of permeation at which stage of design engagement. Identifying, selecting, then implementing the junction and attendant communication strategy from the design toolbox allows non-design fields to acknowledge and accept design more readily, based on context. This strategy will certainly guide me as I conduct further cooperative research in the future.

9.8 Summary

This chapter primarily generates reflective analysis then synthesis following the completion of the case studies and design frameworks. These reflections act very much as self-evaluations, to help build an overarching comparison among practice reviews – what I read – field trips – what I saw – and case studies – what I did. The details and specific criteria in the x axes of figures 84, 85, 86 are more likely sub-solutions corresponding with sub-problems (Archer 1965). To some extent, they indicate how far and how satisfactorily the research questions have been answered through this research. Using frameworks that reflect on and utilise the WHO (1986) guidelines can, secondly, be seen as evidence of my *contribution to theory*: how my research outcome has expanded the theoretical guidance, moving from the initial WHO perspective towards a practical framework fitting the Chinese context. This visual practical framework is designed for Chinese HPHs to understand and contains a comprehensive HPH programme with process and methods. Maintaining clarity allows these hospitals to assess actions based on readily derived checklists. This level of conceptual and procedural clarity is one of the research contributions (others are mentioned in chapter 10).

After due reflection that generated changes to my PhD narrative (see 9.4), key topics emerged:

1. How to accelerate design thinking in Chinese public sectors (see 9.5);
2. How communication design contributes to the fertile debate between design and non-design fields (see 9.6).

In terms of transdisciplinary education, design education entering Chinese elementary education (see 9.7) and the urgency of developing a health design course in Chinese higher education (see 9.6) stand out as important for further exploration and testing.

Chapter 10: Conclusion

The final chapter examines the extent to which the research questions have been answered, suggesting what my research contributes to design and healthcare knowledge and describing both limitations and possible future areas for exploration.

10.1 Answering the research questions

Figure 89 describes how and where the ancillary questions were answered before the key research questions.

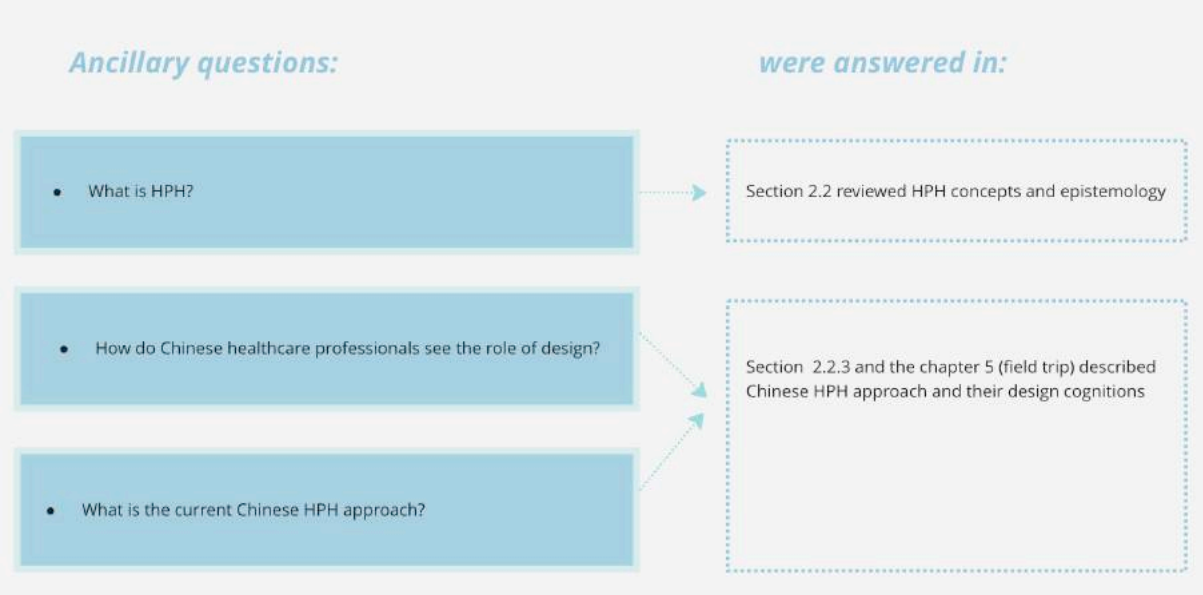


Figure 89: Answering ancillary questions

The first research question – how can design thinking create a supportive, sustained and creative community setting for Chinese HPH? – has been answered in:

- **Six "ifs" in literature review (Figure 11)**

  The connections between HPH and design show the potential of design subjects and how can support HPH.

- **Case studies (chapters 4 and 6)**

  These case studies prove that PCD methods can create a supportive and creative community setting. Case study one demonstrates how a bottom-up grassroots strategy can support local HPH. Case study two verifies that co-creation through partnerships can form creative HPH communities.

- **Reflection on case studies (chapter 7)**

  Key themes emerged from reflections – in *focus group, co-settings, mutual learning, visual materials and prototyping* – and two transition threads (see Figure 68) further clarified how design-oriented practice contributes to creative HPH through transitional processing.

- **Design frameworks (chapter 8)**

  Frameworks – *designerly ways of knowing* (see Figure 78), *doing* (see Figure 79), *and thinking* (see Figures 80 and 81) HPH – offer supportive guidelines, platforms and relevant capacity as well as creative leadership and a sustained strategy for HPH.

The second research question – how can design thinking offer a more pragmatic framework extending from WHO theoretical guidance? – has been answered in:

- Reflection on the case studies (see 7.4) re-organisation of the sequence of WHO's (1986) five actions;
- Design frameworks (chapter 8) offer a practical guide from a design perspective, showing how to achieve HPH rather than only indicating what needs to be achieved from WHO's theoretical guidance.
- Reflections on WHO's (1986) guidelines (see 9.3) illustrate how my design framework (Figure 87) and design subjects and disciples (Figure 88) underpin WHO's five actions.

10.2 Contribution to knowledge

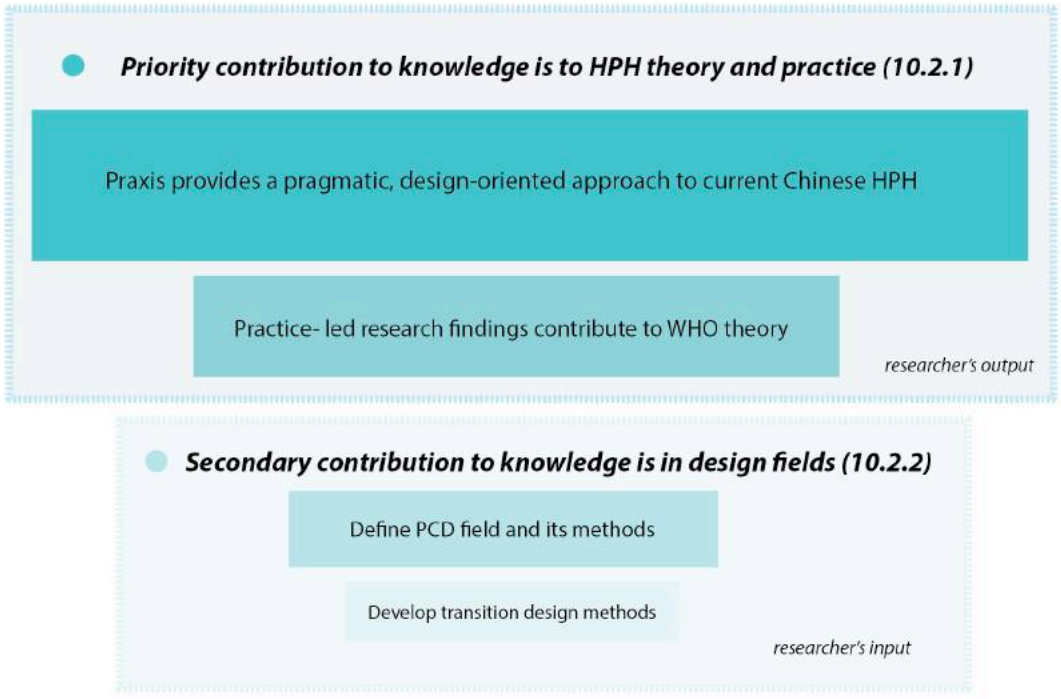


Figure 90: Overall contribution to knowledge

Figure 90 illustrates the overall hierarchical contribution to knowledge through this research. My main PhD contribution is to the current context of Chinese HPH practice and WHO theory (see 10.2.1), which is measured in terms of my *output* as a design researcher exploring HPH practice.

My secondary contribution to knowledge is within design fields (see 10.2.2). This can be considered my *input* – what I have gained from interdisciplinary research and the reconstruction of theory *through design* (see 10.2.3).

10.2.1 Contribution to knowledge within HPH discipline

A. Contribution to the field of Chinese HPH

Praxis demonstrates and provides an alternative, design-oriented approach to current Chinese HPH and my findings contribute to the unique and swiftly evolving patterns of Chinese HPH provision. Considering that, currently, the majority of Chinese HPH remains a top-down model as HP implementation that is standardised, text-based and without nuancing or contextualisation. This practice-led PhD research offers to Chinese HPH a pluralistic, situated, nuanced and inclusive process.

The case studies suggest Chinese HPH needs to draw on local contexts and the needs of specific groups, to investigate and generate a deeper understanding of local communitity' problems, behaviour and needs in terms of HPH before embarking on related projects.

PCD methodology in this action research might encourage Chinese HPH to shift from promoting health for people to promoting health with people. An HPH team needs to connect with its community, thereby improving local interaction and citizen engagement. The case studies also suggest that appropriate change from a passive approach – content-based HPH

communication – to an active approach – participatory, community-based programmes is required.

The visualised design frameworks – unlike other text-based theoretical guidelines – offer testable and intuitive, practical guidance for Chinese HPH. Considered as a way of transferring knowledge, hopefully these visually based frameworks can spread to wider audiences with different sets of needs.

Specifically, the first framework – A designerly way of knowing HPH (Figure 78) – offers a comprehensive typology of HPH: the physical, practical and strategic dimensions, visualising the design theoretical epistemology of HPH. This framework can provide a checklist for professionals to examine their current partial approach and help them understand the implications of full-scale provision.

The second framework – The practice process map of a designerly way of conducting HPH (Figure 79) – follows the contours of the HPH design process. It advocates a change from a top-down, linear communication process – where problems are linked simplistically with solutions – to a more reflective, interactive and organic approach. In that non-linear, organically integrated approach, preliminary research has defined themes, explored scenarios and developed community-based solutions.

The third framework – The main ingredients for a designerly way of conceptualising HPH (Figure 80) – is a recipe for the better diagnosis of healthcare provision problems and offers preliminary prognoses. It reminds professionals of those easily neglected pathways their current approach may not recognise or are recognised inappropriately or inadequately.

The fourth framework – The overall map of a designerly way of conducting HPH (Figure 81) – suggests a more contextualised, inclusive, pluralistic, processed and thus nuanced and situated HPH research approach. It also emphasises the importance of a variety of communication materials from probes and toolkits to prototypes at different co-creation stages. This research also proposes the possibility of creating HPH autonomy by setting up creative communities supporting local citizens, helping them learn HP knowledge that becomes mutually enriching. In turn, the research illustrates how hospitals might build connections to other settings, generating sustainable, local autonomies with and between hospitals, enabling people – professional or non-professional, doctor or patient – to design their personal HP learning experiences at their own pace, using appropriate tools, artefacts and methods.

B. Contribution to HPH theory

The theory of five actions of HP derived from WHO (Figure 70) are orientated top-down. Research findings from case study reflections (see 7.4) led to reordering five actions of HP through design scaffoldings (see Figure 71), providing an alternative and more democratic ordering of WHO's theoretical structure. It shows how design findings can pinpoint each action.

Furthermore, Figure 87 illustrates how my designerly way of interpreting an HPH framework underpins each action while broadly following WHO guidelines. Figure 88 lists different design disciplines contribution to each action. These further embody my practice-led design

research contribution to theory from a WHO perspective, making theoretical guidelines more practical and feasible through design interpretation.

10.2.2 Contribution to knowledge in design fields

A. Defining the PCD field and its methodologies

The definition of PCD (see Figure 9) as a theory integrating three fields – participatory design, communication design and communication theory – illustrates my inter-disciplinary contribution to both communication and participatory design. Other researchers have explored each discrete topic without considering PCD. The research joins discursive regions, closing the gap while developing PCD methods from other design subjects (Figure 12), drawing a communication approach staircase guiding participatory communication designers' practice (Figure 13). Whether PCD can be developed as an independent subject after existing as a transdisciplinary field, may be worth future reflection.

B. Development of transitional design methodologies

The second contribution to knowledge in design is expanding the transition design methodology, adding transition communication strategy during both the reflection and final knowledge delivery stages. Firstly, reflection (Figure 68) led to a progressive, transformational outcome (Figure 78), helping intangible elements integrate and form tangible – that is real, easily identifiable – connections, bringing tacit knowledge into the light. My strategy demonstrates that reflective methods – reflective *in*, *on* and *for* action – can

be utilised to evoke transitional design. Secondly, during the final knowledge delivery stage, transitional keywords from the frameworks (see 8.5.4) – as part of the key transactional communication strategy – were effectively transmitted so that other designers might advance both practice and theory. This gentle push from an existing system into unknown territory used transitional keywords as guides and corresponds to nudge theory (Thaler and Sunstein 2008), which expands transactional communication strategy. Transitional design communication strategy – produced in this research through communication design – fills in the design methods gap. Communication design can be expanded and made both more effective and resilient by adding a transition design strategy, suggesting pathways for delivery despite cognitive gaps between designers and the users they seek to serve.

10.2.3 Theoretic constructions using design

Markussen (2017: 95) classifies building theory through design research in three ways (see Figure 91):

1. **Extending** from existing theories;
2. **Scaffolding** – (re)-constructing a number of separate or side-by-side theories built from observations of the same phenomena, and
3. **Blending** – hybridising two or more theories generated by observations of different phenomena into an integrative whole, not derived from or interpreted by either single theory.

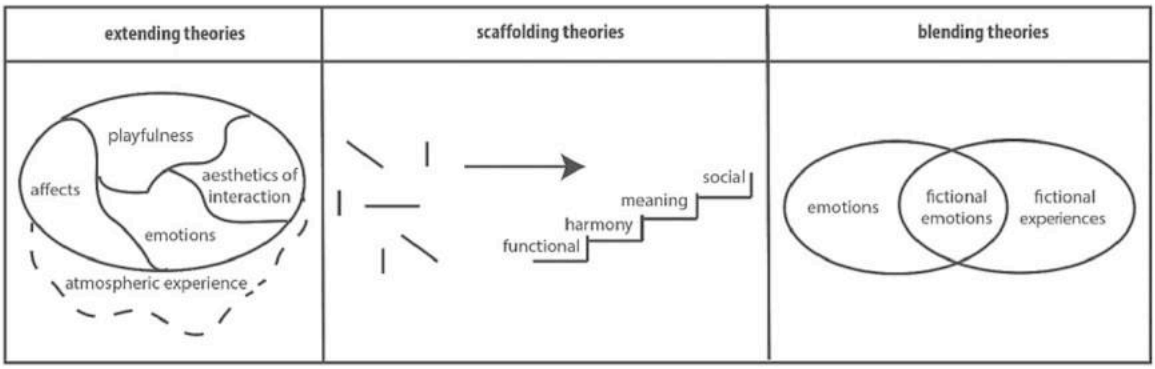


Figure 91: Three forms of theory construction through design (Markussen, 2017: 95)

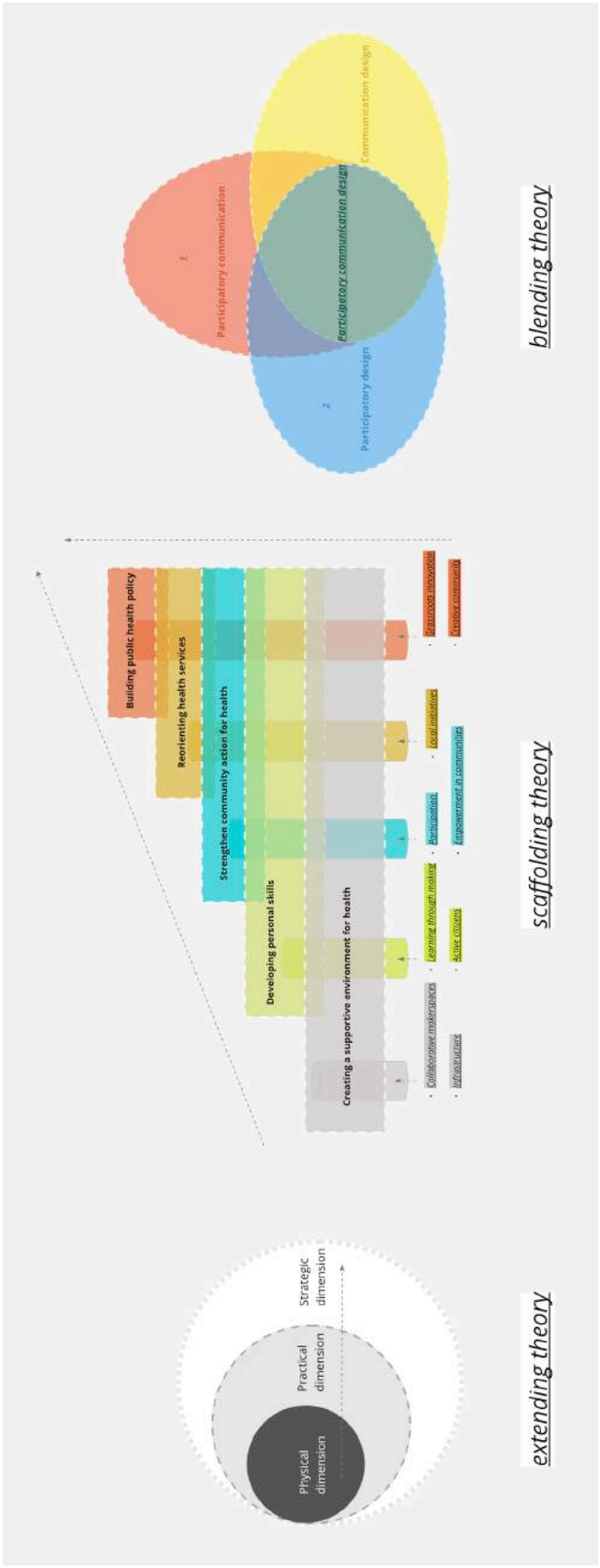


Figure 92: Theoretical constructions through design

Based on this process, Figure 92 illustrates my three different theoretical constructions through design. First, I suggest my design frameworks (chapter 8) extend theories of Chinese HPH, expand their cognitive and typological boundaries in terms of a *designerly* way of HPH, from a physical through to a practical then strategic dimension (Figure 78). Developing a transitional communication strategy extends the theory for transitional design methodology. Secondly, the reordering the sequence of HP's "five actions" through the case study reflection proposes how design subjects and disciplines fit the HPH guidelines (WHO 1986) (see Figure 71 and 87) and act as scaffolding theory. Finally, PCD (see Figure 9) is a blended, interdisciplinary discovery to benefit areas of research through mutual learning.

10.3 Limitations

The first limitation is clear from the literature review: there is a lack of relevant resources in terms of Chinese HPH studies from a design perspective. This could because design research in China is strongly commercialised, while social or predominantly non-commercial design research is still emerging and, therefore, scarce (Xin, 2020). There may be some excellent design oriented HPH projects, but they usually end without useful reflection and certainly without any writing up from an academic research perspective. This is not good for the circulation and enrichment of research-based knowledge, though changes in Chinese academic design research means the situation is improving (Cai 2022).

The second limitation is the quantity of the data collection and analysis from the Chapter 5 field trip- only focusing on Central and Eastern China. Access was generated by and through my identified gatekeepers: network connections and linked ethical considerations combined

with the fact that the hospitals were recognised as prominent HPH examples only from the CHEC perspective. Managers at these hospitals have, nevertheless, a better understanding of design due to the outstanding level of design education and promotion in their cities. Henan People's Hospital did not, however, fit this positive description. The main aim of this field trip was not collecting comprehensive data from across China, which is impossible to achieve. The three aims are made clear in 5.1: first to seek advanced examples of Chinese HPH practice and their design conceptualisations; second to seek partnerships for my second case study; and, third to build communication skills, empowering a designer's role within action research. These aims were all achieved and analysed in 5.4, 5.5 and 5.6.

Further to the second limitation is the fact that most people from these cities are ethnically Han Chinese. China has at least 56 nationalities (Ma 2007) with many different socio-cultural structures, institutional and organisational patterns and therefore lifestyles. This research did not include any Chinese minorities, even though it fosters focus groups that encourage bottom-up, identity-driven dynamics. My suggestion is, therefore, that HPH research needs to be more pluralistic and inclusive. Given the limitations of PhD research and the scale of Chinese HPH practice, I focussed on specific examples to determine gaps, those elements which Chinese HPH is missing. My research generalised from specific case studies and field trips to a general conclusion in an inductive process, with a next stage of deductive testing of frameworks in specific contexts to refine or criticise data. This generalisation again reflects the constraints of research: an observation not an excuse.

The final limitation is the restriction created by the COVID-19 epidemic, most markedly from the beginning of 2020. Despite the UK government's relaxation of restrictions in late 2022, China was still experiencing waves of strict regional lockdowns. This meant as I was in

the throes of my research many hospitals were not fully open to receive general patients or visitors. Chinese hospitals' role seems to have reversed from HP back to the earlier model of disease prevention. HPH intervention should be allied with changes in hospital management and policies (Hamidi et al 2021) and be fit to respond to health emergencies such as COVID. Evaluation of how HPH has been changed in China by the pandemic can only be done in future studies.

10.4 Future research

In the short-term, any further research building on elements of this PhD will, hopefully, be other design based HPH projects. These would increase access for minority groups in China, exploring the dynamic ethnic profile of a rapidly changing country (Zhang 2015). Such a data set expansion would test both my design frameworks and research findings.

Preparatory to completion of my PhD, I worked as a design researcher for one year, looking at how visual communication can contribute to hand hygiene messages on public sanitisers and encourage people to sanitise prompted by visual messages. [23] This research extended my knowledge from HPH into HP in UK public spaces, allowing me to consider how user centred messages and design appropriate health communication might be framed for different types of users. In the longer term, my intent is to develop research on how design improves healthcare services both inside and outside hospitals – beyond the HPH research subject area and Chinese context. My design research continues to contribute to the wider public sector and specifically to informing and encouraging the vision of social innovation in China, only in its infancy.

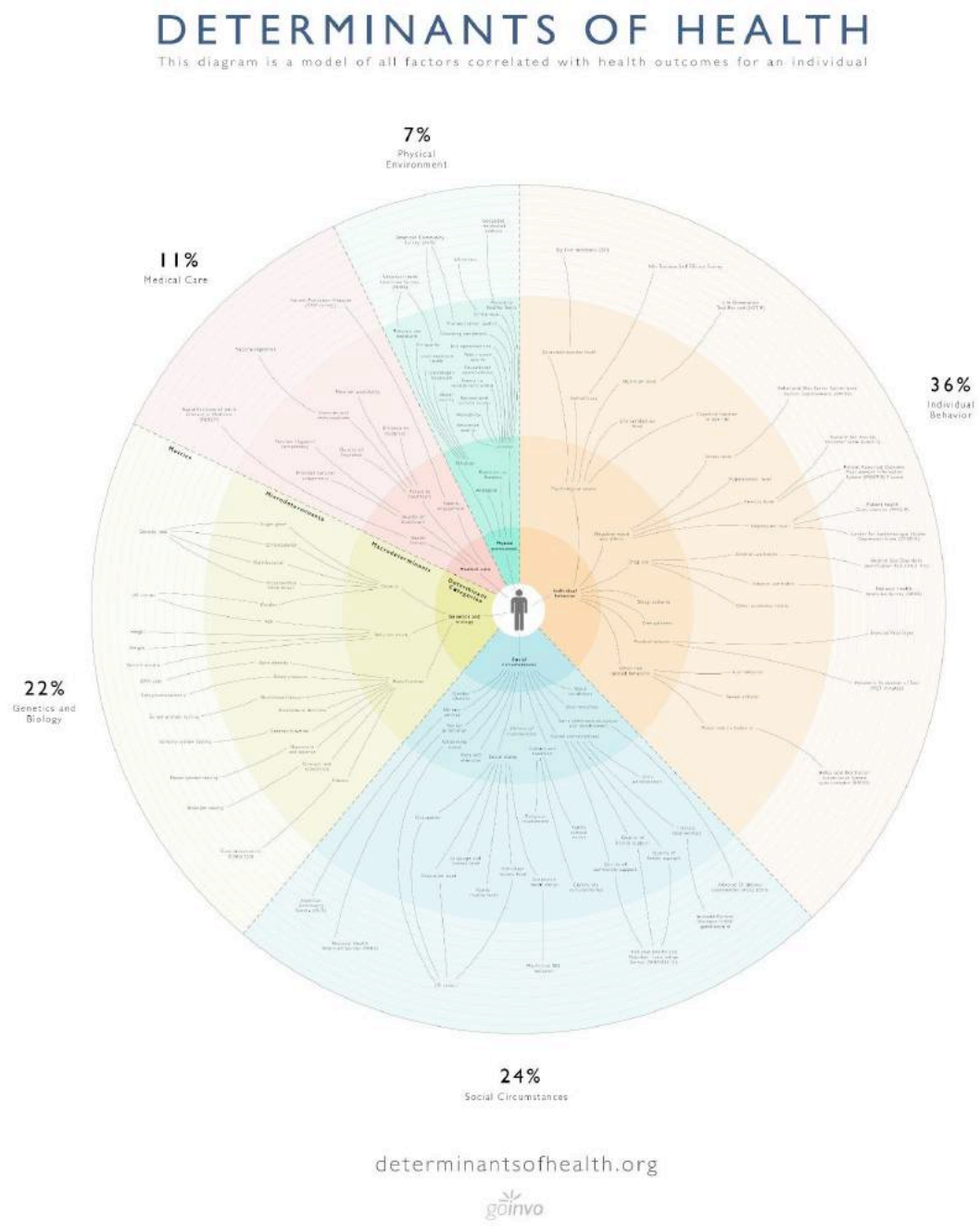
[23] This project is called "Hand Hygiene at work", funded by Innovate UK (2021).

Appendices

Appendix A: 18 core strategies for HPH **(**WHO 2005: 59-60**)**

HP for/ by …	**Patients**	**Staff**	**Community**
HP quality development of treatment & care, by empowerment of stakeholders for health promoting *self-reproduction*	Empowerment of patients for health promoting self care / self maintenance / self reproduction in the hospital (PAT-1)	Empowerment of staff for health promoting self care / self maintenance / self reproduction in the hospital (STA-1)	Empowerment of community health promoting self care / self reproduction by adequate access to hospital (COM-1)
HP quality development of treatment & care, by empowerment of stakeholders for health promoting *co-production*	Empowerment of patients for health promoting participation / co-production in treatment and care (PAT-2)	Empowerment of staff for health promoting participation / co-production in treatment and care (STA-2)	Empowerment of health professionals in the community for health promoting co-production in treatment and after-care of patients (COM-2)
HP quality development for health promoting & empowering hospital setting for stakeholders	Development of hospital into a supportive, health promoting & empowering setting for patients (PAT-3)	Development of hospital into a supportive, health promoting & empowering setting for staff (STA-3)	Development of hospital into a health promoting & empowering setting for the community (COM-3)
Provision of specific HP services - empowering illness management (patient education) for stakeholders	Empowerment of patients for health promoting management of chronic illness (after discharge) (PAT-4)	Empowerment of staff for health promoting management of occupational illness (STA-4)	Empowerment of community population for health promoting management of chronic illness (COM-4)
Provision of specific HP services - empowering lifestyle development (health education) for stakeholders	Empowerment of patients for health promoting lifestyle development (after discharge) (PAT-5)	Empowerment of staff for health promoting lifestyle development (STA-5)	Empowerment of community population for health promoting lifestyle development (COM-5)
Provision of specific HP activities – participation in health promoting & empowering community development for stakeholders	Participation in health promoting & empowering development of community infrastructures for specific patient needs (PAT-6)	Participation in health promoting & empowering development of community infrastructures for specific needs of staff (STA-6)	Participation in health promoting & empowering community development for general population (COM-6)

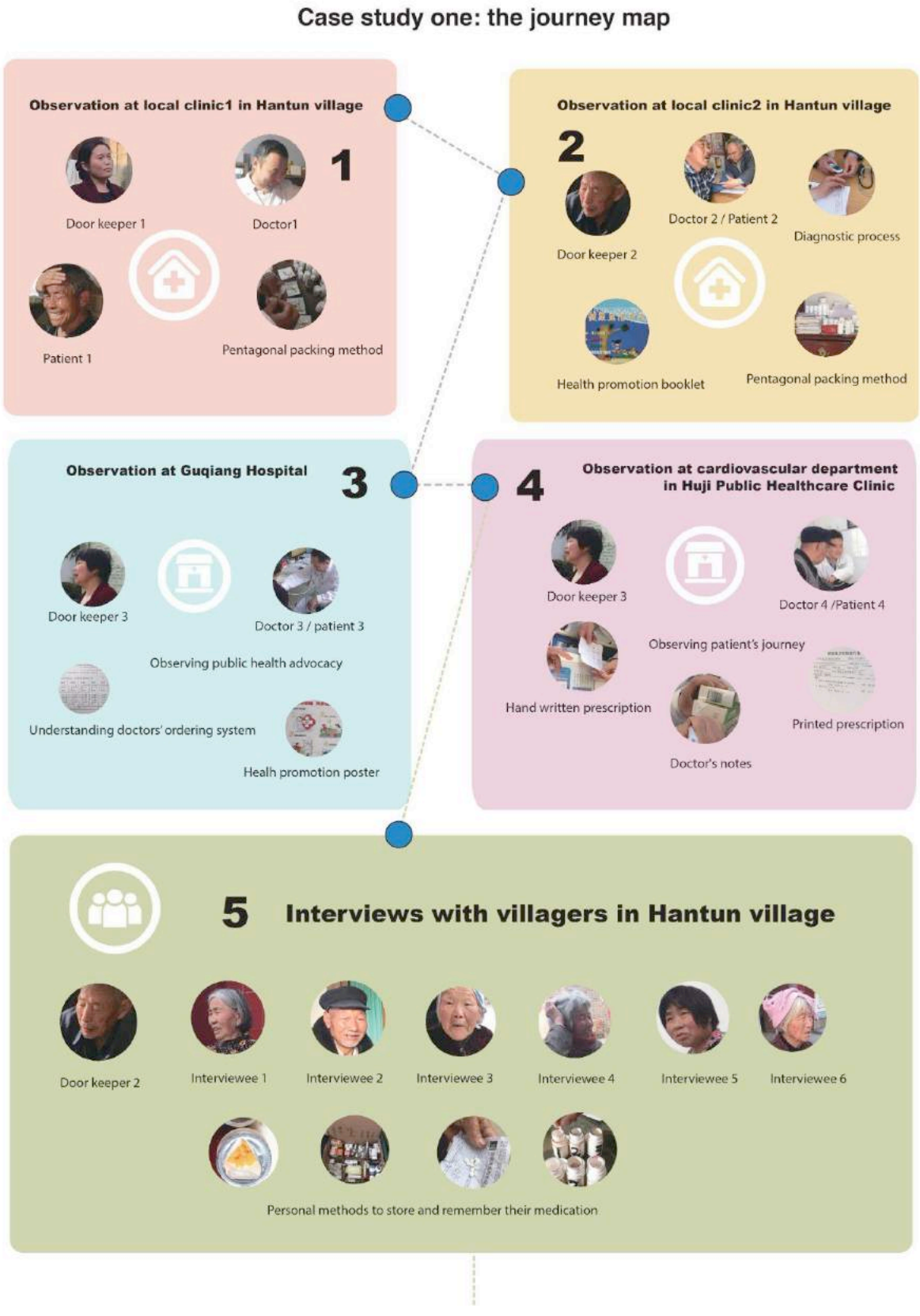
Appendix B: Deterninants of Health (GOIVO 2017)



Appendix C: Comparing diffrent design concepts (Ventura and Bichard 2017)

Concept	Focuses on	Towards the designer or the user	Advantages	Disadvantages	Amount of user involvement
Inclusive	Extreme users, often those who are socially excluded due to age or ability but increasingly socio-economic exclusions	The designer focuses on a smaller population	Brings extreme users to the forefront of the design process	The term is ambiguous, shouldn't every contemporary design be inclusive? Does this approach stem from a marketing-centred approach to broaden the brand's market or is it truly interesting in creating democratic design?	Depends on the project, since the context can drive the user involvement which can be intensive
Empathic	A humanistic approach focused on understanding the user's world	As in Geertz's classic depiction, the designer looks through the user's eyes, yet the focal point is the designer	A deeper consideration of the user's needs and constraints	While positive as an approach, the users do not take active part in the design process	Depends on the project
Co-design	Users actively participate in the design process	The designer leads the users towards integrating their needs into the design process	The design process benefits from the unique knowledge of both the designer and the users	The designer leads the design process, taking into consideration all the design aspects, of which user knowledge is one aspect	Context/project dependant
Participatory	A partnership between the designer and the users in the design process	An ideological commitment to considering user involvement in the design process	The users are embedded in the design process	While better than the previous concepts, this approach is still focused on the somewhat limited sphere of the designed product	Considerable, but again, in relation with the context/project
Social Design	Offers deeper understanding of the socio-cultural worlds of the users and the designer	Design anthropology serves to mediate between the two	Strives to take into consideration multi facets of the design situation	This lengthier process, based on design anthropology highlights broader socio-cultural, economic and ethical issues influencing the broader margins of the design process	The design anthropologist serves as mediator between the design partners, designers and other parties in the wider design network

Appendix D : The journey of case studies (Ai 2018-2019)



6 Participatory workshop

Idea triggers, interactive brainstorming

Co- creation

Visual prototype from participants

7 Network connection

Reporting to an officer at the National Health Commission of China

Introducing me to an officer at the National Health Centre

8 Hospital site visits

Introducing me to several hospital visits

Wuhan

Wuhan University Stomatological Hospital
(one door keeper, one health promoting expert)

Preliminary site visit

Wenzhou

The Eye Hospital of Wenzhou Medical College
(one door keeper, one health promoting expert, two doctors)

Nanjing

JiangSu Provincial Center for Disease Control and Prevention
(one door keeper, three health promoting experts)

Jiangsu People's Hospital
(one door keeper, one doctor, three nurses)

JiangSu Provincial Maternal and Child Health Hospital
(one door keeper, one doctor)

Agreed to next cooperation (case study two)

Case study two: the journey map

1 Secondary site visits

Observation at the children's department

Door keeper 1

Understanding their health promoting methods

2

Meeting with health promoting teams

Finding a third partner: TIMI Art School

Initial meetings with the headmaster

3

Network building

Literature review **4**

Children's hospitals: Literature review

Design education review

Review of current elementary art design education in Wuhan

5

Designing and preparing a curriculum

(with one headmaster, one deputy head, one course supervisor, two teachers)

Three weeks participatory art design-based dental health promotion course **6**

(with one course supervisor, two teachers, 12 students)

Preliminary incentives
Playful creative making
Empathetic teaching
Narrative drawing

7

Interactive exhibition as practice evaluation

Interactive game with parents and children

Artwork display Questionnaires

Presentation and awards

"Fashion show"

Appendix E: The example of health archive of vulnerable residents in Hantun

附件 1

老年人中医药健康管理服务记录表

姓名：

编号：□□□-□□□□□

请根据近一年的体验和感觉，回答以下问题。	没有（根本不/从来没有）	很少（有一点/偶尔）	有时（有些/少数时间）	经常（相当/多数时间）	总是（非常/每天）
(1) 您精力充沛吗？（指精神头足，乐于做事）	1	2	3	4	5
(2) 您容易疲乏吗？（指体力如何，是否稍微活动一下或做一点家务劳动就感到累）	1	2	3	4	5
(3) 您容易气短，呼吸短促，接不上气吗？	1	2	3	4	5
(4) 您说话声音低弱无力吗？（指说话没有力气）	1	2	3	4	5
(5) 您感到闷闷不乐、情绪低沉吗？（指心情不愉快，情绪低落）	1	2	3	4	5
(6) 您容易精神紧张、焦虑不安吗？（指遇事是否心情紧张）	1	2	3	4	5
(7) 您因为生活状态改变而感到孤独、失落吗？	1	2	3	4	5
(8) 您容易感到害怕或受到惊吓吗？	1	2	3	4	5
(9) 您感到身体超重不轻松吗？（感觉身体沉重）[BMI 指数 = 体重（kg）/ 身高^2（m）]	1（BMI < 24）	2（24 ≤ BMI<25）	3（25 ≤ BMI<26）	4（26 ≤ BMI<28）	5（BMI ≥ 28）
(10) 您眼睛干涩吗？	1	2	3	4	5
(11) 您手脚发凉吗？（不包含因周围温度低或穿的少导致的手脚发冷）	1	2	3	4	5
(12) 您胃脘部、背部或腰膝部怕冷吗？（指上腹部、背部、腰部或膝关节等，有一处或多处怕冷）	1	2	3	4	5
(13) 您比一般人耐受不了寒冷吗？（指比别人容易害怕冬天或是夏天的冷空调、电扇等）	1	2	3	4	5

Translated by the researcher:

Please answer the following questions according to your feelings over the past 12 months	**No/ never**	**A little**	**Sometimes**	**Frequently**	**All the time**
1. Are you energetic? (full of energy and positive)	1	2	3	4	5
2. Do you feel easily fatigued?	1	2	3	4	5
3. Do you feel short of breath?	1	2	3	4	5
4.Do you have energy to talk or speak quietly?	1	2	3	4	5
5.Do you feel depressed?	1	2	3	4	5
6. Do you feel anxious / nervous?	1	2	3	4	5
7. Do you feel helpless / lonely?	1	2	3	4	5
8. Do you feel scared / frightened?	1	2	3	4	5
9. What is your BMI index? (BMI = weight/height)	BMI<24	24≤BMI <25	25≤BMI<26	26≤BMI<28	BMI≥28
10. Are your eyes dry?	1	2	3	4	5
11. Do your hands and feet feel cold?	1	2	3	4	5
12. Do your stomach / back / joints always feel cold?	1	2	3	4	5
13. Can you feel it's more difficult to bear cold / hot weather compared to others? (e.g.: cannot use air-conditioning / fan)	1	2	3	4	5

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